

FUNDAMENTALS OF NURSING

STANDARDS & PRACTICE

SECOND EDITION

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S.C.D.

*To Wayne, Kelly, Wayne Jr., Gretchen, and Michael
P.K.L.*

*We dedicate this book to our grandchildren,
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Preface

*H*ealth care is changing like never before. Every day there are new technologies, new treatments, and new pressures. Changes in response to social, political, and economic factors are challenging and changing everything—including nursing. This text addresses these changes by recognizing that students, now and in the future, will have less clinical experience in acute care settings and more exposure to alternate settings, such as skilled nursing units, home health, and outpatient clinics, for clinical learning experiences.

A holistic concept of people, health, wellness, and healing is used to avoid the fragmentation that may occur in some health care settings. A holistic perspective focuses on all dimensions of an individual, including physiological, psychological, social, cultural, cognitive, and spiritual. An individual cannot be divided into separate entities and still be viewed as a unique being. In keeping with the holistic perspective, many concepts (such as sexuality, spirituality) have been integrated throughout the text.

Special attention has been given to provide a clear, concise presentation of content that is realistic for the beginning nursing student. This text is timely in its approach to content, recognizing the inherent changes affecting the health care delivery system and the nursing curriculum. The authors recognize the student as an active participant who assumes a collaborative role in the learning process. Content is presented to challenge the student to develop critical thinking skills.

ORGANIZATION

Unit I, *Nursing's Perspective: Past, Present and Future*, explores many aspects that are essential to nursing. A historical overview of early leaders and social forces that have influenced the development of nursing practice is provided. The theoretical frame-

works for guiding professional practice and the significance of incorporating research into nursing practice are emphasized. The evolution of our current health care delivery system is discussed with attention given to proposals for change.

Unit II, *Nursing Process, The Standard of Care*, explains each component of the nursing process. The nursing process is the framework for delivering holistic care in an organized scientific manner. A chapter on critical thinking leads the unit discussion of the five phases of the nursing process.

Unit III, *The Therapeutic Nature of Nursing*, discusses the caring nature of nursing as demonstrated through therapeutic communication and actions. Nursing, by definition and purpose, is a therapeutic process. Improving interpersonal and therapeutic effectiveness through knowledge and skills are key to this unit presentation. Nurses' roles in client education are addressed. Complementary and alternative treatment modalities are presented here.

Unit IV, *The Individual and Health*, focuses on the holistic nature of individuals and nursing as a holistic discipline. The impact on an individual's health related behaviors are discussed in relation to the life cycle, aging, stress, culture, self-concept and reaction to loss.

Unit V, *Professional Accountability*, addresses accountability from the professional, legal and ethical perspectives. Documentation and quality management are discussed in detail in this unit.

Unit VI, *Diagnostic and Therapeutic Interventions*, present many of the fundamental skills and tools for providing nursing care. Step-by-step instruction and rationale are provided for each of the skills presented.

Unit VII, *Nursing Management of Basic Needs*, discusses areas of nursing care that are common to every area of practice. Concepts such as safety and infection control, mobility, fluid and electrolyte balance, skin integrity, and nutrition are described. Step-by-step skill presentation with rationale is also presented for each chapter.

CONCEPTUAL APPROACH

The concept for *Fundamentals of Nursing* arose from a need identified by the authors for a straightforward, well-organized, and easily read and assimilated text. Content is designed to challenge students to view nursing as a holistic and caring practice based on theory and research. Similar concepts have been grouped together to encourage students to learn through association; this method of presentation also prevented duplication of content, which allowed the authors to create several unique chapters.

Chapter 11

Nursing is an art and science of caring and healing that promotes health. The art of caring is implemented through the nursing process. Healing is a process that empowers both the health care recipient and provider. Health is a relative concept focusing on the client's abilities and assets, regardless of the presence or absence of "disease." The caring aspect of nursing is highlighted in this chapter.

Chapter 14

Due to the phenomenal increase in consumer use of complementary and alternative treatment approaches, the authors decided it was imperative that students understand some of the complementary and alternative approaches to healing.

Chapter 17

To present the dynamic, flowing concepts of growth and development, the life cycle is presented in one comprehensive chapter.

Chapter 22

Professionalism and accountability is inherent in nursing practice. Even though beginning students assume no formalized managerial role, it is important for them to understand such leadership skills as delegating and collaborating.

Chapter 25

With emphasis on quality in health care organizations, this chapter was designed to encourage students to start implementing quality initiatives at the beginning of their student careers rather than just before graduation.

CHANGES TO THE NEW EDITION

- Coverage of the nursing process has been moved forward, opening with expanded discussion of critical thinking and the nursing process. This lays the foundation for the content presented in later chapters.
- Content related to spirituality and sexuality is emphasized throughout as appropriate so that students may see how these vital aspects affect clients in vital ways. Tables in Chapter 13 emphasize the sexual dimension.
- Increased coverage of family and community health concepts—especially in Chapter 11 on the legal framework. Home health care content is also emphasized throughout in order to highlight the many arenas of contemporary client care.
- Coverage of Complementary/Alternative Treatments is covered in Chapter 14 and is highlighted in each chapter, as appropriate, reflecting the author's holistic philosophy.
- New unit on "Diagnostic and Therapeutic Interventions," which includes vital signs and physical assessment, diagnostic testing, care of perioperative clients, and medication administration.
- Discussion of quality has been integrated with that of accountability to highlight the importance of keeping the "care" in nursing care in an age of a cost-conscious, business-oriented health care system.
- The chapter on mobility has been totally revised, now emphasizing the impact of immobility on health status. It also presents information on the functional aspects of mobility.
- The overall number of boxed items was reduced to enhance clarity of presentation.
- A clinical companion is available that contains many valuable reference tools as well as every skill presented in the book—perfect for use in a clinical setting.
- Free CD-ROM at back of book contains flashcard software that reviews concepts on a chapter-by-chapter basis.
- DeLaune home page (<http://delaune.Delmar-Nursing.com>) contains free student resources: chapter summaries, frequently asked questions, course notes and more. Instructor resources include downloadable supplements and a library of over 100 nursing case studies.

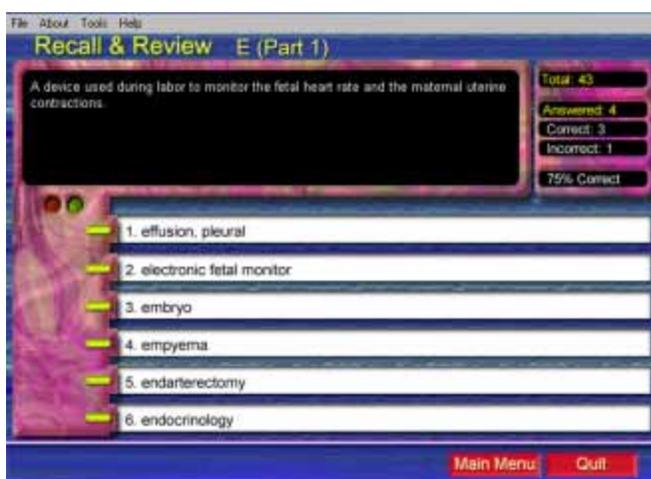
EXTENSIVE TEACHING/LEARNING PACKAGE

The complete Supplements Package was developed to achieve two goals:

1. To assist students in learning the essential skills and competencies needed to secure a career in the area of nursing
2. To assist instructors in planning and implementing their programs for the most efficient use of time and other resources

Student Tutorial CD-ROM

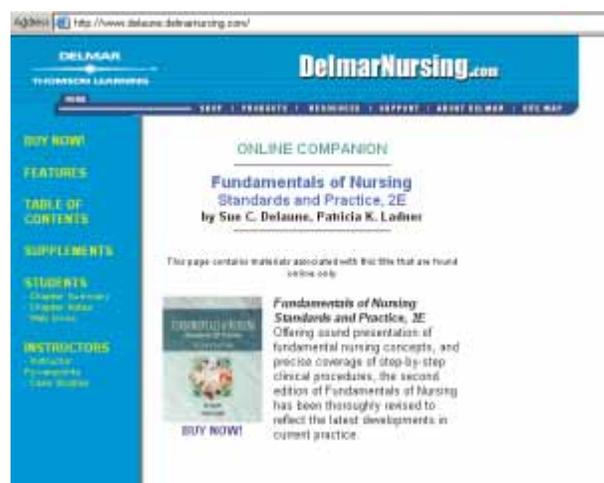
A free student tutorial CD-ROM is packaged with each text. It is a computerized flashcard question-and-answer program designed to help users learn and retain large amounts of information quickly and easily. This CD-ROM contains terms and definitions in a question-and-answer format to aid in overall understanding of the complexity of human illness. This unique program provides a fun, self-paced environment for anyone learning or brushing up on nursing concepts. User-defined preferences control how information is presented—in what order, pause length between questions, and more. FLASH! Displays the question with the answer automatically or manually. System requirements: 100 MHz Pentium, 24 MB RAM, Microsoft Windows 95 or newer SVGA 24-bit color display, 8 MB free disk space.



Online Companion

Delmar offers a series of Online Companions™. Through the Delmar site on the World Wide Web, the DeLaune Online Companion™ allows users of *Fundamentals of Nursing: Standards and Practice*, 2nd edition, to access a wealth of information designed to enhance the book.

- Student resources such as Power Notes (an online PowerPoint presentation that supplements the text's coverage) and chapter summaries that students may access anyplace, anytime.
- Instructor resources such as additional case studies and downloadable supplements.



To access the site for *Fundamentals of Nursing: Standards and Practice*, 2nd edition, simply point your browser to <http://DeLaune.DelmarNursing.com>.

Clinical Companion

ISBN 0-7668-2455-1

The *Clinical Companion* is an invaluable resource for any student nurse. A convenient, portable sized volume, the *Companion* includes many useful tools and resources—including every skill presented in the book, many lab findings, and much more.

Student Study Guide

ISBN 0-7668-2453-5

Containing over 500 questions in an easy-to-use format, this study aid builds on and reinforces the content that is presented in the text. Students have an avenue to learn key concepts at a pace that is comfortable for them.

Features:

- Multiple question types—true/false, matching, sequencing, multiple choice, short answer, and essay.
- Various levels of difficulty.
- Questions built upon the key concepts on a chapter-by-chapter basis.

Skills Checklist to Accompany *Fundamentals of Nursing: Standards & Practice, Second Edition*

ISBN 0-7668-2454-3

This teaching/learning tool contains key steps for every procedure in *Fundamentals of Nursing: Standards & Practice*, Second Edition by Sue C. DeLaune and Patricia K. Ladner. These checklists may be used to help students evaluate their comprehension and execution of the procedures.

Key Features:

- Three categories to document performance: able to perform, able to perform with assistance, and unable to perform
- Comments section at each step for constructive feedback
- Easy-to-follow format

Classroom Manager

ISBN # 0-7668-2457-8

A must have for all instructors, this comprehensive and resource packed three-ring binder includes:

Instructor's Guide

- **Key Terms**—The key terms for each chapter are listed alphabetically with corresponding definitions.
- **Instructional Strategies**—Centered around the competencies at the beginning of each chapter, Critical Thinking questions, followed by a student activity (group and/or individual), are provided to enhance student comprehension and critical thinking skills.
- **Additional Resource Aids**—Additional audiovisual, computer programs/software, and web sites are included to increase student awareness of current issues, trends, and skills.
- **Evaluation Strategies**—Five additional discussion questions are provided for each chapter to enhance student writing and thinking skills.

Computerized and Printed Testbank with Electronic Gradebook

- **Testbank**—Computerized testbank includes over 1000 multiple choice questions.
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CD-ROM Image Library

The Image Library is a software tool that includes an organized digital library of approximately 600 illustrations and photographs from the text. A Microsoft Windows 3.1 and Windows 95 application, it can be used with the most common graphics file formats (BMP, TIFF, GIF). This allows the instructor and student to add new images.

With the Image Library you can:

- Create additional libraries.
- Set up electronic pointers to actual image files or collections.
- Sort art by desired categories.
- Print selected pieces.

The Image Library will work in combination with:

- Microsoft PowerPoint for Windows 95, version 7.0 and higher.
- Other Delmar Image Collections.

Color Transparencies

Includes approximately 50 images from the text that provide the instructor with yet another means of promoting student understanding of skills and concepts.

LEARNING ENHANCEMENTS

Also available are several unique CD-ROMSs.

Delmar's Anatomy and Physiology CD-ROM

ISBN 0-7668-2415-2

Intended for any course where a brief review of anatomy and physiology is desired, *Delmar's Anatomy and Physiology CD-ROM* presents anatomy and physiology in an accessible and engaging manner. Organized by body system, the CD-ROM is perfect for self-guided learning or review. Features include:

- Organization by body system.
- Separate quiz and tutorial modes.

Delmar's Heart and Lung Sounds for Nurses CD-ROM

Single User Version: ISBN 0-7668-2416-0

Institutional Version: ISBN 0-7668-4257-6

Auscultation is one of the most difficult skills for student nurses to master. *Delmar's Heart and Lung Sounds for Nurses CD-ROM* is an excellent learning tool that helps nurses identify and interpret normal and abnormal heart and lung sounds. Features include:

- An extensive library of normal and abnormal heart and lung sounds for students to reference.
- A three-part heart sounds module.
- A skill review section includes Overview, Step-by-Step (with actions and rationales), Variations, and Tips and Errors.

Delmar's Nursing Fundamentals Critical Thinking CD-ROM

Single User version: ISBN 0-7668-2456-X

This CD-ROM is an invaluable resource for any nursing fundamentals course. Containing a content-rich library of 20 nursing cases that emphasize clinical decision-making and a dynamic review of anatomy and physiology, *Delmar's Nursing Fundamentals Critical Thinking CD-ROM* will help users both learn valuable concepts and think like a nurse.

Acknowledgments

This textbook is the product of many dedicated, knowledgeable, and conscientious individuals. First, we would like to thank Carol Kneisl for initiating our work on this text. We would like to thank all the contributors who persevered to produce an outstanding contribution to the nursing literature. The content for nursing fundamentals has changed greatly over the past 20 years in an effort to incorporate the advances in nursing theory and research and technology. Your clinical expertise is evident in this final product.

Likewise, we need to thank all the reviewers who critically read and commented on the manuscript. Your clinical and academic expertise provided valuable suggestions that strengthened the text.

Our friends and professional colleagues provided encouragement throughout the development of this manuscript. Thank you for sharing so many of your resources and support with us.

Our families deserve recognition for their daily queries relative to the book, which often stimulated humor, easing a sometimes tedious task. Special thanks to Jay, Jennifer, Katie, and Sarabeth and Wayne, Kelly, Wayne Jr., Gretchen, and Michael for demonstrating daily understanding and support when the book had to be given priority.

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Sue Carter DeLaune earned a Bachelor of Science in Nursing from Northwestern State University, Natchitoches, Louisiana and a Master's degree in Nursing from Louisiana State University Medical Center, New Orleans. She has taught nursing in diploma, associate degree, and baccalaureate schools of nursing, as well as in RN degree-completion programs. With over 30 years experience as an educator, clinician, and administrator, Sue has taught fundamentals of nursing, psychiatric/mental health nursing, and nursing leadership in a variety of programs. She also presents seminars and workshops across the country that assist nurses to

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Sue is a member of the American Holistic Nurses Association, Sigma Theta Tau, and the American Nurses Association. She has been recognized as one of the "Great 100 Nurses" by the New Orleans District Nurses Association.

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Mrs. Ladner has been listed in *Who's Who in American Nursing*. She is currently the Nursing Practice Consultant for the Louisiana State Board of Nursing.



How to Use This Text

The following suggests how you can use the features of this text to gain competence and confidence in your assessment and nursing skills.

PROCEDURE 29-3

Withdrawing Medication from a Vial

Equipment

- Medication administration record (MAR)
- Sterile syringe and needle
- Alcohol swab
- Vial of medication
- Sterile needle

Action

- Wash your hands.
- Prepare the vial.
 - Open the alcohol wipe.
 - New vial, remove metal cap from vial of medicine and cleanse the rubber top of the vial.
 - Used vial, cleanse the rubber top of the vial.
- Prepare syringe.
 - Choose a syringe of appropriate size to accommodate the volume of medication to be withdrawn.
 - Grasp needle and turn barrel of syringe to the right.
 - Remove the needle cap and pull back on plunger to fill syringe with an amount of air equal to amount of solution to be withdrawn from the vial.
- Insert the needle into the center of the upright vial and inject air into the vial.
- Invert vial; keep the vial at eye level and the needle's bevel below the fluid level, and remove the exact amount of medicine while touching only the syringe barrel and plunger tip (Figure 29-17).

Rationale

- Reduces transmission of microorganisms.
- Provides access to vial. Removes surface contamination. (*Note:* Manufacturers do not ensure sterility of rubber top.)
- Ensures a closed system.
 - Ensures withdrawing all the medication at one time.
 - Displaces the solution with air to prevent the formation of a vacuum in the sealed vial.
- Creates positive pressure inside vial to allow accurate withdrawal of medicine.
- Prevents contamination of the plunger, barrel, and medicine.



Figure 29-17 Invert the vial, and keep the needle below the fluid level.

(continues)

Procedures

Procedure boxes are step-by-step guides to performing basic clinical nursing skills. This feature will help you gain competence in nursing skills. Use this feature as a study tool to help you understand the rationale behind the nursing interventions, as a guide for mastery of procedures, and as a review aid for future reference.

RESEARCH FOCUS

Title of Study

“Clinical Decision-Making Process in Perioperative Nursing”

Authors

Parker, C., Minick, P., & Kee, C.

Purpose

The purpose of this phenomenological study was to reveal the processes of clinical decision-making by expert perioperative nurses.

Methods

Six expert nurses from five different hospitals in a large southern metropolitan area participated in the study. Expert nurses were defined as having worked a minimum of 5 years and considered themselves to be expert circulating nurses in the OR. Based on a pre-developed interview guide, the participants were asked to describe any perioperative clinical situation in which they intervened on the patient's behalf and affected the patient's outcome by doing so. The interviews were transcribed verbatim; data were loaded into a software program to categorize, sort, and manage the data.

Findings

The predominant pattern contributing to the clinical decision-making process among the expert nurses was “seeing the big picture: engendered through caring.” Multiple decisions were identified within each nurse's practice, and within each decision, certain characteristics were identified and categorized into themes. Data analysis identified three themes as requisite for expert clinical decision-making: connecting with patients; advocating for patients; and embodied knowing.

Implications

This study demonstrates that positive patient outcomes depend on the ability of the perioperative nurse to integrate all nursing knowledge, make rapid decisions, and constantly advocate for the patient. These data also suggest that nurses and nursing students would both benefit if personal care experiences were shared so that the taken-for-granted knowledge of clinical practice could be examined and caring practices could be made explicit.

Parker, C., Minick, P., & Kee, C. (1999). Clinical decision-making process in perioperative nursing. *AORN Journal*, 70(1), 45–62.

Research Focus

The Research Focus box emphasizes the importance of clinical research in nursing by linking theory to practice. A useful learning tool, the box focuses attention on current issues and trends in nursing, as well as illustrates the correct way to write an abstract for a nursing research paper.

Nursing Process Highlight

Implementation: Client Teaching

The American Nurses Association and various governing bodies support written medication information for clients that is “scientifically accurate, unbiased in content and tone, sufficiently specific and comprehensive, presented in an understandable and legible format, timely, up to date, and useful.” Written medication information should:

- Be appropriate to client literacy levels
- Reflect print size appropriate to client's visual abilities
- Give straightforward instructions
- Include brand and trade names
- Prominently display drug warnings
- Outline indications for use, contraindications, and precautions
- List possible adverse reactions and risks, storage, and use

(From American Nurses Association. [1997, March/April]. *The American Nurse*, 29 [2], 11)

Nursing Process Highlights

These boxes offer a detailed snapshot of a given step of the nursing process and allow you to refer back to the material as needed until you have mastered the step and incorporated the information into your repertoire of clinical nursing skills.

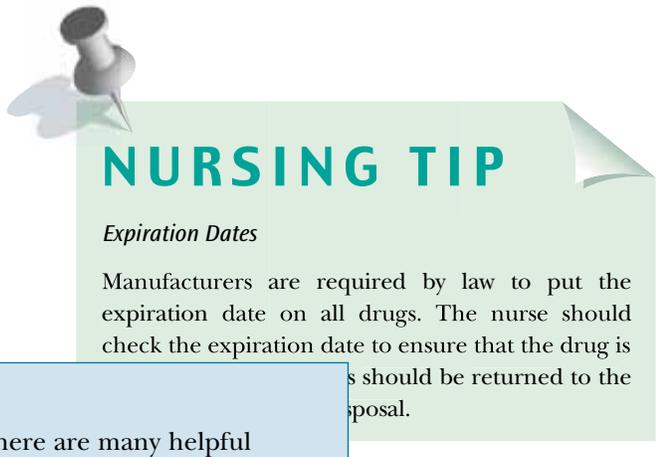
Think About It

This feature helps you to develop sensitivity to ethical and moral issues, and guides you to think critically in clinical situations and be active in problem solving. You may choose to read through each one and explore the issues *before* reading the chapter. Then as you read through the chapter, readdress each Think About It and reevaluate your original thoughts. If you choose to read them as you go through the chapter, perhaps write your thoughts down, then go back and look at them at a later date.

THINK ABOUT IT

Medication Error

While monitoring a client who has an order for Solu-Cortef (anti-inflammatory drug) intravenously, you notice that Solu-Medrol (anti-inflammatory drug) is in the client's room. You recheck the order to make sure that the original order was for Solu-Cortef and that the order was not changed. What should your next action be? How do you feel about the nurse who made the medication error but did not recognize it?



NURSING TIP

Expiration Dates

Manufacturers are required by law to put the expiration date on all drugs. The nurse should check the expiration date to ensure that the drug is safe to use. Expired drugs should be returned to the manufacturer for disposal.

Nursing Tips

In any profession there are many helpful hints that assist you in performing more efficiently. In nursing, you need to be able to practice sensitivity in the process. The wide variety of hints, tips, and strategies presented here will help you as you work toward professional advancement. Study, share, and discuss them with your colleagues.



CLIENT TEACHING CHECKLIST

Safety Measures to Prevent Accidental Poisonings

- Store medications in child-resistant containers (Figure 31-10).
- Do not take medications in front of children.
- Never call medicine candy.
- Limit the number of tablets in a medicine container.
- Place toxic substances in a locked cabinet out of reach of children.

Client Teaching Checklist

As a nurse, you will often be a client's main link to health care. The Client Teaching Checklist is a great resource for ensuring success in teaching exercises and procedures, and in relaying critical information to clients.

- Remove labels from containers.
- Do not place poisonous substances in food or medicine containers.
- Place poison stickers on toxic substances.
- Post poison control center phone numbers in prominent places.
- Post poison control center phone numbers in prominent places.

NURSING CARE PLAN Client at Risk for Injury

Case Presentation

Mr. Simon, age 75, is admitted to the hospital with coronary heart disease (CHD). CHD. He smokes two packs of cigarettes per day, has diabetes mellitus, and is obese.

Assessment

- Weight gain of 7 pounds in past month
- Blood cholesterol 320 mg/dl
- High-density lipoproteins (HDL) 28 mg/dl
- Blood pressure 186/116
- Diminished visual acuity
- Decreased bladder tone
- Weakness and syncope
- Glasgow Coma Scale (GCS) score of 12

Nursing Diagnosis #1

Risk for injury related to sensory dysfunction and altered level of consciousness .

Expected Outcomes

The client will be protected from injury during the hospitalization.

Intervention/Rationale

1. Initiate the fall prevention protocol.
Identifies and reduces risk for injury.
2. Reassess the client's injury status every 4 hours.
Identifies changes and highlights need to modify plan of care.
3. Place the client in a room as close as possible to the nurses station.
Facilitates faster response time to client's needs.
4. Place fall alert signs on the client's door and head of bed.
Alerts other health care workers to client's risk status.
5. Put the bed alarm on.
Helps monitor client status and facilitates prompt response.
6. Monitor the client and the environment every 2 hours.
Provides information on status, progress, and needs of client.
7. Instruct all caregivers to respond promptly to call light.
Ensures rapid response to client's needs.
8. Teach the client to use the call light; reinforce teaching.
Ensures that client has means and knowledge to call for assistance.

Evaluation

Fall prevention protocol implemented; client discharged on third day of hospitalization.

Nursing Care Plan

The Nursing Care Plan walks you through the process of planning care, performing interventions, and evaluating the success of your course of care. These are very helpful in strengthening your understanding of the nursing process in "live" nursing situations, in exercising your critical thinking skills, and for use as a blueprint from which to develop your own complete plans of care.

NURSING ALERT

Systemic Effects of Eyedrops

The nurse should apply pressure to the inner canthus when instilling eyedrops that have potential systemic effects such as atropine (Atropine). Gentle pressure over the inner canthus prevents the medication from flowing into the systemic circulation, decreasing the absorption.

Nursing Alert

As a professional, you will need to be able to react immediately in some situations in order to ensure the health and safety of your patients. Pay careful attention to this feature as it will help you to begin to identify and respond to critical situations on your own, both efficiently and effectively.



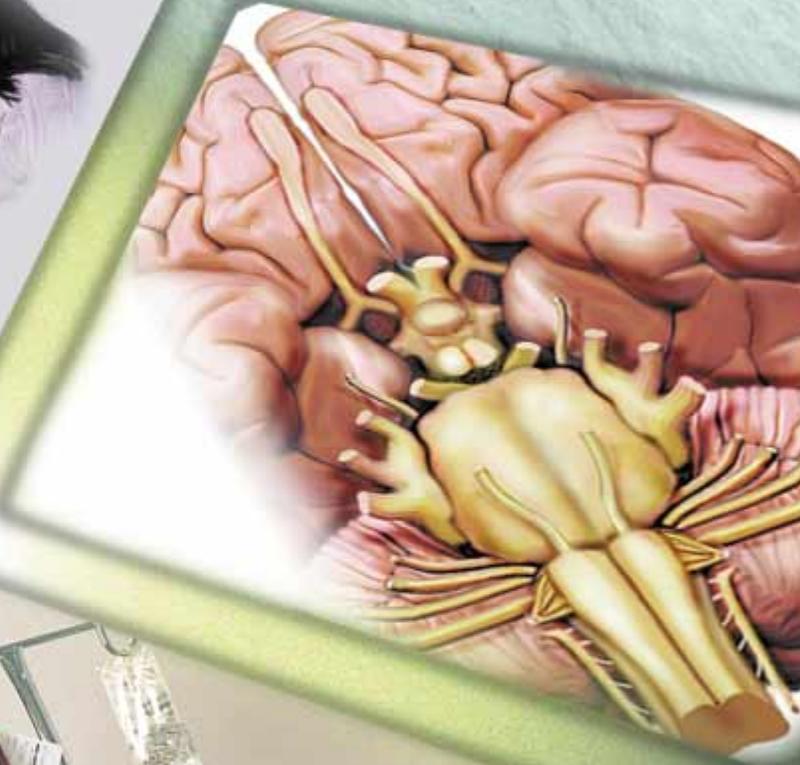
NURSING CHECKLIST

Eye Care for the Comatose Client

- Cleanse eyelids, eyelashes, and eyebrows with warm washcloth at least every 4 hours. Clean from inner to outer canthus.
- If eyes remain open and blink reflex is absent, liquid tear solutions should be applied to prevent corneal drying and ulcerations.
- Eyes can be closed and covered with an eye patch or protective shield. The eye patch or protective shield should be removed at least every 4 hours to assess eyes and provide care.

Nursing Checklist

Nursing Checklist boxes outline important points for you to consider before, during, and after utilizing the nursing process. Checklists are your reference guide to using critical thinking in nursing and to understanding the steps in the nursing process.



Unit



Nursing's Perspective: Past, Present, and Future

- 1 Evolution of Nursing and Health Care
- 2 Theoretical Foundations of Nursing
- 3 Nursing Education and Research
- 4 The Health Care Delivery System

Evolution of Nursing and Health Care



All history is modern history.

—Wallace Stevens,
American poet and author (1879–1955)

COMPETENCIES

1. Define nursing as an art and a science.
2. Identify major historical and social events that have shaped current nursing practice.
3. Describe Florence Nightingale's impact on current nursing practice.
4. Discuss the contributions of early leaders in American nursing.
5. Discuss the impact of selected landmark reports on nursing education and practice.
6. Relate the social forces of nursing's evolution to the current status of advanced practitioners.

KEY
TERMS

autonomy
empowerment
evidence-based practice
health maintenance organization
history
nursing
primary health care



Figure 1-1 Graduating Class (1900) of Touro Infirmary Training School for Nurses (Photo courtesy of Touro Infirmary Archives, New Orleans, LA)

Nursing is an art and a science by which people are assisted in learning to care for themselves whenever possible and cared for by others when they are unable to meet their own needs.

Nursing has evolved from an unstructured method of caring for the ill to a scientific profession. The result has been movement from the mystical beliefs of primitive times to a “high-tech, high-touch” era. Nursing combines art and science. Using scientific knowledge in a humane manner, nursing combines critical thinking skills with caring behaviors.

Nursing requires a delicate balance of promoting clients’ independence and dependence. Nursing focuses not on illness but rather on the client’s *response* to illness.

Nursing promotes health and helps clients move to a higher level of wellness. This aspect of nursing also includes assisting a client with a terminal illness to maintain comfort and dignity in the final stage of life.

This chapter traces the evolution of nursing by exploring its rich heritage. Social forces that have affected the development of nursing are examined.

HISTORICAL OVERVIEW

To understand the present status of nursing, it is necessary to have a base of historical knowledge about the profession. By studying nursing history, the nurse is better able to understand such issues as **autonomy** (being self-directed), unity within the profession, supply and demand, salary, education, and current practice. **History** is a study of the past that includes events, situations, and individuals (Figure 1-1). By learning from historical role models, nurses can enhance their abilities to create positive change in the present and set a course for the future.

The study of nursing history offers another advantage—learning where the profession has been and its advancements. **Empowerment** is the process of enabling others to do for themselves. Only when nurses are empowered are they truly autonomous. Autonomy has

THINK ABOUT IT

Lessons from History

Think of some lessons you have learned from the past. Can you identify some life experiences that have been excellent teachers? List two lessons gained from these experiences or situations.

historically been difficult for nurses to achieve. Empowerment and autonomy go together and are necessary for nursing to bring about positive changes in health care today (Figure 1-2). Power is not authority—authority is power. See Chapter 10 for further discussion of this topic.

Learning from the past is the major reason for studying history. Ignoring nursing’s history can be detrimental to the future of the profession. By applying the



Figure 1-2 Through consultation and exchange of information, nurses demonstrate their roles as autonomous professionals. How important are the qualities of autonomy and empowerment to your career goals?

lessons gained from a historical review, nurses will indeed be a vital force in the new millennium.

Evolution of Nursing

Nursing has evolved with the development of civilization of mankind. Refer to Table 1-1 and the following for a discussion of nursing from early civilizations to the present era of advanced nursing practice and health care reform.

THINK ABOUT IT

Attributes of Nursing Leaders

Personal power comes to individuals who are clear about what they want from life and who see their work as essential to the contributions they wish to make. As you read about nursing leaders, reflect on the personal traits that empowered them to direct change and shape nursing's future in health care.

Early Civilizations

The evolution of nursing dates back to 4000 BC, to primitive societies in which mother-nurses worked with priests. In 2000 BC, the use of wet nurses is recorded in Babylonia and Assyria.

Ancient Greece

The ancient Greeks built temples to honor Hygiea, the goddess of health. These temples were more like health spas rather than hospitals in that they were religious institutions governed by priests. Priestesses (who were not nurses) attended to those housed in the temples. The nursing that was done by women was performed in the home.

Roman Empire

Hospitals were first established in the Eastern Roman Empire (Byzantine Empire). St. Jerome was responsible, through one of his disciples, Fabiola, for introducing hospitals in the West. Western hospitals were primarily religious and charitable institutions housed in monasteries and convents. The caregivers had no formal training in therapeutic modalities and volunteered their time to nurse the sick.

Middle Ages

Hospitals in large Byzantine cities were staffed primarily by paid male assistants and male nurses. During the

medieval era, these hospitals were established primarily as almshouses, with care of the sick being secondary.

Medical practices in Western Europe remained basically unchanged until the 11th and 12th centuries, when formal medical education for physicians was required in a university setting. Although there were not enough physicians to care for all the sick, other caregivers were not required to receive any formal training. The dominant caregivers in the Byzantine setting were men; however, this was not true in the rural parts of the Eastern Roman Empire and in the West. In these societies, nursing was viewed as a natural nurturing job for women.

Renaissance

During the Renaissance (AD 1400–1550), interest in the arts and sciences emerged. This was also the time of many geographic explorations by Europeans. As a result, the world literally expanded.

Because of renewed interest in science, universities were established, but no formal nursing schools were founded. Because of social status and customs, women were not encouraged to leave their homes; they continued to fulfill the traditional role of nurturer/caregiver in the home.

Enlightenment and Industrial Revolution

The Industrial Revolution introduced technology that led to a proliferation of factories. Conditions for the factory workers were deplorable. Long hours, grueling work, and unsafe conditions prevailed in the workplace. The health status of laborers received little, if any, attention.

Medical schools were founded, including the Royal College of Surgeons in London in 1800. In France, men who were barbers also functioned as surgeons by performing procedures such as leeching, giving enemas, and extracting teeth.

At the end of the 18th century, there were no standards for nurses who worked in hospitals. In the early to mid-1800s, nursing was considered unseemly for women even though some hospitals (almshouses) relied on women to make beds, scrub floors, and bathe the poor. Most nursing care was still performed in the home by female relatives of the ill.

Religious Influences

The strong influence of religions on the development of nursing started in India (800–600 BC) and flourished in Greece and Ireland in 3 BC with male nurse-priests.

In 1836, Theodor Fleidner revived the Church Order of Deaconesses to care for those in a hospital he had founded. These deaconesses of Kaiserwerth became famous because they were the only ones formally

TABLE 1-1
Historical Events Influencing the Evolution of Nursing

Date	Event
4000 BC	Primitive societies
2000 BC	Babylonia and Assyria
800–600 BC	Health religions of India
700 BC	Greece: source of modern medical science
460 BC	Hippocrates
3 BC	Ireland: pre-Christian nursing
AD 390	Fabiola: founded first hospital
390–407	Early Christianity, deaconesses
711	Field hospital with nursing, Spain
1100	Ambulatory clinics, Spain (Moslems)
1440	First Chairs of Medicine, Oxford and Cambridge
1522	Military nursing orders
1600–1752	Deterioration of hospitals and nursing
1633	Founded: Daughters of Charity
1820	Florence Nightingale born
1826	Kaiserwerth deaconesses reestablished
1837	First American college for women, Mount Holyoke
1841	Founded: Nursing Sisters of the Holy Cross
1848	Women's Rights Convention, Seneca Falls, New York
1854–1856	Crimean War
1859	<i>Nightingale's Notes on Nursing</i> published in England
1860	First Nightingale School of Nursing, St. Thomas' Hospital, London
1861–1865	Civil War, United States
1863	Charter granted to the New England Hospital for Women, Boston
1871	New York State Training School for Nurses, Brooklyn Maternity, Brooklyn, New York
1872	New England Hospital for Women: one year program for nurses America's first trained nurse, Linda Richards
1873	First three Nightingale schools in United States: Bellevue (New York City), Connecticut, and Massachusetts General
1881	Founded: American Red Cross
1882	Founded: American Association of University Women
1888	Founded: International Council of Women (ICW) Founded: National Council of Women (NCW)
1893	First Nurses' Settlement House, New York City, founded by Lillian Wald and Mary Brewster Founded: first American Nursing Society, American Society of Superintendents of Training Schools for Nurses (Superintendents' Society)

(continues)

TABLE 1-1 (continued)
Historical Events Influencing the Evolution of Nursing

Date	Event
1896	Founded: National Association of Colored Women
1896–1911	Founded: Nurses' Associated Alumnae of the United States and Canada (Associated Alumnae)
1899	Founded: International Council of Nurses (ICN) First postgraduate courses for nurses at Teachers College, Columbia University
1900	<i>American Journal of Nursing</i> (AJN)
1901–1912	Founded: American Federation of Nurses (Federation) Federation Joins NCW and ICW
1903	New York: efforts failed to pass a nurse licensing law North Carolina: passes first state nurse registration law Founded: Army Nurse Corps
1905	Federation withdraws from NCW and joins ICN
1908	National Association of Colored Graduate Nurses (NACGN) Founded: Navy Nurse Corps
1909	Founded: first 3-year diploma school in a university setting at University of Minnesota
1910	Flexner report
1911	Founded: American Nurses Association (ANA), formerly the Associated Alumnae
1912	Founded: National Organization of Public Health Nursing (NOPHN) Founded: National League of Nursing Education (NLN), formerly the Superintendents' Society ANA represents American nurses at ICN Nutting Report: Educational Status of Nursing Developments in preventive medicine Founded: Town and Country Rural Nursing Service
1913	Founded: National Women's Party
1916	Founded: National Association of Deans of Women
1920	Founded: National League for Women Voters Congress passes the federal suffrage amendment
1920s	Depression: social programs and health insurance First prepaid medical plan, Pacific Northwest Founded: Bureaus of Medical Services Hospitals offered a prepaid plan Baylor Plan (prototype of Blue Cross) Goldmark report
1921	Women earn right to vote
1922	Studies of institutional nursing
1923	Studies of nursing education

(continues)

TABLE 1-1 (continued)
Historical Events Influencing the Evolution of Nursing

Date	Event
	Founded: Yale University School of Nursing
1926	Burgess report
1933	American Hospital Association endorses Blue Cross
1938	American Medical Association endorses Blue Shield
	Economic Security Program for Nurses
1940	Cost studies of nursing education and service
1943	Founded: Federal Cadet Nurse Corps
1948	Brown report: <i>Future of Nursing</i>
1953	U.S. Public Health Services Studies in Nursing Education
1955	Practical Nursing (Title III) Health Amendment Act
1956	Hughes study: <i>20,000 Nurses Tell Their Stories</i>
1960s	Created: Medicare and Medicaid
1961	Surgeon General's Consultant Group
1964	Nurse Training Act
1965	First nurse practitioner program, pediatric
	ANA position paper on entry into practice
1966	Educational opportunity grants for nurses
1970	Secretary's commission to study extended roles for nurses
1973	Health Maintenance Organization Act
1977	Rural Health Clinic Service Act
	National Commission for Manpower Policy Study
1979	U.S. Surgeon General Report <i>Healthy People</i>
1980	Omnibus Budget Reconciliation Act
1982	Budget cut to Health Maintenance Organization Act
	Tax Equity Fiscal Responsibility Act (TEFRA)
1983	Institute of Medicine Committee on Nursing and Nursing Education study
1987	Secretary's Commission on Nursing
1990s	Health care reform
1991	U.S. Department of Health and Human Services Healthy People 2000
1997	Agency for Health Care Policy and Research, now known as the Agency for Healthcare Research and Quality, established 12 evidence-based practice centers
2000	U.S. Department of Health and Human Services Healthy People 2010

trained in nursing. Pastor Fleidner had a profound influence on nursing because Florence Nightingale received her nurse's training at the Kaiserwerth Institute.

The Nursing Sisters of the Holy Cross was founded in LeMans, France by Father Bassil Moreau in 1841. Father Sorin brought four sisters to Notre Dame in South Bend, Indiana in 1841. In 1844, these sisters established St. Mary's Academy in Bertrand, Michigan. In 1855, the school was moved to Notre Dame and became known as Saint Mary's College, which became influential on the emerging role of women.

Florence Nightingale

Florence Nightingale is considered the founder of modern nursing. She grew up in a wealthy upper-class family in England during the mid-1800s. Unlike other young women of her era, Nightingale received a thorough education including Greek, Latin, history, mathematics, and philosophy. She had always been interested in relieving suffering and caring for the sick. Social mores of the time made it impossible for her to consider caring for others because she was not a member of a religious order. She became a nurse over the objections of society and her family.



Title of Study

"Religion, Gender, and Autonomy: A Comparison of Two Religious Women's Groups in Nursing and Hospitals in the Late Nineteenth and Early Twentieth Centuries"

Authors

Marshall, E. S., & Wall, B. M.

Purpose

This comparative study examines cases of Catholic nuns and Mormon women, and their effect on nursing in the American frontier in the 1800s and 1900s. The purpose of the study was to show how beliefs about religion and gender translated into power that women used to effectively administer health care services.

Method

A comparative study of selected case studies was done to analyze the effect of Catholic nuns and Mormon women on the delivery of nursing care in the pioneer American West.

Findings

The two groups studied, Catholic nuns and Mormon women, lived in separate cultures on the frontier together. However, there are remarkable parallels in religious devotion, unique gender initiatives, autonomy, and the use of power. The numerous parallels include the following:

- The women in both groups were strong and capable in a society that promoted modesty and self-effacement of women.
- Women of both groups had a compelling sense of purpose ("mission") that empowered them to provide health care services.
- They received trust and support from male leaders because of their religious beliefs that broadened their roles in the community.
- The religious calling or mission did not interfere with or compromise professional competence of the women.
- Both groups of women had a privileged status and authority within their communities.

Implications

The role of religious groups in the American frontier has been largely ignored by modern historical research. This study is the beginning effort to focus importance on the experience of women as nurses and administrators of health care institutions.

Marshall, E. S., & Wall, B. M. (1999). Religion, gender, and autonomy: A comparison of two religious women's groups in nursing and hospitals in the late nineteenth and early twentieth centuries. *Advances in Nursing Science*, 22(1), 1–22.

After completing the 3-month course of study at Kaiserwerth Institute, Nightingale became active in reforming health care. The advent of Britain's war in the Crimea presented the stage for Nightingale to further develop the public's awareness of the need for educated nurses (Figure 1-3). The implementation of her principles in the areas of nursing practice and environmental modifications resulted in reduced morbidity and mortality rates during the war.

Nightingale forged the future of nursing education as a result of her experiences in training nurses to care for British soldiers. She established the Nightingale Training School of Nurses at St. Thomas' Hospital in London. This was the first school for nurses that provided both theory-based knowledge and clinical skill building. She revolutionized not only the public's perception of nursing but also the method for educating nurses. Some of Nightingale's novel beliefs about nursing education were:

- A holistic framework inclusive of illness and health
- The need for a theoretical basis for nursing practice
- A liberal education as a foundation for nursing practice
- The importance of creating an environment that promotes healing
- The need for a body of nursing knowledge that was distinct from medical knowledge (Nightingale, 1969)

Nightingale introduced many other concepts that, though unique in her time, are still used today. She advocated: (1) having a systematic method of assessing clients; (2) individualizing care on the basis of the client's needs and preferences; and (3) maintaining confidentiality.

Nightingale also recognized the influence of environmental factors on health. She advocated that nurses provide clean surroundings with fresh air and light to improve the quality of care (Nightingale, 1969). Nightingale believed that nurses should be formally educated and should function as client advocates.

Nursing and the Civil War

America's need for nurses increased dramatically during the Civil War (1861–1865). The sisters of the



Figure 1-3 Florence Nightingale in the Crimea (Photo courtesy of Parke-Davis, a division of Warner-Lambert Company)

Holy Cross were the first to respond to the need for nurses during the Civil War. Answering a request of Indiana's governor, 12 sisters started caring for wounded soldiers. By the end of the war, 80 sisters had cared for soldiers in Illinois, Missouri, Kentucky, and Tennessee.

During the Civil War, nursing care was provided by the Sisters of Mercy, Daughters of Charity, Dominican Sisters, and the Franciscan Sisters of the Poor. The sisters were influenced by the roles assigned to women during the 19th century. Although they were submissive to authority, they were willing to take risks when human rights were threatened. Women volunteered to care for the soldiers of both the Union and Confederate armies (Figure 1-4). These women performed various duties, including the implementation of sanitary conditions in field hospitals.

Dorothea Dix, a New England schoolteacher, was appointed Superintendent of the Female Nurses of the Army in 1861; no woman had ever before been appointed to an administrative position by the federal government. As a result of her recruitment efforts, more than 2000 women cared for the sick in the Union Army. After the Civil War, Dix concentrated her energies on reforming treatment of the mentally ill.

Clara Barton volunteered her nursing services during the Civil War and, in 1881, organized the Red Cross in the United States.

Realizing that "women played a special role in providing aid during times of crisis" (Frantz, 1998), Clara Barton began her efforts to establish an organization after the Civil War. Although nursing in America was not recognized as an acceptable career for women, Barton lobbied presidents and senators to allow nurses

THINK ABOUT IT

Nightingale as a Role Model

Nightingale has been described as being strong minded and assertive. In what ways would it be helpful for you to develop such characteristics? How can these traits be cultivated in nurses today?



Figure 1-4 During the Civil War, women were instrumental in the effort to minimize the risk of spreading contagious diseases among wounded soldiers. (Photo courtesy of Corbis-Bettmann)

to form an organization to provide war relief. Determined to provide aid in times of crisis, Barton, who was unsuccessful in her lobbying efforts to sponsor war relief, established the American Red Cross in 1881 to provide disaster relief. States rallied with support by creating their own branches of the American Red Cross. In 1898, Barton's knowledge from the Civil War allowed her and the State of Texas to effectively provide war relief to the Cuban citizens, and eventually to the American army during the Spanish-American War in Cuba (Frantz, 1998).

The Women's Movement

In 1848, the Women's Rights Convention in Seneca Falls, New York, signaled the beginnings of social unrest. Women were not considered equal to men, society did not value education for women, and women did not have the right to vote. With suffrage, not only were the rights of women advocated but also the nursing profession itself advanced. By the mid-1900s, more women were being accepted into colleges and universities, even though only limited numbers of university-based nursing programs were available.

Nursing Pioneers

Modern nursing was forged by the contributions of many outstanding nurses through the years. The establishment of public health nursing, the provision of rural health care services, and the advancement of nursing education occurred as a result of the works of nurse pioneers, who are discussed below. Note that the term *trained nurse* was used historically as the predecessor of *registered nurse*.

Lillian Wald

Lillian Wald (Figure 1-5) spent her life providing nursing care to the indigent population. In 1893, as the first community health nurse, she founded public health nursing with the establishment of the Henry Street Settlement Service (Figure 1-6) in New York City. Wald was a tireless reformer who:

- Improved housing conditions in tenement districts
- Supported education for the mentally challenged
- Advocated passage of more lenient immigration regulations
- Initiated change of child labor laws and founded the Children's Bureau of the U.S. Department of Labor

In addition to initiating public health nursing, Wald also established a school of nursing.

Isabel Hampton Robb

Isabel Hampton Robb (Figure 1-7) was responsible for founding several nursing organizations, namely the Superintendents' Society in 1893 and the Nurses' Associated Alumnae of the United States and Canada in 1896. She recognized the necessity of nurses' participating in professional organizations to establish unity throughout nursing on positions and issues. She was instrumental in establishing both the American Nurses Association and the National League of Nursing Education. Robb was also an early supporter of the rights of nursing students. She called for shorter working hours and emphasized the role of the nursing student as learner instead of employee.



Figure 1-5 Lillian Wald (Photo courtesy of the American Nurses Association)



Figure 1-6 Nurses at the Henry Street Settlement in New York City (Photo courtesy of Visiting Nurses Service of New York)

THINK ABOUT IT

Robb's View of Nursing Students

What is the impact of Robb's view of nursing students as learner versus employee on the role of nursing students today?

Jane Delano

During World War I, Jane Delano, a graduate of Bellevue School of Nursing and former American Nurses Association president, took one of the first stances that created a division among nursing leaders (Figure 1-8). In 1912, physicians wanted the Red Cross to put untrained nursing aides at their sides to assist with war casualties. Physicians, not nurses, would train the aides in caring for the sick.

Delano was opposed to the aide education plan because it violated the educational standards already established by nursing. This position pitted Delano against Annie Goodrich and Adelaide Nutting. The Red Cross recognized Delano's leadership abilities and dropped the aide plan. Delano was active in the Army Nurse Corps until she resigned her Army position in 1912 to work full time with the Red Cross. She died during wartime service in Europe.



Figure 1-7 Isabel Hampton Robb (Photo courtesy of the American Nurses Association)



Figure 1-8 Jane Delano (Photo courtesy of the American Nurses Association)

Annie Goodrich

Annie Goodrich (Figure 1-9) was influential in national and international nursing issues. During World War I, the supply of civilian nurses was greatly depleted because of the Army's need for trained nurses. Goodrich pushed for the establishment of an Army training school for nurses, which she envisioned as a model for other schools of nursing. She then was appointed dean of the Army School of Nursing. As an advocate of college-based educational nursing programs, Goodrich became the first dean of Yale University School of Nursing.

Adelaide Nutting

Adelaide Nutting was a nursing educator, historian, and scholar. She actively campaigned for nurses being educated in university settings and was the first nurse to be appointed to a university professorship. In 1910, Nutting was appointed to direct the newly established department of nursing and health at Teachers College, Columbia University in New York City. This department was established to prepare nurses for teaching and supervision in nurse training schools, for administration in hospitals, and for work in preventive and social aspects of nursing.

Lavinia Dock

An influential leader in American nursing education was Lavinia Dock, who graduated from Bellevue Training School for Nurses in 1886. In her early nursing practice, she worked at the Henry Street Settlement House in New York City providing visiting nursing services to the indigent. She wrote one of the first nursing textbooks, *Materia Medica for Nurses*. Dock wrote many other books



Figure 1-9 Annie Goodrich (Photo courtesy of the American Nurses Association)

and was the first editor of the *American Journal of Nursing* (*AJN*). Dock was a political activist who in 1914 encouraged nurses to unite when physicians objected to reforming labor laws to include nursing students.

Nursing Leaders

American nursing's history is rich with many outstanding leaders. Following is a discussion of some other nursing pioneers in America. Information is presented in alphabetical, not chronological, order.

Mary Breckinridge

In 1925, Mary Breckinridge introduced a system for delivering health care to rural America. She created a decentralized system for primary nursing care services in the Kentucky Appalachian Mountains. This system, the Frontier Nursing Service, lowered the childbirth mortality rate in Leslie County, Kentucky, from the highest in the nation to below the national average.

Martha Franklin

Martha Franklin was one of the first people to advocate racial equality in nursing. She was the only African American graduate of her class at Women's Hospital Training School for Nurses in Philadelphia. In 1908, Franklin organized the National Association of Colored Graduate Nurses (NACGN), which advocated that black nurses meet the same standards required of other nurses to prevent a double standard based on race. In 1951, the NACGN merged with the American Nurses Association (ANA).

Amelia Greenwald

Amelia Greenwald was a pioneer in public health nursing on the international scene. In 1908, she entered the Touro Infirmiry Training School for Nurses in New Orleans, Louisiana. After graduation, Greenwald studied psychiatric and public health nursing. She served as Chief Nurse in several field hospitals during World War I. In 1923, she accepted the challenge of establishing a school of nursing in Poland. She received the Polish Golden Cross of Merit for her contributions to the welfare of the people. Greenwald was a catalyst for international public health nursing.

Mamie Hale

In 1942, Mamie Hale was hired by the Arkansas Health Department to upgrade the educational programs for midwives (Figure 1-10). Hale, a graduate of Tuskegee School of Nurse-Midwifery, gained the support of granny midwives, public health nurses, and obstetricians. Through education, Hale decreased superstition and illiteracy of those functioning as midwives. Hale's



Figure 1-10 Mamie Hale (Photo courtesy of Historical Research Center, University of Arkansas for Medical Sciences Library, Little Rock, RG 515, Box 47)

efforts resulted in improved mortality rates for both mothers and infants.

Mary Mahoney

America's first African American professional nurse, Mary Mahoney (Figure 1-11), was a noted nursing leader who encouraged a respect for cultural diversity. Today, the ANA bestows the Mary Mahoney Award in recognition of individuals who make significant contributions toward improving relationships among multicultural groups.

Harriet Neuton Phillips

Harriet Neuton Phillips was the first known graduate of the Women's Hospital of Philadelphia. A 6-month training course for nurses had been established by Dr. Ann Preston in 1861. Although no formal diplomas were awarded, the graduate nurses worked in the hospital and did private duty nursing in homes. Thus, Harriet Phillips can claim the title of the first American nurse to receive a training certificate. As a pioneer in community

nursing, she worked with Chinese immigrants in San Francisco and with Native Americans in Wisconsin.

Linda Richards

In 1873, the first diploma from an American training school for nurses was awarded to Linda Richards. Richards founded or reorganized 10 hospital-based training schools for nurses. She introduced the practice of keeping nurses' notes and physicians' orders as part of medical records. Also, Richards began the practice of nurses wearing uniforms. As the first Superintendent of Nurses at Massachusetts General Hospital, she demonstrated that trained nurses gave better care than those without formal nursing education.

Margaret Sanger

In 1912, Margaret Sanger, a nurse living in New York City, became concerned with women who had too many children to support. She coined the phrase "birth control" and began writing about contraceptive measures (Figure 1-12). Sanger fought to revise legislation that prohibited dissemination of information about contraception.

Sanger was not afraid of controversy and spent one month in jail for distributing information on birth control. As a true activist, Sanger made birth control an issue and fought for the rights of poor women. She understood the relationship between poverty, overpopulation, and high infant and maternal mortality rates. Sanger founded the American Birth Control League and was the first president of the International Planned Parenthood Federation.



Figure 1-11 Mary Mahoney (Photo courtesy of the American Nurses Association)



Figure 1-12 Margaret Sanger (Photo courtesy of the American Nurses Association)

THINK ABOUT IT

Nursing's Influence on Reproductive Issues

Nursing did not have sleeping giants but rather leaders who embraced the social issues of their times to challenge America's Constitution, promoting equal rights for all citizens.

Margaret Sanger saw the need for birth control and legislation to protect children from the abuses of poverty and cruel child labor practices. She viewed birth control as the major solution to social problems affecting children.

How would history have been written if Sanger had succeeded at making birth control widely available in 1912? If birth control had been in practice before the 1960s, what impact would it have had on women's reproductive health issues (such as abortion) today?

Shirley Titus

Shirley Titus received a diploma from St. Luke's Hospital School of Nursing in San Francisco in 1915. During her career, Titus served as dean of the School of Nursing at Vanderbilt University and in 1940 was the executive director of the California State Nurses' Association. She advocated improved economic security for nurses. Some of the many approaches to economic security for which she campaigned were malpractice insurance coverage, improved salaries and benefits, and collective bargaining.

Adah Belle Thoms

Adah Belle Thoms was a crusader for improved relationships among persons of all races. In the early 1900s, she

THINK ABOUT IT

Employment Issues

In the current health care environment, how do you feel about nurses going on strike? Do you think it is ethical for nurses to take a job action regarding client care issues, safety of the work environment, or salary and benefits? Does your answer vary depending on the reason for the job action or does it remain the same regardless of the underlying issue?

became acting director of nursing of the Lincoln School for Nurses in New York when African Americans rarely held high level positions (Chinn, 1994). Thoms was one of the first to recognize public health as a field of nursing. She campaigned for equal rights for black nurses in the American Red Cross and the Army Nurse Corps.

NURSING IN THE 20TH CENTURY

The beginning of the 20th century brought about changes that have influenced contemporary nursing. Several landmark reports about medical and nursing education, as well as some contemporary reports, are discussed below. The establishment of visiting nurse associations and their use of protocols are discussed.

Flexner Report

In 1910, supported by a Carnegie grant, Abraham Flexner visited the 155 medical schools in the United States and Canada. The Flexner report was based on these findings, and its goal was to increase accountability in medical education. The results of the study brought about the following changes: closure of inadequate medical schools, consolidation of schools with limited resources, creation of nonprofit status for remaining schools, and establishment of medical education in university settings based on standards and strong economic resources.

Adelaide Nutting saw the value and impact of the Flexner report on medical education, and, in 1911, together with other colleagues of the Superintendents' Society, presented a proposal to the Carnegie Foundation to study nursing education. This foundation never allocated monies to study nursing education, but it supported educational studies in other disciplines such as law, dentistry, and teaching.

Although the efforts of Nutting and other nursing leaders went unheeded, in 1906 Richard Olding Beard successfully established a 3-year diploma school of nursing at the University of Minnesota under the College of Medicine.

Early Insurance Plans

At the turn of the 20th century, there were more than 4000 hospitals and 1000 schools of nursing. During this time, the concepts of third-party payments and prepaid health insurance were instituted. Third-party payments refer to situations in which someone other than the recipient of health care (usually an insurance company) pays for the health care services provided. Prepaid medical plans were started in Pacific Northwest lumber and mining camps where employers contracted for and paid a monthly fee for medical services. This led to the establishment of the Bureau of Medical Services, where the employer contracted for medical services and the subscriber selected one of the physicians in the bureau.

Lillian Wald suggested the establishment of a national health insurance plan when she was the first president of the National Organization for Public Health Nursing.

Blue Cross and Blue Shield

The Depression provided the main impetus for the growth of insurance plans. In addition, the American philosophy of health care for all contributed to the growth of insurance plans. In 1920, American hospitals offered a prepaid hospital plan that led to the “Baylor Plan,” which eventually became the prototype of Blue Cross.

Blue Cross was the result of a joint venture between hospitals, physicians, and the general public. The American Hospital Association pioneered the development of an insurance company to provide benefits to subscribers who were hospitalized. Blue Shield was developed by the American Medical Association to provide reimbursement for medical services provided to subscribers. In 1933, the American Hospital Association endorsed Blue Cross, and in 1938 the American Medical Association endorsed Blue Shield.

The federal government became more involved in health care delivery in 1935 with the passage of the Social Security Act, which provided for (among other things) benefits for the elderly, child welfare, and federal funding for training of health care personnel. During World War II, the U.S. government extended the benefits for military services to include health care for veterans and their dependents.

Visiting Nurses Associations

In 1901, at the suggestion of Lillian Wald, the Metropolitan Life Insurance Company, which provided visiting nursing services to its policyholders, entered into an agreement with the Henry Street Settlement. Wald worked with Metropolitan to expand the services of the Henry Street Settlement to other cities; thus, one form of managed care began.

Nurses providing care in the home environment experienced greater autonomy of practice than hospital-based nurses (Figure 1-13). This led to conflicts with

some physicians about the scope of medical practice versus nursing practice parameters. Some physicians thought nurses were taking over their practice, whereas other physicians encouraged nurses to do whatever was necessary to care for the sick at home.

In 1912, in an effort to provide direction to home health staff nurses, the Chicago Visiting Nurse Association developed a list of standing orders for nurses to follow in providing home care. These orders were to direct the nursing care of clients when the nurse did not have specific orders from a physician. Thus, the groundwork for nursing protocols was established.

Landmark Reports in Nursing Education

During the first half of the 20th century, a number of reports were issued concerning nursing education and practice. Three of them, the Goldmark, the Brown, and the Institute of Research and Service in Nursing Education reports, are discussed below.

Goldmark Report

In 1918, Adelaide Nutting (relentless in her efforts to document the need for nursing education reform) approached the Rockefeller Foundation for support. Funding was provided, and, in 1919, the Committee for the Study of Nursing Education was established to investigate the training of public health nurses. E. A. Winslow, professor of public health, Yale University, chaired the committee, composed of ten physicians, two lay persons, and six nurses: Adelaide Nutting, Mary Beard, Lillian Clay, Annie Goodrich, Lillian Wald, and Helen Wood. Josephine Goldmark, a social worker, served as the secretary to the committee.

As secretary, Goldmark developed the methodology of data collection and analysis for a small sampling of



Figure 1-13 A baby being weighed by a student nurse and a Junior League volunteer in 1929. (Photo courtesy of Touro Infirmary Archives, New Orleans, LA)

the 1800 schools of nursing in existence. The study of 23 of the best nursing schools across the nation represented a cross-sample of schools—small and large, public and private.

The Goldmark report, entitled *Nursing and Nursing Education in the United States*, was published in 1923. Goldmark identified the major weakness of the hospital-based training programs as that of putting the needs of the institution (service delivery) before the needs of the student (education). Nursing tradition and the apprenticeship form of education reinforced putting the needs of the client before the learning needs of the student.

Some major inadequacies identified in nursing education by the study were limited resources, low admission standards, lack of supervision, poorly trained instructors, and failure to correlate clinical practice with theory. The report concluded that for nursing to be on equal footing with other disciplines, nursing education should occur in the university setting.

Brown Report

In 1948, Esther Lucille Brown, a social anthropologist, published *Nursing for the Future and Nursing Reconsidered: A Study for Change*. Several recommendations were put forth in this study, including the need for nurses to demonstrate greater professional competence by moving nursing education from the hospital to the university setting.

Although published 20 years after the Goldmark report, the Brown report identified many of the same problems in diploma education—nursing students were still being used for service by the hospitals and inadequate resources and authoritarianism in hospitals still prevailed in nursing education.

Brown recognized that nursing education in the university setting would provide the proper intellectual climate for the professional. Visionary nurse educators were securing necessary learning resources: libraries, laboratories, and clinical facilities. Professional endeavors such as research and publication were being implemented by nurse leaders.

Institute of Research and Service in Nursing Education Report

During the 1950s, there was a deficit in the supply of nurses as the post-World War II demand for nursing services increased. Some contributing factors to the dearth of nurses were the low esteem of nursing as a profession, long hours with a heavy workload, and low salaries.

The Institute of Research and Service in Nursing Education report resulted in the establishment of practical nursing under Title III of the Health Amendment Act of 1955. There was a proliferation of practical nursing schools in the United States to increase the supply of nurses.

Other Health Care Initiatives

In the 1960s, health care services were provided to the elderly and the indigent with the federal government's inception of Medicare and Medicaid.

This era also saw passage of the Nurse Training Act (1964), which provided federal funds to expand enrollments in schools of nursing. Federal funds were used to construct nursing schools, and student loans and scholarships were made available to nursing students.

Selected Legislation

The Health Maintenance Organization Act of 1973 provided an alternative to the private health insurance industry. **Health maintenance organizations** (HMOs) are prepaid health plans that provide primary health care services for a predetermined fee. (See Chapter 7 for further discussion.) Because the fee is set in advance of services being rendered, HMOs provide cost-effective services. **Primary health care** refers to the client's point of entry into the health care system and includes assessment, diagnosis, treatment, coordination of care, preventive services, and education. (See Chapter 3 for further discussion.)

The National Commission for Manpower study, released in 1977, resulted in amendments to the House of Representatives 2504 of Title XVIII of the Social Security Act that provided payment for rural health clinic services. Through the efforts of Anne Zimmerman, former President of the ANA, the bill was amended to substitute the term *primary care providers* for *physician extenders* and, therefore, allowed nurse practitioners to be paid directly for their services. This was a major success for nursing.

The Rural Health Clinic Service Act of 1977 covered services rendered by nurse practitioners and nurse-midwives. The Omnibus Budget Reconciliation Act of 1980 mandated payment for nurse-midwife services to needy recipients. (See Chapter 7 for further discussion.) Nursing became an integral part in meeting the needs of vulnerable populations.

Education and Practice: Contemporary Reports

During the 1980s, several important studies were commissioned to examine the areas of nursing education and practice. Some of these reports are discussed on page 20.

National Commission on Nursing

The National Commission on Nursing was created in 1980 by the American Hospital Association (AHA), the Hospital Research and Education Trust, and the American Hospital Supply Corporation to study nursing education and related issues in hospital

management, nursing practice, and nursing education. The commission's conclusions addressed the need for:

- Adequate clinical education for students
- Baccalaureate education and educational mobility
- Involvement of nurses in collaborative institutional and clinical decision making
- Improved working conditions, specifically, salaries, flexible scheduling, and differentiated practice

As a result of the commission's study, attention was given to the need for physicians and nurses to enter into collaborative practice.

Institute of Medicine

Concurrent with the National Commission on Nursing study, another study was initiated by Congress in 1979 and conducted by the Institute of Medicine (IOM). The study, *Nursing and Nursing Education: Public Policies and Private Actions*, focused on the need for continued federal funding to nursing education. The findings indicated that there was not a shortage of the general supply of nurses, but there was a serious shortage of nurses in research, teaching, administration, and advanced clinical practice. A significant nursing shortage existed in preventive and primary care for the disadvantaged and elderly in inner cities and rural areas.

Secretary's Commission on Nursing

Although the IOM study indicated that there were sufficient numbers of staff nurses, based on supply and demand, hospitals continued to report severe shortages. As a response to hospitals' recruitment and retention challenges, Health and Human Services Secretary Otis R. Brown, MD, established the Secretary's Commission on Nursing, which made the following recommendations related to nursing practice:

- Nurse compensation
- Health care financing
- Nurse decision making
- Development, use, and maintenance of nursing resources (Secretary's Commission on Nursing, 1988)

This commission recognized that the federal government alone could not correct the problems facing nursing and health care but rather that the concerted efforts of health care organizations were needed for the implementation of the report's recommendations.

SOCIAL FORCES AFFECTING NURSING

From the earliest recordings of nursing, 4000 BC through the Christian era, women were allowed to per-

form the nurse role only in the home. Nursing's links with the church caused nursing to be viewed as a "service," not a profession such as medicine. The Crimean and Civil Wars had a significant impact on nursing's future by focusing on women as nurse providers and on the need for nurse training.

During the 20th century, the evolution of medical education as an established profession had far advanced that of nursing. The Flexner report carved the destiny for physicians. The Goldmark and Brown reports created havoc for nurses as they debated the issue of nursing education in the university setting.

The Depression and World War II brought social reform and created health and medical insurance that strengthened the organized power base of both physician and hospital. Nursing—almost exclusively a female profession—had little power and, therefore, did not exert much influence on the social forces at play. The greatest advances for nurses were seen in the realm of public health and preventive health care.

As physicians were released from military service after World War II, the era of specialized medicine began. Physicians used their veterans' educational entitlement benefits to take residency training in one or more specialty areas. By 1966, more than 70% of the physicians in practice were specialists.

The 1960s was a decade of growth and change. As technologic advances increased the scope of practice of medicine and nursing, other social forces were at play: access to health care services enhanced by Medicare and Medicaid; physician and nurse shortages; the feminist movement; the inception of nurse practitioners; and a focus on health maintenance.

The economic recession of the 1970s saw health care costs escalating along with unemployment. Professional autonomy was being debated, nursing theories were being developed, and nursing education was being integrated into the university setting. Nurses were becoming more politically astute in that they were working through professional organizations to affect health care legislation.

During the 1980s, nursing became more specialized and autonomous. The rapid technologic advances in medicine required more specialization in nursing. Nurse practitioners were being more widely accepted by the general public and other health care providers. Expanded roles of nurses were developing in response to greater demands for nursing services. One factor that led to an increased need for nursing was the proliferation of HMOs in early 1980s.

During the 1990s, nurses were actively assuming more responsibilities for the delivery of health care. Evolving technology mandated nurses to continue to advance their knowledge base and skills. The aging of the population called for more nursing involvement with the elderly. Nurses, as individuals and as members of professional organizations, were involved in shaping policies for health care reform. Nursing was a stronger advocate for vulnerable populations: the elderly; those

living in poverty; the homeless; and those with human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS).

Healthy People Initiatives

Healthy People initiatives has become the nation's health agenda. This initiative began with a report entitled *Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention in 1979*. The report described the Healthy People as the nation's health agenda to guide policy on public health initiatives for health promotion and disease prevention activities during the decade 1980–1990. Five goals were identified to decrease the mortality rates for four distinct age groups (infants, children ages 1–14 years, adolescents and young adults up to age 34, adults ages 25–65) and to reduce the average number of days of illness among those over age 65 (U.S. Public Health Service, 1979). Also identified in the report were 15 strategies to achieve the goals; these strategies were studied by panels of experts and resulted in quantifiable objectives to implement the 15 strategies by governmental bodies and private sector agencies at the national, state, local, and community levels (U.S. Public Health Service, 1979). Achievement of the 226 objectives was measured and reported at 2-year increments by the National Center for Health Statistics. While positive changes were achieved for infants, children and adults, the goals for adolescents and the elderly were not achieved by 1990 (“Results of the 1990 Objectives,” 1992).

The outcomes from the 1979 Healthy People initiative led to the development of the Healthy People 2000 Objectives. Coordinated by the U.S. Public Health Service, this program identified the following goals to be achieved from 1990 to 2000: increase the span of healthy life; reduce health disparities; and promote access to preventive services for all Americans (U.S. Department of Health and Human Services, 1991). The original 15 strategies were expanded to include 22 priority areas, and the total number of objectives was increased to 319. The objectives were classified into three major categories: health promotion; health protection; and preventive services. Wilson (1999) described the Healthy People 2000 Objectives as a challenge to the nation to move beyond merely saving lives, to decrease unnecessary suffering, illness, and disability, and to improve the quality of life. Although methodologies were similar to the first study regarding data collection and analysis, it is difficult to measure this program's success since many of the surveillance systems needed to measure outcomes were not in place at the onset of the study (Wilson, 1999).

The first draft of Healthy People 2010 initiatives appeared in the September 1997 issue of the *Federal Register*. Early work focused on identifying the 2000 objectives to be continued into the 2010 agenda. The Healthy People Consortium, an alliance that includes more than 350 national organizations and 270 state pub-

lic health, mental health, substance abuse, and environmental agencies, launched in January 2000 the following Healthy People 2010 goals and objectives.

- Major goals
 1. Increase quality and years of healthy life.
 2. Eliminate health disparities.
- Enabling goals
 1. Promote healthy behaviors.
 2. Promote healthy and safe communities.
 3. Improve systems for personal and public health.
 4. Prevent and reduce diseases and disorders.

An additional 26 focus areas, objectives, and developmental objectives were identified to support the achievement of the major and enabling goals.

Success of the Healthy People program requires the cooperative efforts of all health care disciplines to pool their resources and services in order to provide accessible, quality health care and preventive services for all Americans regardless of nationality, ethnicity, and economic status (Wilson, 1999). Refer to Chapter 15 for a complete discussion of the three generations of the Healthy People initiatives.

Alternative Methods of Health Care Delivery

As it has evolved over time, nursing is still focused on caring. Rapid technologic advances, the changing climate of financing health care, and the explosion of alternative delivery methods present challenges to nurses. How are nurses responding to these challenges?

- By shaping health care policies
- By collaborating with other health care providers
- By continuing to advance nursing education

Nursing in the new millennium will be vastly different from what it has been. Collaborative health care services and innovative settings for the delivery of health care are currently being developed by nurses.

Costs and Quality Controls

During the 1970s, the cost-control systems of various federal government health programs were inadequate because of the rapid escalation of health care expenditures. Consequently, the Tax Equity Fiscal Responsibility Act (TEFRA) of 1982 was created in response to the \$287 billion spent on health care in 1981. While the federal government, with TEFRA and prospective payment legislation, tried to control costs, there was also a heightened concern with the quality of health care.

Business and industry embraced quality control systems in the 1940s and 1950s. However, the health care

industry failed to see the need for these types of controls until the 1980s. The Joint Commission on the Accreditation of Healthcare Organizations' (JCAHO) agenda for change in the late 1980s emphasized monitoring quality for outcomes rather than process, thus advocating change from a static quality assurance system to dynamic quality improvement. The JCAHO (1996) views quality of care as an ongoing process that continuously looks for ways to improve the care provided. See Chapter 25 for a discussion of the issue of quality management in nursing and health care.

Health Care Reform

Health care access and costs were the focus of attention in the 1990s with an ever-increasing number (over 60 million) of Americans being uninsured or underinsured. Children remain at risk for having their health care neglected; one in five American children is not insured.

Nursing as a profession has made great strides in effecting federal and state health care legislation (Figure 1-14). The 1990s were filled with challenges as nurses were held accountable for quality nursing care amidst cutbacks in staffing patterns. Some of these challenges were settled by legislative outcomes such as determining nurse client ratios in skilled nursing facilities and prohibiting acute care hospitals from assigning unlicensed personnel to perform nursing functions, in lieu of a registered nurse. Nurses worked in collaboration with other health care professionals in providing community-based services and in developing **evidence-based practice** among diverse health care settings. "Evidence-based practice is the application of the best available empirical evidence, including recent research findings to clinical practice in order to aid clinical decision-making" (Taylor-Piliae, p. 30, 1998).



Figure 1-14 Nurses making a presentation before a state legislature. Considering the issues for which historic nursing leaders worked, what challenges do you think merit your participation in the health care debate? (Photo courtesy of the New York State Nurses Association)

THE FUTURE OF NURSING

History is being made daily for nurses and other health care providers as the citizens of this country decide which way to move with health care reform initiatives. Pressing issues for nursing include developing evidence-based practice that can be uniformly adopted in diverse nursing care settings; monitoring safe practice in a restructured health care environment; and designing systems that will enhance collaborative planning, and implement actions and policies to address the changes occurring in the nursing labor market. Nurses can make the most of this time of transformation, which is driven by societal needs. Nurses and nursing students need to stay abreast of current issues and be active with local nursing leaders to communicate nursing's position(s) on health care reform and alternative health care delivery models.

Nurses are being recognized as autonomous professionals and are involved in administrative and clinical decision making (Figure 1-15). Only when nurses are empowered are they truly autonomous.

KEY CONCEPTS

- Nursing is an art and a science in which people are assisted in learning to care for themselves whenever possible and cared for when they are unable to meet their own needs.
- Nurses will understand such issues as autonomy, unity within the profession, supply and demand, salary, education, and current practice and the empowerment of the profession by studying nursing's history.
- Nursing's early history was heavily influenced by religious organizations and the need for nurses to care for soldiers during wartime.

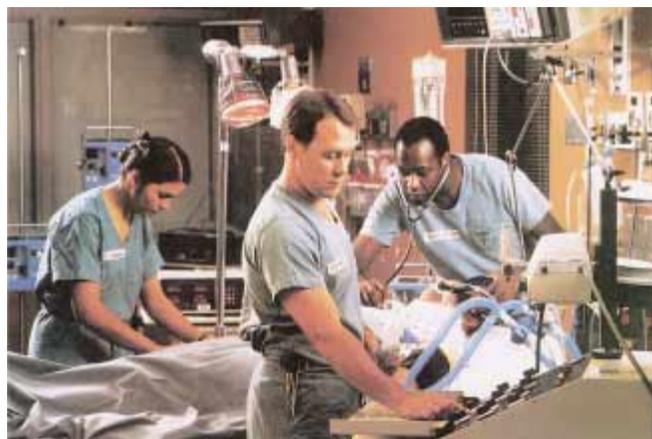


Figure 1-15 A component of the professional role of nurses is the delivery of highly skilled care to clients. In what ways can nurses build on these skills so as to achieve full autonomy and empowerment as members of the health care team? ("Be All You Can Be," Courtesy of the U.S. Government, as represented by the Secretary of the Army)

- Florence Nightingale forged the future of nursing practice and education as a result of her experiences in training nurses to care for soldiers.
- Nursing's early American leaders, professional organizations, and landmark reports have influenced the infrastructure of current nursing practice.
- Influential nursing leaders, such as Lillian Wald, Jane Delano, Isabel Hampton Robb, Annie Goodrich, Adelaide Nutting, and Lavinia Dock, were instrumental in the advancement of nursing education and practice.
- Other nursing pioneers, such as Amelia Greenwald, Mary Breckenridge, Mamie Hale, Mary Mahoney, Linda Richards, and Margaret Sanger, made important contributions to both nursing education and the fields of rural, public health, maternity, and multicultural nursing.
- In 1923, the Goldmark report concluded that, for nursing to be on equal footing with other disciplines, nursing education should occur in the university setting.
- The Brown report (1948) addressed the need for nurses to demonstrate greater professional competence by moving nursing education to the university setting.
- The Health Maintenance Organization Act of 1973 provided an alternative to the private health insurance industry.
- Contemporary reports issued by the National Commission on Nursing, the Institute of Medicine, and the Secretary's Commission on Nursing focused on the areas of nursing education, practice, and nursing's role in health care financing policies.
- Developments such as alternative methods of health care delivery, evidence-based practice, and the efforts devoted to health care reform have led to diversified nursing roles.
- As the nursing profession continues to evolve and respond to the challenges within the health care system, nurses will remain responsive to societal needs.

CRITICAL THINKING ACTIVITIES

1. What does the phrase "using their own history" mean to nurses? After studying this chapter, list some major lessons nurses can derive from history.
2. Examine the history of your nursing school. Are the early leaders honored for their contributions?
3. Identify some contemporary nursing leaders. What are their contributions to the nursing profession?
4. Choose the correct answer. The major recommendation of both the Goldmark and Brown reports was to:
 - a. recruit more people into the nursing profession.
 - b. compensate nurses with higher salaries and more comprehensive benefits.
 - c. place nursing education within institutions of higher learning.
 - d. increase the amount of clinical practice in nursing education programs.
5. List some key legislative measures that have affected nurse's role in the delivery of health care in the United States.

WEB RESOURCES

Agency for Healthcare Research and Quality
<http://www.ahrq.gov>
 American Association for the History of Nursing
<http://www.aahn.org>
 Healthy People 2010
HPWebsite@osophs.dhhs.gov
 National Council of State Board of Nursing
<http://www.ncsbn.org>
 U.S. Department of Health and Human Services
<http://www.hhs.gov>

Theoretical Foundations of Nursing



Theory is the poetry of Science.

—Levine (1995)

COMPETENCIES

1. Explain the relationships of concepts and propositions to theory.
2. Discuss the purpose of theory.
3. Describe the link between nursing theory and the continuing development of the nursing profession.
4. Explain the interdependent roles of nursing practice, nursing theory, and nursing research.
5. Identify the three categories relating to the scope of theories.
6. Describe the metaparadigm concepts in nursing and how they differ from the metaparadigm concepts in medicine.
7. Discuss the process of paradigm revolution and paradigm shift in nursing and relate it to the current paradigms in nursing.
8. Apply the principles of selected nursing theories, such as the Conservation Theory, the Self-Care Deficit Theory of Nursing, the Roy Adaptation Model, the Theory of Human Caring, the Science of Unitary Human Beings, and Man-Living-Health, to nursing practice.

KEY
TERMS

concept	micro-range theory	phenomenon
conceptual framework	middle-range theory	proposition
discipline	nursing research	self-care
existentialism	paradigm	Simultaneity Paradigm
grand theory	paradigm revolution	theory
metaparadigm	paradigm shift	Totality Paradigm

This chapter explores the theoretical foundation on which the knowledge base of the nursing profession has been and is being built. Nursing theory provides a perspective from which to define the *what* of nursing, to describe the *who* of nursing (who is the client) and *when* nursing is needed, and to identify the boundaries and goals of nursing's therapeutic activities. Theory is fundamental to effective nursing practice and research. The professionalization of nursing has been and is being brought about through the development and use of nursing theory.

This chapter first addresses basic ideas about the meaning of nursing theory and its relevance to professional nursing. Issues related to the purpose, use, and diversity of nursing theories are discussed. It then presents a broad overview of selected nursing theories. The major ideas of selected nursing theories are explained and examples of their use in nursing situations are provided.

COMPONENTS OF THE THEORETICAL FOUNDATION

The basic elements that structure a nursing theory are concepts and propositions. In a theory, propositions represent how concepts affect each other.

What Is a Concept?

A concept is the basic building block of a theory. A **concept** is a vehicle of thought. According to Chinn and Kramer (1995, p. 78), the term *concept* refers to a “complex mental formulation of . . . [our] perceptions of the world.” A concept labels or names a **phenomenon**, an observable fact that can be perceived through the senses and explained. A concept assists us in formulating a mental image about an object or situation. Concepts help us to name things and occurrences in the world around us and assist us in communicating with each other about the world. Independence, self-care, and caring are just a few examples of concepts frequently encountered in health care. Theories are formulated by linking concepts together. A **conceptual framework** is a structure that links global concepts together and represents the unified whole of a larger reality. The specifics about phenomena within the global whole are better explained by theory.

By its nature, a concept is a socially constructed label that may represent more than a single phenomenon. For example, when you hear the word *chair*, a mental image that probably comes to mind is an item of furniture used for sitting. The word *chair* could represent many different kinds of furniture for sitting, such as a desk chair, a high chair, or an easy chair. Further, the word *chair* could also represent the leader of a committee or the head of a corporation. The meaning of the word *chair* depends on the context in which it is used.

In health care, the concept of *wandering* may be represented by words such as aimless and random movement, disorganized thought processes, and conversation that is difficult to follow. To be useful, the multiple meanings that often underlie a concept must be thoroughly understood and clearly defined within the context in which it is used.

It is important to remember that the same concept may be used differently in various theories. For example, one nursing theory may use the concept of *environment* to mean all that surrounds a human being (the external environment), whereas another theory may use this concept to mean the external environment *and* all the biological and psychological components of the person (the internal environment).

What Is a Proposition?

A **proposition** (another structural element of a theory) is a statement that proposes a relationship between concepts. An example of a nonnursing proposition might be the statement “people seem to be happier in the springtime.” This proposition establishes a relationship between the concept of happiness and the time of the year. A nursing propositional statement linking the concept of helplessness and the concept of loss might be stated as “multiple and rapid losses predispose one to feelings of helplessness.” Propositional statements in a theory represent the theorist's particular view of which concepts fit together and, in most theories, establish how concepts affect one another.

What Is a Theory?

A **theory** is a set of concepts and propositions that provide an orderly way to view phenomena. In the scientific literature, *theory* may be defined in many different ways,

with subtle nuances specific to the particular author's viewpoint. These various explanations share a common notion of the purpose of the theory, that being description, explanation, and prediction. "The purpose of a theory in scientific disciplines is to guide research to enhance the science by supporting existing knowledge or generating new knowledge" (Parse, 1987 p. 3). A theory not only helps us to organize our thoughts and ideas, but it may also help direct us in what to do and when and how to do it.

The use of the term *theory* is not restricted to the scientific world, however. It is often used in daily life and conversation. For example, when telling a friend about a mystery novel you are reading, you may have said, "I have a theory about who committed the crime." Or you may have heard a Little League coach saying to his players, "I have a theory about how to improve our performance." The way in which this term is used in these statements is a useful way to think about the meaning of theory.

USE OF THEORIES FROM OTHER DISCIPLINES

In addition to using theories specifically constructed to describe, explain, and predict the phenomena of concern to nursing, the nursing profession has long used theories from other disciplines. A **discipline** is a field of study. Theories from biological, physical, and behavioral sciences are commonly used in the practice of nursing. For example, nonnursing theories such as Maslow's Hierarchy of Basic Human Needs, Erikson's Theory of Human Development, and Selye's General Adaptation Syndrome have been and continue to be useful in nursing practice.

These nonnursing theories are often incorporated into nursing practice together with specific nursing theories. When used in conjunction with a nursing theory, a non-nursing theory is transformed by the unique approach of the nursing perspective. This perspective provides the specific framework or viewpoint within which to use theories and knowledge from other disciplines.

IMPORTANCE OF NURSING THEORIES

Why do we have nursing theories? In the early part of nursing's history, knowledge was extremely limited and almost entirely task oriented. The knowledge explosion that occurred in health care in the 1950s produced the need to systematically organize the tremendous volume of new information being generated. From the very beginnings of nursing education, there was a need to categorize knowledge and to analyze client care situations in order to communicate in coherent and meaningful ways.

The literature about the relationship between theory and nursing care yields many interpretations in terms of

the role each component plays in the health care environment. According to Barnum (1994, p. 1), "a theory is a construct that accounts for or organizes some phenomenon." Chinn and Kramer (1995, p. 20) viewed theory as a "systematic abstraction of reality that serves some purpose." Meleis (1991, p. 13) stated that a theory is "a symbolic depiction of aspects of reality that are discovered or invented for the purpose of describing, explaining, predicting, or prescribing responses, events, situations, conditions, or relationships." Similarly, Parse (1987, p. 2) defined a theory as a "set of interrelated concepts at the same level of discourse that explains, describes, or makes predictions about the phenomena of the discipline."

Nursing theories provide a framework for thought in which to examine situations. As new situations are encountered, this framework provides a structure for organization, analysis, and decision making. In addition, nursing theories provide a structure for communicating with other nurses and with other members of the health care team. Nursing theories assist the discipline of nursing in clarifying beliefs, values, and goals, and they help to define the unique contribution of nursing in the care of clients. When the focus of nursing's contribution is clear, then greater professional autonomy and, ultimately, control of certain aspects of practice are achieved.

In the broadest sense, nursing theory is necessary for the continued development and evolution of the discipline of nursing. Because the world of health care changes virtually on a daily basis, nursing needs to continue to expand its knowledge base to proactively respond to changes in societal needs. Knowledge for nursing practice is developed through nursing research that, in turn, is used to either test existing theories or generate new theories. **Nursing research** is the systematic application of formalized methods for generating valid and dependable information about the phenomena of concern to the discipline of nursing (Chinn & Kramer, 1995).

The relationship between nursing practice, theory, and research is depicted in Figure 2-1. These processes are so closely related that to consider one aspect without

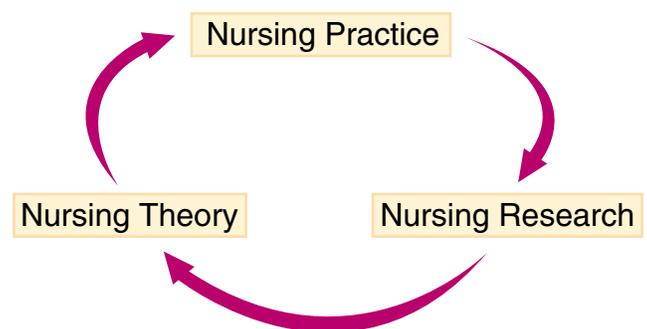


Figure 2-1 Process of knowledge development. Nursing practice, theory, and research are interdependent. Nursing theory development and nursing research activities are directed toward developing nursing practice standards.

considering the other two aspects would be the same as seeing only a part of the whole. Nursing practice is the focal point of the relationship between practice, theory, and research. It provides the raw material for the ideas that are systematically developed and organized in the form of nursing theory. The ideas proposed by nursing theory must be tested and validated through nursing research. In turn, new knowledge that results from nursing research is used to transform and inform nursing practice. Alternatively, nursing practice generates questions that serve as the basis for nursing research. Nursing research, then, influences the development of nursing theory that, in turn, transforms nursing practice.

Levine stated that “exploring a variety of nursing theories ought to provide nurses with new insights into patient care, opening nursing options otherwise hidden, and stimulating innovative interventions” (1995, p. 13). Theoretical thinking enhances and strengthens the nurse’s role and helps one to actually *think* nursing. As nurses learn more about specific nursing theories, it may be discovered that they can relate more to one theory than another or that they can appreciate the ideas

contained in several different theories. Nurses may use a specific nursing theory to help guide their practice or may choose a more eclectic approach and adopt ideas from several theories. Both of these approaches are valid. Furthermore, nurses may find some theories more appropriate for certain situations. In that case, one theory can be used with a client in a home health care setting, whereas another theory may be more applicable to a client in an acute care environment. Regardless of the approach chosen, nurses will recognize the value and usefulness of nursing theory as a tool for effective nursing practice.

SCOPE OF THEORIES

“Although theories address relatively specific and concrete phenomena, they vary in scope. Scope refers to the relative level of substantive specificity of a theory and the concreteness of its concepts and propositions” (Fawcett, 1993, p. 19). Essentially, three different cate-



Title of Study

“Nurse-Expressed Empathy, Client Outcomes, and Development of a Middle-Range Theory”

Authors

Olson, J., & Hanchett, E.

Purpose

To demonstrate how a middle-range theory was developed and tested through research that examined relationships between nurse-expressed empathy and two client outcomes: client-perceived empathy and client distress.

Methods

A sample of 140 subjects, 70 staff RNs, and 70 clients from hospital medical-surgical acute care units were used to test Orlando’s model. Each nurse-subject completed two measures of nurse-expressed empathy and each client-subject completed a measure of perceived empathy and two measures of distress.

Findings

Negative relationships were found between nurse-expressed empathy and client distress, and between client-perceived empathy and client distress. A moderate positive relationship was found between nurse-expressed empathy and client-perceived empathy.

Implications

The results of the study demonstrated support for relationships proposed in Orlando’s model and also demonstrated that a model can be tested when propositions theoretically linked to the model are empirically tested. Ongoing research is needed to determine the client outcomes that are related to the empathy of nurses.

Olson, J., & Hanchett, E. (1997). Nurse-expressed empathy, patient outcomes, and development of a middle-range theory. *Image: Journal of Nursing Scholarship*, 29(1), 71–76.

gories relate to the scope of theories: grand theories, middle-range theories, and micro-range theories. This classification is applicable to both nursing and non-nursing theories.

Grand Theory

A **grand theory** is composed of concepts representing global and extremely complex phenomena. It is the broadest in scope, represents the most abstract level of development, and addresses the broad phenomena of concern within the discipline. Typically, a grand theory is not intended to provide guidance for the formation of specific nursing interventions, but rather provides an overall framework for structuring broad, abstract ideas (Fawcett, 1993). An example of a grand theory is Orem's Self-Care Deficit Theory of Nursing.

Middle-Range Theory

A theory that addresses more concrete and more narrowly defined phenomena than a grand theory is known as a **middle-range theory**. Descriptions, explanations, and predictions put forth in a middle-range theory are intended to answer questions about nursing phenomena, yet they do not cover the full range of phenomena of concern to the discipline. A middle-range theory provides a perspective from which to view complex situations and a direction for interventions (Fawcett, 1993). An example of a middle-range theory is Peplau's Theory of Interpersonal Relations.

Micro-Range Theory

A micro-range theory is the most concrete and narrow in scope. A **micro-range theory** explains a specific phenomenon of concern to the discipline (Fawcett, 1993), such as the effect of social supports on grieving and would establish nursing care guidelines to address the problem.

THE EVOLUTION OF NURSING THEORY

The work of early nursing theorists in the 1950s focused on the tasks of nursing practice from a somewhat mechanistic viewpoint. Because of this emphasis, much of the art of nursing—the value of caring, the relationship aspects of nursing, and the esthetics of practice—was diminished. During the decades of the 1960s, 1970s, and 1980s, many nursing theorists struggled with making nursing practice, theory, and research fit into the then prevailing view of science. Table 2-1 provides a chronological summary of the development of nursing's theory base through the contributions of noted theorists and influential leaders in nursing.

Reflecting changes in global awareness of health care needs, several contemporary nursing theorists have projected a new perspective for nursing that truly unifies the notion of nursing as both an art and a science. Noted nursing theorists such as Leininger, Watson, Rogers, Parse, and Newman have been urging the discipline of nursing to embrace this new emerging view that is seen as more holistic, humanistic, client focused, and grounded in the notion of caring as the core of nursing.

Since the early 1950s, many nursing theories have been systematically developed to help describe, explain, and predict the phenomena of concern to nursing. Each of these established theories provides a unique perspective and each is distinct and separate from other nursing theories in its particular view of nursing phenomena. An overview of several nursing theories is presented later in the chapter.

KNOWLEDGE DEVELOPMENT IN NURSING

The knowledge in a particular discipline can be arranged in a hierarchical structure that ranges from abstract to concrete. Theories represent the most concrete component of a discipline. Several theories that share a common view of the world can be grouped together to form a paradigm. A **paradigm** is a particular viewpoint or perspective. Each discipline has a defined metaparadigm, which is the most abstract component of knowledge and which can consist of more than one paradigm (Fawcett, 1989). A **metaparadigm** is the unifying force in a discipline that names the phenomena of concern to that discipline.

The Metaparadigm of Nursing

What is it that distinguishes nursing from any other discipline such as biology, sociology, or psychology? Each of these other disciplines—biology, sociology, and psychology—is concerned with specific aspects of the

THINK ABOUT IT

Metaparadigm Concepts in Nursing

Some of the more contemporary theories in nursing are creating new views of person, environment, health, and nursing. What are your beliefs about the nature of the person? Do you view the person as a holistic being or parts that make up a whole? Is your concept of environment centered more on external or internal conditions? Can the person be considered in isolation of the environment? How do you define health? Is illness the opposite of health? What is the purpose of nursing? How does nursing accomplish its goals?

TABLE 2-1
Chronology of Nursing Theory Development

Date	Theorist	Theory/Publications
1859	Florence Nightingale	<i>Notes on Nursing: What It Is and What It Is Not</i>
1952	Hildegard Peplau	<i>Interpersonal Relations in Nursing</i>
1964		<i>Basic Principles of Patient Counseling</i>
1992		Interpersonal relations: A theoretical framework for application in nursing practice (in <i>Nursing Science Quarterly</i>)
1955	Virginia Henderson	(with B. Harmer) <i>Textbook for the Principles and Practice of Nursing</i>
1966		<i>The Nature of Nursing: A Definition and Its Implication for Practice, Research and Education</i>
1991		<i>The Nature of Nursing: Reflections after 20 Years</i>
1960, 1968, 1973	Faye Abdelleh	(with Beland, Martin, and Matheney) <i>Patient-Centered Approaches to Care</i>
1961, 1990	Ida Jean Orlando (Pelletier)	<i>The Dynamic Nurse-Patient Relationship</i>
1964	Ernestine Wiedenbach	<i>Clinical Nursing: A Helping Art</i>
1966, 1971	Joyce Travelbee	<i>Interpersonal Aspects of Nursing</i>
1969, 1973	Myra Levine	<i>Introduction to Clinical Nursing</i>
1989		The four conservation principles: Twenty years later
1991		The conservation principles: A model for health
1970	Martha Rogers	<i>An Introduction to the Theoretical Basis of Nursing</i>
1980		Nursing: A science of unitary man
1989		Nursing: A science of unitary human beings
1971	Imogene King	<i>Toward a Theory of Nursing: General Concepts of Human Behavior</i>
1981		A theory for nursing: Systems, concepts and process
1989		King's general systems framework and theory
1971, 1980, 1988, 1991	Dorothea Orem	<i>Nursing Concepts of Practice</i>
1976	Dorothy Johnson	<i>Behavioral Systems and Nursing</i>
1980		The behavioral systems model for nursing
1976, 1984	Callista Roy	<i>Introduction to Nursing: An Adaptation Model</i>
1980		<i>The Roy Adaptation Model</i>
1987		<i>Theory Construction in Nursing: An Adaptation Model</i>
1991		<i>The Roy Adaptation Model: The Definitive Statement</i>
1976	Josephine Paterson & Loretta Zderad	<i>Humanistic Nursing</i>
1978	Madeline Leininger	<i>Transcultural Nursing, Concepts, Theories and Practice</i>

(continues)

TABLE 2-1 (continued)
Chronology of Nursing Theory Development

Date	Theorist	Theory/Publications
1980		<i>Caring: A Central Focus of Nursing</i>
1988		<i>Leininger's Theory of Nursing: Culture Care Diversity and Universality</i>
1979	Jean Watson	<i>Nursing: The Philosophy and Science of Caring</i>
1985		<i>Nursing: Human Science and Human Care</i>
1988		New dimensions of human caring theory
1989		Watson's philosophy and theory of human caring in nursing
1979	Margaret Newman	<i>Theory Development in Nursing</i>
1983		Newman's health theory
1986		<i>Health as Expanding Consciousness</i>
1980	Betty Neuman	The Betty Neuman health care systems model: A total person approach to patient problems
1982, 1989		<i>The Neuman Systems Model</i>
1981, 1989	Rosemarie Parse	<i>Man-Living-Health: A Theory of Nursing</i>
1983	Joyce Fitzpatrick	Fitzpatrick's rhythm model: Analysis for nursing science
1984	Patricia Benner	<i>From Novice to Expert: Excellence and Power in Clinical Nursing Practice</i>
1989		<i>The Primacy of Caring: Stress and Coping in Health and Illness</i>

human being. "Each discipline singles out certain phenomena with which it will deal in a unique manner" (Fawcett, 1989, p. 5). The field of biology (the study of living organisms) has defined limits and boundaries that do not extend into psychology. Similarly, psychology (which is concerned with the behavior of individuals) does not extend its concerns into the domain of sociology, which has as its main focus the social behavior of human beings.

The broadly identified concerns of a discipline are defined in its metaparadigm. The metaparadigm concepts provide the boundaries and limitations of a discipline, identify the common viewpoint that all members of a discipline share, and help to focus the activities of the members of that discipline. Disciplines are distinguished from each other by differing metaparadigm concepts. Most metaparadigms consist of several major concepts.

Initial consensus on the metaparadigm concepts in nursing was achieved in 1984. According to Fawcett (1984), the major concepts that provide structure to the domain of nursing are *person, environment, health, and nursing*. These metaparadigm elements name the overall areas of concern for the nursing discipline. Each nursing theory presents a slightly different view of the metaparadigm concepts. Refer to the section entitled

"Selected Nursing Theories" for a discussion of how various theorists address and link the metaparadigm concepts.

Consider for a moment the practice of nursing by a school nurse, an emergency room nurse, and a psychiatric nurse. What is the unifying thread among these various nurses? Although each nurse's practice is obviously different, they all consider their work as part of the profession of nursing because all share the same major concerns. Regardless of the setting or the type of client involved, each nurse is concerned with person, environment, health, and nursing. Nursing's metaparadigm is shared by all nurses despite differences in their individual practices.

How is nursing's metaparadigm different from that of other helping professions? The metaparadigm of medicine focuses on pathophysiology and the curing of disease. Nursing's metaparadigm is broader and focuses on the person, health, and the environment. Consider a physician's and a nurse's view of a client who is newly diagnosed with diabetes. The physician is concerned with reducing the client's abnormal blood glucose values to normal levels, if possible. The physician prescribes medications, an exercise regime, and nutritional counseling in an effort to control blood sugar levels. In dealing with the same client situation, the nurse is

concerned with such issues as the client's ability to cope with a chronic condition, the effect of the diagnosis on the client's family, and teaching about the need for changes in the client's daily living patterns. The nurse is concerned with the impact of the diagnosis on all aspects of the client's life. Although both health care providers are viewing the same client situation, each has a different perspective or focus. Each discipline's metaparadigm provides a viewpoint that leads to the development of knowledge as seen within that viewpoint.

Despite the fact that person, health, environment, and nursing are the generally accepted metaparadigm elements in nursing, there is growing discontent with the limitation of these elements. As dialogue continues and as clarity emerges, the metaparadigm elements will change to reflect contemporary thought and practice.

One example of this evolution in the discipline of nursing is the inclusion of caring as a basic core concept, central to the practice of nursing. Nurse scholars have urged a reconsideration of the identified metaparadigm elements. Watson (1985, p. 35) stated that "care is the essence of nursing and the most central and unifying focus for nursing practice." According to Watson (1990, p. 21), "human caring needs to be explicitly incorporated into nursing's metaparadigm."

Paradigms in Nursing

The metaparadigm of a discipline identifies common areas of concern. A paradigm is a particular way of viewing the phenomena of concern that have been delineated by the metaparadigm of the discipline. The term *paradigm* stems from the work of Kuhn (1970), who referred to a paradigm as "worldview" about the phenomena of concern in a discipline.

Two individuals with different paradigmatic views can look at precisely the same phenomenon and each will "see" or view the phenomenon differently. For example, consider the viewpoints of a mother and father who are watching their daughter at T-ball practice. The mother looks at her daughter and "sees" a graceful, yet somewhat shy child who has shown improvement in her ability to make new friends. On the other hand, the father "sees" a strong runner who needs help with batting drills. Each parent is looking at the same phenomenon (their daughter), but each is "seeing" the phenomenon from a completely different perspective. Each parent is operating from a different paradigm.

The prevailing paradigm in a discipline represents the dominant viewpoint of particular concepts. This viewpoint is supported by theories and research that for the time being adequately address the concerns of the discipline. By consensus, the community of scholars in a discipline accepts and agrees on a particular viewpoint or worldview. When new theories and research surface that challenge the prevailing paradigm, a new paradigm emerges to compete with the prevailing worldview. The competition between the paradigms results in what

Kuhn (1970) refers to as a paradigm revolution. A **paradigm revolution** is the turmoil and conflict that occur in a discipline when a competing paradigm gains acceptance over the dominant paradigm. If the competing paradigm answers more questions and solves more problems for the discipline than the prevailing paradigm, then a paradigm shift occurs. A **paradigm shift** refers to the acceptance of the competing paradigm over the prevailing paradigm or a shifting away from one worldview toward another worldview. Again, by consensus the competing paradigm becomes the dominant paradigm and the process begins again (Kuhn, 1970).

The notion of paradigm revolution can be likened to the revolution that might occur in a country where the ruling government is overthrown by a competing group who proposed to have more and better solutions to the country's problems. In this situation, power shifts from one ruling body to another. In another example, a paradigm shift occurred when people began to view the world as round rather than flat. Once it was agreed on by the community of scholars that the world was round (now the prevailing paradigm), all other views about the world also changed. Paradigms can be mutually exclusive. Members of a discipline cannot subscribe to two competing paradigms at the same time. One cannot believe at the same time that the world is flat *and* that the world is round.

Several nursing scholars have proposed that the discipline of nursing is in the midst of a paradigm revolution. The implication is that there are at least two paradigms in competition with each other. Although the scholarly literature in nursing reflects the views of several authors who present and name different paradigms in nursing, the work of Parse is highlighted here. According to Parse (1987), there are currently two paradigms in nursing: the *Totality Paradigm* and the *Simultaneity Paradigm* (Figure 2-2). Each of these paradigms is composed of various nursing theories that are similar in their worldview of the metaparadigm concepts. However, each theory, which is grouped within a particular paradigm, has different definitions of concepts and propositions that state how these concepts are related.

In the **Totality Paradigm**, the person, who is a combination of biological, psychological, social, and spiritual features, is in constant interaction with the environment to accomplish goals and maintain balance. "The goals of nursing in the totality paradigm focus on health promotion, care and cure of the sick, and prevention of illness. Those receiving nursing care are persons designated as ill by societal norms" (Parse, 1987, p. 32). Identification with the Totality Paradigm is understandable because it has been and is the prevailing paradigm in nursing. Many of the nursing theories developed to date have a view of the discipline of nursing that fits the Totality Paradigm.

In the competing paradigm, the Simultaneity Paradigm, the person-environment interaction is viewed very differently. In the **Simultaneity Paradigm**,

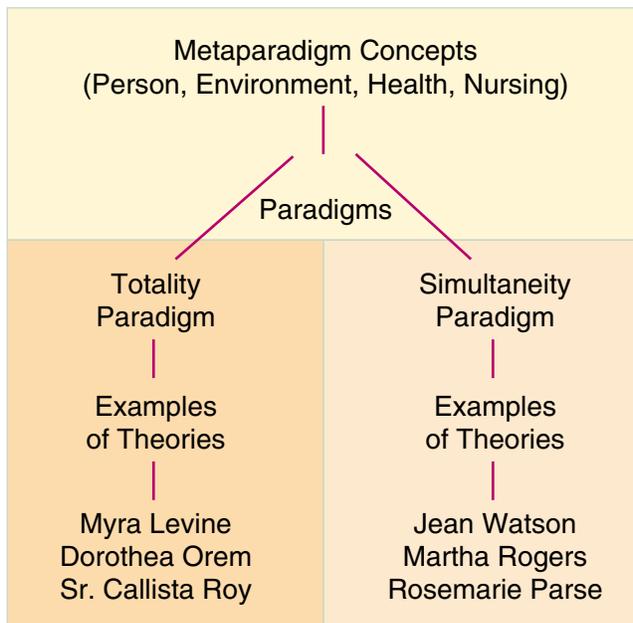


Figure 2-2 Hierarchy of knowledge development in nursing. In the hierarchical arrangement of knowledge development in a discipline, the metaparadigm concepts are the most abstract. Theories represent the most concrete level in this hierarchy.

the person is seen as “more than and different from the sum of the parts, changing mutually and simultaneously with the environment . . . as a freely choosing being cocreating health through mutual interchange with the environment” (Parse, 1987, p. 4). “The goals of nursing in the simultaneity paradigm focus on the quality of life from the person’s perspective. Designation of illness by societal norms is not a significant factor. The authority and prime decision maker in regard to nursing is the person not the nurse” (Parse, 1987, pp. 136–137).

Clearly, these two paradigms represent very different viewpoints. Each paradigm has several nursing theories that are congruent with the worldview proposed by that paradigm.

Debate, dialogue, discussion, theory development, and research continue within the discipline of nursing. Some nursing scholars argue about the structural elements of the discipline; some debate the value of competing paradigms; and some present alternative metaparadigm elements. Yet, with all the uncertainty that is created by these questions and alternative ideas, the ongoing dialogue is a healthy sign of the development of the nursing profession.

SELECTED NURSING THEORIES

Although there are many nursing theories, frameworks, and models in nursing, this chapter addresses only selected ones. The theories discussed have been selected

because they represent the development of nursing’s scientific thought.

Florence Nightingale

Nightingale did not develop a theory of nursing as theory is defined today, but rather she provided the nursing profession with the philosophical basis from which other theories have emerged and developed. Nightingale’s ideas about nursing have guided both theoretical thought and actual nursing practice throughout the history of modern nursing.

Nightingale considered nursing similar to a religious calling to be answered only by women with an all-consuming and passionate response. She considered nursing to be both an art and a science and believed that nurses should be formally educated.

Her writings did not focus on the nature of the person but did stress the importance of caring for the ill person rather than caring for the illness. In Nightingale’s view, the person was a passive recipient of care, and nursing’s primary focus was on the manipulation of the person’s environment to maintain or achieve a state of health.

Despite the fact that she did not believe in the germ theory, her experiences in the Crimean War magnified her interest in the principles of sanitation and the relationship between environment and health. A person’s health was the direct result of environmental influences, specifically cleanliness, light, pure air, pure water, and efficient drainage. Through manipulating the environment, nursing “aims to discover the laws of nature that would assist in putting the patient in the best possible condition so that nature can effect a cure” (Nightingale, 1859, p. 6). Nursing’s main focus was health, and health was closely related to nursing. Nursing was concerned with the healthy, as well as the sick (Nightingale, 1859).

Nightingale’s principles regarding environment-health-nursing were implemented in America at the turn of the 20th century. With the development of hospital-based schools of nursing, Nightingale’s principles of sanitation were used to clean up the rat-infested, dirty hospitals of the day. With the use of Nightingale’s ideas, hospitals became a place for people to recover rather than a place to die. When, for a variety of reasons, hospitals did not hire their own nursing graduates, nurses applied Nightingale’s principles in the community in the development of public health nursing. The Henry Street Settlement founded by Lillian Wald is an excellent example of Nightingale’s theory in practice.

Private duty nursing and public health nursing remained the primary focus of nursing practice until World War II. At this time, there was a tremendous increase in scientific knowledge and technology affecting health care. As the practice of medicine became more scientifically based, more clients were cared for in hospital settings. Nursing practice likewise became

centered in the hospital rather than the home. With this development, it became clear that nursing did not have an adequate theory base to organize new knowledge and guide nursing practice. Nursing began to further develop its knowledge base by incorporating the principles of Nightingale into modern nursing theory.

Early Nursing Theories

By its very nature, the development of nursing's theoretical base has progressed in a methodical and systematic, albeit slow, fashion. Knowledge development is an ongoing process that is often influenced by driving forces outside the discipline of nursing. The early nurse theorists were not attempting to address the metaparadigm concepts because initial consensus on these had not yet been achieved. Rather, these theories were attempting to answer the question, "What is nursing?"

Hildegard Peplau

Hildegard Peplau, a psychiatric nurse, combined her research and experience in the development of a theory of psychodynamic nursing, published in *Interpersonal Relations in Nursing* (1952). Drawing from her own knowledge and that from other disciplines, Peplau defined the concepts and stages involved in the development of the nurse-client relationship. From that relationship, she identified the roles of the nurse as stranger, resource person, teacher, leader, surrogate, and counselor. Peplau developed a middle-range theory with a focus on both nursing and the person and did not incorporate all aspects of the metaparadigm into her theory. Although other theories may view the nurse-client relationship differently, the primacy of this relationship in nursing has remained.

Virginia Henderson

Virginia Henderson's definition of nursing, considered to be a classic, first appeared in 1955.

The unique function of the nurse is to assist the individual, sick or well, in the performance of those activities contributing to health or its recovery (or to a peaceful death) that he would perform unaided if he has the necessary strength, will, or knowledge. And to do this in such a way as to help him gain independence as rapidly as possible. (Henderson, 1966, p. 15)

Together with Bertha Harmer, Henderson attempted to identify those basic human needs viewed as the basis of nursing care. These needs include the need to maintain physiologic balance, to adjust to the environment, to communicate and participate in social interaction, and to worship according to one's faith. Her 14 basic needs were published in the *Textbook of the Principles and Practice*

of Nursing, one of the first nursing textbooks. Henderson viewed the nursing role as helping the client from dependence to independence. As an early nursing theorist, Henderson did not intend to develop a theory of nursing, but rather she attempted to define the unique focus of nursing. Henderson's emphasis on basic human needs as the central focus of nursing practice has led to further theory development regarding the needs of the person and how nursing can assist in meeting those needs.

Faye Abdellah

Faye Abdellah, acknowledging the influence of Henderson, expanded Henderson's 14 needs into 21 problems that she believed would serve as a knowledge base for nursing. Throughout her career, she strongly supported the idea that nursing research would be the key factor in helping nursing to emerge as a true profession. The research that was done regarding these common needs/problems has served as a foundation for the development of what we now know as nursing diagnoses.

Joyce Travelbee

Joyce Travelbee, an educator and psychiatric nurse, was influenced by the philosophy of **existentialism**, a movement that is centered on individual existence in an incomprehensible world and the role that free will plays in it, and searched to find meaning in life's experiences. She extensively developed the ideas of sympathy, empathy, and rapport in which the nurse could begin to comprehend and relate to the uniqueness of others. Her work focused on the human-to-human relationship and on finding meaning in experiences such as pain, illness, and distress. Travelbee based most of her theory on her own experiences and readings and first published her work in *Interpersonal Aspects of Nursing* in 1966.

Josephine Paterson and Loretta Zderad

The work of Josephine Paterson and Loretta Zderad was similar to that of Travelbee in that it emphasized the humanistic and existential basis of nursing practice. According to Paterson and Zderad, theory developed from the practice of nursing. Although the models proposed by Travelbee and Paterson and Zderad had some impact at the time of their initial introduction, they did not gain wide popularity and application in nursing. The work of Travelbee and Paterson and Zderad most appropriately fit the Simultaneity Paradigm. Current theorists—such as Watson, Rogers, Parse, Fitzpatrick, and Newman—who have an existential orientation, are rediscovering the merits of Travelbee and Paterson and Zderad.

Contemporary Nursing Theories

Although early nursing theorists attempted to answer the question “What is nursing?,” contemporary theorists addressed the metaparadigm concepts in more depth, focused more specifically on nursing actions, and tried to answer the question “When is nursing needed?” The work of contemporary theorists such as Levine, Orem, and Roy form the theoretical basis for many interventions in current nursing practice.

Myra Levine

Myra Levine’s Conservation Theory is directly grounded in nursing practice. In her attempt to describe, explain, and predict the phenomena of concern to nursing, Levine published the four conservation principles in 1969 in *Introduction to Clinical Nursing*. Conservation is derived from the Latin word “to keep together.” Levine believed in the wholeness of the human being and the primary focus of conservation is to maintain that wholeness. Levine viewed nursing as assisting clients with the conservation of their uniqueness by helping clients to adapt appropriately. Conservation principles are universal principles designed to link concepts into a cohesive framework within which nursing practice in different environments can be performed (Levine, 1990).

According to Levine, the four principles of conservation are:

1. *Conservation of Energy*: “The individual requires a balance of energy and a constant renewal of energy to maintain life activities” (Levine, 1990, p. 197).
2. *Conservation of Structural Integrity*: “Structural integrity is concerned with the processes of healing . . . to restore wholeness and continuity after injury or illness” (Levine, 1989, p. 333).
3. *Conservation of Personal Integrity*: “Everyone seeks to defend his or her identity as a self, in both that hidden, intensely private person that dwells within and in the public faces assumed as individuals move through their relationships with others” (Levine, 1989, p. 334).
4. *Conservation of Social Integrity*: “No diagnosis should be made that does not include the other persons whose lives are entwined with that of the individual” (Levine, 1989, p. 336).

According to Levine, the *person* is who the person knows himself or herself to be and the *environment* is the context in which the person lives his or her life. In Levine’s view, health is socially defined and the goal of nursing is based on the four conservation principles. Levine did not operationally define and relate the metaparadigm concepts in her theory because her original work was initially intended to be a medical-surgical nursing textbook and not a developed nursing theory. In reevaluating her theory 20 years later, Levine stated

that she has “grown in [her] conviction that they [the conservation principles] continue to offer an approach to nursing that is scientific, research oriented, and above all suitable in daily practice in many environments” (Levine, 1989, p. 331).

A nurse who is involved in acute care situations such as an emergency room or intensive care unit often deals with clients who are exposed to severe threats to physiological integrity. The conservation of structural integrity is often the immediate priority in these acute care situations. For example, when a nurse in an emergency room is dealing with a client who has been in a severe motor vehicle accident, the client’s structural integrity is at risk. When the client’s structural integrity has been damaged, the client must put all available energy into healing the self. The nurse tries to provide care for that client so that energy can be conserved for the processes of healing. In addition to experiencing a threat to structural integrity, this client has other needs as well. The client has social relationships and these relationships are also disrupted by the accident. The nurse is concerned with the client’s spouse and family who are part of the social unit. Even in this time of crisis in the emergency room, the client’s social integrity is of concern. Finally, the nurse is also concerned about the client’s personal integrity because the traumatic experience and necessary treatment can be frightening and dehumanizing. As the nurse strives to maintain the client’s structural, social, and personal integrity, the nurse recognizes that the client is a person who is a unique individual.

Levine’s four conservation principles can also be useful in a home setting in which the family rather than a single individual is the client. The nurse recognizes that energy within the family needs to be maintained to keep the family whole. In caring for the family, the nurse needs to maintain the structural, social, and personal integrity of the family and of each individual while dealing with the illness of a specific family member. Consider, for example, the nurse who makes a home health visit to see a child with cystic fibrosis. In this situation, the nurse’s attention needs to be directed toward conservation of energy for the child. To help conserve the child’s energy for breathing, exercises must be taught to and done by others. The nurse directs strategies toward conserving the child’s structural integrity while recognizing that the

THINK ABOUT IT

Levine’s Conservation Principles

Undoubtedly, as a new student in nursing, you have had to make major adjustments in your life. Using Levine’s four conservation principles, design strategies for yourself that will conserve your own energy, structural integrity, personal integrity, and social integrity.

child is a unique individual and is a member of a social group, the family. Conservation of social integrity would be accomplished through maintaining interest in and monitoring the family dynamics.

Levine is pragmatic, and the conservation principles can be applied to most nursing situations. Her theory is appropriate for use in situations in which the nurse has had a long-term relationship with the client, yet is also useful for short-term relationships. Levine's theory is congruent with the characteristics of the Totality Paradigm.

Dorothea Orem

In attempting to plan a nursing curriculum for licensed practical nurses, Dorothea Orem was searching for a pragmatic framework to organize nursing knowledge. She focused on the questions "What is nursing?" and "When do people need nursing care?" and from this she derived that people need nursing when they are unable to care for themselves. In 1971, she presented the Self-Care Deficit Theory of Nursing (S-CDTN) in the book *Nursing Concepts of Practice* and has continually revised and updated her theory.

Orem's theory incorporates the medical model rather than rejects it, centers on the individual, is problem oriented, and is easily adaptable in varied clinical situations. These attributes create its wide appeal for application in nursing practice. Meleis (1991, p. 401) stated that it has "the widest circle of all theories in practice." As a grand theory, the S-CDTN has three interconnecting theories: Theory of Self-Care, Theory of Self-Care Deficit, and Theory of Nursing Systems. Each one is discussed below.

Theory of Self-Care

According to this theory, **self-care** is a learned behavior and a deliberate action in response to a need. Orem identified three categories of self-care requisites: universal self-care requisites, developmental self-care requisites, and health-deviation self-care requisites. Universal self-care requisites are common to all human beings and include both physiological and social interaction needs. Developmental self-care requisites are the needs that arise as the individual grows and develops. Health-deviation self-care requisites result from the needs produced by disease or illness states. Self-care is performed by mature and maturing individuals. When someone else must perform a self-care need, it is termed dependent care.

Theory of Self-Care Deficit

This theory purports that nursing care is needed when people are affected by limitations that do not allow them to meet their self-care needs. The relationship between the nurse and the client is established when a self-care deficit is present. Self-care deficits, not medical diagnosis, determine the need for nursing care.

According to Orem, the only legitimate need for nursing care is when a self-care deficit exists.

Theory of Nursing Systems

This is the unifying theory that "subsumes the theory of self-care deficit which subsumes the theory of self-care" (Orem, 1991, p. 66). The Theory of Nursing Systems attempts to answer the question "What do nurses do?" This was the original question that prompted the development of Orem's theory.

The nurse determines whether or not there is a legitimate need for nursing care. Is a person able to meet self-care needs? Does a deficit exist? If a deficit exists, then the nurse plans care that identifies what is to be done by whom: the nurse, the client, or other (family or significant other). Collectively, the actions of all these people are called the nursing system. Orem identified three types of nursing systems: wholly compensatory, partly compensatory, and supportive-educative.

In the wholly compensatory nursing system, the nurse supports and protects the client, compensates for the client's inability to care for self, and attempts to provide care for the client. The nurse would use the wholly compensatory nursing system when caring for a newborn or with a client in a postanesthesia care unit who is recovering from surgery. Both of these clients are completely unable to provide self-care.

THINK ABOUT IT

Types of Nursing Systems

When caring for clients who require the wholly compensatory nursing system, how would you feel about giving complete personal care to a client who has experienced a stroke and is unable to bathe or toilet himself or herself? How would you approach such a situation?

In the partly compensatory nursing system, both the nurse and client perform care measures. For example, the nurse can assist the postoperative client to ambulate. The nurse may bring in a meal tray for the client who is able to feed self. The nurse compensates for what the client cannot do. The client is able to perform selected self-care activities but also accepts care performed by the nurse for needs the client is unable to meet independently.

In the supportive-educative nursing system, the nurse's actions are to help clients develop their own self-care abilities through knowledge, support, and encouragement. Clients must learn and perform their own self-care activities. The supportive-educative nursing system is being used when a nurse guides a new mother to breastfeed her baby. Counseling a psychiatric client on more adaptive coping strategies is

another example of the use of the supportive-educative nursing system.

Orem focused primarily on the needs of the person and the action of nursing to meet those needs. Lesser emphasis was given to defining health and the environment. The S-CDTN is useful in determining the kind of nursing assistance needed by the client and, therefore, has merit as a theory that guides nursing practice. Orem's theory is consistent with the characteristics of the Totality Paradigm.

Sister Callista Roy

Sister Callista Roy combined general systems theory with adaptation theory to produce the Roy Adaptation Model. Roy was greatly influenced by her teacher and mentor, Dorothy E. Johnson, a nursing theorist who developed the Behavioral Systems Model. Roy first published her model in the 1970s and has continued to further refine and develop the theory. As a contemporary theorist, Roy worked with the metaparadigm concepts to define and relate these concepts.

Roy defines a person as “an adaptive system . . . a whole comprised of parts that function as a unity for some purpose” (Andrews & Roy, 1991, p. 4). The person is a biopsychosocial being in constant interaction with a changing internal and external environment. Nursing attempts to alter the environment when the person is not adapting well or has ineffective coping responses.

“The world around and within (the person as an adaptive system) is called the environment” and “includes all conditions, circumstances, and influences that surround and affect the development and behavior of the person” (Andrews & Roy, 1991, p. 18). The environmental stimuli can be classified as either focal, residual, or contextual. Focal stimuli are those that are immediately present in the person's environment. Focal stimuli are the objects or events that most attract one's attention. Most stimuli never become focal. Residual stimuli are those attitudes that are developed during previous experiences in one's life whose effects on the current situation are unclear. Contextual stimuli are “all the other stimuli present in the situation that contribute to the effect of the focal stimulus” (Andrews & Roy, 1991, p. 9). Because stimuli are constantly changing, that which is a focal stimulus one minute can become a residual stimulus the next.

According to the Roy Adaptation Model, the person has coping mechanisms that are broadly categorized in either the regulator or cognator subsystem. Adaptation is accomplished through these coping mechanisms that are innate, “genetically determined . . . and automatic processes” (Andrews & Roy, 1991, p. 13). The regulator subsystem functions through the autonomic nervous system, which “responds automatically through neural, chemical, and endocrine coping processes” (Andrews & Roy, 1991, p. 14). The cognator subsystem enables the person to respond to stimuli through processing stim-

uli, learning, judgment, and emotion. All input into the system (the person) is channeled through the regulator and cognator subsystems. If the regulator or cognator subsystem fails, there is ineffective adaptation.

Neither the regulator nor the cognator subsystem can be observed directly. Only the responses that each produces are observable. Roy categorized these responses into four adaptive modes: physiologic, self-concept, role function, and interdependence. The physiologic mode allows individuals to respond physiologically to their environment. The self-concept mode “focuses on psychologic and spiritual aspects of the person” (Andrews & Roy, 1991, p. 16). The basic underlying need of the self-concept mode is psychologic integrity. The role function mode focuses on the need to know who one is. The emphasis of the interdependence mode is affectional adequacy or the feeling of security in nurturing relationships (Andrews & Roy, 1991).

The purposes of adaptation are survival, growth, reproduction, and mastery. Adaptive responses contribute to these goals, whereas ineffective responses may threaten the person's survival, growth, reproduction, or mastery (Andrews & Roy, 1991).

The goal of nursing is “the promotion of adaptation in each of the four modes, thereby contributing to the person's health, quality of life, and dying with dignity” (Andrews & Roy, 1991, p. 20). Nursing care needs to be provided when a person has unusual stressors or when usual coping mechanisms are ineffective. See Chapter 23 for a discussion of the nature of and management of stress. Basically, the nurse attempts to manipulate stimuli in such a way as to allow the client to cope effectively. Roy defines health as “a state and a process of being and becoming an integrated and whole person” and a “lack of integration represents lack of health” (Andrews & Roy, 1991, p. 419).

In Roy's view, the nurse must first assess how the client behaves in each adaptive mode and then determine what can be altered in that mode to produce more efficient and effective adaptive responses. The nurse then either alters the environment directly or helps the person to alter the environment for better adaptive responses.

In the physiological mode, problems may arise in areas such as exercise, nutrition, elimination, fluid and electrolytes, temperature regulation, and oxygenation. For example, in caring for a client with a fever, the nurse helps the client to adapt by administering medications to lower the temperature, administering cool baths, and providing adequate fluids. Through these interventions, the nurse is attempting to alter both the internal and external environments of the person.

In the self-concept mode, the term *self-concept* refers to both the physical and the personal self. The physical self is affected or threatened during invasive procedures such as surgery. Anxiety, guilt, and distress are responses within the personal self to physical or emotional stressors. For example, in caring for an obese person who feels guilty

about developing diabetes at an early age, a nurse can help reframe the client's thinking to work through the guilt and anxiety. Through the use of counseling techniques, the nurse can teach the client how to adapt to the present situation and learn how to cope with it in the future.

Within the framework of the role function mode, the nurse would help a woman disabled with arthritis to identify adaptive approaches to maintain the roles of wife and homemaker. Nursing actions might include referral to occupational therapy for needed adaptive devices that could assist the client in maintenance of roles.

In the interdependence mode, problems may include feelings of alienation, disengagement, loneliness, or disenfranchisement that are experienced in various relationships. Examples of clients with problems in interdependence may include a grieving widow or a person with an abusive spouse.

The Roy Adaptation Model has gained wide acceptance in nursing practice, research, and education and is part of the dominant worldview of nursing. Roy's views of the person and the person-environment interaction clearly represent characteristics of the Totality Paradigm.

Theories for the New Worldview of Nursing

Theories for the new worldview of nursing describe, explain, and predict the phenomena of concern to nursing from a unique, more holistic perspective. In this new worldview, the client has primacy and the client-environment interaction is of utmost importance. Theories by Jean Watson, Martha Rogers, and Rosemarie Parse exemplify the new worldview.

Jean Watson

In the 1980s, Jean Watson developed the Theory of Human Caring, which focuses on the art and science of human caring. According to Watson (1985, p. 33), "caring is the essence of nursing and the most central and unifying focus of nursing practice." This theory offers a new way of conceptualizing and maximizing human-to-human transactions that occur daily in nursing practice. Watson's theory is influenced by Eastern philosophy and is "based on a metaphysical, spiritual-existential, and phenomenological orientation" (Fawcett, 1993, p. 220). These influences link Watson's theory to the work of early theorists such as Travelbee and Paterson and Zderad.

The Theory of Human Caring evolved from Watson's beliefs, values, and assumptions about caring. In Watson's view (1985), care and love comprise the primal universal psychic energy and are the basis for our humanity. Watson noted that, throughout its history, nursing has been involved in caring and has actually evolved out of caring. Furthermore, she stated that

caring will determine nursing's contribution to the humanizing of the world.

Watson's theory is composed of 10 carative factors, which are classified as nursing actions or caring processes. Watson's carative factors are:

1. Formation of a humanistic-altruistic system of values
2. Nurturing of faith-hope
3. Cultivation of sensitivity to one's self and to others
4. Developing a helping-trusting, human caring relationship
5. Promotion and acceptance of the expression of positive and negative feelings
6. Use of creative problem-solving method processes
7. Promotion of transpersonal teaching and learning
8. Provision for a supportive, protective, or corrective mental, physical, sociocultural, and spiritual environment
9. Assistance with gratification of human needs
10. Allowance for existential-phenomenological forces (Watson, 1989)

The first three carative factors serve as the philosophical foundation for the science of caring. The remaining seven provide more specific direction for nursing actions.

Watson stated that "health refers to unity and harmony within the mind, body, and soul. Health is also associated with the degree of congruence between the self as perceived and the self as experienced" (Watson, 1985, p. 48). In Watson's (1985, p. 49) view, the goal of nursing "is to help persons gain a higher degree of harmony with the mind, body, and soul." The nurse uses the above carative factors to accomplish the goal of nursing. Watson's theory clearly fits within the principles of the Simultaneity Paradigm.

Although the concept of caring is being deemphasized in today's health care environment because of exploding technology and cost-containment strategies, nursing must persevere in delivering care to clients. The challenge of nursing is to create moments of caring through human-to-human interaction in the face of the fast-paced world of health care.

Martha Rogers

Martha Rogers, a visionary leader and pioneer in the development of nursing's unique knowledge base, developed the highly abstract theory of the Science of Unitary Human Beings. According to Rogers, "nursing is a learned profession: a science and an art. A science is an organized body of abstract knowledge. The art involved in nursing is the creative use of science for human betterment" (Rogers, 1990, p. 198). Rogers' contribution to the discipline of nursing was revolutionary and provided new directions for the practice of nursing. Rogers first presented her ideas in the book *An*

THINK ABOUT IT

Theory of Human Caring

Recall the last time that you were sick with the flu. Reflect on what it means to you “to be cared about,” “to be cared for,” and “to be taken care of.” How are these the same? How are these different? As the recipient of care, what kinds of behaviors did you identify as “caring behaviors”? How could these behaviors be different for another person who grew up in a different family? A different culture?

Introduction to the Theoretical Basis of Nursing (1970). Her ideas regarding the person and the environment as energy fields were not considered to be consistent with the dominant paradigm of the 1970s but are more applicable with the principles of the Simultaneity Paradigm of the late 1980s.

According to Rogers (1990, p. 108), “the uniqueness of nursing is identified in the phenomena of concern. Nursing is the study of unitary, irreducible human beings and their respective environments.” Unitary person is an irreducible pandimensional energy field characterized by pattern and expressing qualities that are unique to the whole and cannot be foreseen from knowledge of the parts (Rogers, 1990). Environment is defined as “an irreducible pandimensional energy field identified by pattern and integral with a given human field” (Rogers, 1990, p. 109).

Within the viewpoint of the Science of Unitary Human Beings, the person is a unified whole and seen as greater than and different from the sum of the parts. The whole person cannot be known by examining any particular aspect or dimension of the person because all aspects together combine to form an entity different from the collection of parts. It is the characterization of the person as a human energy field that unites all aspects of the person into a unified whole. The whole of the person’s energy field interacts with the whole of the environmental energy field, which results in the process of life. There is a constant exchange of matter and energy between the person-environment unit, yet the uniqueness of each person is maintained through rhythmical patterns and relationships. “In a worldview where person and environment are in a constant, dynamic simultaneous process of change the concept of homeostasis is obsolete” (Joseph, 1990, pp. 116–117).

Nursing identifies the patterns and organization of the person-environment unit and aims to repattern the rhythm and organization of these energy fields so that the person’s integrity is heightened. “Maintenance and promotion of health, prevention of disease, nursing diagnosis, intervention, and rehabilitation encompass the scope of nursing’s goals” (Rogers, 1970, p. 86).

Rosemarie Parse

Rosemarie Parse synthesized Rogers’ Science of Unitary Human Beings with existential-phenomenological philosophy and added emphasis on the meaning and values that influence a person’s behavioral choices. Parse differs from Rogers in that she “does not view Man as an energy field, but rather as an open being who cocreates personal health” (Parse, 1987, p. 159). According to Leddy and Pepper (1993, p. 170), health is a “constantly changing process of becoming that incorporates values. Because it is not a state, health cannot be contrasted with disease.” Parse (1987, p. 169) states that “the practice of nursing . . . is a subject-to-subject interrelationship, a loving, true presence with the other to promote health and quality of life.” Parse provides a practice methodology in which the nurse helps clients to understand their own feelings and situation, find meaning within themselves and the situation, and plan for changes in the lived health patterns. In Parse’s perspective, the nurse does things *with* people as opposed to *for* them or *to* them. Clearly, Parse’s theory is consistent with the principles of the Simultaneity Paradigm.

Similar to the work of Parse, Joyce Fitzpatrick’s Life Perspective Rhythm Model (1989) and Margaret Newman’s Model of Health (1986) are current developing theories within the Simultaneity Paradigm.

CONTINUING EVOLUTION OF NURSING THEORY

Current theorists are continually expanding and refining the work of theorists before them, and they are developing new ways of looking at the metaparadigm concepts of person, environment, health, and nursing. Our understanding of the nature of nursing is, and always has been, in a state of change. Although change is healthy and leads to growth, it is not always easy. Knowledge is not static, and what one learns today may be challenged by different thoughts tomorrow.

The world of health care changes on a daily basis. Client needs and problems often change on a minute-by-minute basis. Knowledge, information, and technology in both health care and nursing are growing at unprecedented rates. In the face of these advances, nursing strives to preserve *the notion of caring* in health care. Theories are needed to organize knowledge and to guide nursing practice and nursing research. More nursing research is needed to confirm or refute theories. A strong theoretical foundation on which to base the practice of nursing is essential.

Nurses encounter a variety of clinical situations in which application of nursing theory is needed. In these occurrences, nurses may discover that specific theories will be more appropriate for certain clinical situations than others. Knowledge of specific theories should expand as nurses gain experience in nursing practice. In

all cases, theories that are selected for application in practice should be congruent with the nurse's own beliefs and values.

KEY CONCEPTS

- Concepts are abstract vehicles of thought and are the building blocks of theory.
- Propositions are relational statements that link concepts together.
- Theories help to show how things fit together. The function of theory is to provide a framework for explaining, predicting, and sometimes controlling situations.
- Nursing uses theories from other disciplines in conjunction with nursing theory.
- The development, use, and testing of nursing theory are necessary for the professionalization of the discipline of nursing.
- The relationship between nursing theory, practice, and research is an interdependent one. As a practice-oriented discipline, nursing theory and research inform and transform nursing practice.
- Theories range in scope from grand theories to middle-range theories to micro-range theories.
- The metaparadigm names the phenomena of concern to a discipline and distinguishes one discipline from another.
- The currently accepted metaparadigm concepts in nursing are person, environment, health, and nursing.
- The metaparadigm may be composed of more than one paradigm. Parse purports that there are two paradigms in nursing: the Totality Paradigm and the Simultaneity Paradigm.
- Early nursing theorists were attempting to answer questions related to the “what” and “how” of nursing.
- The theories developed by Levine, Orem, and Roy are useful in guiding nursing practice.
- A new worldview of nursing is emerging in the work of such theorists as Watson, Rogers, and Parse.

CRITICAL THINKING ACTIVITIES

1. Explain the relationship between concepts and propositions. How are concepts and propositions related to theory?
2. Define the term *theory*. What is the purpose of theory?
3. Explain the relationship between nursing theory, practice, and research.
4. Identify the main features of a metaparadigm. What are the metaparadigm concepts in nursing? How is nursing's metaparadigm different from medicine's metaparadigm?
5. What is a paradigm? What is the purpose of a paradigm?
6. Name the two paradigms in nursing identified by Parse and identify the principal philosophical underpinnings of each.
7. Discuss Nightingale's influence on modern nursing.
8. True or false: The early nursing theorists were attempting to address all of the metaparadigm concepts. Justify your answer.
9. Discuss the features of the following theories:
Levine
Roy
Orem
Watson
Rogers
10. Discuss how you plan to use nursing theory in your practice.

WEB RESOURCES

- Nursing Journals
<http://www.sciencekomm.at>
- Nursing Links
<http://views.vcu.edu>
- Virtual Nursing Center – Martindale
<http://www-sci.lib.uci.edu>

Nursing Education and Research



By changing nothing, we hang on to what we understand, even if it is the bars of our own jail.

(John LeCarre, 1990)

COMPETENCIES

1. Describe the characteristics of each of the educational programs for entry level nursing practice.
2. Discuss the Health Care Professionals' Competencies document and the strategies proposed by the PEW Health Professions Commission for nursing education reform.
3. Describe the trends in nursing education that specifically relate to the issues of competency development and delivery of care.
4. Explain the basis for research and knowledge development in nursing.
5. Describe the steps in the research process.
6. Explain the responsibilities of the researcher in guarding the rights of research participants and others who assist in the research study.
7. Identify the various applications of nursing research in nursing practice.
8. Discuss the trends occurring in health care that will influence the priorities for nursing research.

KEY
TERMS

abstract	organizations	primary source
client-focused care	hypothesis	qualitative analysis
competencies	independent variable	qualitative research
concepts	informed consent	quantitative research
conceptual framework	magnet hospitals	research
conceptualization	managed care	research design
construct	phenomena	secondary source
dependent variable	preferred-provider organizations	theory
full disclosure	primary care providers	value
health maintenance		variable

Trends in nursing education and research cannot be isolated from the dynamics of nursing practice. Likewise, nursing trends are responsive to the projected changes in the delivery, organization, and financing of health care. The health care revolution occurring in the United States is spurred by the questionable effectiveness of the current system to provide access to basic health services in an efficient and cost-effective manner. Because of the lack of a unified federal and state health care policy that directs, monitors, and ensures the basic value of health, discussion about appropriate practice roles and an adequate supply of professionals is central in the health care industry. To address these concerns, immediate shifts in traditional activities may offer solutions by developing guidelines for the optimal size of the health care work force, thus providing the nature and structure of care that guarantees access to health care for all U.S. citizens.

This chapter discusses the interrelatedness of nursing education, research, and practice. The various educational programs of the United States and Canada are presented in terms of their characteristics and the graduate's nursing role in health care delivery. Research studies are described within the context of methodology and relationship to practice. This chapter also discusses trends that question nursing's contribution to health care delivery from an educational or research perspective.

Nursing as a scientific discipline and as a profession is an essential component of any delivery system that influences improved health outcomes. According to the American Nurses Association (ANA, 1995a):

Nursing has a single scope of practice that is dynamic and evolves with changes in the phenomenon of concern, knowledge about the effects of various interventions on patient or group outcomes, the political environment, legal conditions and demographic patterns in society. . . . Individual nurses engage in the total scope of nursing practice . . . dependent on their educational preparation, experience, role and the nature of the patient populations they serve. (p. 5)

To produce beneficial results for the client (individual, family, group, or community), nurses must use sci-

entific methods and other ways of knowing to measure the efficacy of interventions. Theoretical and research-based understanding of **phenomena** (observable facts or events that can be perceived through the senses and are susceptible to description and explanation) will influence the quality of clinical decisions made by the nurse. It is within the framework of formal and accountable academic postsecondary education that these cognitive, attitudinal, and psychomotor skills are initially mastered.

NURSING EDUCATION

Educational programs that prepare graduates to write a licensing examination must be approved by a state or provincial (Canada) Board of Nursing. Boards approve entry level programs to ensure the safe practice of nursing by setting minimum educational requirements and guaranteeing the graduate of the program is an eligible candidate to write a licensing examination. In the United States, candidates must pass the National Council Licensing Examination (NCLEX) to obtain a license to practice nursing. In Canada, the licensing examination is administered by the Canadian Nurses Association Testing Service (CNATS).

Types of Programs

Two types of entry level nursing programs are available in the United States: licensed practical or vocational nurse (LPN or LVN) and registered nurse (RN). An *entry level educational program* means that the program prepares graduates to write a licensing examination. Graduates of the licensed practical/vocational programs write the NCLEX for practical nurses (NCLEX-PN), and graduates of registered nurse programs write the NCLEX for registered nurses (NCLEX-RN).

Postgraduate programs prepare nurses to practice in various roles as advanced practice registered nurses (APRNs). Individual states have varying statutory provisions for APRNs. For instance, some states recognize the APRN's credentials to practice, whereas others require licensure.

Licensed Practical Nursing

An LPN or LVN is trained in basic nursing skills to provide client care under the guidance of an RN or other licensed provider, for example, a physician or dentist. In the United States, these programs are 9 to 12 months in length and exist in a variety of settings: high schools, community colleges, vocational schools, hospitals, and other health care agencies. The Canadian equivalent to the LPN is a registered nurse's assistant (RNA). RNAs usually receive 12 months of education in a community college or hospital setting.

Practical nursing programs provide the graduate with didactic learning and clinical skills to perform selected nursing skills. Once licensed, practical nurses are prepared to work in structured settings, such as hospital and long-term care facilities, under RN supervision.

Registered Nursing

Registered nurse candidates are graduates from programs that are state approved and, in many cases, accredited by national accrediting organizations. In the United States, the National League for Nursing Accrediting Commission (NLNAC) accredits nursing programs; the Canadian Association of University Schools of Nursing (CAUSN) accredits baccalaureate programs. The Commission on Collegiate Nursing Education (CCNE) was established in 1996 as an accrediting agency of the American Association of Colleges of Nursing (AACN) to evaluate the quality and integrity of baccalaureate and graduate degree nursing education programs. RNs are prepared for entry into practice typically in three ways: associate degree nursing programs, hospital diploma programs, or baccalaureate degree nursing programs. Educational preparation for entry into practice has been an ongoing debate in nursing since the 1930s and 1940s, when the Brown and Goldmark reports recommended two levels of educational preparation for nurses. ANA's 1965 Position Statement identified two entry levels of educational preparation: minimum preparation for professional practice, baccalaureate degree; and minimum preparation for technical practice, associate degree. Again in 1985, the ANA adopted a resolution regarding titles: professional nurse, a nurse possessing the baccalaureate degree in nursing; and associate nurse, a nurse prepared in an associate degree program. Although AACN, CAUSN, and the professional nursing organizations in the United States (American Nurses Association) and Canada (Canadian Nurses Association) have supported the baccalaureate degree to be the minimum entry level for professional practice, the authority to enforce this requirement rests with the individual states and provinces.

CAUSN's mission is to promote health and wellness by advancing nursing education and nursing research. Although CAUSN supports baccalaureate education as the required educational preparation for beginning practitioners, the association established a Task Force

for Collaborative Nursing Education Models to foster collaboration between diploma and university schools in Canada (CAUSN Position Statement on Education, November 1998).

Associate Degree In the 1950s, Mildred L. Montag introduced the blueprint for associate degree nursing programs in response to the nursing shortage that followed World War II. Montag envisioned the associate degree graduate as a technical nurse who would work under the supervision of a professional nurse.

Associate degree programs are typically 2 years in length and are located in community colleges but may be found as options at 4-year degree granting universities. Program content in associate degree programs has reflected basic skill preparation and has traditionally emphasized clinical practice in a hospital setting. However, because of the decreasing demand for hospital beds, these students are likely to spend more clinical education hours in community-based institutions (ambulatory settings, schools, and clinics).

Diploma Programs Nursing education began in hospital-based diploma programs established by Florence Nightingale. The first program to train women in nursing was established in 1860 at St. Thomas' Hospital, England. Today's hospital-based educational programs vary from 2 to 3 years in length and are often affiliated with colleges or universities. Diploma education has always been associated with providing nursing students with strong hospital-based clinical experience. With the decline in hospitalized clients, diploma programs have expanded their practice sites to include community-based services (NLN, 1996).

Baccalaureate Degree In the early 1900s, baccalaureate nursing programs were established in university settings in the United States and Canada to provide the students with a liberal arts education. The typical 4 year educational preparation provides the student with a Bachelor of Science degree in nursing (BSN). The equivalent degree in Canada is a Bachelor of Science in Nursing (BScN) or a Bachelor in Nursing (BN). Most baccalaureate programs have special curricula to accommodate RNs of associate degree and diploma programs to articulate to a BSN. The major components of baccalaureate nursing education are liberal education, professional values, core competencies (critical thinking, communication, assessment, and technical skills), core knowledge and role development (AACN 1998).

Enrollment Trends in Nursing Programs According to the NLN (2000) enrollments in all entry level nursing programs have decreased between 1995 and 1999. The AACN (2000) reported a fifth consecutive year decline for entry level enrollment in baccalaureate

nursing programs, with a decrease of 4.6% in 1999. AACN attributes the decline in enrollments to several resource constraints: faculty shortages and a limited supply of clinical training sites. Other factors causing lower enrollments in entry level nursing programs are the proliferation of new career opportunities for women and a lingering belief that nursing is not a secure job (AACN Issue Bulletin, 2000).

Nontraditional Entry Level Programs

Nontraditional programs provide the student with an alternative method for entry into professional nursing. Second degree programs are examples of nontraditional programs. Second degree programs build on the student's prior education and/or experience, and provide the student with several years of accelerated nursing education. According to the AACN, "these innovative models provide us with a variety of graduate education approaches for professional entry, and they need to be carefully examined and evaluated" (AACN, 1998, p. 20).

Postgraduate Programs

During the 1970s and 1980s, nurses wanting to expand their *clinical practice* in certain areas of specialization enrolled in postgraduate, nondegree-granting programs. These programs, usually 9 to 12 months in length, include a formal course of study (didactic and clinical practice) and award a diploma or certificate on completion. The graduate, on successful completion of the program and national certification in the area of specialization (for example, midwife, neonatal nurse practitioner, and certified nurse anesthetist), can apply for recognition or licensure as an advanced practitioner with the state Board of Nursing.

Graduate Nursing Education

The master's degree in nursing allows nurses to expand their roles: educator, administrator, or advanced practitioner. Various master's degrees in nursing are offered by educational institutions of higher learning: Master of Arts (MA), Master in Nursing (MN), and Master of Science in Nursing (MSN). The program of studies exposes the student to advanced knowledge in the humanities, sciences, nursing theory, and specialization in an area of clinical practice.

Doctorate programs in nursing build on the master's preparation with emphasis on the application of research findings to clinical nursing. Doctoral programs confer a Doctorate of Science in Nursing (DSN) or Doctorate of Nursing in Science (DNSc) degree. Although many of the first doctorates in nursing were DSN or DSNc, the majority of current nursing doctorates are PhD degrees (McBride, 1999).

Advanced Practice

Advanced practice RNs have acquired and demonstrated a knowledge base and the practical experiences to prepare them for specialization, expansion, and advancement in practice. Nursing organizations and regulatory agencies now recommend or require graduate education (master's degree) as preparation for advanced practice roles such as clinical nurse specialists, nurse anesthetists, and nurse midwives.

In 1986, Lehman College of the City University of New York, in response to the need for nurses with advanced degrees, instituted a special pathway to graduate education for RNs with baccalaureate degrees in other disciplines. Frik, Speed, and Pollock (1996) studied the 65 graduates from Lehman College to determine the viability of this program in preparing non-BSN RNs for advanced practice. The study did not reveal any differences in retention and successful completion of the master's programs and professional socialization between nurses who enter the program with a BSN and those with a baccalaureate degree in another discipline.

Enrollment Trends in Graduate Nursing Programs

Nursing enrollments and graduations have increased significantly for master's programs as well as programs combining a nursing master's degree with another degree (American Association of Colleges of Nursing, 1999). One notable surge in master's degree education is the rapid increase of nurse practitioner programs.

Between 1970–1972 and 1994–1996, the number of masters degree graduates increased from 1,988 to 9,261; likewise, the number of doctoral graduates increased from 27 to 425 for the same time frame (McBride, 1999). AACN's survey showed a steady increase in the enrollment of full-time master's degree nursing students, and the number of nursing graduates from these programs rose 3.3% over the fall of 1997, while the number of these graduates grew by 4.3% between August 1997 and 1998 (AACN, 1999).

Staff Development and Continuing Education

Once nurses are in practice, both staff development and continuing education are used to maintain the requisite knowledge and skill needed for contemporary practice in addition to a formal academic degree. Staff development typically occurs in the setting of employment and is described as the delivery of instruction to assist the nurse to achieve the goals of the employer. According to the ANA (1990):

. . . nursing staff development is a process of orientation, in-service education and continuing education for the purpose of promoting the development of personnel within any employment setting, consistent with the goals and responsibilities of the employer. (p. 3)

Orientation is an important organizational tool for recruitment and retention. Orientation sessions typically occur at the initiation of employment and whenever positions and roles change. Content in orientation education unique to the institution of employment includes philosophy, goals, policies and procedures, role expectations, facilities, resources and special services, and assessment and development of competency with equipment and supplies used in the work setting (ANA, 1990).

In-service education is that phase of the staff development process that occurs after orientation and supports the nurse in acquiring, maintaining, and increasing skills to fulfill assigned responsibilities. Challenging learning opportunities in the employment setting include:

- Technology development
- Changing nature of health care and nursing science
- Interdisciplinary practice
- Changing delivery systems
- New equipment and supplies
- Enlarging roles of nursing related to leadership, management, delegation, supervision, and legal and ethical demands on practice

Active orientation and in-service development for nurses is a critical element of a delivery system that holds high standards for quality of care delivery in a cost-effective manner. Staff development is guided by the accreditation standards of the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and ANA's *Standards for Nursing Staff Development* (ANA, 1990).

Professional nurses are responsible for their own continuing education. Continuing education offers both personal and professional growth to the nurse and may serve as an incentive to pursue an academic degree. Continuing education builds on acquired knowledge, attitudes, and skills and constitutes an essential dimension of lifelong learning.

Although half the boards of nursing require continuing education units (CEUs) as part of the licensure renewal process to document the registered nurse's competency, increasing evidence supports the assertion that "CE [continuing education] requirements do not guarantee continuing competence" (PEW Health Professions Commission, 1995, p. 1). With the release of the full PEW Health Professions Commission report and the repeal of Colorado's mandatory continuing education legislation, the debate over the value of mandating continuing education is certain to escalate (Hewlett & Eichelberger, 1996).

Lifelong learning is essential to career development and competency achievement in nursing practice. Technology has expanded the delivery and scheduling flexibility of continuing education for nurses in different geographic sites. Accessibility to continuing education will continue to improve the ability of the nurse to be flexible, factual, futuristic, and functional. The nurse

of the future will be the professional who knows how to obtain and use the relevant scientific base of nursing and health care delivery to achieve quality outcomes for health care.

Education Reform Mandates

The scientific base for nursing practice demands **competencies** (the ability to function in a particular way) from multiple sources: philosophy and ethics; physical, economic, behavioral, and social sciences; nursing science; and biomedicine. Additional competencies in collaboration, coordination, and the interdisciplinary practice activities of exchanging knowledge and techniques are critical to nursing practice and health care delivery. These competencies raise questions about the single, discipline-specific method of educating the nursing work force and offer alternative scenarios for nursing education.

The PEW Health Professions Commission (O'Neil, 1993; PEW Health Professions Commission, 1995; Shugars, O'Neil, & Bader, 1991), in its widely referenced and distributed reports, has recommended that academic institutions investigate whether the providers of educational experiences in health care are addressing the needs of clients. The *competencies* of practitioners in health care professions (physicians, nurses, dentists,

HEALTH CARE PROFESSIONALS' COMPETENCIES FOR THE YEAR 2005

- Care for the community's health
- Expand access to effective care
- Provide contemporary clinical care
- Emphasize primary care
- Participate in coordinated care
- Ensure cost-effective, appropriate care
- Practice prevention
- Involve patients and families in the decision-making process
- Promote healthy lifestyles
- Assess and use technology appropriately
- Improve the health care system
- Manage information
- Understand the role of the environment in mitigating the impact of environmental hazards on health
- Provide counseling on ethical issues
- Accommodate expanded accountability
- Participate in a racially and culturally diverse society
- Continue to learn

(From Shugars, D. A., O'Neil, E. H., & Bader, J. D. [1991]. *Healthy America: Practitioners for 2005: An agenda for action for U.S. health professional schools* [pp. 18–20]. Durham, NC: The PEW Health Professions Commission.)

pharmacists, and veterinarians) are targeted for implementation in the year 2005, and strategies for achieving these competencies are fully discussed in the PEW Health Professions Commission's report entitled *Healthy America* (Shugars et al., 1991). The accompanying display lists the PEW Health Professions Commission competencies.

Nursing leaders have embraced these competencies as consistent with the values and issues raised in *Nursing's Agenda for Health Care Reform* (ANA, 1991). To ensure that the nursing work force is educated sufficiently to demonstrate these competencies, schools are being challenged to redefine their educational core. To accomplish this goal, schools of nursing, health science centers, and institutions of higher education are refining mission statements, developing strategic plans and implementation activities, and examining curriculum activities, faculty competencies, educational methods and technologies, and sites/populations for clinical experiences.

To assist academic programs in achieving the changes needed in health care education, six strategies specifically designed for nursing education are proposed by the PEW Health Professions Commission (Shugars et al., 1991). The strategies for change are discussed in the accompanying display.

THINK ABOUT IT

Development of Competencies

After reviewing the PEW Health Care Professionals' Competencies for the year 2005, describe the basic science, liberal arts, or nursing courses you have taken or are currently taking that will assist you in developing these competencies. Discuss these with your peers and faculty.

The strategies recommended by the PEW Health Professions Commission for change in nursing education are parallel to the education strategies of all professional health care providers. Clearly, the demographics of the United States and the epidemiologic trends of health and disease patterns in the future are influencing the changing nature of nursing to provide core, competency-based educational experiences in all nursing programs.

Implications for the education of entry level nurses are clear: regardless of the type of educational program, entry level nurse generalists will be best prepared to demonstrate the PEW competencies to meet clients' needs in the year 2005 through educational reform efforts initiated now in nursing education. The trends in education (discussed below) reflect these reform initiatives.

Trends in Nursing Education

Four clusters of trends in nursing education are apparent from the issues and data presented by the PEW commission fourth and final major report. Each is discussed

STRATEGIES FOR CHANGE

- Refine the educational core by examining the disciplines represented in the nursing care setting of clinical education; teaching-learning strategies; educational teaming of students with those in other disciplines; process and outcome evaluation of curriculum; and earlier and greater access to professional, interprofessional, and multicompetency education.
- Restructure education and delivery of services to be responsible for the health care needs of a particular community; to provide for new, flexible program development; to provide for continued professional career competency; and to provide cost-effective education with faculty role models demonstrating the newest competencies.
- Obtain support by the university for innovative leadership to bring nursing education in tandem with diverse multicultural needs for health care. Programming will require strategic resource support for faculty, compensation systems, student recruitment and progression, and development of community clinical practicums.
- Health professions associations such as PEW, ANA, NLN, American Association of Colleges of Nursing, and Association of Nurse Executives should support a professional nursing redefinition consistent with the changing health care needs of clients and systems. Licensure and accreditation bodies should work closely with educational programs to support educational reform. See Chapter 10 for a discussion of professional licensure.
- Government (federal and state) should support changes in education through incentives for innovative educational programs; financing of practitioner education consistent with the PEW competencies; work force preparation policies (numbers, distribution, and specialty mix needed); and encouragement of regulatory and accreditation bodies to support innovation.
- The public (client) should participate in redefining the role of professionals in delivering health care. Schools of nursing can benefit from working with consumer advocacy groups and inviting participation in educational planning and evaluation by community representatives.

(From Shugars, D. A., O'Neil, E. H., & Bader, J. D. [1991]. *Healthy America: Practitioners for 2005: An agenda for action for U.S. health professional schools* [p. xi]. Durham, NC: PEW Health Professions Commission; and O'Neil, E. H. [1993]. *Health professions education for the future: Schools in service to the nation*. San Francisco: PEW Health Professions Commission.)

THINK ABOUT IT

Reforming Nursing Education

If you were to survey the public, what ideas would they share to reform nursing education? Interview some of your acquaintances who are not health care providers to determine their perceptions of needed changes and competencies in the nursing profession. Do you agree? State the rationale for your answer.

relative to the predicted and preferred future of nursing, nursing education, and the public's health.

Enrollment Strategies

Enrollment in entry level programs should be determined by the numbers and types of nurses appropriate to local or regional demand, rather than institutional and political needs. Schools of nursing are implementing aggressive recruitment efforts to increase enrollment by targeting high school and early college level students. AACN (AACN Issue Bulletin, 2000) reported that deans of nursing programs were utilizing media and promotional outlets to advertise their particular academic programs and the rewards of a nursing career. For example, one school used radio and newspaper ads, and a year-long run of still slides shown at local movie theaters before the start of the films to portray a positive image of nursing. Other schools of nursing offer college credit courses such as medical terminology and introduction to health careers on their campus to high school students to stimulate interest in nursing as a career.

Competency Development and Differentiated Practice

Debate concerning multiple educational levels for entry level nursing practice will continue to be active. The focus on basic competency demonstration by *all entry level* graduates regardless of educational level is likely to gain much greater support from professional nursing because it allows for both consensus about the outcome (competency) and diversity (innovation) about the process of achieving the competency.

Competency development in nursing education, which is consistent with the PEW Health Professions Commission's report (1998) and with *Nursing's Agenda for Health Care Reform* (ANA, 1991), is stimulating the following changes in nursing education:

- Revise the content and learning experiences in the nursing curriculum to produce graduates with the competencies needed for differentiated practice
- Clinical practicum experiences in community-based health care delivery sites for all courses in a curriculum

- Strengthen existing career mobility programs that facilitate educational advancement for associate degree and diploma graduates
- The use of nursing, medicine, and allied health student course work and practicum experiences to foster interdisciplinary communication and clinical care planning, intervention, and evaluation; to promote interdisciplinary role expectations for practice; and to demonstrate a holistic and coordinated approach to the client's health-illness continuum
- Additional depth in basic science course work that expands the environmental science interrelationships of health and disease patterns

As work redesign approaches (such as cross-training and unlicensed assistive personnel) continue to be implemented and evaluated for cost, quality, and safety in the delivery system, nursing education will need to support competency development in human and information resource management, delegation, supervision, leadership, and accountability. These indirect areas of nursing practice are expected to demand more guided practice and development in the academic programs. Even for entry level RNs, skills in planning, outcomes measurement, and evaluation will be demanded of new graduates.

Research

The need to further nursing's professional and practical goals requires that schools of nursing integrate research, teaching, and practice into the curriculum. The PEW report encourages that:

- Diploma and associate degree programs employ nurses to teach with extensive clinical practice experience, particularly in integrated systems of care
- Baccalaureate and higher degree nursing programs expand the opportunities for faculty to participate in clinical research, and to reward the faculty for such activity
- The increase in clinical research has prepared the way for nursing students to learn clinical decision-making skills based on the evidence relating to support specific interventions such as wound care and urinary catheterization. Evidenced-based practice is discussed later in this chapter.

Enrollments

Enrollments in schools of nursing have continued to decrease since 1995. As a result of the growing diversity of the American population, nursing students have become more diverse in terms of age, race, gender, and learning style, and nurse educators have begun to place greater emphasis on the value of diversity and cultural competence (McBride, 1999). Even with these changes in student diversity, the homogeneity of nursing remains one of the most salient features of the profession in that 86% are white women (McBride, 1999).

According to the projections of AACN (AACN Issue Bulletin, 1998), if current enrollment trends continue, by 2015, 114,000 full-time jobs for registered nurses are expected to be unfilled nationwide. The estimated predicted shortage is greatest for bachelor's and graduate degree nurses as the job market seeks nurses with management skills, clinical management skills, technological capabilities, critical thinking, and professional judgment (PEW, 1998).

While BSN enrollments are declining, increasing evidence shows an association between health care quality and the educational level of nursing staff, the number of RNs in the clinical setting, and the perceived value placed on nursing staff by the practice setting (Bednash, 2000). These findings have been documented in **magnet hospitals** that have been identified as good places to practice nursing and are recognized for their ability to attract and retain RNs in times of shortage. Magnet hospitals also have a higher proportion of nursing staff prepared at the BSN level, an average of 59% compared to 34% for all hospitals (Aikens, Havens, & Sloane, 2000).

Instructional Strategies

Diversity in instructional strategies and technology will encourage critical thinking, problem solving, and information management. Virtual reality technology, small group participant learning, and distance technology will offer greater consistency in knowledge acquisition that is independent of faculty expertise or location. The developing instructional strategies will provide greater access and flexibility for students and staff pursuing health care professions education and continued career competency development regardless of setting, location, or schedule.

Nursing Faculty

Demographic trends indicate that two-thirds of the current faculty in higher education will retire by 2005 (American Association of Colleges of Nursing, 1996). This trend is likely to escalate the competition for qualified faculty and increase faculty compensation, faculty turnover, the use of teaching assistants, and the use of part-time faculty. Graduate programs will need to prepare sufficient numbers of faculty to replace a gap created by the demographic trends of retirement.

Although there is a documented shortage of nurse faculty, their ability to provide cost-effective quality education is also being studied. McBride (1999) cites that schools of nursing will operate in the future, based on principles of responsibility-centered management and that this trend will mean that faculty will have to have more knowledge regarding the financing of their programs and take personal responsibility for expanding resources. Oermann questions "how faculty beginning their teaching career develop a knowledge base for clinical teaching and awareness of behaviors which facilitate learning in clinical practice" (1998, p. 201). Oermann's research findings on the



Title of Study

"Differences in Clinical Experiences of ADN and BSN Students"

Author

Oermann, M. H.

Purpose

The purposes of this study were to compare the clinical experiences of ADN and BSN students at different levels in the programs and describe these experiences from the student's perspectives.

Methods

A descriptive exploratory design was used for the research. Both quantitative and qualitative data were collected from 415 ADN and BSN students from 10 randomly selected NLN accredited ADN and BSN programs in the Midwest. The independent variables were type of nursing student and level in the nursing program. Dependent variables were the degrees of stress, challenge, and threat associated with the clinical experience.

Findings

The stress experienced by both ADN and BSN students in clinical practice increased as they progressed through the programs. The most stressful time in terms of clinical practice for both ADN and BSN students was the semester prior to graduation. The predominant stressor reported by students in ADN programs across all levels of the curriculum was the instructor. The most prevalent stressors among BSN students were coping with demands associated with client care and the clinical instructor. The findings highlight the important role of the clinical faculty in both types of nursing programs.

Implications

The need for graduate education to prepare faculty for clinical teaching is exemplified by the findings of this study.

Oermann, M. H. (1998). Differences in clinical experiences of ADN and BSN students. *Journal of Nursing Education*, 37(5), 197–201.

differences in clinical experiences in ADN and BSN students identified that the instructor was the predominant stressor reported by ADN students and was a prevalent stressor among BSN students.

Advanced Educational Preparation

A master's degree has become the standard requirement for APRNs. Additional credentials besides RN licensure, in the form of either a second license or certification credential, will be required to practice as an APRN within individual states.

The number of nurses graduating from doctoral programs will grow to meet the demand for more advanced nurse practice roles. Innovative "entry to doctoral" paths will be implemented that will assist in the timely and cost-effective production of the doctorally educated nursing work force. Case Western Reserve University is an example of a nursing program that offers the nursing doctorate as the first professional degree in nursing.

Licensure

Differential licensure and practice realities will shape the future of nursing education. Supplemental licensure for baccalaureate students is a licensure alternative that may prove useful for nursing programs, the public, and employers of graduates. Professional nursing organizations, such as the American Association of Colleges of Nursing, NLNAC, ANA, and Association of Nurse Executives, will participate in documentation to substantiate their positions in support of differentiation. As an example, the Maine State Board of Nursing has reported that a distinct set of skills possessed by BSN-prepared nurses have begun to be specified in job descriptions.

The National Council of State Boards of Nursing (NCSBN) has endorsed mutual recognition (multi-state licensure). Mutual recognition will legalize the practice of nursing beyond state borders. Several states have successfully passed legislation regarding mutual recognition. Under the leadership of the NCBSN, some states have embraced mutual recognition. Although mutual recognition facilitates mobility of licensed nurses, an area of concern regarding mutual recognition is the lack of uniform core licensure requirements. The lack of core licensure requirements may limit the authority of individual boards of nursing to regulate nursing, thereby threatening the board's mission to protect the public health, safety, and welfare of its citizens. See chapter 22 for a complete discussion of mutual recognition.

Size of Work Force

The demand for RNs in all practice settings continues to decrease the supply of experienced RNs, especially in critical care areas and the operating room. Schools of nursing will be forced to increase enrollment as health care requires more RNs to provide primary and preventive care services throughout the community. Couple these factors with an aging workforce of RNs, and a real nursing shortage will become a reality as we enter the 21st century.

The primary factor that has led to the aging of the RN workforce appears to be the decline in younger women choosing nursing as a career during the last 2 decades. Unless this trend is reversed, the RN workforce will continue to age, and eventually shrink, and will not meet projected long-term workforce requirements. (Buerhaus, Staiger, & Auerback, 2000, p. 2949)

According to the U.S. Department of Health and Human Services, by 2010 there will be only 635,000 registered nurses to fill nearly 1.8 million positions. The reasons for the shortage include the following:

- Aging nursing work force
- Nonhospital jobs available for nurses
- Stress of hospital workload
- Working conditions

Other reasons for the shortage include expanded career opportunities for women, who make up 94% of all RNs and the fact that nursing is not often chosen as a career because of increased pressure to provide care for more people with fewer resources.

Delivery of Care

The demand for nursing care will continue to be driven by aging populations, long-term care, home health care services, expansion of primary and preventive care, increased use of ambulatory care services, increased complexity of health care delivery, and increased demand to provide health services to underserved populations (such as inner city residents or those in rural areas).

Due to the increasing demands for **primary care providers** (health care providers whom a client sees first for health care), master's programs in nursing education will produce more advanced practice nursing graduates to answer the demand unmet by physicians pursuing specialty practice.

Clinical experiences in nursing education will parallel the nursing health care delivery sites burgeoning outside the hospital setting.

Managed care arrangements will continue as the primary delivery systems of the future. Almost 20% of the U.S. population is enrolled in **health maintenance organizations (HMOs)** (health plans that offer a full package of basic services in exchange for a set fee), and the number of subscribers enrolled in **preferred-provider organizations** (type of managed care model in which member choice is limited to providers within the system) is growing (Bartling, 1995). These types of health care plans are expected to increase in the years ahead.

Managed care emphasizes wellness, disease prevention, and health promotion. What a natural fit for nursing practice! Nursing has long been aware that health behaviors, genetics, the environment, and biologic factors contribute to health. The 10 leading causes of death actually result from a combination of genetic/biologic

HEALTHY PEOPLE 2010 AGENDA

GOALS

- Increase quality and years of healthy life
- Eliminate health disparities

INDICATORS

- Physical activity
- Overweight and obesity
- Tobacco use
- Substance abuse
- Responsible sexual behavior
- Mental health
- Injury and violence
- Environmental quality
- Immunization
- Access to health care

FOCUS AREAS

- Access to quality health services
- Arthritis, osteoporosis, and chronic back conditions
- Cancer
- Chronic kidney disease
- Diabetes
- Disability and secondary conditions
- Educational and community-based programs
- Environmental health
- Family planning
- Food safety
- Health communication
- Heart disease and stroke
- HIV
- Immunization and infectious disease
- Injury and violence prevention
- Maternal, infant, and child health
- Medical product safety
- Mental health and mental disorders
- Nutrition and overweight
- Occupational safety and health
- Oral health
- Physical activity and fitness
- Public health infrastructure
- Respiratory disease
- Sexually transmitted diseases
- Substance abuse
- Tobacco use
- Vision and hearing

(From Institute of Medicine, Office of Disease Prevention and Health Promotion, U.S. Department of Health and Human Services. [1999]. *Leading health indicators for healthy people 2010. Final report*. Washington, DC: National Academy Press.)

choices clients make and are amenable to knowledge, a supportive social environment, and availability of facilitative services (McGinnis & Foege, 1993). These are interventions that nurses have traditionally used in addition to highly technologically driven activities.

As additional contributing factors of disease point to health behaviors and preventive interventions, nursing education must provide a strong scientific base in health-seeking and health behavior frameworks that can prevent premature morbidity and mortality. The *Healthy People 2010* objectives will be accomplished only through the intervention of nursing in collaboration with other disciplines. Refer to the accompanying display for a listing of *Healthy People 2010* agenda.

Nursing education must instill in nursing graduates an appreciation for the complexity of human behaviors that have an impact on health outcomes. In the interaction with clients, entry level graduates must demonstrate competency with methods to support healthy lifestyle behaviors and changes in destructive behavior.

The trends in demographics, indicators of health status in the U.S. population, the influence of global factors, and the shifts in financing and organization of health care services will all have an impact on educational structures and programs for the nursing work force. If health policy initiatives solidly emphasize health and prevention dramatically beyond the current level of 3% to 5% of the total federal budget, the changing skill development achieved in nursing education will establish a firm leadership position for nurses among health care team members. Clearly, these skills and the PEW Health Professions Commission competencies must be standardized for all entry level nurses and amplified, researched, and evaluated for clinical and population outcomes by nurses educated at the master's and doctoral levels.

Education is an essential factor in the ability to fully practice the legal and professional scope of nursing practice. Addressing the issues of quality, cost, and access for education is as important to the preparation of a competent nurse work force as these three values are to the successes in health care delivery and for the health status of the public.

THINK ABOUT IT

Implementing Healthy People 2000 Objectives

Select and review one objective within each of the four areas (health promotion, health protection, prevention services, and surveillance and data systems) from the Healthy People 2000 objectives. How can your interventions as a nurse support the achievement of that objective? What knowledge and skills will you need to provide effective nursing care to your clients so each objective can be met?

and external factors. *External factors* (such as tobacco, diet and activity patterns, and alcohol) influencing the three leading causes of death (heart disease, cancer, and cerebrovascular diseases) are rooted in behavioral

Evidence-Based Practice

Nursing as a profession has always recognized the importance of research as an essential basis for its development. The identification of the knowledge base for nursing practice contributes to achieving client outcomes and making nursing practice credible (McPheeters & Lohr, 1999). During the past decade, nursing has witnessed increasing emphasis on the integration of research and clinical care with the evolution of evidence-based practice and best practices.

Taylor-Piliae (1998) describes evidence-based practice as the application of the best available empirical evidence that applies recent research findings to clinical practice in order to assist the provider's clinical decision-making. "Evidence-based practices are proven ways to diagnose and treat patients based on rigorous scientific evidence and clinical effectiveness studies" (Ling, 2000, p. 81).

Although the terms best practices and evidence-based practice are often used interchangeably, these terms have different meanings. Evidence-based practice can be a best practice, but a best practice is not necessarily evidence-based; best practices are simply ideas/strategies that work, such as programs, services, or interventions that produce positive client outcomes or reduce costs (Ling, 2000). Nurses need to base their clinical practice on empirical evidence to optimize client outcomes, to provide cost-effective safe practice and to enhance the credibility of nursing care.

Taylor-Piliae (1998) recognizes that a gap still exists between research findings and their implementation in practice. Nurses continue to have difficulty synthesizing empirical and contextual evidence and integrating evidence-based changes into practice (Rosswurm & Larrabee, 1999).

Although nurses are well placed to contribute towards more clinically effective and cost-effective client care, nurses need skills and resources to appraise, synthesize, and implement the best evidence into practice. Gross (2000) contends that efforts to promote the implementation of evidence-based practice should focus on designing organizational systems that will facilitate change as opposed to those trying to change the behavior of the health care provider.

RESEARCH: SUBSTANTIATING THE SCIENCE OF NURSING

Nursing is a profession characterized by educational standards, autonomy, socialization, an established knowledge base, licensure, formal entry examinations, code of ethics, technical expertise, professional standards, altruistic service, and public trust. The main characteristics of a profession are established, specialized training in a body of abstract knowledge and a collectivity of service orientation.

The science of nursing knowledge is established by the same systematic, investigative process used by all science-based disciplines, the research process. **Research** is a systematic method of exploring, describing, explaining, relating, or establishing the existence of a phenomenon, the factors that cause changes in the phenomenon, and how the phenomenon influences other phenomena. Nursing practice activities are substantiated as predicting valid and reliable outcomes for clients (the individual, family, group, or community) only after a body of knowledge has been established and confirmed by numerous research efforts.

Historical Development

Nursing research is aligned with the founder of modern nursing, Florence Nightingale. Nightingale combined dedicated client care with vigorous research to show the "impact of disease and the effects of improved sanitary conditions" (Oermann, 1991, p. 233). The groundwork established by Nightingale for using research to direct client care was not sustained by subsequent nursing leaders because of two forces that had a direct impact on nursing's future. First, societal norms basically excluded women from becoming scientists; therefore, initiating or participating in scientific discovery (research) was not an option for women. The second force dealt with the "training" as opposed to the "education" of nurses. It was not until 1899, with the inception of a graduate course and later undergraduate programs for nurses at Teachers College, Columbia University, that nursing was able to capitalize on building a scientific foundation. With the integration of nursing into higher education, the role of researcher became a natural acquisition for nurses.

Nursing research from 1940 to 1965 focused on educational curriculum questions and the roles and characteristics of nurses rather than developing a scientific base for clinical practice. Nursing during this era was still basically a female profession striving to define the autonomy of nurses and implement societal and educational reforms as recommended by studies and reports.

The *Journal of Nursing Research* was established in 1952 to inform nurses about clinical, knowledge-based research. Regrettably, this goal was not attained until the mid-1970s, through the combined commitment of several organizations, when research outcomes became applicable to clinical practice (Hinshaw, 1999)

In 1974, the ANA House of Delegates passed a resolution calling for more clinical research findings to support practice. ANA's standards for research were disseminated in 1981 as guidelines for investigative functions of nurses at various educational levels; for instance, nurses with a baccalaureate in nursing apply established findings of nursing and other related research findings to nursing practice. The majority of baccalaureate programs include nursing research content in their curricula.

Sigma Theta Tau, nursing's professional honor society, has taken a leadership role in supporting the use of

research in practice. Their goals address the development and dissemination of clinical databases to bridge the gap between nursing research and practice.

The National Institute of Nursing Research and the Agency for Health Care Research, and Quality, have provided resources to promote scientific knowledge to direct clinical practice. The contributions of these agencies are discussed later in this chapter.

Framework

Knowledge gained from both nursing research and practice is necessary to support the predictable outcomes of nursing care. Research used in nursing comes from nursing as well as other disciplines such as psychology, education, sociology, biology, and anthropology. Nursing research explores the many pathways through which scientific and practical knowledge regarding nursing care are established.

Research Process

The person conducting the research is called *researcher*, *investigator*, or *scientist*. When a researcher poses a problem or answers a question using the *scientific approach*, it is called a study, an investigation, or a research project. The people who are being studied are called *subjects* or *study participants*.

Scientific research is mainly concerned with vehicles of thought defined as **concepts**. The process of developing and refining concepts is referred to as **conceptual-**

ization. A **construct** is an abstraction or mental representation inferred from situations, events, or behaviors. Constructs are different from concepts in that the constructs are deliberately invented (or constructed) by researchers for a specific scientific purpose. These concepts or constructs are ideas that formulate a **theory** (a set of concepts and propositions that provide an orderly way to view phenomena). “In a theory, concepts (or constructs) are knitted together into an orderly system to explain the way in which our world and the people in it function” (Polit & Hungler, 1998, p. 22).

Nurse researchers can use one of two broad approaches to gather and analyze scientific information:

Quantitative research involves the systematic collection of numerical information, often under conditions of considerable control, and the analysis of the information using statistical procedures; **qualitative research** involves the systematic collection and analysis of more subjective narrative materials, using procedures in which there tends to be a minimum of researcher-imposed control. (Polit & Hungler, 1998, p. 15)

See the accompanying display for a comparison of the major characteristics of quantitative and qualitative research.

The scientific method requires an exact, orderly, and objective approach of acquiring knowledge. Controlled methods are used to study problems and test the **hypothesis** (statement of an asserted relationship between two or more variables). A **variable** is anything that may dif-

MAJOR CHARACTERISTICS: QUANTITATIVE AND QUALITATIVE RESEARCH

Quantitative Research

Hard science

Purpose: test theory

Focus: concise and narrow

Reasoning: deductive

Design: reductionist

Data collection: control, instruments

Basic element of analysis: numbers; statistical analysis

Reporting of findings: generalization; objective; formal style

Qualitative Research

Soft science

Purpose: develop sensitizing concepts, create theory

Focus: complete and broad

Reasoning: inductive

Design: holistic

Data collection: shared interpretation; communication and observation

Basic element of analysis: words; individual interpretation

Reporting of findings: uniqueness; subjective; rich narrative; expressive language

(Adapted from Burns, N., & Grove, S. [2000]. *The practice of nursing research* [4th ed.]. Philadelphia: W. B. Saunders Company; and Dempsey, P., & Dempsey A. [2000]. *Using nursing research: Process, critical evaluation & utilization* [5th ed.]. Philadelphia: Lippincott.)

fer from the norm. The two types of variables are independent and dependent.

The **independent variable** (criterion variable) is that variable that is believed to cause or influence the **dependent variable**, which is the outcome variable of interest and is the variable that is hypothesized to depend on or be caused by or predicted by the independent variable (Polit & Hungler, 1998). For example, if the question reads *to what extent does age predict recovery from surgical anesthesia relative to when perioperative instructions were first given*, the independent variable is age and the dependent variable is recovery from surgical anesthesia relative to when perioperative instructions were first given. **Value** is the variation of the variable. The values of the independent variable are actual ages of surgical clients, and the values of the dependent variable are when instructions were first given.

There are multiple ways in which nurses establish the sources and the realm of knowledge about nursing, human responses, diagnoses, and treatments. Holm and Llewellyn (1986) describe the establishment of nursing knowledge through multiple ways: logical reasoning, trial and error, experience, tradition, customs and habits, authority, precedent, and basic and applied research. There is also the belief that men and women use different ways of knowing (Belenky, Clinchy, Goldberger & Tarule, 1986). Carper (1978, 1992) describes four fundamental patterns of knowing:

- *Empirical*: using research to explain, describe and predict
- *Ethical*: extending knowledge of valuing, clarifying, and advocating
- *Personal*: encountering and focusing on self and others
- *Esthetics*: interpreting, engaging, and envisioning clues to knowledge

STEPS IN THE RESEARCH PROCESS

- Formulating a research question or problem
- Defining the purpose of the study
- Reviewing relevant literature
- Developing a **conceptual framework** (structure that links global concepts together to form a unified whole)
- Developing research objectives, questions, and hypotheses
- Defining research variables
- Selecting a **research design** (overall plan used to conduct the research); see the accompanying display for types of research design
- Defining the population, sample, and setting
- Conducting a pilot study
- Collecting data
- Analyzing data
- Communicating research findings, their implications, and the limitations of the study

TYPES OF RESEARCH DESIGN

Historical: Systematic investigation of a past event using relevant sources to describe or explain the event

Exploratory: Preliminary investigation designed to develop or refine hypotheses or to test the data collection methods

Evaluative: Systematic investigation of how well a program, practice, or policy is working

Descriptive: Investigations that have as their main objective the accurate portrayal of the characteristics of persons, groups, or situations and the frequency with which certain phenomena occur

Experimental: Research studies in which the investigator controls (manipulates) the independent variable and randomly assigns subjects to different conditions

Quasi-experimental: Studies that deviate from the methods of the experimental component in that subjects cannot be randomly assigned to treatment conditions even though the researcher manipulates the independent variable and exercises certain controls to enhance the internal validity of the results

(Adapted from Polit, D. F., & Hungler, B. P. [1998]. *Nursing research: Principles and methods* [6th ed.]. Philadelphia: Lippincott.)

The research process is based on sequential, interrelated steps; see the accompanying display.

Once the researcher has developed the conceptual framework, the research literature is reviewed to provide a foundation on which to base new knowledge. In selecting a research design, the researcher determines the methods to be used to address the research question and test the hypothesis, the specific population to be studied, and how the data will be collected.

Clearly, the contemporary thought on knowledge generation incorporates a variety of sources of data collection, each with its own strengths and weaknesses. However, knowledge in nursing is developed and used most effectively through the combination of nursing theory, research, and practice.

Following data collection, the researcher subjects the data to analysis in an orderly fashion so that patterns and relationships can be discerned. **Qualitative analysis** involves the “integration and synthesis of narrative, non-numerical data” (Polit & Hungler, 1998, p. 36), whereas quantitative information is usually analyzed through statistical procedures. If the data support the research hypothesis, the findings are reported in a straightforward fashion; however, if the results fail to support the hypothesis, the researcher must explain the possible reasons for this failure, for example, problems with the research method (use of inappropriate tools for data collection). The research findings can be communicated in various forms such as dissertations and journal

articles. Usually, research reports discuss how the findings can be incorporated into the practice of nursing.

Roles

Becoming a nurse researcher requires education and experience in the process of scientific inquiry. That process is then combined with the nurse's already established clinical experience and expertise. A nurse scientist is an RN with a strong clinical background who has also been educated at the doctoral level to conduct research (Hinshaw, 1999). However, nurses participate as consumers and critics of research by conducting the important work of translating, applying, and evaluating the new knowledge with clients and systems. Nurses also participate on research teams or with research protocols to plan, apply, collect data, and evaluate the process.

Each of these roles (nurse scientist, principal investigator, research team member, research consumer, and advocate for research clients) offers a substantial contribution to the process of scientific knowledge development in nursing and health care. Interdisciplinary experiences can further enrich the nurse's understanding of the concept or phenomenon and add to the research team's perspective of the research project.

Rights

During the research design phase of the process, the researcher must determine how to safeguard the rights of the research participants. An important role of the nurse researcher is that of advocate for the client's rights during the process; see the accompanying display regarding the human rights that require protection during research.

Obtaining **informed consent** requires that the researcher provide **full disclosure** (communication of complete information to potential research subjects regarding the nature of the study, the subject's right to refuse participation, and the likely risks and benefits that would be incurred) (Polit & Hungler, 1998). The nature, seriousness, and likelihood of risks (physical, psychological, social, and legal) are explained to the participants. The researcher must also identify what precautions will be taken to minimize the risks. Protection of subjects requires that the potential benefits outweigh potential risks.

Nurses have an obligation to collaborate in the research, provided the researcher has followed proper protocols. The researcher must obtain permission from the agency to use its facility as part of the research setting. Staff nurses who are expected to participate in the research process must have an adequate understanding of the nature of the study. Likewise, the staff nurse has the right to refuse to participate in the study.

Application

Accessing nursing research can be a challenge to students. "Nursing students are often intimidated by the research

PROTECTING HUMAN RIGHTS IN RESEARCH

- **Self-determination:** The person has the right to control his or her own destiny
- **Privacy:** The person has to determine the time, extent, and general circumstances under which private information will be shared with or withheld from others.
- **Anonymity:** Data collected will be kept confidential.
- **Fair treatment:** The person should be treated fairly and should receive what he or she is due or owed.
- **Protection from discomfort and harm:** Based on the principle of beneficence (one should do good and, above all, do no harm) the person should be protected from physical, emotional, social, and economic discomfort and harm.
- **Informed consent:** The person understands the reason for the proposed intervention and its benefits and risks, and agrees to the treatment by signing a consent form.

(Adapted from Burns, N., & Grove, S. [2000]. *The practice of nursing research* [4th ed.]. Philadelphia: W. B. Saunders Company.)

process" (Morse, Oleson, Duffy, Patek, & Sohr, 1996, p. 148). Nursing students are exposed to research in varying degrees as determined by the program's curriculum.

Nursing students need to familiarize themselves with a few general terms before they read and analyze research studies. When an article is written by one or more researchers, it is called a **primary source**. When an author addresses the research of someone else, it is referred to as a **secondary source**.

Research articles usually begin with an **abstract**, a summary statement that identifies the purpose, methodology (inclusive of subject population), findings, and

THINK ABOUT IT

Responsibility in Nursing Research

What should a nurse do when a risk factor has not been fully explained to a client who has agreed to participate in a study? You are a staff nurse working at a medical center where it is common practice for the nurses to participate in research studies that use investigational drugs. In reading the accompanying literature on the investigational drug being used in this particular study, you discover that the risk for infertility has not been addressed in the informed consent. Although you realize that you do not have to participate in the research, what should you do to protect the client's rights?

ABSTRACT CONTENTS

Title of the Study

Introduction of the Scientific Problem

- Statement of the problem and purpose
- Identification of the framework

Methodology

- Design
- Sample size
- Identification of data analysis methods

Results

- Major findings
- Conclusions
- Implications for nursing
- Recommendations for further research

conclusions. Some authors also include implications for further study within the context of the abstract; see the accompanying display for the major elements of an abstract.

During the career of a nurse, many clinical and practice questions will be raised that will require research methods to answer confidently. By pursuing and applying research in the area of choice, nurses acquire valid and reliable information that enables them to provide quality care.

Organizational Structure

The National Institute of Nursing Research (NINR) was initially established as the National Center for Nursing Research (NCNR) as a part of the National Institutes of Health (NIH) to build a strong scientific foundation for nursing practice. The name of the NCNR was changed to

THINK ABOUT IT

Nursing Research

Research in community health practice is challenging. The variables can be difficult to identify and measure. Consider ways that you might structure your research to answer the following.

- How might you measure the “health” or “wellness” of your community?
- You have decided to implement a teaching project on stress management to a group of well elders. What criteria might you use to measure the effectiveness of your nursing interventions?
- You are a new occupational health nurse at a local plastics factory. What questions might you ask the employees to better understand their need for and interest in health-promotion topics?



Title of Study

“Strategic Planning for Research Use in Nursing Practice”

Author

Mullem, C. V., Burke, L. J., and Dobbmeyer, K.

Purpose

The purposes of this study were to assess RN’s knowledge, attitudes, and practices of nursing research activities, assess factors that support a research environment, and determine facilitating and challenging factors related to conducting regional nursing research.

Methods

A descriptive 33-item survey based on the Iowa Model for Evidence-Based Practice was developed, validated, and determined to be reliable. Site coordinators collected the data from 2,736 RNs who worked in six hospitals, 65 affiliated clinics, and three business units.

Findings

Self-reported research activity patterns differed by roles and education: nurses prepared at the masters level, specifically clinical nurse specialists, reported having more knowledge, willingness, and ability to participate in research than did staff members or managers. Nurses with bachelors degrees self-reported more moderate and high knowledge and ability to perform research activities than did those at the diploma or associate degree level; however, there were no differences in willingness to engage in research activities among these three groups.

Implications

While exposure to research during nursing school increases the nurse’s knowledge of research activities, results suggest that it is the expectations of the health care systems that are gradually creating change. Health care systems are recognizing that research utilization is essential to defining nursing’s role in meeting the emerging health care needs of the population through cost-effective approaches.

Mullem, C. V., Burke, L.J., and Dobbmeyer, K. (1999). Strategic planning for research use in nursing practice. *The Journal of Nursing Administration*, 29(12) 38–49.

THINK ABOUT IT

Ways of Knowing

Nurses use scientific and “other ways of knowing” to measure the effectiveness of nursing interventions.

- Name and describe three “other ways of knowing” that you use in your personal life to solve problems.
- What are the advantages and disadvantages of each method you use?
- How can “other ways of knowing” be used by nurses to measure the client’s situation or the outcome of the nursing activity applied to the situation?

the NINR in 1993. NINR promotes research and the training of researchers in universities, hospitals, and research centers and with other scientific disciplines at NIH.

The NINR develops nursing research priorities to establish funding preferences (research and training grants) based on collaboration and communication with the academic and practice communities. Currently, the three major areas are *Health Promotion/Disease Prevention, Acute and Chronic Illness, and Nursing System*. In addition to investigator-initiated applications for research funding, a National Nursing Research Agenda has guided the priorities and future nursing research concerns since NINR’s inception.

The Agency for Health Care Research and Quality (AHCRO), founded in 1987 as the Agency for Health Care Policy and Research, is a part of the U.S. Department of Health and Human Services. AHCRO’s purpose is to support research designed to improve the quality of health care, reduce costs, and broaden access to essential health care services. The agency has developed and published clinical practice guidelines, ranging from acute pain to urinary incontinence. These guidelines are based on evidence, provide the consumer with information directly related to the clinical practice guidelines, and are available online (refer to the Web Resources at the end of this chapter for AHCRO’s website address). AHCRO’s website has links to 12 U.S. evidence-based practice centers.

Trends in Nursing Research

The following trends in health care will have a definite impact on future nursing research.

1. Increasing numbers of doctorally prepared nurses will contribute to building and evaluating the science of nursing practice.
2. Nurse scientists will build international collaboration teams with scientists from other disciplines.
3. National research priorities will establish a strong scientific base for nursing within the priorities.

4. Nurse scientists will increasingly be educated and funded in health services research as related to clinical practice guidelines for nursing care services to reduce variance in nursing practice activities.
5. Nurses working with clients on research protocols will continue to confront ethical dilemmas that balance the goals of research with those of the client and client care. The client advocacy and empowerment role will consume a larger component of nursing practice.
6. The collaborative efforts by national organizations to develop innovative systems strategies to identify the barriers and bridge the gaps around the process of adopting evidence-based practice.

“Nursing research has much to celebrate and much to accomplish as we stand at the beginning of a new millennium” (Grady, 2000, p. 33).

With the identification of clear, significant priorities for study, striving for excellence in the evolving knowledge base, and confirming study findings, nursing researchers are providing a creditable scientific position from which to address societal health care issues and guide nursing practice.

KEY CONCEPTS

- The three types of programs that currently prepare nurses for entry level practice are diploma, associate degree, and baccalaureate degree nursing programs.
- To achieve the competencies established for health care professionals, several strategies for nursing education reform have been proposed in the areas of institutional, governmental, and federal involvement with the nursing profession.
- Trends in nursing education have been identified in the areas of competency development, enrollments, instructional strategies, nursing faculty, advanced educational preparation, licensure, size of the work force, and delivery of care.
- The science of nursing is established by the same systematic, investigative process used by all science-based disciplines, the research process.
- Knowledge and nursing science are predicated on many ways of knowing such as tradition, systematic inquiry, esthetics, and empiricism and are influenced by gender perspectives.
- The five steps of the research process are statement of the research problem, delineation of a conceptual framework and review of the literature, selection of a research design, analysis and interpretation of the findings, and communication of the results of the research study.
- Research, education, and practice constitute the required integrated approach to the daily practice of all nurses.

- Obtaining informed consent for clients participating in the research process requires that the researcher provides full disclosure of the nature of the study, the subject's right to refuse participation, and the likely risks and benefits that would be incurred by the study.
- The various applications of nursing research to education and practice can significantly influence the quality and delivery of nursing care.
- The importance of nursing research will increase as the result of trends occurring in educational programs, interdisciplinary collaboration, interrelationships between nursing practice and research, and nurse-client involvement in research activities.

CRITICAL THINKING ACTIVITIES

1. Debate these statements:
 - a. One licensure examination for RNs demands only one type of educational program.
 - b. Different licensure examinations should be administered to graduates from different types of entry and advanced levels of educational programs.
2. Describe how nursing education will be different in the next 10 years to graduate nurses who demonstrate the competencies issued from the PEW Health Professions Commission.
3. Name a phenomenon you may see in nursing or in clients that raises a question for you. Discuss the steps you would take to answer the question using a systematic investigation method.
4. Which type of research design is used in the Research Focus feature that is relative to early hospital discharge and home follow-up of women having cesarean birth?
 - a. Exploratory
 - b. Descriptive
 - c. Experimental
 - d. Quasi-experimental

5. Why must the researcher secure an informed consent from research participants?
6. How do the nursing research priorities established by NINR match with the *Healthy People 2000* goals and objectives?

WEB RESOURCES

- Agency for Healthcare Research and Quality
(Evidence-based Practice Centers)
<http://www.ahrq.gov>
- American Association of Colleges of Nursing
<http://www.aacn.nche.edu>
- Bureau of Labor Statistics
<http://www.bls.census.gov>
- Evidence-Based Nursing
<http://www.evidencebasednursing.com>
- Healthy People 2010
<http://www.health.gov>
- Joint Commission
<http://www.jacho.org>
- National Guideline Clearinghouse
<http://www.guideline.gov>
- National Institute of Nursing Research (NINR)
<http://www.nih.gov>
- National League for Nursing Accrediting Commission
<http://www.nlnac.org>
- Student Nurse Information Center
<http://glass.toledolink.com>
- Student Nursing Links
<http://www.nursehealer.com>
- University of Alberta Nursing Research Journals
<http://www.ualberta.ca>

The Health Care Delivery System



*The future is not some place we are going to,
But one we are creating.
The paths to it are not found, but made.
And the activity of making them
Changes both the maker and the destiny.*

—Anonymous (in Zerwekh & Claborn, 1994)

COMPETENCIES

1. Describe the types of services of the U.S. health care delivery system.
2. Discuss the various health care settings through which health care services are delivered.
3. Identify the members of the health care team and their respective roles.
4. Describe the differences between the various financial programs for health care services and reimbursement.
5. Explain the factors that influence health care delivery.
6. Explore the challenges that exist within the health care system.
7. Discuss nursing's role in meeting the challenges within the health care system.
8. Describe the emerging trends and issues for the health care delivery system.

**KEY
TERMS**

capitated rates
comorbidity
exclusive provider
organization
fee-for-service
health care delivery system

health maintenance
organization
managed care
medical model
preferred provider
organization

prescriptive authority
primary care provider
primary health care
single-payer system
single point of entry
subacute care

A **health care delivery system** is a mechanism for providing services that meet the health-related needs of individuals. The U.S. health care delivery system is currently experiencing dramatic change. Health care institutions that once flourished economically are now searching for ways to survive. Health care providers are seeking cost-effective ways to deliver an ever-increasing range of services to consumers. Consumers are demanding greater accessibility to quality health care services that are affordable.

Nursing is a major component of the U.S. health care delivery system. Consequently, nurses must understand the changes occurring within this system, as well as their role in shaping the changes. This chapter discusses the types of health care services available, various settings in which these services are provided, and the members of the health care team. The economics of health care and the challenges within the health care delivery system are also discussed. Nursing's role in meeting these challenges is described.

Americans are becoming increasingly confused about the services and coverage offered by the health care system. This chapter examines some of the problems and possible solutions in health care delivery.

TYPES OF HEALTH CARE SERVICES

Basically, health care services can be categorized into three levels: primary, secondary, and tertiary (Figure 4-1). The complexity of care varies according to the individual's need, provider's expertise, and delivery setting. Table 4-1 provides an overview of the types of care.

Primary: Health Promotion and Illness Prevention

The major purposes of health care are to promote wellness and prevent illness or disability. Traditionally, the U.S. health care system focused on disease prevention rather than health promotion. However, within the past decade, society has begun to engage in health-promoting behaviors. Illness prevention activities are directed at the individual, the family, and/or the community.

Unfortunately, our entire system of health care delivery is not a *health* care system but rather an *illness* care system. Services are directed to caring for an individual after disease or disability has developed rather than

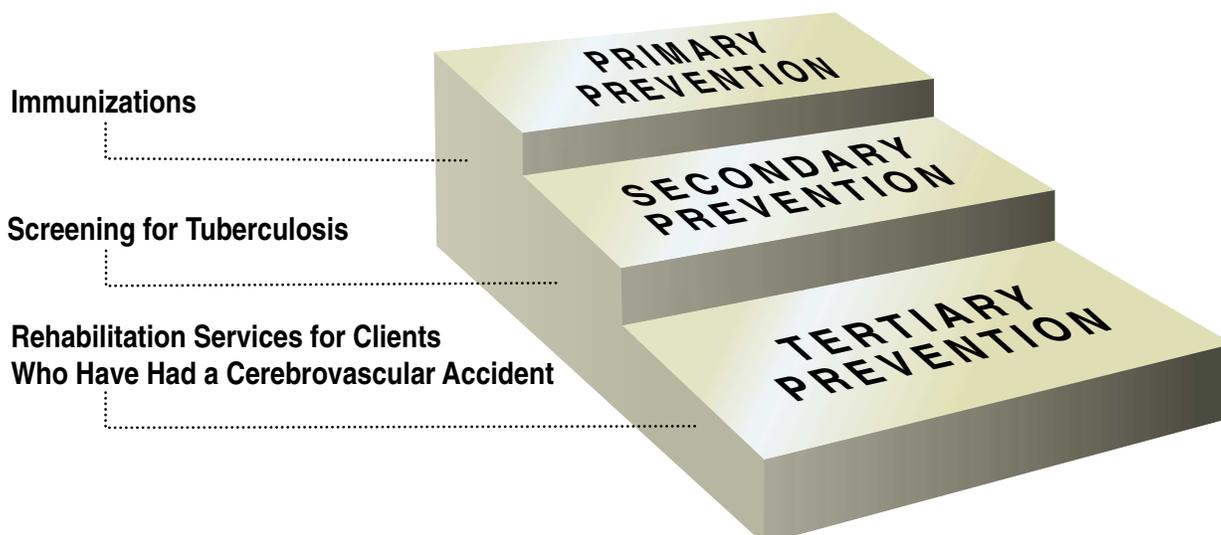


Figure 4-1 Three Levels of Prevention: Examples

TABLE 4-1
Types of Health Care Services

Type of Care	Description	Examples
<i>Primary</i>	<p><i>Goal:</i> To decrease the risk to a client (individual or community) for disease or dysfunction</p> <p><i>Explanation:</i> General health promotion Protection against specific illnesses</p>	<p>Teaching Lifestyle modification for health (e.g., smoking cessation, nutritional counseling)</p> <p>Referrals Immunization Promotion of a safe environment (e.g., sanitation, protection from toxic agents)</p>
<i>Secondary</i>	<p><i>Goal:</i> Early intervention to alleviate disease and prevent further disability</p> <p><i>Explanation:</i> Early detection and intervention</p>	<p>Screenings/diagnosis Acute care Surgery</p>
<i>Tertiary</i>	<p><i>Goal:</i> To minimize effects and permanent disability of chronic or irreversible condition</p> <p><i>Explanation:</i> Restorative and rehabilitative activities to obtain optimal level of functioning</p>	<p>Education and retraining Provision of direct care Environmental modifications (e.g., advising on necessity of wheelchair accessibility for a person who has experienced a cardiovascular accident [stroke])</p>

THINK ABOUT IT

Is the Health Care System in Crisis?

Before focusing on the problems within the current health care delivery system, stop and think! The American health care system is first in technologic advances, biomedical research, and state-of-the-art clinical equipment and facilities. Yet, even with these advantages, many consider that this system is in crisis. From your perspective, is the health care system in a position of strength or weakness?

emphasizing preventive aspects of care (Pruitt & Campbell, 1994). Ideally, preventive care occurs in the community (e.g., homes, workplaces, schools) and emphasizes the development of healthy lifestyles.

Secondary: Diagnosis and Treatment

Most services occur within this secondary type of health care. Acute treatment centers (hospitals) are still the predominant site of delivery of health care services. There is a growing movement to have diagnostic and therapeutic services provided in locations that are more easily accessed by individuals. This trend is discussed later in this chapter.

Tertiary: Rehabilitation

Restoring an individual to the state that existed before the development of an illness is the purpose of rehabilitative (or restorative) care. In situations in which the person is unable to regain previous functional abilities, the goal of rehabilitation is to help the client reach the optimal level of self-care. Restorative care is holistic, in that the entire person is cared for—physiological, psychological, social, and spiritual aspects.

HEALTH CARE SETTINGS

The U.S. health care delivery system is complex, involving myriad providers, consumers, and settings. Health care services in this country are delivered by both the public (including official and voluntary) and private sectors.

Public Sector

Public agencies are financed with tax monies; thus, these agencies are accountable to the public. The public sector includes official (or governmental) agencies, voluntary agencies, and nonprofit agencies. Figure 4-2 shows the hierarchy of the public sector of health care delivery.

At the local level, services provided include immunizations, maternal-child care, and activities directed at control of chronic diseases. Each state varies in the

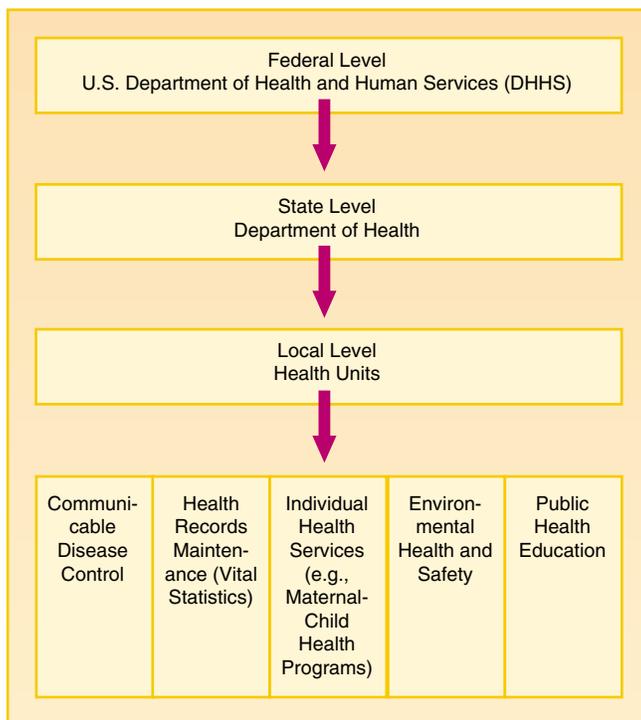


Figure 4-2 The Public Sector of Health Care Delivery

provision of public health services. Generally, a state department of health coordinates the activities of local health units.

At the national level, the U.S. Department of Health and Human Services (DHHS) is administratively responsible for health care services delivered to the public. The Surgeon General is the chief officer of the U.S. Public Health Service (USPHS), the major agency that oversees the actual delivery of care services. Table 4-2 lists the USPHS agencies and their purposes.

An important part of the public sector of the health care delivery system is voluntary agencies. These not-for-profit agencies exert significant legislative influence (e.g., the American Nurses Association [ANA] and the American Medical Association). Other voluntary agencies, such as the American Cancer Society and the American Heart Association, provide educational resources to the general public and to health care providers. Voluntary agencies are funded in a variety of ways, including individual contributions, corporate philanthropy, and membership dues.

Private Sector

The private sector of the health care delivery system primarily comprises independent providers who are reimbursed on a **fee-for-service** basis (the recipient directly pays the provider for services as they are provided). The variety of settings in which health care is delivered and the roles of nurses in these settings are presented in Table 4-3. These practices settings are directly influenced by social and economic factors.

TABLE 4-2
Agencies of the U.S. Public Health Service

Agency	Purpose
Health Resources and Services Administration (HRSA)	Provide health-related information Administer programs concerned with health care for the homeless, people with human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS), organ transplants, rural health care, and employee occupational health
Food and Drug Administration (FDA)	Protect the public from unsafe drugs, food, and cosmetics
Centers for Disease Control and Prevention (CDC)	Prevent the transmission of communicable diseases
National Institutes of Health (NIH)	Conduct research and education related to specific illnesses
Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA)	Serve as clearinghouse for information on substance abuse and mental health issues
Agency for Toxic Substances and Disease Registry (ATSDR)	Maintain registry of certain diseases Provide information on toxic agents Conduct mortality and morbidity studies on defined population groups
Indian Health Service (IHS)	Provide health care services to Native Americans, including: health promotion, disease prevention, alcoholism prevention, substance abuse prevention, suicide prevention, nutrition, maternal-child health
Agency for Healthcare Research and Quality (AHRQ)	Primary source of federal support for research related to quality of health care delivery

TABLE 4-3
Health Care Settings

Setting	Services Provided	Nurse's Role
Hospitals	Diagnosis and treatment of illnesses (acute and chronic) Acute inpatient services Emergency care Ambulatory care services Critical (intensive) care Rehabilitative care Surgical interventions Diagnostic procedures	Caregiver Client educator Provides ongoing assessment Coordinates care and collaborates with other health care providers Maintains client safety Initiates discharge planning Has a variety of areas in which to specialize: Cardiology Critical care Dialysis Emergency Geriatrics Infection control Neurology Oncology Orthopedics Pediatrics Psychiatry Rehabilitation Surgery
Extended care (long-term care) facilities (e.g., nursing homes, skilled nursing facilities)	Intermediate and long-term care for people with chronic illnesses or those who are unable to care for themselves Restorative care until client is ready for discharge to home	Provides care directed at meeting basic needs (e.g., nutrition, hydration, comfort, elimination) Provides teaching and counseling Plans and coordinates care Administers medications, treatments, and other therapeutic modalities
Home health agencies	Wide range of services, including curative and rehabilitative	Provides skilled nursing care Coordinates health promotion activities (e.g., education)
Hospices	Care of individuals with terminal illnesses Improving the quality of life until death	Promotes comfort measures Provides pain control Supports grieving families
Outpatient settings (clinics, health care practitioners' offices, ambulatory treatment centers)	Treatment of illness (acute and chronic) Diagnostic testing Simple surgical procedures	<i>Traditional Role:</i> Checks vital signs Assists with diagnostic tests Prepares client for examination <i>Expanded Role:</i> Provides teaching and counseling Performs physical (or mental status) examination In some settings, advanced practice registered nurses (APRNs) are the primary care providers
Schools	School-based clinics (SCBs) are federally funded providers of physical and mental health services in middle and high schools.	Coordinates health promotion and disease prevention activities Treats minor illnesses Provides health education
Industrial clinics	Maintain health and safety of workers	Coordinates health promotion activities Provides education for safety Provides urgent care as needed Maintains health records Conducts ongoing screenings Provides preventive services (e.g., tuberculosis testing)
Managed care organizations	Reimbursement for health care services	Serves as case manager Uses triage to determine the most appropriate intervention for clients
Community nursing centers	Direct access to professional nursing services	Treats client's responses to health problems Promotes health and wellness
Rural primary care hospitals (RPCs)	Stabilize clients until they are physiologically able to be transferred to more skilled facilities	Performs assessments and provides emergency care

HEALTH CARE TEAM

Health care services are delivered by a multidisciplinary team. Table 4-4 provides a list of health care providers. Because nurses work with other care providers on an ongoing basis, it is necessary to understand the role of each provider. Nurses coordinate the care provided by other personnel.

Nurse

What do nurses do? Nurses fulfill a variety of roles while assisting clients to meet their needs. Table 4-5 defines the most common roles of nurses. These roles are affected by changes in the health care environment. Nurses function in dependent, independent, and interdependent roles. The degree of autonomy nurses experience is related to client needs, expertise of the nurse, and practice setting.

TABLE 4-4
Health Care Providers

Professional	Function/Role
Nurse (RN)	Provides care to individuals who are unable to care for themselves; with a holistic approach, nurses assist clients to cope with illness or disability Addresses the needs of the client (individual, family, community) Emphasizes health promotion
Physician (MD)	Makes medical diagnoses and prescribes therapeutic modalities Performs medical procedures (e.g., surgery) May specialize in a variety of areas (e.g., gynecology/obstetrics, oncology, surgery)
Physician Assistant (PA)	Provides medical services under the supervision of a health care practitioner
Pharmacist (RPh)	Prepares and dispenses drugs for therapeutic use Often involved in client education
Dentist (DDS)	Diagnoses and treats conditions affecting mouth, teeth, and gums Performs preventive measures to promote dental health
Dietitian (RD)	Plans diets to meet special needs of clients Promotes health and prevents disease through education and counseling May supervise preparation of meals
Social worker (SW)	Assists clients with psychosocial problems (e.g., financial, marital) Conducts discharge planning Makes referrals for placement
Respiratory therapist (RT)	Administers pulmonary function tests Performs therapeutic measures to assist with respiration (e.g., oxygen administration, ventilators)
Physical therapist (PT)	Works with clients experiencing musculoskeletal problems Assesses person's strength and mobility Performs therapeutic measures (e.g., range of motion, massage, application of heat and cold) Teaches new skills (e.g., walking with crutches)
Occupational therapist (OT)	Works with clients with functional impairment to learn skills for activities of daily living
Chaplain	Assists in helping clients meet spiritual needs Provides individual counseling Provides support to families Conducts religious services
Unlicensed assistive personnel (UAP)	Assists in provision of client care activities under the direction of the RN May include certified nurses aide, personal care assistant, nursing assistant, orderly, and certified phlebotomist

TABLE 4-5
Nursing Roles

Role	Description
Caregiver	Traditional and most essential role Functions as nurturer Provides direct care Is supportive Demonstrates clinical proficiency Promotes comfort of client
Teacher	Provides information Serves as counselor Seeks to empower clients for self-care Encourages compliance with prescribed therapy Promotes healthy lifestyles Interprets information
Advocate	Protects the client Provides explanations in client's language Acts as change agent Supports client's decisions
Manager	Makes decisions Coordinates activities of others Allocates resources Evaluates care and personnel Serves as a leader Takes initiative
Expert	Advanced practice clinician Conducts research Teaches in schools of nursing Develops theory Contributes to professional literature Provides testimony at governmental hearings and in courts
Case manager	Tracks client's progress through the health care system Coordinates care to ensure continuity
Team member	Collaborates with others Possesses highly skilled communication methods Performs therapeutic measures to assist with respiration (e.g., oxygen administration, ventilators)

ECONOMICS OF HEALTH CARE

The reform movement in health care has been motivated primarily by health care costs. Control of costs has shifted from the health care providers to the insurers. As a result, there are increasing constraints on reim-

bursement. For years, the predominant method of covering health care costs was the fee-for-service method. There was little, if any, incentive for cost-effective delivery of care (Chamberlain, Chen, Osuna, & Yamamoto, 1995). All that is changing.

The United States health care system has a diverse financial base, composed of both private and public funding. As a result, administrative costs for health care reimbursement are higher in this country than in countries with a **single-payer system** (a model in which the government is the only entity to reimburse health care costs: e.g., Canada). The level of U.S. health care expenditures is higher than in any other nation, and previous cost-containment measures have been ineffective in slowing the growth of expenditures (Schieber, Poullier, & Greenwald, 1994). Despite the enormous expenditures of public funds, the United States has not found a way to provide adequate health care coverage for all citizens.

Private Insurance

The system for financing health care services in the United States is based on the private insurance model. One of the largest sectors of the health care system is private insurance companies. Currently, more than 1000 private insurance companies exist (Schieber et al., 1994). Payment rates to health care providers vary among insurance companies.

Insured individuals are paying substantial monthly premiums and deductibles for health care services. These costs limit access for many Americans. In addition, insurers will no longer pay for services that they deem unnecessary. The quality of care provided is being monitored by providers, third-party payers, and, ever-increasingly, by consumers.

Managed Care

Managed care is a system of providing and monitoring care in which access, cost, and quality are controlled before or during delivery of services. The goal of managed care is the delivery of services in the most cost-efficient manner possible. Managed care seeks to control costs by monitoring delivery of services and restricting access to expensive procedures and providers.

Managed care was designed to provide coordinated services with an emphasis on prevention and primary care (ANA, 1995). The rationale for managed care is to give consumers preventive services delivered by a **primary care provider** (a health care provider whom a client sees first for health care) that, in turn, results in less expensive interventions.

Managed care has been in existence for years; however, it is only within the past few decades that it has received national prominence (Society for Ambulatory Care Professionals, 1994). The Health Maintenance Organization Act (passed in 1973) implemented two

mandates. First, federal grants and loans were made available to **health maintenance organizations (HMOs)** (prepaid health plans that provide primary health care services for a preset fee and focus on cost-effective treatment measures) that complied with strict federal regulations as opposed to the less restrictive state requirements. Second, the act required large employers to provide an HMO as an option for employees for health care coverage (Society for Ambulatory Care Professionals, 1994). From their inception, HMOs have been a viable alternative to the traditional fee-for-service system.

Managed care is not a place but rather an organizational structure with a few variations. One is represented by HMOs, which are both providers and insurers. Other variations are represented by **preferred provider organizations (PPOs)** (a type of managed care model in which member choice is limited to providers within the system) and **exclusive provider organizations (EPOs)** (organizations in which care must be delivered by the plan for clients to receive reimbursement). The latter creates a network of providers (such as physicians and hospitals) and offers the incentive of consumer services with little or no copayment if these providers are used exclusively. Table 4-6 provides a comparison of independent practice and managed care organizational structures.

The impact of managed care is that caregivers and institutions must change from providing as many ser-

vices as possible under a fee-for-service payment approach to keeping the client well and providing fewer services so as to protect their financial interests. “In a fee-for-service system, the concern is that a client might receive too many or unnecessary services; in a prepaid system, the concern is that too few services might be given in order to save the provider and the managed care plan money” (Hitchcock, Schubert, & Thomas, 1999, p. 46).

Health Maintenance Organizations

The HMOs often maintain primary health care sites and commonly employ provider professionals. They use **capitated rates** (a preset flat fee that is based on membership in, not services provided by, the HMO), assume the risk of clients who are heavy users, and exert control on the use of services. HMOs have been noted for their use of advanced practice registered nurses (APRNs) as primary care providers, precertification programs to limit unnecessary hospitalization, and an emphasis on client education for health promotion and self-care.

Another common feature of HMOs is the practice of **single point of entry** (entry into the health care system is required through a point designated by the plan) through which primary care is delivered. **Primary health care** is the client's point of entry into the health care system and includes assessment, diagnosis, treatment, coordination of care, education, preventive services, and surveillance. It consists of the spectrum of services provided by a family practitioner (nurse or physician) in an ambulatory setting. Primary care providers (PCPs) serve as “gatekeepers” to the health care system in that they determine which, if any, referrals to specialists are needed by the client. To reduce costs, direct access to specialists is limited. Extensive data collection proves that APRNs are exceptionally suited to these primary provider/gatekeeper roles (ANA, 1993a). Managed care plans assume a significant portion of the risk of providing health care and, consequently, encourage both prudent use by consumers and prescription by providers.

Preferred Provider Organizations

The most common managed care systems are preferred provider organizations (PPOs). A PPO is a contractual relationship between hospitals, providers, employers, and third-party payers to form a network in which providers negotiate with group purchasers to provide health services for a defined population at a predetermined price (Society for Ambulatory Care Professionals, 1994). Even though PPOs have been very popular with the American public, it appears that HMOs are gaining in market share among the American public (Kelly & Joel, 1995). Currently, managed care is emerging as the preferred model for delivery of services.

TABLE 4-6
Comparison of Independent Practice
with Managed Care

Type	Description
Independent practice	Fee-for-service Functions within socially prescribed boundaries (professional ethics) Consumer choice of provider Disease-oriented philosophy
Health maintenance organizations (HMOs)	Provide services to a group of enrolled persons Fee is preset and prepaid Service provision is limited
Preferred provider organizations (PPOs)	Networks of providers that give discounts to sponsoring organization Members are not mandated to select a primary care health care practitioner but must use a health care practitioner in the network
Exclusive provider organizations (EPOs)	Plan pays no benefit if member is treated outside the network Are usually regulated by state insurance laws



Title of Study

“Primary Care Outcomes in Patients Treated by Nurse Practitioners or Physicians: A Randomized Trial”

Author

Mundinger, M. O., Kane, R. L., Lenz, E. R., Totten, A. M., Tsai, W., Cleary, P. D., Friedewald, W. T., Siu, A. L., & Shelanski, M. L.

Purpose

To compare outcomes for clients treated by nurse practitioners or health care practitioners for primary care follow-up and ongoing care after an urgent care visit or emergency department visit. This study provided direct comparison of outcomes for clients with services provided by nurse practitioners and by health care practitioners.

Methods

A randomized trial was conducted from August 1995 to October 1997, with client interviews 6 months and 1 year following an initial appointment. The study occurred at four community-based primary clinics (17 health care practitioners) and one primary care clinic (seven nurse practitioners) at an urban academic medical center.

Findings

No significant differences were found in clients' health status at 6 months following the appointment. No significant differences were found in health services utilization after 6 months or 1 year. Clients reported no differences in satisfaction ratings following the initial appointment. In an ambulatory care setting in which clients were randomly assigned to nurse practitioners or health care practitioners, client outcomes were comparable.

Implications

This was a groundbreaking study in that it was published in a premiere medical journal and showed no statistical advantages for clients to be treated by health care practitioners instead of nurse practitioners in an ambulatory treatment setting. This study can be useful in documenting the efficacy of nurse practitioners.

Mundinger, M. O., Kane, R. L., Lenz, E. R., Totten, A. M., Tsai, W., Cleary, P. D., Friedewald, W. T., Siu, A. L., & Shelanski, M. L. (2000). Primary care outcomes in patients treated by nurse practitioners or physicians: A randomized trial. *Journal of the American Medical Association* 283(1), 59.

Federal Government Insurance Plans

The federal government became a third-party payer for health care services with the advent of Medicare and Medicaid in 1965. The Health Care Financing Administration (HCFA) is a federal agency that regulates Medicare and Medicaid expenditures. Public funding is used for about 42% of total health expenditures (Schieber et al., 1994). There are myriad public programs for financing health care, with Medicare and Medicaid being the predominant ones. Medicare is the federally funded program that provides health care coverage for the elderly and the disabled. Medicaid is a jointly administered program between the federal and state governments that provides health care coverage for the economically disadvantaged.

The federal government created diagnosis-related groups (DRGs) to curtail spending for hospitalized Medicare recipients and to ensure that health care dollars would get to those who most need them. Through this system, an inclusive rate is established for each episode of hospitalization based on the client's age, principal diagnosis, and the presence or absence of surgery and **comorbidity** (existence of simultaneous disease processes within an individual). Hospitals are now reimbursed only for services that are determined to be medically necessary. An accelerating trend for the federal government is to give recipients of public monies the personal right to choose, through the use of vouchers, a managed care program in the private sector.

Medicare

When Medicare was established in 1965, it was intended to protect individuals over the age of 65 from exorbitant costs of health care by providing public funds to cover the majority of health care services.

In 1972, Medicare was modified to include permanently disabled individuals and those with end-stage renal disease.

Medicaid

Medicaid is a shared venture between the federal and state governments. Each state has latitude in determining who is “medically indigent,” and thus qualifies for public monies. Minimal services covered by Medicaid are defined by the federal government and include inpatient and outpatient hospital services, physician services, laboratory services (including x-rays), and rural health clinic services. States may elect to cover other services, such as dental, vision, and prescription drugs.

Canadian Health Insurance

Canada has a national health insurance program that covers each citizen for short- and long-term care. This mandatory program is financed with tax dollars. Each

province runs its own health system in accordance with federal rules and with a fixed federal monetary contribution. Physicians are reimbursed on a prenegotiated fee-for-service basis (Schieber et al., 1994). Table 4-7 describes the characteristics of the Canadian health care system.

Although some disagreement persists in the nursing community, the Canadian (or single-payer) model is not generally seen as the best choice for the United States. The Canadian system is more suited to a highly homogeneous population and the ethos of “the greatest good for the most people.” The latter sounds like an incontestable truth, but it is a questionable fit with the American spirit, which is more aligned with the idea of equal opportunity for all plus the availability of extra services for those who can afford them.

It is also appropriate to challenge the illusion of the Canadian health care system as a panacea. Further, increasing costs are prompting a debate in Canada about which services are really affordable and whether copayment and deductibles will eventually be necessary. The Canadian Government is implementing a plan that responds to the need for more nurses in all sectors of health care. In 1988, \$20 million per year were allocated to increase the number of nurses in long-term care facilities (Hirsch, 1999). In Canadian provinces that have additionally chosen to enrich the basic standard established at the national level, there is the possibility of cutbacks.

THINK ABOUT IT

U.S. versus Canadian Health Care Systems

What is your response to the difference in philosophical frameworks of Canada and the United States regarding delivery of health care services?

TABLE 4-7
Characteristics of the Canadian Health Care System

Principle	Description
Comprehensive scope	All medically necessary services are covered.
Universality	All citizens have coverage.
Public administration	Health care is accountable to the public because it is financed entirely with public funds.
Accessibility	Health care providers and services are available to all citizens.
Portability	Coverage remains uninterrupted as individuals change jobs or move to different provinces.

FACTORS INFLUENCING THE DELIVERY OF HEALTH CARE

Despite cost-containment efforts (such as DRGs established by the federal government and managed care by the insurers), the U.S. health care system still has problems with issues of cost, access, and quality.

Cost

Why is consideration of cost so important? The very existence of the health care system depends on fiscal issues (O’Neil, 1993). Cost has been a driving force for change in the health care system as evidenced by the strength and numbers of managed care plans, increased use of outpatient treatment, and shortened hospital stays. These market forces (to maximize profits by minimizing costs) are dominating the current changes in the health care system.

The U.S. government spends more on health care per person than any other country (O’Neil, 1993). The increasing consumption of federal funds for health care means that resources are being moved from other areas of need, such as education, housing, and social services (Grace, 1994).

The cost of providing health care has risen dramatically during the past 20 years. Health care costs are expected to consume 16.2% of the Gross Domestic Product (GDP) by the year 2008 (Health Care Financing Administration, 1997).

The health care bureaucracy has become mammoth. The most cost-efficient programs in terms of administration are Medicare and Medicaid because of the number of people eligible for these benefits. In contrast, some private plans, particularly small business plans, use over 40 cents of each dollar for administration. The cost of health care is seriously compromising American business and industry. For example, the chief executive officer of Ford Motor Company stated that the costs for health care coverage of employees exceeded the total expenditures on steel used in building cars (Grace & Brock, 1994). This policy may lead businesses to invest less money in growth and development, a decision that places the United States at risk in global markets. Over the last generation, the United States has moved rapidly toward becoming a service-dominated economy. Yet, a society’s economic strength depends on its manufacturing and industry. This imbalance leaves few resources to return our industries to a position of world prominence. The cost of employee health care benefits is an expensive commitment for small businesses and is a serious factor when one considers that the economy of this country has survived—if not thrived—because of the contributions of small businesses.

Four major factors increase the cost of health care: (1) an oversupply of specialized providers, (2) a surplus of hospital beds, (3) the passive role assumed by most consumers, and (4) inequitable financing of services

(Grace, 1994). Other factors that contribute to the high cost of health care are the aging of the population, the increased number of people with chronic illnesses, the increase in health-related lawsuits that has resulted in the unnecessary use of services, and advanced technology that has allowed more people to survive disabling illnesses.

Access

In addition to the issue of cost, access to health care services has a serious impact on the functioning of the health care system. As a result of the cost, health care for many people is crisis-oriented and fragmented. A large number of Americans are unable to gain access to health care services owing to low income or lack of insurance, and, therefore, their illnesses progress to an acute stage before they seek intervention. Poverty often adversely affects an individual's access to health care services. For example, limited transportation (lack of an automobile or funding for public transit) interferes with the ability to travel to health care facilities. Services used by individuals during acute illnesses are typically those provided by emergency departments. Emergency room and acute care services are expensive when compared with early intervention and preventive measures.

Approximately 43 million Americans are uninsured (Falter 1999). Only a small portion of the medically indigent are covered by Medicare. In addition, many individuals are underinsured. These people are neither poor nor old, but middle-class unemployed Americans or those in jobs without adequate health care benefits.

In addition to poverty and unemployment, other factors impede a person's ability to obtain insurance. Refer to the accompanying display that lists factors affecting access to health care services.

FACTORS LIMITING ACCESS TO HEALTH CARE SERVICES

- No provision for insurance by an employer due to prohibitive costs
- Inability to obtain individual insurance due to high costs
- Difficulty for people with certain medical problems (preexisting conditions) to obtain insurance
- Cultural barriers
- Shortages of health care providers in some geographic areas (especially rural or inner city areas)
- Limited access to ancillary services (e.g., child care, transportation)

Other variables affecting access are the increase in the number of women employed outside the home and the number of single-parent families. These factors

impair access to health care services because it is often difficult for parents to take time off from work to transport children to health care providers (Uphold & Graham, 1993).

Quality

It is estimated that 30% to 40% of diagnostic and medical procedures performed in this country are unnecessary (Lee, Soffel, & Luft, 1994). This inappropriate use of resources can be traced to several causative factors, including:

- The litigious environment that creates the tendency toward defensive practice
- Resource consumption is highly influenced by the widely held American belief that more is better
- Lack of access to and continuity of services with subsequent misuse of acute care services

In an attempt to provide universal access to services in a cost-effective manner, quality does not have to be sacrificed. For example, hospitals that are reducing the numbers of registered nurses ("downsizing") risk endangering quality. Safety and quality are frequently compromised by inappropriate substitution of unqualified personnel for registered nurses in direct care of clients. The Economic Policy Institute (1999) released a study that indicates that, as more tasks are delegated to unlicensed assistive personnel (UAP), the quality of data used in decision-making diminishes.

A study conducted in 1998 revealed that 72% of nurses surveyed stated that the quality of care provided at their hospitals had deteriorated because of cost-containment measures. This reflects a 12% increase from 1988 similar survey results (Wolfe, 1999). Cross-training of staff, increased use of unlicensed personnel, and reductions in full-time positions for nurses are affecting the type of care delivered in hospitals. In an attempt to be cost-effective, some hospitals have decreased the number of registered nurses, thereby creating unsafe situations for clients (American Nurses Association, 1995). Any movement toward reform must focus on providing quality nursing care to all consumers.

CHALLENGES WITHIN THE HEALTH CARE SYSTEM

The major challenges facing the U.S. health care delivery system include the public's disillusionment with providers, loss of control over health care decisions, decreased use of hospitals and the impact on quality of care, changing practice settings, ethical issues, and vulnerable populations.

Disillusionment with Professionals

Americans believe the major problem of the health care system is greed and waste (Maraldo, 1994). Whether this problem is caused by defensive practice, consumer demand, or professional economics is irrelevant to the public. Success in reform depends on starting where the public expects it should begin—by eliminating greed and waste. Further, Americans are suspicious of medical professionals. The high level of esteem with which medicine has traditionally been held has diminished over the past few years. Consumers are becoming increasingly tired of paying the high cost of care and question medical practices and fees (Zerwekh & Claborn, 1994). However, the public is not suspicious of nurses (Kellogg Foundation, 1994). This positive perception of nurses will be important as reform initiatives are established.

THINK ABOUT IT

Perception of Nurses

What factors do you think have contributed to a positive perception of nurses? On the other hand, what factors have led to the development of negative images? What can you do specifically to promote positive images of nurses to the public?

Positive Perception of Nurses

Several studies (ANA, 1993a; Kellogg Foundation, 1994) verify the public's trust in nurses. The public sees nurses as part of the solution, not the problem, and believes that, if nurses were allowed to use their skills, they would significantly enhance quality and reduce cost. One survey (ANA, 1993a) inquired about consumer receptivity to nurses' assuming expanded responsibilities. Respondents supported **prescriptive authority** (legal recognition of the ability to prescribe medications) for nurses and endorsed their role in performing physical examinations and managing minor acute illnesses. Nurses have limited their own vision of their roles owing to the roots of their education in the **medical model** (traditional approach to health care in which the focus is on treatment and cure of disease) and their socialization into the hierarchy that this model assumes.

Loss of Control

Consumers express the sentiment of feeling terrorized by the health care delivery system. They feel they have lost personal control, and they do not trust the people who represent them. Many Americans stay in unsatisfying jobs because of their health care benefits and relinquish

employment mobility due to a fear of being denied a new policy because of preexisting conditions. Many American workers state that their greatest concern is the possible loss of health care coverage (Grace & Brock, 1994).

Decreased Hospital Use

In the early 20th century, hospitals focused on providing care to those who had no caregivers in the family or community. The focus of these early institutions was care not cure (Grace, 1994). The focus of hospitals changed in the mid-1940s as a result of technologic changes and the passage of the Hill-Burton Act by Congress in 1946, which provided funding for renovation and construction of hospitals. One unanticipated outcome of this act was a substantial oversupply of hospital beds. Health care costs escalated with the need to keep the hospital beds occupied.

From 1945 to 1982, the demand for hospital beds steadily increased. After 1982, a steady decline in the number of hospital admissions and the length of stay occurred (Grace, 1994). "As patient care services continue to move to outpatient settings, HCFA says that hospitals can expect to get only 30% of the nation's total expenditures by 2007—that's 5% less than in 1997" (Ventura, 1999, p. 14).

Currently, hospitals continue to be the nucleus of the health care delivery system in the United States. Hospitals account for the largest proportion of expenditures and employ the majority of health care workers. Hospitals have fewer clients today because of the trend toward rapid discharge and more procedures being performed in outpatient settings. The clients who are hospitalized require more nursing care because of the greater complexity of needs and severity of illness. The accompanying display lists factors that have contributed to the decreased hospital population.

FACTORS INFLUENCING DECREASED HOSPITAL POPULATION

- Shorter lengths of stay
- Technologic advances
- Greater availability of outpatient facilities
- More services available in outpatient settings
- Expectations/demands of third-party payers

As a result of the changes in reimbursement practices, hospitals are restructuring (also referred to as redesigning and re-engineering). Examples of restructuring activities include mergers with larger institutions; development of integrated systems that provide a full range of services focusing on continuity of care such as preadmission, outpatient, acute inpatient, long-term inpatient, and home care; and the substitution of multiskilled workers for nurses. Approximately 67% of registered nurses are employed by hospitals (McCloskey & Grace, 1994).

The majority of these nursing positions are direct care providers (staff nurses). In some institutions, restructuring includes replacing registered nurses with unlicensed personnel, which may lead to decreased quality of care. Nurses must ensure that cost-cutting efforts do not threaten client safety.

As the average lengths of stay in hospitals decline, the acuity level of clients increases. The presence of increasingly ill clients requires nurses who possess technical expertise, critical thinking skills, and interpersonal competence. Community based services, such as home health, will need to continue to expand to meet the increased needs of the steadily growing elderly population (Hull, 1994).

Changing Practice Settings

Most nurses currently practice in hospitals and will continue to do so in the future (Aiken, 1995). However, there is an ever-increasing need for nurses in different areas of practice. Social and political changes are affecting nurses by creating the need for expanded services and settings. Because of these changes, demand for nursing care fluctuates. For example, nursing employment outside the hospital continues to increase rapidly. Health care expenditures for home care are rapidly increasing. It is predicted that 70%–80% of care will be delivered in the home by the year 2010 (Conger et al., 1999). Since the advent of Medicare and Medicaid, home health care has grown rapidly.

More nurses will be needed in the future due to:

- The growing elderly population will require more health care services.
- The number of people admitted to nursing homes is steadily growing.
- The number of homeless individuals, who are most often denied access to health care, is increasing.

As health care reform occurs, some nurses may be displaced from their current jobs. But overall, many more jobs will be created by the demand for greater access to health care services. Some examples of areas in which larger numbers of nurses will be required are primary care, public health, extended care facilities, and the home setting.

THINK ABOUT IT

Preparing for the Future

Consider the following anonymous quote: “The future belongs to those who prepare for it.” As the number of hospital closings continues to increase across the country, fewer numbers of registered nurses are needed to function in the “traditional” setting. How do you see yourself functioning in a professional role? How are you positioning yourself for the future?

Ethical Issues

The United States is struggling with a major ethical conflict of cost containment versus compassionate quality care. According to Hicks and Boles (1994), no country, regardless of how wealthy it is, can provide all citizens with every health care service they desire or need. Today, the U.S. health care delivery system is faced with the dilemma of citizens’ needs being greater than available resources. Thus, some difficult choices must be made to determine which needs will be met and which will remain unmet.

The expectation that “everything must be done to save” a dying person has created an enormous drain on the health care resources of this country. As decisions are made about allocating scarce resources, there will be much debate about the ethics involved. The appropriateness of futile life-sustaining measures must be addressed (Rowe, 1996). Nurses must continue to strongly advocate for just and ethical distribution of resources as health care reform progresses.

THINK ABOUT IT

Rationing Health Care

Think about the ethical ramifications of determining medically necessary therapeutics. Is rationing of scarce resources the answer to our health care dilemma?

Vulnerable Populations

Meeting the health care needs of underserved populations is especially challenging. Groups that may be unable to gain access to health care services include: children, the elderly, people with AIDS, the homeless, and others living in poverty. Approximately 43 million people in America had no health insurance in 1997. (US Census Bureau, 1998) Medicaid is no longer adequate to meet the needs of the medically indigent.

Our current health care system neglects the overall needs of children. Children are more likely than adults to be uninsured. One in 5 children lives in families with income below the poverty level; only half of those children living in poverty are covered by Medicaid (Uphold & Graham, 1993). As the federal and state governments continue to curb expenditures for health care, more children will be declared ineligible for Medicaid. Children who are covered by health insurance have a greater degree of well-being. Approximately 1 in 5 children in the United States is uninsured (Baker, 1994).

Over 35% of preschool children in this country are not immunized. Many parents do not begin having their children immunized until the children are ready to start school (Kyle & Coulter, 1995). Preventive health care should be available to children of all ages, with an emphasis on early immunization. In addition, maternal-child

health among select ethnic and racial minorities in certain geographic areas of this country is poorer than that in developing countries. The health of a country is often judged by its maternal-child health indicators (Kelly & Joel, 1995). The ANA and a coalition of allied nursing associations are working together in an attempt to immunize all children in the United States.

Over 230,000 Americans have been diagnosed with AIDS and approximately 1 million Americans are infected with HIV (Hull, 1994). The most rapid spread of the disease is occurring among women, children, and intravenous drug users and their sexual partners. Women who have AIDS have a higher mortality rate than men, and decreased access to health care may be one contributing factor to this higher mortality rate (Tlusty, 1994). Although the cost of the AIDS epidemic is unmeasurable in terms of human suffering, approximately \$10.5 billion dollars was spent on care of people with AIDS in 1994 alone (Hull, 1994). Not only will additional funding be necessary, but also outpatient care settings (such as hospices, home care, and clinics) must be expanded to care for those affected by this epidemic.

Traditionally, rural areas have always had few health care providers and facilities that were easily accessible. A large number of elderly people (approximately 45% of those over the age 65) live in rural areas (Vrabec, 1995). Because people in rural areas tend to work for small businesses or are self-employed, many of them have no health insurance. Also, many hospitals in rural areas have been closed due to economic pressures.

Usually, adults in the United States who receive little assistance in health promotion maintain unhealthy lifestyles, which lead to the development of chronic illnesses. Older adults who have accumulated problems that could have been prevented are admitted to nursing homes, which are very costly (Grace & Brock, 1994).

It is in the best interests of society to see that those who cannot afford the basic health services are not denied such services. The entire society's health is threatened when some sectors are denied basic care. As a group, nurses are concerned with the availability of health care services to everyone, regardless of their ability to pay (Hicks & Boles, 1994).

NURSING'S RESPONSE TO HEALTH CARE CHALLENGES

As the United States continues to look for ways to address the issue of health care reform, the implications for nursing will continue to increase. Some nurses feel threatened by impending changes, whereas others are excited about the possibility of transforming the health care system into something better. The nursing profession has responded to the myriad challenges in health care delivery by proposing a plan for reform.

Nursing's Agenda for Health Care Reform

In 1991, in response to the problems of high cost, limited access, and eroding quality that were affecting the U.S. health care system, the nursing community created a public policy agenda that is currently endorsed by more than 70 organizations. *Nursing's Agenda for Health Care Reform* (ANA, 1991) provides a valid framework for change in health care policies. The accompanying display lists the major tenets of this agenda. A cornerstone of nursing's proposal is the delivery of health care services in environments that are easily accessible, familiar, and consumer friendly. Another essential part of nursing's agenda is the empowerment of consumers for self-care. This goal has enormous implications for nurses as

NURSING'S AGENDA FOR HEALTH CARE REFORM

Nursing's agenda for health care reform includes several basic premises, including the following:

- All citizens and residents of the United States must have equitable access to essential health care services.
- Primary health care services must play a very basic and prominent role in service delivery.
- Consumers must be the central focus of the health care system. Assessment of health care needs must be the determining factor in the ultimate structuring and delivery of programs and services.
- Consumers must be guaranteed direct access to a full range of qualified health care providers who offer their services in a variety of delivery arrangements at sites that are accessible, convenient, and familiar to the consumer.
- Consumers must assume more responsibility for their own care and become better informed about the range of providers and potential options for services.
- Health care services must be restructured to create a better balance between the prevailing orientation toward illness and cure and a new commitment to wellness and care.
- The health care system must assure that appropriate, effective care is delivered through efficient use of resources.
- A standardized package of essential health care services must be provided and financed through an integration of public and private sources.
- Mechanisms must be implemented to protect against catastrophic costs and impoverishment.

(From American Nurses Association. [1991]. *Nursing's agenda for health care reform*. Kansas City, MO: Author.)

health educators and for the use of incentives for increasing personal accountability for one's own health status.

Standards of Care

Another approach to the challenges experienced by the health care delivery system has been the move toward standardization of care. In December 1990, the Agency for Health Care Research and Quality (AHRQ), formerly known as the Agency for Health Care Policy and Research (AHCPR), was established with the specific charge of achieving consensus within the medical/health care community on the usual treatment of high-volume and expensive disease conditions that differ in their therapeutic management despite substantial research. More simply put, there is significant variation in the diagnosis and treatment of certain illnesses and diseases. The medical justification for such variance has been that every client is an individual and the choice of treatment is a private decision involving client and physician. AHRQ aims to identify the standards of treatment for which the health care community can be held accountable.

THINK ABOUT IT

Standards of Treatment

How do you feel about AHRQ's development of treatment standards for medical/health care practice? What potential outcomes can you envision as a result of standardization?

When AHRQ was created, the ANA recognized the need to strengthen nursing practice standards. Three interdisciplinary panels chaired by nurses were created to propose standards for conditions that are highly responsive to nursing interventions. Currently, AHRQ published guidelines are available to the public and should be integral to nursing practice.

Advanced Practice

The advanced practice of nursing has evolved as nursing has become more complex and specialized. Since the late 1960s, nurse practitioners (NPs), clinical nurse specialists (CNS), certified nurse midwives (CNMs), and other advanced practice registered nurses (APRNs) have provided primary health care services to individuals, many of whom would have had inadequate or no access to services. (APRNs) possess advanced skills and in-depth knowledge in specific areas of practice. Even though there are differences in various advanced practice roles, all APRNs are experts who work with clients to prevent disease and to promote health.

There are currently more than 100,000 APRNs in the United States (ANA, 1995). It is predicted that there will be a 50% to 75% increase in the demand for APRNs in the next 10 years, with an accompanying decrease in demand for RNs without APRN preparation (Peterson, 1999). Nurses in advanced practice are also moving toward independent practice. Data suggest that APRNs can independently diagnose and resolve over 80% of the primary health care problems of the American public (ANA, 1993a). Nurses are preferable to other providers in terms of client compliance with a therapeutic regimen, consumer satisfaction, and client gains in functional ability and self-care. NPs facilitate access to and continuity of care and provide high-quality care (Brown & Grimes, 1993). APRNs prescribe less-expensive diagnostic tests, the length of their visits is comparable to that of physicians, and they charge less for services because of the low cost of professional liability insurance (ANA, 1993b). Despite repeated proof of the cost efficiency and therapeutic effectiveness of APRNs, obstacles to this role for nurses persist. In a recent Division of Nursing report on APRNs, the singular most formidable obstacle to practice is the fact that most people are unaware of what APRNs offer (Washington Consulting Group, 1994).

For APRNs, direct access to clients is a necessity and requires direct reimbursement, prescriptive authority, sufficient professional liability insurance, autonomy in managed care plans, professional staff privileges in service systems, and adequate practice acts. As the social and economic barriers to advanced practice are removed, utilization of these nurse specialists will increase.

THINK ABOUT IT

Advanced Practice

Read the nurse practice act for your state. Do nurses in your state have prescriptive authority? Are they eligible for reimbursement from third-party payers? What about staff privileges in local health care institutions? How does your state measure up in promoting advanced practice nursing?

Recently, progress has been made on the access issues that constrain APRNs. Reimbursement is now available to some segments of the advanced practice community in every federal entitlement program. Although insurance providers in the private sector are governed by state law and vary to the extent that they recognize advanced practice, APRNs report some form of reimbursement (in addition to that which is federally mandated) in every state and the District of Columbia (Pearson, 1996).

Currently, every state and the District of Columbia award APRNs some type of prescriptive authority (Pearson, 1996).

The ANA (through the Joint Commission on the Accreditation of Healthcare Organizations [JCAHO])

and HCFA) began the groundwork for professional staff privileges for APRNs in its revision of the official definitions of professional staff that include a broad range of providers. The issue of institutional privileges is complicated given the fact that a facility may impose additional requirements on these privileges, including joint or collaborative practice with a physician (ANA, 1993b).

THINK ABOUT IT

Universal Health Care Guarantee

If you were to develop a core of basic health care services to which all Americans would have access, what would be included?

Public versus Private Programs

The combination of public and private sector resources for health care seems to be comfortable for Americans. The competition between the two types of settings has encouraged quality and progress. Each setting provides benefits as well as drawbacks to health care recipients.

The nursing profession supports an integration of public and private sector programs and resources. Public dollars are required to help the poor and those who do not receive health care benefits through the workplace. Actual services should be available through a variety of public and private sources. To safeguard the health care system from becoming a two-tiered process based on personal resources, both the poor and non-poor and the privileged and nonprivileged must be enrolled in the same programs.

Finally, the basic required package of services must be defined in the same way in each state and required as the minimum for both public and private sector programs. The persistence for national standards must be tempered with a respect for local needs and differences. In other words, set minimal national standards, but promote local planning and implementation. Local insights are particularly critical to the public health, meaning the health of a community as an aggregate of people, and not personal health services delivered in the community.

The states' rights philosophy prevailing in the United States creates an obstacle to national standards, which are necessary for several areas of assurance. Some coast-to-coast consistency in the cost of services is needed with local area adjustments. Further, a national standard to qualify for public entitlement is long overdue.

Public Health

Public health includes services such as immunizations, prenatal care, environmental concerns, and analysis of the prevailing disease patterns in a community. Current public health problems include:

- Increase of sexually transmitted diseases that were once nearly eradicated (e.g., syphilis and gonorrhea)
- Appearance of new fatal diseases (e.g., AIDS and the Ebola virus)
- Emergence of drug-resistant strains of tuberculosis
- Underimmunization of infants and children
- Prevalence of overweight and inadequately nourished young people
- Presence of toxic environmental conditions

For today's needs, the medical model is insufficient. Table 4-8 presents a comparison of the medical model and the nursing model. In most instances, the nursing profession's approach to these issues transcends a health model and looks to a social model for response and assistance. Social models view areas of health, housing, education, and employment, in fact all social welfare concerns and programs, as an integrated whole. Education for healthy living is a good example. Healthy personal behaviors from adults are possible only if they have filtered down into the schools for the purposes of educating for health and influencing the peer systems that reinforce behaviors.

Nursing's strategic plan, as described in *Nursing's Agenda for Health Care Reform* (ANA, 1991), for achieving a better balance between illness and cure and wellness and care is only an interim step. Nursing must document its effectiveness in providing quality, cost-efficient services. Establishing joint ventures, procuring grant monies and other funding sources, and conducting research are avenues that nursing must pursue to achieve these objectives.

Community Health

Parris and Hines (1995) recommend a commitment to a community-based approach to reform the system of health care delivery. Community-based care focuses on prevention and primary care. Community health nurses work in a variety of settings, including homes, clinics, workplaces, schools, church parishes, and organizations. They are skilled at providing services to populations at high risk for illness, homeless persons, aging populations, and those experiencing chronic illness. Regardless of the setting, fundamental principles of community care include the following (Hunt, 1998):

TABLE 4-8
Medical Model versus Nursing Model

Medical Model	Nursing Model
Focuses on disease and illness	Focuses on wellness
Cure oriented	Care oriented
Fragmented cases	Holistic perspective

- Focusing on prevention
- Advocating client self-care
- Interactive nature between family, culture, and community
- Continuity of care
- Collaborative care

School Nursing

The advent of school nursing was an extension of public health nursing in the early 1900s. Los Angeles became the first city to hire school nurses. The emphasis was on preventing the spread of communicable diseases. Early school nurses also provided health education to students and their families, performed physical assessments, and treated minor infections (Hitchcock, Schubert, & Thomas, 1999). Currently, services provided by school nurses have expanded to include maintaining a safe, healthy school environment, case finding, referral, and teaching other personnel how to care for children with special health care needs. Nursing has a rich heritage of providing community services. Thus, as nursing reclaims community-based practice as an integral part of its role, it is returning to its professional roots.

An ANA/American Association of Occupational Health Nurses (AAOHN) partnership published a proposal that describes how occupational health settings can be expanded into family health centers (ANA & AAOHN, 1993). Industry-based primary care programs in which employee health services are self-insured are particularly popular. The ANA has written a similar model with school health nursing organizations (Igoe & Giordano, 1992). This model proposes that occupational and school health sites offer families a full range of primary care services, such as disease prevention, health promotion, diagnosis and treatment of minor acute illness, and monitoring and management of chronic disease.

This scope and immediacy of health care services is extremely significant to school children. A generation ago, programs funded by the Robert Wood Johnson Foundation demonstrated that school nurse practitioners can identify over 90% of the health problems of school-age children and independently resolve over 80% of those problems (Igoe & Giordano, 1992). Despite these data, such services continue to be inaccessible to many children.

In 1992, HCFA funded Community Nursing Organizations (CNOs) to help meet the needs of elderly people in the community. The goal of CNOs is to provide quality health care services in a cost-effective manner. The four pilot projects (Carondelet Health Services, Tucson, AZ; Carle Clinic Association, Urbana, IL; Living at Home/Block Nurse Program, St. Paul, MN; and Visiting Nurse Service of New York, New York City) have demonstrated the following results:

- A high degree of client satisfaction
- Decreased Medicare expenditures in home care costs

- Use of less expensive equipment
- An expected decrease in emergency department costs (ANA, 1995)

Naylor and Buhler-Wilkerson (1999) call for nursing to “emphasize knowledge development related to care of vulnerable populations and the testing of innovative models of community based care,” (pp. 126–127). Examples of innovative models that meet community health care needs include:

- *Columbia Advanced Practice Nurse Associates (CAPNA)*—This practice, established in 1997, collaborates with Columbia University’s medical faculty to provide comprehensive services to clients in midtown Manhattan (Bocuzzi, 1998).
- *North Carolina Maternal and Child Health Migrant Project*—Nurses train women in migrant camps to provide health teaching and first aid (Sandhaus, 1998).
- *University of Pennsylvania School of Nursing*—This school has established a community-based practice that focuses on meeting the needs of frail elderly clients (Naylor & Buhler-Wilkerson, 1999).
- *Alberta Children’s Hospital in Canada*—Nurses here, in 1982, assumed the role of providing health care advice via a telephone triage services (Vollmerhaus, 1999). There are several similar triage services managed by nurses throughout the United States.

THINK ABOUT IT

Nursing’s Response to Health Care Challenges

Are there programs in your community in which nurses are delivering health services to vulnerable populations? What is the need for such services, taking into consideration populations such as children, the elderly, people with AIDS, the indigent, and the homeless?

Long-Term Care

Nurses propose a community-personal partnership in addressing long-term care and support various financial plans that enable individuals to anticipate their long-term care needs; for example, long-term care insurance, long-term care individual retirement accounts (IRAs), and accessing the equity in property and life insurance policies to use for health care costs. Nurses are also aware that need will exceed resources for many chronically ill, frail, and disabled Americans. In those cases where there is catastrophic need, government dollars must be available.

Nurses also support the concept of **subacute care** (short-term aggressive care that emphasizes restorative interventions before the client’s reentry into the community). The idea is not new but dates back to the Loeb Center of Montefiore Hospital in New York City in the 1960s (Kelly & Joel, 1995).

TRENDS AFFECTING DELIVERY OF HEALTH CARE SERVICES

- The aging of the U.S. population
- Increasing diversity in the U.S. population
- Increased number of single-parent families, with more children living in poverty
- Continued growth in outpatient settings with a greater demand for primary care providers
- Advances in technology with a resultant ability to perform more services in outpatient settings (including the home)
- More states using managed care models to deliver services to the medically indigent
- More emphasis on disease prevention and health promotion at the workplace
- Expectations of third-party payers and providers for clients to assume more personal responsibility for care
- Incentives for individuals who participate in preventive activities
- Federal funding of health care provider education focusing on service to underserved populations and areas
- The system as a union of both public and private sector resources and services
- Managed care dominating as the context for service delivery
- The right for individuals to enhance a basic package or expand their choices if they care to purchase that privilege
- Continuing focus on quality improvement

TRENDS AND ISSUES

As current trends continue into the millennium, the delivery of health care services will continue to change. The accompanying display lists factors that will continue to shape reform of the health care delivery system.

The states and private sector will lead the way through a process to a product suited to the American character. The nursing profession has reached a point in time where there are few questions about the direction or process of health care reform. As health care reform occurs, some professions will experience opportunities while others will experience losses (O'Neil, 1993). The challenge is to improve the nation's delivery of health care services by positioning nursing to preserve its integrity and guarantee its preferred future. Nurses must continue to be in the forefront of change.

KEY CONCEPTS

- The three levels of health care services can be categorized as primary, secondary, and tertiary levels.
- Health care services are delivered by both the public (official, voluntary, and nonprofit agencies) and private (hospitals, extended care facilities, home health agencies, hospices, outpatient settings, schools, industrial clinics, managed care organizations, community nursing centers, and rural hospitals) sectors.
- The health care team is composed of nurses, APRNs, physicians, physician assistants, pharmacists, dentists, dietitians, social workers, therapists, and chaplains.
- Health care in the United States is financed through a combination of both private and public funding.
- Managed care organizations seek to control health care costs by monitoring the delivery of services and restricting access to costly procedures and providers.
- Managed care plans include health maintenance organizations, preferred provider organizations, and exclusive provider organizations.
- The primary federal government insurance plans are Medicare, the program that provides health care coverage for the elderly and disabled, and Medicaid, the jointly administered program that provides health care services for the poor.
- Health care reform must address the three critical issues of cost, access, and quality of health care services to achieve equity for all Americans.
- The cost of health care has been influenced by the oversupply of specialists, a surplus of hospital beds, the passive role assumed by most consumers, and the inequitable financing of health care services.
- The challenges that the health care delivery system need to overcome are the public's disillusionment with providers, the public's loss of control over health care decisions, the decreased use of hospitals and the related impact on quality of care, the change in practice settings, ethical issues, and the health care needs of vulnerable populations.
- *Nursing's Agenda for Health Care Reform*, written by the American Nurses Association and endorsed by over 70 professional organizations, outlines nursing's proposals for easing the current problems in health care delivery.
- The Agency for Health Care Research and Quality aims to identify therapeutic standards for which the health care community can be held accountable.
- For advanced practice nurses to continue to provide access to high quality care, issues such as direct reimbursement for services, prescriptive authority, comprehensive professional liability insurance, autonomy in managed care plans, professional staff privileges in health care facilities, and adequate practice acts need to be resolved.
- A primary goal of the nursing profession within the areas of public health, community health, and long-term care is to provide health care services that emphasize prevention and primary health care to clients in these settings and thus help reduce the cost and increase the quality of health care.

CRITICAL THINKING ACTIVITIES

1. What are some contributing factors to the current status of the health care delivery system?
2. Compare the American and Canadian health care delivery systems in terms of universality, accessibility, and portability.
3. Imagine that you are lobbying your state legislators about health care reform. List five points you would present to them.
4. Select three tenets of *Nursing's Agenda for Health Care Reform* and state some specific ways for implementing them.
5. One challenge encountered in health care today is shorter length of hospital stays. State some specific ways nurses can address this challenge. Note that many of your ideas may already be implemented in certain areas of the health care delivery system.

WEB RESOURCES

Agency for Healthcare Research and Quality
www.ahrq.gov

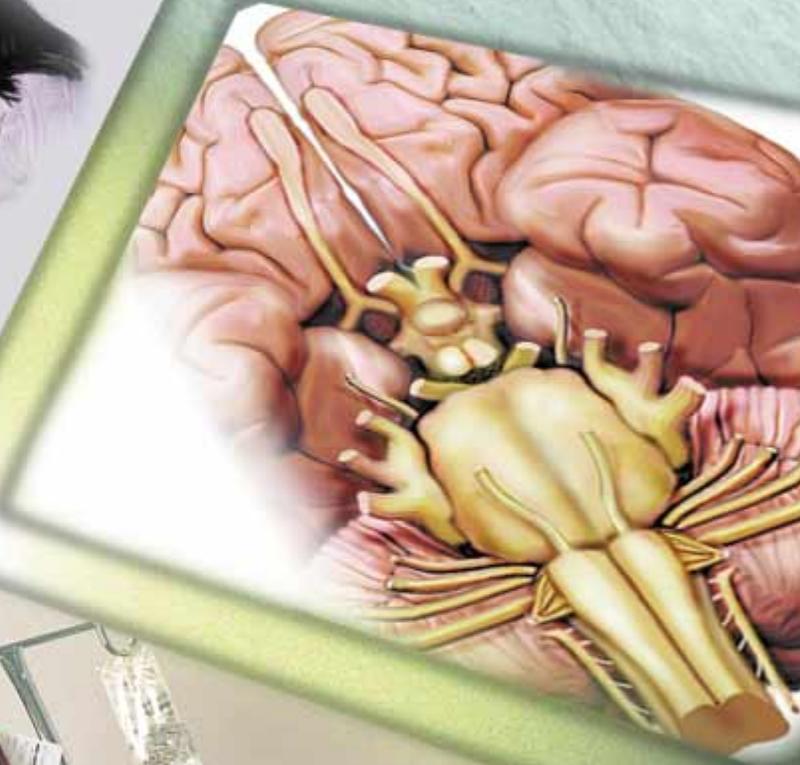
Community Health Status Indicators Project
www.communityhealth.hrsa.gov

Healthcare Financing Administration
www.hcfa.gov

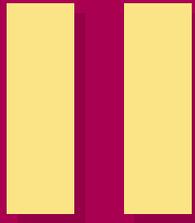
Insure Kids Now
www.insurekidsnow.gov

Medicare: The Official U.S. Government Site for Medicare Information
www.medicare.gov

U.S. Department of Health & Human Services.
www.hhs.gov



Unit



Nursing Process: The Standard of Care

- 5** Critical Thinking and the Nursing Process
- 6** Assessment
- 7** Nursing Diagnosis
- 8** Outcome Identification and Planning
- 9** Implementation
- 10** Evaluation

Critical Thinking and the Nursing Process



The principal goal of education is to create men and women . . . who have minds which can be critical, can verify, and not accept everything they are offered.

Jean Piaget

COMPETENCIES

1. Identify the components of critical thinking.
2. Describe the relationship between critical thinking and problem solving and decision making.
3. Compare critical thinking and creative thinking.
4. Relate critical thinking to the nursing process
5. Describe the components of the assessment step of the nursing process.
6. Describe the four types of nursing diagnoses.
7. List the tasks involved in the outcome identification and planning step of the nursing process.
8. Discuss the types of skills that nurses must possess in order to perform the nursing interventions during the implementation step of the nursing process.
9. Identify factors that may influence evaluation.
10. Relate the nursing process to the problem-solving method.

KEY
TERMS

actual nursing diagnosis
analysis
assessment
collaborative problems
creative problem solving
critical thinking
decision making
declarative knowledge
evaluation

expected outcome
goal
groupthink
implementation
nursing diagnosis
nursing intervention
nursing process
objective data
operative knowledge

planning
possible nursing diagnosis
primary source
process
risk nursing diagnosis
secondary source
subjective data
synthesis
wellness nursing diagnosis

Thinking is an ongoing activity for professional nurses. This chapter presents information about critical thinking, an overview of the nursing process, and elements that compose each step of the process. Also included is a discussion on how the nurse uses critical thinking in each step of the nursing process and on the relationship between problem solving, decision making, and the nursing process.

Noted nursing leaders (Benefield, et al., 2000) predict that “critical thinking will be expected of all professional nurses (p. 22).” **Critical thinking** is the process that allows nurses to see the big picture (envision the overall perspective) instead of focusing only on details.

CRITICAL THINKING

There are many definitions of critical thinking, including Ennis’ (1987) classic description, “reasonable reflective thinking that is focused on deciding what to believe or do (p. 10).” Every day, nurses make decisions that are derived through critical thinking. Making clinical judgments relies on critical thinking. Critical thinking is identified as an essential nursing competency by the National League for Nurses (1997). Nursing students and graduates must demonstrate critical thinking skills.

Knowing how one thinks helps the nurse work collaboratively with other health care providers (Rubinfeld & Scheffer, 1999). Critical thinkers are people who know how to think. They possess intellectual autonomy, in that they refuse to accept conclusions without evaluating the evidence (facts and reasons) for themselves. Critical thinkers have the ability to think beyond the obvious and make connections between ideas.

Components of Critical Thinking

According to Jenkins and Turick-Gibson (1999), critical thinking is composed of three primary components: mental operations, knowledge, and attitudes.

Mental Operations

Mental operations include activities such as decision-making and reasoning that are used to find or create meaning. Nurses engage in such activities whenever they search for solutions based on sound rationale and develop outcomes accordingly. The result of these mental operations is creative, appropriate problem solving. Other cognitive operations involved in critical thinking are strategizing (planning) and evaluating one’s thinking (Jenkins & Turick-Gibson, 1999).

Knowledge

Critical thinking calls for a knowledge base that includes **declarative knowledge**, (specific facts or information) and **operative knowledge** (an understanding of the nature of that knowledge). Nursing curricula assist the student in learning specific facts about nursing and the delivery of quality care. Students are also taught how to examine the beliefs underlying the facts in order to analyze and interpret those facts. In other words, students are not expected to merely repeat facts that have been memorized (learned by rote) but instead to understand the reasoning behind the knowledge. Finding meaning in what one is learning is the core of critical thinking.

In order to think critically, to solve problems, and to make decisions, nurses must develop a broad base of knowledge. This knowledge base includes information from other disciplines such as science (anatomy, physiology, biology), psychology, and philosophy (logic). Nurses apply this knowledge to specific client situations through critical thinking.

Attitudes

Certain attitudes enhance a person’s ability to think critically. One of the most important attitudes needed by a critical thinker is a sense of curiosity that allows the person to question assumptions upon which decisions are based. Analysis of basic assumptions allows the person to plan and act in a rational manner rather than out of habit or routine. The accompanying display lists other attitudes of critical thinkers.

ATTITUDES OF CRITICAL THINKERS

- Tolerance, open-mindedness, nonjudgmental mind-set
- Curiosity
- Persistence, intellectual courage
- Respect for others' perspectives
- Comfort dealing with ambiguity, uncertainty
- Intellectual humility (knowing that one does not have all the answers)
- Self-confidence (belief in own ability to think things through and make appropriate decisions)

(Data from: Beyer [1987]; Ennis [1987]; Krathwohl, Bloom, & Masia [1964]; Paul, [1993]; and Rubenfeld & Scheffer [1999].)

In addition to the attitudes discussed in the display, Alfara-LeFarve (1998) has identified the following as characteristics of critical thinkers:

- Open-minded and curious
- Consciously work in a planning mode
- Proactive instead of reactive
- Flexible
- Organized

Phases of Critical Thinking

Critical thinking is a higher level of cognitive functioning that, according to Brookfield (1991), occurs in four phases:

1. Trigger event: A problem that is reframed as an opportunity for improvement
2. Appraisal of the situation: Self-examination of one's underlying assumptions
3. Exploration: Searching for new ideas, solutions, and/or approaches
4. Integration: Incorporating new information and new ways of thinking

Critical thinking helps the nurse make a smooth transition from the old to the new by facilitating analysis and planning.

Development of Critical Thinking Skills

The development of critical thinking skills is a gradual process related to the individual's maturity, in that maturity enhances the ability to suspend judgment until the data have been collected. It takes time to break habitual ways of thinking and doing.

Listed below are some specific strategies that promote the development and application of critical thinking:

- Identify goals.
- Determine what knowledge is required.
- Assess the margin for error.
- Determine the amount of time available for decision making.
- Identify available resources.
- Recognize factors (i.e., biases, fatigue) that may influence decision making (Alfaro-LeFevre, 1998).

Table 5-1 lists skills necessary for critical thinking to occur.

TABLE 5-1
Critical Thinking Skills

Interpretation	Categorize, decode sentences, clarify meanings
Analysis	Examine ideas, identify and analyze arguments
Influence	Query evidence, conjecture alternatives, draw conclusions
Explanation	State results, justify procedures, present arguments
Evaluation	Assess claims, assess arguments
Self-regulation	Self-examination, self-correction (if necessary)

(Data from Pesut, D. J., & Herman, J. [1999]. *Clinical reasoning: The art and science of critical and creative thinking*. Albany, NY: Delmar.)

Critical Thinking and Creativity

Critical thinkers are also creative thinkers. Both types of thinking require assessment and result in new discoveries (Paul & Ballin, 1988). Creative nurses think in new ways when searching for innovative solutions to problems. The process of **creative problem solving** is goal-directed thinking that leads to achievement by using new ideas or methods. Creativity is, according to Gilmartin (1999), "the basic building block of invention and thus innovation" (p. 2). The challenges presented by the current health care environment demand that nurses be creative thinkers.

Creative thinking is the foundation for individualizing client care, in that the nurse identifies unique needs of each client and develops interventions specific to those needs. Without creative thinking, nursing care would become routine, that is, the same for every client.

There is a strong link between critical and creative thinking. In order to develop creative solutions to problems, the nurse needs to use critical intellect. Also, to be an excellent critical thinker, the nurse exercises creative thinking (Le Storti et al, 1999). Table 5-2 compares critical and creative thinking behaviors.

TABLE 5-2
Comparison of Critical and Creative Thinking

Critical Thinkers	Creative Thinkers
<ul style="list-style-type: none"> • Defines the parameters of a problem 	<ul style="list-style-type: none"> • Defines the existing problem
<ul style="list-style-type: none"> • Identifies key issues 	<ul style="list-style-type: none"> • Breaks usual cognitive set by considering new ways of problem solving
<ul style="list-style-type: none"> • Sets reasonable criteria for assessing the appropriateness of an action 	<ul style="list-style-type: none"> • Delays judgment or suspends criticism of alternatives
<ul style="list-style-type: none"> • Adapts one's behavior as needs and/or norms change 	<ul style="list-style-type: none"> • Exercises judgment in selecting the best alternative
<ul style="list-style-type: none"> • Transfers learning from one situation to another 	<ul style="list-style-type: none"> • Learns from mistakes
<ul style="list-style-type: none"> • Pays attention to the problem at hand 	<ul style="list-style-type: none"> • Breaks away from usual problem-solving methods to develop creative responses
<ul style="list-style-type: none"> • Detects ambiguity or false inferences 	
<ul style="list-style-type: none"> • Analyzes interrelationships of ideas from several perspectives 	
<ul style="list-style-type: none"> • Tests out inferences by considering opposing viewpoints 	
<ul style="list-style-type: none"> • Creates innovative solutions to complex problems 	

(Data from Gilmartin [1999] and Paul [1993].)

It is easy to fall into routine ways of thinking instead of being creative. The accompanying display lists some common barriers to creative thinking.

Another major block to creativity is **groupthink** (going along with the majority opinion while personally having another viewpoint). Nurses who engage in groupthink generally wish to avoid interpersonal conflict. It takes intellectual courage to think something new and different from one's peers, and then act on those thoughts. Independent thinking is a hallmark of persons who think critically and creatively.

Critical Thinking and Problem Solving

Critical thinking includes problem solving and decision making processes. People use problem solving in their daily lives. With the problem-solving method, problems are identified, information is gathered, a specific problem is named, a plan for solving the problem is developed, the plan is put into action, and results of the plan are evaluated. However, this kind of problem solving is frequently based on incomplete data, and plans are sometimes based on guesses. Conversely, the nurse uses the **nursing process** to identify and to make decisions

BLOCKS TO CREATIVE THINKING

Habit
 Comfort with the status quo
 Fear of making mistakes
 Tradition
 Use of meaningless routines and rituals
 Rigid mind-set

about client needs. It is a systematic and scientifically based process that requires the use of many cognitive and psychomotor skills.

According to Costello-Nikitas (1997, p. 85), the following actions interfere with effective problem solving:

- Jumping too quickly toward a conclusion before exploring all the aspects of a problem
- Failing to obtain critical facts, about either the problem or proposed change
- Selecting problems or changes that are too general, too complex, or poorly defined
- Failing to articulate a rational solution to the problem or proposed change
- Failing to implement and evaluate the proposal appropriately

Critical thinkers avoid the pitfalls listed above by clearly defining the problem, analyzing the data, understanding the causes, and creating new ideas that will lead to problem resolution.

Critical Thinking and Decision Making

When making a clinical decision, the nurse determines action that will help move the client toward achievement of the expected outcomes. Thus, **decision making** is defined as considering and selecting interventions from a repertoire of actions that facilitate the achievement of a desired outcome (Pesut, 1999). Nurses exercise clinical judgment by making sound decisions; clinical judgment can be viewed as critical thinking applied in clinical situations. Nursing judgments are formed after collecting assessment data and examining the relationships among those data. Since nursing judgments form the basis of client care, they occur in every phase of the nursing process (Rubenfeld & Scheffer, 1999).

Nurses make decisions every day. It is important that those decisions be the best decisions possible, that they be based on reliable information, and that they be made with as much critical thought as possible. Bevis (1989) states that “decision making is the acquiring, ordering, and selecting of tools or alternatives for reaching goals or fulfilling needs” (p. 117). Through a process of problem solving, one arrives at the point at which decisions can be made. The nursing process is the specific problem-solving method used by nurses to arrive at the point at which decisions about client care can be made.

A comparison of problem solving and the nursing process is presented later in this chapter.

THE NURSING PROCESS

The **nursing process** is the framework for providing professional, quality nursing care. It directs nursing activities for health promotion, health protection, and disease prevention and is used by nurses in every practice setting and specialty. “The nursing process provides the basis for critical thinking in nursing” (Alfaro-LeFavre, 1998, p. 64).

HISTORICAL PERSPECTIVE

Lydia Hall first referred to nursing as a “process” in a 1955 journal article, yet the term was not widely used until the late 1960s (Edelman & Mandel, 1997). Referring to the “nursing process” as a series of steps, Johnson (1959), Orlando (1961), and Wiedenbach (1963) further developed this description of nursing. At this time, the nursing process involved only three steps:

assessment, planning, and evaluation. In their 1967 book *The Nursing Process*, Yura and Walsh identified four steps in the nursing process:

- Assessing
- Planning
- Implementing
- Evaluating

The *Standards of Practice*, first published in 1973 by the American Nurses Association (ANA), included eight standards. These standards identified each of the steps, including nursing diagnosis, that are now included in the nursing process.

Fry (1953) first used the term **nursing diagnosis**, but it was not until 1974, after the first meeting of the group now called the North American Nursing Diagnosis Association (NANDA), that Gebbie and Lavin added nursing diagnosis as a separate and distinct step in the nursing process. Prior to this, nursing diagnosis had been included as a natural conclusion to the first step, assessment.

Following publication of the ANA standards, the nurse practice acts of many states were revised to include the steps of the nursing process specifically. The ANA made revisions to the standards in 1991 to include outcome identification as a specific part of the planning phase. Currently, the steps in the nursing process are:

- Assessment
- Diagnosis
- Outcome identification and planning
- Implementation
- Evaluation

The American Nurses Association practice standards address each step of the nursing process.

OVERVIEW OF THE NURSING PROCESS

A **process** is a series of steps or acts that lead to accomplishment of some goal or purpose. The purpose of the nursing process is to provide care for clients that is individualized, holistic, effective, and efficient. The steps of the nursing process build upon each other, but they are not linear. There is overlap of each step with the previous and subsequent steps (Figure 5-1).

The nursing process is dynamic and requires creativity for its application. The steps remain the same, but the application and results will be different in each client situation. The nursing process is designed to be used with clients throughout the life span and in any setting in which a nurse provides care for clients. It is also a basic organizing system for the National Council Licensure Examination for Registered Nurses (NCLEX-RN).

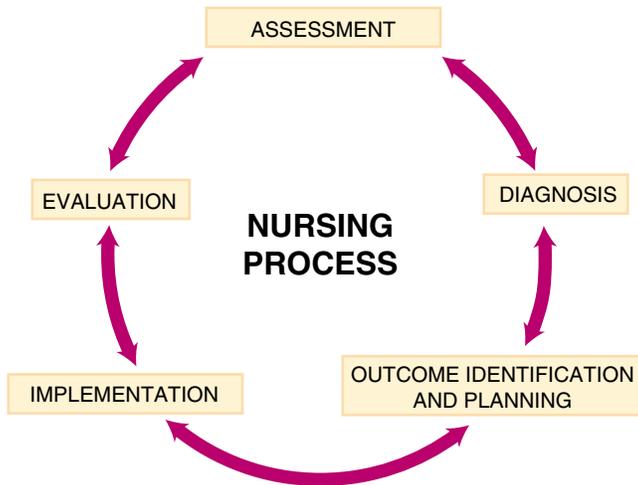


Figure 5-1 Components of the Nursing Process

Assessment

Assessment is the first step in the nursing process and includes collection, verification, organization, interpretation, and documentation of data. The completeness and correctness of the information obtained during assessment are directly related to the accuracy of the steps that follow. Assessment involves several steps:

- Collecting data from a variety of sources
- Validating the data
- Organizing data
- Categorizing or identifying patterns in the data
- Making initial inferences or impressions
- Recording or reporting data

Data are collected from a variety of sources; however, the client should be considered the **primary source** of data (the major provider of information about self). As much information as possible should be gathered from the client, using both interview techniques and physical exam-

THINK ABOUT IT

Cultural Influences

You are collecting data from a 35-year-old Asian American woman while her parents and older brother are in the room. Family is very important to this client, whose parents consistently interrupt her while she is answering your questions. If you ask the family to leave the room while you complete the interview, you risk offending the client and her family and creating barriers to your communication process. If you allow the family to remain in the room, the parents may influence the client's responses so that you are unable to make a complete assessment. How do you respect family dynamics while ensuring that the client receives the most appropriate care?

ination skills. Sources of data other than the client are considered **secondary sources** and include family members, other health care providers, and medical records.

Assessment provides information that will form the client database. Two types of information are collected through the assessment component: subjective and objective.

Subjective data are data from the client's point of view and include feelings, perceptions, and concerns. The method of collecting subjective information is primarily the interview. Using therapeutic interviewing techniques, the nurse collects data that will begin to build the client database. Examples of subjective information include such statements as:

- "I drink only coffee for breakfast."
- "I have had pains in my legs for three days now."
- "I go to sleep easily each night, but I wake up about two hours later and cannot go back to sleep until it is time to get up in the morning."

Objective data are observable and measurable data that are obtained through both standard assessment techniques performed during the physical examination and diagnostic tests. The primary method of collecting objective information is the physical examination, which provides information about the function of body systems (Figure 5-2). Examples of objective information include:

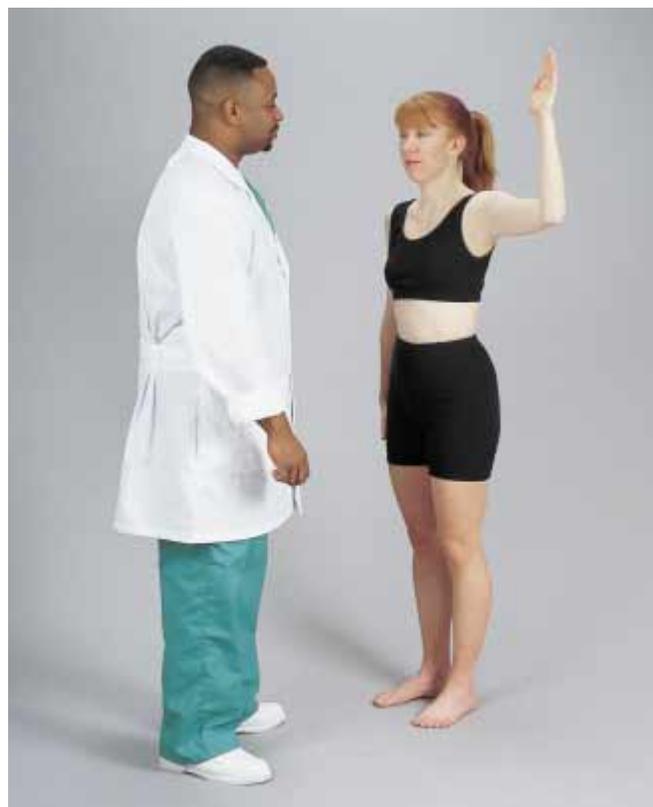


Figure 5-2 Nurse assessing client's ability to perform ROM activity. This nurse is gathering objective data through assessment of the client's ability to perform range-of-motion (ROM) activity.

- T 98.6°F, P 100, R 12, B/P 130/76
- Bowel sounds auscultated in all four quadrants
- Gait slow, shuffling, and unsteady

This objective information may add to or validate subjective information. Validation is a critical step in data collection to avoid omissions, prevent misunderstandings, and avoid incorrect inferences and conclusions.

Data that are collected must be organized to be useful to the health care professional collecting the data as well as others involved with the client's care. Clustering similar pieces of information assists the nurse in constructing a picture of the client's problems and strengths. There are a number of organizing frameworks for collection of data—for example, Gordon's Functional Health Patterns. Many health care agencies use an admission assessment format, which assists the nurse in collecting data in specific categories of functioning.

Critical thinking is used in determining the significance of data collected. Once data are organized into categories, the data are clustered into groups of related pieces. Placing data into clusters helps the nurse to recognize patterns of response or behavior. When data are placed into clusters, the nurse can:

- Distinguish between relevant and irrelevant data
- Determine if and where there are gaps in the data
- Identify patterns of cause and effect

With this information, the nurse, through critical thinking, can begin to develop impressions or inferences about what the data mean.

Assessment data must be recorded and reported. The nurse must make a judgment about which data are to be reported immediately and which data need only to be recorded at that time. Data that reflect a significant deviation from the normal (for example, rapid heart rate with irregular rhythm, severe difficulty in breathing, or high levels of anxiety) would need to be reported as well as recorded. Examples of data that need only to be recorded at the time include a report that prescribed medication has relieved a headache and a determination that an abdominal dressing is dry and intact.

Assessment does not end with the initial interview and physical examination. Assessment is dynamic and continues with each nurse-client interaction.

Diagnosis

The second step in the nursing process involves further **analysis** (breaking the whole down into parts that can be examined) and **synthesis** (putting data together in a new way) of the data that have been collected. Formulation of the list of nursing diagnoses is the outcome of this process. According to the North American Nursing Diagnosis Association (NANDA) a **nursing diagnosis**

is a clinical judgment about individual, family, or community responses to actual or potential health problems/life processes. Nursing diagnoses provide the basis for selection of nursing interventions to achieve outcomes for which the nurse is accountable. (Carroll-Johnson, 1990, p. 50)

The nursing diagnoses developed during this phase of the nursing process provide the basis for client care delivered through the remaining steps.

Client problems are labeled by both medical and nursing diagnoses. Clients receive both medical and nursing diagnoses. Table 5-3 compares the two categories of diagnoses.

TABLE 5-3
Comparison of Medical Diagnoses
and Nursing Diagnoses

Medical Diagnosis	Nursing Diagnosis
Focuses on the illness, injury, or disease process.	Focuses on the responses to actual or potential health problems or life processes.
Remains constant until a cure is effected.	Changes as the client's response and/or the health problem changes.
Identifies conditions the health care practitioner is licensed and qualified to treat.	Identifies situations in which the nurse is licensed and qualified to intervene.

The nurse uses critical-thinking and decision-making skills in developing nursing diagnoses. This process is facilitated by asking questions such as:

- Are there problems here?
- If so, what are the specific problems?
- What are some possible causes for the problems?
- Is there a situation involving risk factors?
- What are the risk factors?
- Is there a situation in which a problem can develop if preventive measures are not taken?
- Has the client indicated a desire for a higher level of wellness in a particular area of function?
- What are the client's strengths?
- What data are available to answer these questions?
- Are more data needed to answer the question?
- If so, what are some possible sources of the data that are needed?

See the accompanying display for a clinical example of applying critical thinking when determining nursing diagnoses.

CLINICAL APPLICATION: CRITICAL THINKING AND DIAGNOSING

Read the information below about Mr. Jona. As you read, think about questions that are stimulated by the information presented. Write your questions as you think of them and compare them with those listed later.

Mr. Jona is a client on your unit. He is a 70-year-old widower, admitted 2 days ago with a broken left hip. While bowling with his church bowling league, Mr. Jona tripped, fell, fractured his hip, and sprained his right wrist. He has recently retired from an administrative position with a large company and moved to Florida from his home in Iowa. He has two children, who both live about 500 miles away. Mr. Jona lives alone in a one-bedroom apartment about 10 blocks from the hospital. In 2 days, Mr. Jona will be discharged and referred to the home health division for follow-up care.

Questions for consideration include: Is he right-handed? What tasks can he perform with his left hand? Will there be anyone to stay with him when he gets home? Who will shop for and prepare food? Does he live in an upstairs apartment? If yes, is there an elevator? Is there someone in his church who could help with errands and food? What about his children: Can one of them come to stay with him for a while? Did you identify any other questions about Mr. Jona's situation?

Types of Nursing Diagnoses

Analysis of the collected data leads the nurse to make a diagnosis in one of the following categories:

- Actual problems
- Potential problems (including those where risk factors exist and there are possible problems)
- Wellness conditions
- Collaborative problems

Examples of the various types of diagnoses are shown in Table 5-4.

An **actual nursing diagnosis** indicates that a problem exists, and is composed of the diagnostic label, related factors, and signs and symptoms. An example of an actual diagnosis is: *Impaired Skin Integrity* related to prolonged pressure on bony prominence as manifested by (AMB) Stage II pressure ulcer over coccyx, 3 cm in diameter.

A **risk nursing diagnosis** (potential problem) indicates that a problem does not yet exist, but special risk factors are present. A risk diagnosis is composed of the diagnostic label preceded by the phrase “risk for,” with the specific risk factors listed. An example of a risk diagnosis is: *Risk for Impaired Skin Integrity* related to inability to turn self from side to side in bed.

A **possible nursing diagnosis** indicates a situation in which a problem could arise unless preventive action is

TABLE 5-4
Types of Nursing Diagnoses

Nursing Diagnosis	Example
Actual diagnosis	<i>Deficient Fluid Volume</i> related to nausea and vomiting as manifested by dry skin and mucous membranes and decreased oral intake of fluids
Risk diagnosis	<i>Risk for Infection</i> related to presence of invasive lines (intravenous line and indwelling bladder catheter)
Possible diagnosis	<i>Possible Imbalanced Nutrition: Less Than Body Requirements</i> related to insufficient oral intake
Wellness diagnosis	<i>Readiness for Enhanced Spiritual Well-Being</i>
Collaborative problem	<i>Potential Complication (PC): Increased Intracranial Pressure</i>

taken. In addition, a possible diagnosis may state a “hunch” or intuition by the nurse that cannot be confirmed or eliminated until more data have been collected. A possible diagnosis is composed of the diagnostic label and related factors. An example of a possible diagnosis is: *Possible Self-Esteem Disturbance* related to recent retirement and relocation. The nurse may not yet have enough data to confirm this diagnosis or a more specific one. However, this diagnosis will alert other nurses to collect data that will either confirm this or another diagnosis, verify a risk diagnosis, or rule out the existence of a problem.

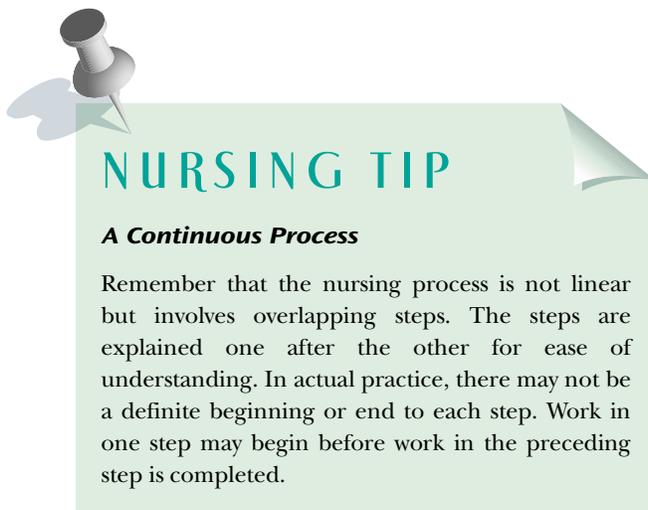
A **wellness nursing diagnosis** indicates the client's expression of a desire to attain a higher level of wellness in some area of function. It is composed of the diagnostic label preceded by the phrase “potential for enhanced.” For example a client who is neither overweight nor underweight tells the nurse that she knows she could improve her diet in some ways. She states that she eats only a small number of vegetables and fruits and thinks that the fat content of her diet is probably high. She expresses a desire to know more about how to improve her diet. The nurse would make a wellness diagnosis of *Potential for Enhanced Nutrition*.

Carpenito introduced the bifocal clinical practice model that includes nursing diagnoses and collaborative problems. **Collaborative problems** are defined as physiologic complications monitored by nurses to assess changes in client status. Collaborative problems are managed through the use of interventions prescribed by other health care practitioners and/or nurses (Carpenito, 1999). Collaborative problems include those conditions in which the nurse seeks medical input for treatment of potential medical problems. Usually,

collaborative problems involve alterations in organ and/or system function or structure (e.g., myocardial infarction, duodenal ulcer). Collaborative problems begin with the label *Potential Complication* (PC) followed by the situation—for example, *Potential Complication: Hemorrhage*.

Analysis of the data also assists the nurse in identifying strengths of the client. For example, the client's strong family support system would be identified as a strength. These areas of positive functioning will be reinforced and used as a basis for planning care for those areas where functioning is less than optimal.

After it is formulated, the list of diagnoses is presented to the client for confirmation if possible. If that is not possible, family members may be able to confirm the diagnoses. Finally, the list of nursing diagnoses is recorded on the client's record. Once this list is developed and recorded, the remainder of the client's plan of care can be completed. The list of nursing diagnoses is not static. It is dynamic, changing as more data are collected and as client goals and client responses to interventions are evaluated.



NURSING TIP

A Continuous Process

Remember that the nursing process is not linear but involves overlapping steps. The steps are explained one after the other for ease of understanding. In actual practice, there may not be a definite beginning or end to each step. Work in one step may begin before work in the preceding step is completed.

Outcome Identification and Planning

Planning is the third step of the nursing process and includes the formulation of guidelines that establish the proposed course of nursing action in the resolution of nursing diagnoses and the development of the client's plan of care. Once the nursing diagnoses have been developed and client strengths have been identified, planning can begin. The planning phase involves several tasks:

- The list of nursing diagnoses is prioritized.
- Client-centered long- and short-term goals and outcomes are identified and written.
- Specific interventions are developed.

- The entire plan of care is recorded in the client's record.

Once the list of nursing diagnoses has been developed from the data, decisions must be made about priority. Critical thinking enables the nurse to make decisions about which diagnoses are the most important and need attention first. There are a number of frameworks used to prioritize nursing diagnoses; however, those diagnoses involving life-threatening situations are given the highest priority. For example, the following nursing diagnoses would be stated in this order of priority:

- *Ineffective Airway Clearance* related to excessive and thick secretions and pain secondary to surgery and inability to cough effectively; respirations: 25, shallow, wheezing
- *Risk for Injury* (falls) related to unsteady gait
- *Imbalanced Nutrition: Less Than Body Requirements* related to nausea and vomiting

Client-centered goals are established in collaboration with the client whenever possible. A **goal** is an aim, intent, or end. Goals are broad statements that describe the intended or desired change in the client's behavior. Goal statements refer to the diagnostic label (or problem statement) of the nursing diagnosis. If the client or significant others are unable to participate in goal development, the nurse assumes that responsibility until the client is able to participate. Client-centered goals assure that nursing care is individualized and focused on the client.

Expected outcomes are specific objectives related to the goals and are used to evaluate the nursing interventions. They must be measurable, have a time limit, and be realistic. Once goals and expected outcomes have been established, nursing interventions are planned that enable the client to reach the goals.

A **nursing intervention** is the activity that the nurse will execute for and with the client to enable accomplishment of the goals. Nursing interventions refer directly to the related factors in the actual nursing diagnoses and the risk factors in risk nursing diagnoses. If the nursing interventions can remove or reduce the related factors and the risk factors, the problem can be resolved or prevented. Nursing interventions also refer to the diagnostic label for possible diagnoses and focus on data needed to confirm or eliminate the diagnosis.

For each nursing diagnosis there may be a number of nursing interventions. Nursing interventions are individualized and are stated in specific terms. Examples of nursing interventions are:

- Turn, cough, and deep breathe q 2 h beginning at 0800, 2/10.
- Teach “nipple care when breastfeeding” at 1000, 2/11.
- Weigh client at each visit.

Once the interventions have been determined for each diagnosis, the interventions are recorded on the client's plan of care. As is true with other steps in the nursing process, the list of interventions is not static. As the nurse interacts with the client, assesses responses to interventions, and evaluates those responses, interventions may change.

Implementation

The fourth step in the nursing process is implementation. **Implementation** involves the execution of the nursing plan of care derived during the planning phase. It consists of performing nursing activities that have been planned to meet the goals set with the client. Nurses may delegate some of the nursing interventions to other persons assigned to care for the client—for example, the licensed practical nurses and unlicensed assistive personnel.

Implementation involves many skills. The nurse must continue to assess the client's condition before, during, and after the nursing intervention. Assessment prior to the intervention provides the nurse with baseline data. Assessment during and after the intervention allows the nurse to detect positive or negative responses the client may have to the intervention. If negative responses occur during the procedure, the nurse must take appropriate action. If positive responses occur, the nurse adds this information to the database for use in evaluating the efficacy of the intervention. The nurse must also possess psychomotor skills, interpersonal skills, and critical thinking skills to perform the nursing interventions that have been planned. The nurse uses psychomotor skills when performing procedures such as giving injections, changing dressings, and helping the client perform range-of-motion (ROM) exercises. Interpersonal skills are necessary as the nurse interacts with the client and the family to collect data, provide information in teaching sessions, and offer support in times of anxiety. Critical thinking skills enable the nurse to think through the situation, ask the appropriate questions, and make decisions about what needs to be done.

The implementation step also involves reporting and documentation. Data to be recorded include the client condition prior to the intervention, the specific intervention performed, the client response to the intervention, and client outcomes.

Evaluation

Evaluation, the fifth step in the nursing process, involves determining whether the client goals have been met, partially met, or not met. If the goal has been met, the nurse must then decide whether nursing activities will cease or continue in order for status to be maintained.

If the goal has been partially met or not been met, the nurse must reassess the situation. Data are collected to determine why the goal has not been achieved and what modifications to the plan of care are necessary. There are a number of possible reasons that goals are not met or are only partially met, including:

- The initial assessment data were incomplete.
- The goals and expected outcomes were not realistic.
- The time frame was too optimistic.
- The goals and/or the nursing interventions planned were not appropriate for the client.

Evaluation is an ongoing process. Nurses continually evaluate data in order to make informed decisions during other phases of the nursing process.



Title of Study

"Acknowledging Intuition in Clinical Decision Making"

Author

Rew, L.

Purpose

To develop a scale that measures nurses' acknowledgment of using intuition in clinical decision making. The overall objective is to obtain reliable valid data about the development and application of this skill (intuitive thinking) in expert nursing practice.

Methods

The study was conducted in three phases:
Phase 1: Construction of the survey instrument
Phase 2: Distributing the scale via mail to nurses practicing in psychiatric/mental health settings
Phase 3: Refinement of the scale, which was then presented to a convenience sample of 112 nurses with various clinical backgrounds.

Findings

This three-phased study indicates that acknowledging the use of intuition as a skill in clinical decision making can be measured with a reliable and valid self-report tool.

Rew, L. (2000). Acknowledging intuition in clinical decision making. *Journal of Holistic Nursing*, 18(2), 94–108.

CRITICAL THINKING APPLIED IN NURSING

Critical thinking is a skill that can be learned just as other skills are learned. The skill of critical thinking is important and useful in all aspects of a person's life. However, it is a vital tool for the nurse in using the nursing process. Critical thinkers develop a questioning attitude and delve into situations in order to seek possible explanations for what is happening. Examples of questions the nurse as a critical thinker might ask at each step in the nursing process are listed in Table 5-5.

There are many similarities between the nursing process and the problem solving process, as shown on Table 5-6.

Nurses use critical thinking skills in each step of the nursing process. "Everything nurses do require high-level thinking; no action is performed without critical thinking" (Rubenfeld & Scheffer, 1999, p. 3). Table 5-7 provides examples of how critical thinking is used in each phase of the nursing process.

"Because the conclusions and decisions we as nurses make affect people's lives, our thinking must be guided by sound reasoning—precise, disciplined thinking that

promotes accuracy and depth of data collection, and seeks to clearly identify the issues at hand" (Alfaro-LeFavre, 1998, p. 64).

TABLE 5-6
Comparison of Problem Solving and Nursing Process

Problem Solving	Nursing Process
Encountering problem	Assessing
Collecting data	Assessing
Identifying exact nature of problem	Formulating nursing diagnosis
Determining plan of action	Planning
Carrying out plan	Implementing
Evaluating plan in new situation	Evaluating

(Adapted from Pesut, D. J. & Herman, J. [1999]. *Clinical reasoning: The art and science of critical and creative thinking*. Albany, NY: Delmar.)

TABLE 5-5
Examples of Critical-Thinking Questions for Use with the Nursing Process

Nursing Process Step	Critical Thinking Question
Assessment	Are the data complete? What other data do I need? What are some possible sources of those data? What assumptions or biases do I have in this situation? What is the client's point of view? Are there other points of view?
Diagnosis	What do these data mean? What else could be happening? Are there any gaps in the data? How are these data similar and how are they different? What assumptions or biases do I have in this situation? Have my assumptions affected my interpretation of the data? If so, in what way?
Outcome identification and planning	What are the goals for this client? What do I want to accomplish? How are my goals related to what the client wants to accomplish? What are the expected outcomes for this client? What interventions are to be used? Who is the best-qualified person to perform these interventions? How much involvement can the client and family or significant others have at this time? How much involvement does the client wish to have at this time?
Implementation	What is the client's current status? What are the most critical steps in this intervention? How must I alter the intervention to best meet this client's needs and maintain principles of safety? What is the client's response during and after the intervention? Is there a need to alter the intervention in any way? If so, why and how?
Evaluation	Were the interventions successful in assisting the client to achieve the desired goals? How could things have been done differently? What data do I need to make new decisions? Where will I get the data? Were there assumptions, biases, or points of view that I missed that affected the outcomes? What can be done about these assumptions, biases, or points of view?

TABLE 5-7
Application of Critical Thinking to Nursing Process

Assessment	Diagnosis	Outcome Identification and Planning	Implementation	Evaluation
<ul style="list-style-type: none"> • Gather pertinent data • Interpret data • Keep an open mind by questioning assumptions about data • Thinking about what information to collect • Determining the significance of data • Making conclusions based on the data 	<ul style="list-style-type: none"> • Develop well thought out conclusions • Seek reasons and principles that justify nursing judgments • Test conclusions against criteria • Suspend judgment when data is insufficient • Differentiate essential and trivial data 	<ul style="list-style-type: none"> • Explore alternative actions • Collaborate with others • Examine assumptions • Reframe problems in order to generate solutions • Generate ideas and possible solutions 	<ul style="list-style-type: none"> • Communicate with others to solve complex problems • Accurately report data and clues • Action is based on sound rationale 	<ul style="list-style-type: none"> • Establish standards (criteria) based on logic rather than assumptions • Analyze course of action • Critique outcomes • Evaluate the soundness of conclusions

KEY CONCEPTS

- Critical-thinking, problem-solving, and decision-making skills are important for use in the nursing process.
- Critical thinkers ask questions, evaluate evidence, identify assumptions, examine alternatives, and seek to understand various points of view.
- The nursing process is an organized method of planning and delivering nursing care.
- The nursing process is composed of five steps: assessment, diagnosis, outcome identification and planning, implementation, and evaluation.
- Assessment is the first step in the nursing process and involves collecting, validating, organizing, categorizing, and recording data.
- Both subjective data (information given by the client) and objective data (information collected by the health care provider using the senses) are collected during the assessment process.
- The second step in the nursing process involves further analysis and synthesis of the data and results in a list of nursing diagnoses.
- Types of nursing diagnoses include: actual, potential (including risk and possible), and wellness.
- Planning, the third step in the nursing process, involves prioritizing nursing diagnoses, identifying and writing goals and client outcomes, developing nursing interventions, and recording the plan of care in the client's record.
- Implementation, the fourth step in the nursing process, involves performing or delegating nursing activities.

- The nurse uses psychomotor skills, interpersonal skills, and cognitive skills when performing nursing activities.
- Evaluation, the fifth step in the nursing process, involves deciding whether the client goals have been met, been partially met, or not been met.
- The steps in the nursing process are similar to those in the problem-solving method in that problems are identified, information is gathered, a specific problem is named, a plan for solving the problem is developed, the plan is put into action, and the results of the plan are evaluated.

CRITICAL THINKING ACTIVITIES

1. Think of all the ways you can use your senses when assessing clients. What type of information can you gather through vision, hearing, smell, and touch?
2. Mrs. Rose was admitted to your unit 2 hours ago. The following data are recorded on her chart. Which data are objective? Which data are subjective? Use "S" and "O" to indicate your response.

<input type="checkbox"/> Temperature 102°F	<input type="checkbox"/> Pulse 98, irregular
<input type="checkbox"/> "My head hurts."	<input type="checkbox"/> Red maculopapular rash
<input type="checkbox"/> Nausea	<input type="checkbox"/> Vomiting for 3 days
<input type="checkbox"/> Grimaces when blinds open	<input type="checkbox"/> Skin flushed, hot
3. Match the steps in the nursing process (Column B) with the activities listed in Column A. Use the letters to indicate your answers.

COLUMN A

1. __ Examine the data for pattern.
 2. __ Write client outcomes.
 3. __ Take the client's blood pressure.
 4. __ Take the health history, using interviewing techniques.
 5. __ Select appropriate nursing actions.
 6. __ Document client response to walking.
 7. __ Conduct a physical assessment.
 8. __ Measure results of nursing interventions.
 9. __ Identify client strengths.
 10. __ Prioritize nursing diagnoses.
4. Which of the following statements would not be used to describe the nursing process?
- a. It is a cyclical dynamic process.
 - b. Creativity is required for its application.
 - c. Cognitive, critical-thinking, and psychomotor skills are used.
 - d. It is a linear static procedure.
 - e. It is used with clients in any setting.

COLUMN B

- a. Assessment
- b. Diagnosis
- c. Outcome identification and planning
- d. Implementation
- e. Evaluation

5. What do you believe about how people react when they are in pain? How do you and the people you know respond when in pain? Your beliefs form the basis for assumptions about pain response. How could these assumptions influence your interpretation of client responses to pain?

 WEB RESOURCES

American Nurses Association

www.nursingworld.com

Concept Mapping for Planning and Evaluation

www.trochim.human.cornell.edu

Problem-Based Learning

www.chemeng.mcmaster.ca

The Critical Thinking Community

www.criticalthinking.org

Assessment



The most important thing in communication is to hear what isn't being said.

—Peter Drucker (in Van Ekeren, 1994)

COMPETENCIES

1. Identify major purposes of data collection.
2. Describe three types of assessment.
3. Differentiate subjective and objective data.
4. Identify examples of nursing and nonnursing models used in collecting and organizing data.
5. Describe five methods involved in data collection.
6. Explain the stages of the assessment interview.
7. Outline the elements of the health history and their importance.
8. Describe the purposes of the physical assessment.
9. Discuss assessment techniques used in the physical examination.
10. Discuss the use of data clustering in organizing the information obtained about the client.
11. Identify four types of assessment formats.

**KEY
TERMS**

assessment
assessment model
auscultation
closed questions
comprehensive assessment
data clustering
data interpretation

data verification
focused assessment
health history
inspection
interview
objective data
observation

ongoing assessment
open-ended questions
palpation
percussion
review of systems
subjective data

Assessment is the first step in the nursing process and includes systematic collection, verification, organization, interpretation, and documentation of data for use by health care professionals. The accompanying display presents the essential elements of the assessment process. Effective planning of client care depends on a complete database and accurate interpretation of information. Incomplete or inadequate assessment may result in inaccurate conclusions and incorrect nursing interventions. Proper collection of assessment data directs decision-making activities of professional nurses.

The goal of assessment is the collection and analysis of data that are used in formulating nursing diagnoses, identifying outcomes and planning care, and developing nursing interventions. This chapter discusses the purpose of assessment, types of assessment, and the use of data in the assessment process.

**ELEMENTS OF THE ASSESSMENT
PROCESS**

- Data collection
- Data verification
- Data organization
- Data interpretation
- Data documentation

PURPOSE OF ASSESSMENT

The purpose of assessment is to establish a database concerning a client's physical, psychosocial, and emotional health in order to identify health promoting behaviors as well as actual and/or potential health problems. The American Nurses Association (ANA), in its *Standards of Clinical Nursing Practice* (1998), supports the use of the nursing process and outlines the essential components of assessment in this process (see the accompanying display). Through assessment, the nurse determines the client's functional abilities and the absence or presence of dysfunction. The client's normal routine for activities of daily living and lifestyle patterns are also assessed. Identification of the client's strengths provides the nurse and other members of the

treatment team information about the skills, abilities, and behaviors the client has available to promote the treatment and recovery process. Some examples of client strengths are family support, intelligence, spiritual beliefs, and coping skills (how previous problems have been solved). The assessment phase also offers an opportunity for the nurse to form a therapeutic interpersonal relationship with the client. During assessment, the client is provided an opportunity to discuss health care concerns and goals with the nurse.

**ASSESSMENT AS A STANDARD
COMPONENT OF CARE:
ANA STANDARDS****Standard I. Assessment**

The nurse collects client health data.

Guidelines:

Data must be:

- Relevant to client needs
- Collected from a variety of sources
- Collected using appropriate techniques
- Collected in a systematic manner
- Documented in a usable format

(From American Nurses Association, [1998], *Standards of clinical nursing practice*. (2nd ed.) Washington, DC: Author. Reprinted with permission.)

TYPES OF ASSESSMENT

The type and scope of information needed for assessment are usually determined by the health care setting and needs of the client (see Figure 6-1). Three types of assessment are comprehensive, focused, and ongoing. Although a comprehensive assessment is most desirable in initially determining a client's need for nursing care, time limitations or special circumstances may dictate the need for abbreviated data collection, as represented by the focused assessment. The assessment database can then be expanded after the initial focused assessment, and data should be updated through the ongoing assessment process.



Figure 6-1 In this focused assessment, the nurse is collecting data about the client prior to her elective surgery.

Comprehensive Assessment

A **comprehensive assessment** is usually completed upon admission to a health care agency and includes a complete health history to determine current needs of the client. This database provides a baseline against which changes in the client's health status can be measured and should include assessment of physical and psychosocial aspects of the client's health, the client's perception of health, the presence of health risk factors, and the client's coping patterns.

Focused Assessment

A **focused assessment** is an assessment that is limited in scope in order to focus on a particular need or health care problem or potential health care risks. Focused assessments are not as detailed as comprehensive assessments and are often used in health care agencies in which short stays are anticipated (e.g., outpatient surgery centers and emergency departments), in specialty areas such as labor and delivery, and in mental health settings or for purposes of screening for specific problems or risk factors (e.g., well-child clinics). See the accompanying display for sample questions used to assess a client experiencing labor.

SAMPLE FOCUSED ASSESSMENT: THE WOMAN EXPERIENCING LABOR

Following are examples of questions that focus on essential information for the nurse caring for a woman during labor:

- When did your contractions begin?
- How far apart are the contractions?
- Are they getting stronger?
- When did your water break?

Ongoing Assessment

Systematic follow-up is required when problems are identified during a comprehensive or focused assessment. An **ongoing assessment** is an assessment that includes systematic monitoring and observation related to specific problems. This type of assessment allows the nurse to broaden the database or to confirm the validity of the data obtained during the initial assessment. Ongoing assessment is particularly important when problems have been identified and a plan of care has been implemented to address these problems. Systematic monitoring and observations allow the nurse to determine the response to nursing interventions and to identify any emerging problems.

The nurse delivering care to a client at home uses ongoing assessment. In the home, the nurse often has to direct the client to provide information relevant to the current problem, as the client may have a tendency to spend a lot of time telling stories of past medical problems and treatment, as opposed to providing information relevant to the situation at hand (Humphrey, 1994). Use of specific questions will be most helpful in eliciting specific information (see the accompanying display).

ONGOING ASSESSMENT: THE HOME HEALTH CLIENT

- What led up to your most recent hospitalization?
- What medications were prescribed for you during that time?
- What kind of diet were you on?
- What type of activities did you do while you were in the hospital?
- While in the hospital, what did you learn about . . . ?
- What adaptations for your comfort and care have you and your family made since your return home?

DATA COLLECTION

The nurse must possess strong cognitive, interpersonal, and technical skills in order to elicit appropriate information and make relevant observations during the data collection process. This process often begins prior to initial contact between the nurse and the client, primarily through the nurse's review of biographical data and medical records. Upon meeting the client, the nurse continues data collection through interview, observation, and examination. A variety of sources and methods are used in compiling a comprehensive database.

Types of Data

Client data include information that the client communicates concerning perceptions of his or her own health status, as well as specific observations made by the nurse. These two types of information are referred to as subjective and objective data. **Subjective data** are data from the client's point of view and include feelings, perceptions, and concerns. The data (also referred to as symptoms) are obtained through interviews with the client. They are called subjective because they rely on the feelings or opinions of the person experiencing them and cannot be readily observed by another.

Objective data are observable and measurable (quantitative) data that are obtained through observation, standard assessment techniques performed during the physical examination, and laboratory and diagnostic testing. These data (also called signs) can be seen, heard, or felt by someone other than the person experiencing them. Assessments that are comprehensive and accurate include both subjective and objective data. See Table 6-1 for examples of both types of data.

Sources of Data

A comprehensive database should include data from every possible source (see the accompanying display). The client should always be considered the primary source of information; however, other sources should not be overlooked. The client's family and significant others can also provide useful information, especially if the client is unable to verbalize or relate information. In addition, other health care professionals who have cared for the client may contribute valuable information. Medical records should also be reviewed, including the medical history and physical examination; results of laboratory and diagnostic tests and various health care professionals should also be consulted.

Pertinent literature should be investigated in order to pursue relevant information and plan appropriate nursing interventions. Written standards are valuable sources of data for comparison, for example, a standard table of infant growth to determine if an infant's weight and height are within normal growth range. Another valuable source of data is knowledge about the client's normal parameters of functioning. The nurse's knowledge based on experience is another important source of data.

SOURCES OF DATA

- Client
- Family/significant other
- Other health care professionals
- Medical records
- Interdisciplinary conferences, rounds, and consultations
- Results of diagnostic tests
- Relevant literature

TABLE 6-1

Sample Application: Types of Data

Data	Type of Data
Charlene Rhodes, age 47, has come to the clinic after "passing out" twice in the last 2 days. She tells the nurse that she becomes "lightheaded" after almost any type of activity. She has experienced some nausea since yesterday and vomited after eating breakfast this morning. She also tells the nurse that she is very nervous about these occurrences because she remembers her mother having similar symptoms when the mother suffered from a brain disorder. The nurse observes that the client's gait is unsteady and her skin is pale. The client also has large bruises on her right arm and the right side of her face, which she states occurred when she fell.	Subjective Report of fainting Complaint of dizziness Nausea Verbalization of anxiety Self-reported fall
	Objective Vomiting Unsteady gait Pale skin Bruises on right side of face and right arm

THINK ABOUT IT

Sources of Data

Mrs. Palmer, age 76, was admitted to the hospital following a stroke. She is responsive but unable to speak or move extremities on the right side. Her daughter, who lives next door, is present at the bedside. Who would be the best source of data in this situation?

Methods of Data Collection

The nurse collects information through the following methods: observation, interview, health history, symptom analysis, physical examination, and laboratory and diagnostic data. These approaches require systematic use of assessment skills that are discussed below.

Observation

The nurse uses the skill of **observation** to carefully and attentively note the general appearance and behavior of the client. These observations occur whenever there is

contact with the client and include factors such as client mood, interactions with others, physical and emotional responses, and any safety considerations. Observation helps the nurse determine the client's status, both physical and mental. By carefully watching the client, the nurse can detect nonverbal cues that indicate a variety of feelings, including presence of pain, anxiety, and anger. Observational skills are essential in detecting the early warning signs of physical changes (e.g., pallor and sweating).

Interview

An **interview** is a therapeutic interaction that has a specific purpose. The purpose of the assessment interview is to collect information about the client's health history and current status in order to make determinations about the client's health needs. Effective interviewing depends on the nurse's knowledge and ability to skillfully elicit information from the client using appropriate techniques of communication. Observation of nonverbal behavior during the interview is also essential to effective data collection.

Interview Preparation

The interview is more productive if the nurse has an opportunity to prepare for the interaction. Such preparation includes review of the client's medical records, conversations with other health care team members (e.g., personnel in emergency departments or long-term care facilities), and research of the presenting medical diagnosis. This information can be useful in obtaining the client's relevant history and formulating a current needs assessment.

Interview Stages

Since the assessment interview often occurs at the beginning of a nurse-client relationship, it is helpful to begin the process with an orientation phase. During this period introductions are made, rapport is established, and roles are defined. The nurse interviews for a variety of reasons throughout the nurse-client relationship, including data collection, teaching, exploration of the client's feelings or concerns, and provision of support. The first few minutes of the nurse-client meeting may give an indication of the type of interviewing needed, so it is important that the nurse exhibit good listening skills as the relationship leads into the interview process. There are three phases to an interview: introduction, working, and closure.

Introduction The introduction stage of the interview establishes the goals for the interaction. The primary goal of the assessment interview is the collection of data about the client. In this phase of the interview, the purpose and use of the data collection should be discussed. For example, the nurse might state, "I need to ask you a few questions and talk to you for a few minutes

about your health so that we can better plan your care." Adequate time and privacy should be allowed for the interview so that the client feels free to share any information that may be relevant. The nurse should also inform the client about the approximate duration of the interview.

The client is more likely to respond freely if the interview environment provides comfort and privacy and if rapport exists between the client and the nurse. The nurse should sit (if possible), establish eye contact with the client, and listen attentively. It is the nurse's responsibility to note nonverbal messages that can indicate that the client is uncomfortable, tired, or preoccupied with other matters. If this situation occurs, it might be necessary to complete the interview at a later time. For example, if the client is guarding an incision and verbalizing discomfort or is extremely anxious about an impending procedure, only essential data are collected and the comprehensive interview is postponed until immediate needs have been met.

Working The working stage of the interview focuses on the details of data collection. The scope of the assessment interview depends on the type of assessment to be conducted (e.g., comprehensive or focused). The interview may be structured and formal (used in situations when a large amount of information needs to be obtained) or unstructured and informal (used in interactions that focus on a specific area of concern to the client). The nurse should be familiar with the specific assessment format used by the health care agency so that attention can be focused toward the client rather than the form itself.

The interview generally begins with questions about biographical and other nonthreatening information. The client's reason for seeking health care is also addressed early in the working phase. The depth of the majority of questions that the nurse will ask the client depends on the data collection model used by the health care agency. Information is usually gathered from the general to the specific, with details about intimate or potentially embarrassing topics reserved until



NURSING CHECKLIST

Preparing the Interview Environment

- Assure adequate lighting.
- Maintain a comfortable room temperature.
- Select an environment that is as free of noise and distractions as possible.
- Maintain client privacy.
- Make sure that the interview is timed appropriately.
- Promote client comfort.

later in the interview. The Nursing Checklist provides guidelines for interview preparation.

Techniques used during the interview will be determined by the setting and purpose of the interview. A comprehensive interview that seeks to identify problems and concerns is facilitated by open-ended questions, while an interview that focuses on specific details about a presenting problem will be facilitated by direct, closed questions. For example, an emergency setting would likely employ more direct, closed questions, while admission to a long-term care facility might require greater use of open-ended questions.

Closed questions are questions that can be answered briefly or with one-word responses. For example, the question “Have you been in the hospital before?” is a closed question that can easily be answered by a one-word response. Questions about the dates of and reasons for the hospitalizations are also closed questions that require brief answers.

THINK ABOUT IT

Assessment Interview

Mrs. Klein arrives at the clinic because of extreme fatigue for the last few weeks. Number each of the following topics in the order you would address them in your interview with this client:

- _____ Describe the type and amount of food you eat in a typical day.
- _____ Describe what you mean by “extreme fatigue.”
- _____ How has your fatigue affected your sex life?
- _____ What kind of family or other support systems do you have?
- _____ Describe your exercise patterns.
- _____ What kind of stressful events have occurred recently?

Open-ended questions are questions that encourage the client to elaborate about a particular concern or problem. For example, the question “What led to your

THINK ABOUT IT

Interview Techniques

Formulate both a closed and open-ended question to elicit information from a client about the following areas:

- Diet
- Perception of health status
- Activity/exercise

Which questions do you think will extract the most useful and complete information from the client? Under which circumstances would each type of question be best used?

coming here today?” is open-ended and allows the client flexibility in response. Both closed and open-ended questions can be effective in collecting information.

Closure Closure is established in the introduction phase when approximate time parameters are set. As the interview session is concluding, the nurse should indicate this fact by stating that almost all the information needed has been obtained or that the time for the interview is almost over. This action allows the client an opportunity to present any other relevant information and it avoids surprises when the interview terminates. During the closure phase, the nurse summarizes what was covered or accomplished during the interview and requests validation of perceptions with the client. If the nurse or the client feels that additional time is needed for further exploration of specific points discussed during this session, plans can be made for future interviews.

Health History

A primary focus of the data collection interview is the health history. The **health history** is a review of the client’s functional health patterns prior to the current contact with a health care agency. While the medical history concentrates on symptoms and the progression of disease, the nursing health history focuses on the client’s functional health patterns, responses to changes in health status, and alterations in lifestyle. The health history is also used in developing the plan of care and formulating nursing interventions.

Demographic Information

Personal data including name, address, date of birth, gender, religion, race/ethnic origin, occupation, and type of health plan/insurance should be included. This information may be useful in helping to foster understanding of a client’s perspective.

Reason for Seeking Health Care

The client’s reason for seeking health care should be described in the client’s own words. For example, the statement “fell off four-foot ladder and landed on right shoulder; unable to move right arm” is the client’s actual report of the event that precipitated his or her need for health care. The client’s perspective is important because it explains what is significant about the event from the client’s point of view. It is also important to determine the time of the onset of symptoms as well as a complete symptom analysis.

Perception of Health Status

Perception of health status refers to the client’s opinion of his or her general health. It may be useful to ask clients to rate their health on a scale of 1 to 10 (with 10 being ideal and 1 being poor), together with the clients’ rationale for their rating score. For example, the nurse

may record a statement such as the following to represent the client's perception of health: "Rates health a 7 on a scale of 1 (poor) to 10 (ideal) because he must take medication regularly in order to maintain mobility, but the medication sometimes upsets his stomach."

Previous Illnesses, Hospitalizations, and Surgeries

The history and timing of any previous experiences with illness, surgery, or hospitalization are helpful in order to assess recurrent conditions and to anticipate responses to illness, since prior experiences often have an impact on current responses.

Client/Family Medical History

The nurse needs to determine any family history of acute and chronic illnesses that tend to be familial. Health history forms will frequently include checklists of various illnesses that the nurse can use as the basis of the questions about this aspect. The client should be instructed that family history refers to blood relatives. It is also helpful to indicate *who* the relative is in relation to the client (e.g., mother, father, sister).



NURSING TIP

Clients Who Were Adopted

Keep in mind that clients who were adopted will have varying degrees of knowledge about their biological parents. Sensitivity to this issue is critical in gaining client trust during the interview process.

Immunizations/Exposure to Communicable Disease

Any history of childhood or other communicable diseases should also be noted. In addition, a record of current immunizations should be obtained. This is particularly important with children; however, records of immunizations for tetanus, influenza, and hepatitis B can also be important for adults. If the client has traveled out of the country, the time frame should be indicated in order to determine incubation periods for relevant diseases. The client should also be asked about potential exposure to communicable diseases, such as tuberculosis, or to human immunodeficiency virus (HIV).

Allergies

Any drug, food, or environmental allergies should be noted in the health history. In addition to the name of the allergen, the type of reaction to the substance should also be noted. For example, a client may report

NURSING ALERT

Assessment for Allergies

It is essential that the nurse explore possible allergies prior to administering any medications. Allergic reactions can be life-threatening and can occur even with very low dosages of medications. A client's sensitivity to a drug can also change over time, resulting in severe reactions even though the client has successfully taken the drug during prior illnesses or experienced only mild reactions to the drug in the past.

that he or she developed a rash or became short of breath. This reaction should be recorded. Clients may report an "allergy" to a medication because they developed an upset stomach after ingesting it, which the nurse will recognize as a side effect that would not necessarily preclude administration of the drug in the future.

Current Medications

All medications currently taken, both prescription and over-the-counter, are to be recorded by name, frequency and dosage. Remind clients that this information should include medications such as birth control pills, laxatives, and nonprescription pain relief medications. Ask which, if any, herbal preparations the client uses. Patterns related to caffeine and alcohol intake and use of tobacco or recreational drugs should also be explored. Use of alternative/complementary treatment methods, including herbals, is often not shared by health care consumers. Some clients fear rejection or ridicule when divulging such information with health care providers. The nurse uses a sensitive, nonjudgmental approach when assessing for the client's use of all healing practices.

Developmental Level

Knowledge of developmental level is essential for considering appropriate norms of behavior and for appraising the achievement of relevant developmental tasks. Any recognized theory of growth and development can be applied in order to determine if clients are functioning within the parameters expected for their age group. For example, if the nurse uses Erikson's stages of psychosocial development, validation of an adult client attaining the developmental task of generativity versus stagnation can be validated by the nurse's statement, such as "client prefers to spend time with his family; very involved in children's school activities."

Psychosocial History

Psychosocial history refers to assessment of dimensions such as self-concept and self-esteem as well as usual

sources of stress and the client's ability to cope. Sources of support for clients in crisis, such as family, significant others, religion, or support groups, should be explored.

Sociocultural History

In exploring the client's sociocultural history, it is important to inquire about the home environment, family situation, and client's role in the family. For example, the client could be the parent of three children and the sole provider in a single-parent family. The responsibilities of the client are important data through which the nurse can determine the impact of changes in health status and thus plan the most beneficial care for the client.

Activities of Daily Living

The activities of daily living is a description of the client's lifestyle and capacity for self-care and is useful both as baseline information and as a source of insight into usual health behaviors. This database should include the following areas:

- *Nutrition:* Includes type of diet and foods eaten and fluids consumed regularly, food preparation, the size of portions, and the number of meals per day. Food preferences and dislikes, as well as the client's need for assistance in food preparation or eating should also be determined.
- *Elimination:* Includes both urinary and bowel elimination frequency and patterns. Any recent changes or problems in these patterns should be noted.
- *Rest/sleep:* Includes the usual number of hours of sleep, number of hours of sleep needed to feel rested, sleep aids used, and the time within the day or night when sleep usually occurs. Any bedtime rituals (especially with children) should also be noted.
- *Activity/exercise:* Includes types of exercise and patterns in a typical day or week. If assistance is needed with activities such as walking, standing, or meeting hygienic needs, this information should be noted.

Review of Systems

The **review of systems** (ROS) is a brief account from the client of any recent signs or symptoms associated with any of the body systems. This allows the client an opportunity to communicate any deviations from normal that have not been otherwise identified. The review of systems relies on subjective information provided by the client rather than on the nurse's own physical examination. When a symptom is encountered, either while eliciting the health history or during the physical examination of the client, the nurse should obtain as much information as possible about the symptom. Relevant data include:

- *Location:* The area of the body in which the symptom (such as pain) can either be pointed to or described in detail.
- *Character:* The quality of the feeling or sensation (e.g., sharp, dull, stabbing).

- *Intensity:* The severity or quantity of the feeling or sensation and its interference with functional abilities. The sensation can be rated on a scale of 1 (very little) to 10 (very intense).
- *Timing:* The onset, duration, frequency, and precipitating factors of the symptom.
- *Aggravating/alleviating factors:* The activities or actions that make the symptom worse or better.

Physical Examination

The purpose of the physical examination is to make direct observations of any deviations from normal and to validate subjective data gathered through the interview. Baseline measurements are obtained, and physical examination techniques are used to gather objective data.

Baseline Data

Baseline data collection is the systematic organization of observations obtained during the physical examination that forms the basis for comparison and evaluation to establish the status of a client at a given point in time. Measurement of height, weight, and vital signs (temperature, pulse, respirations, and blood pressure) is important for comparison with future measurements in order to judge the significance of any changes (progress or regression) over time.

Assessment Techniques

The physical examination incorporates the use of visual, auditory, tactile, and olfactory senses and the use of systematic assessment techniques. The use of visual, auditory, and tactile senses will be described with each of the specific assessment techniques. In addition, olfaction (sense of smell) is helpful in detecting characteristic odors as well as those associated with altered health states. For example, presence of infection is sometimes first detected by the change in the characteristic odor of body fluids or drainage. The four assessment techniques used in physical examination are inspection, palpation, percussion, and auscultation.

Inspection **Inspection** involves careful visual observation. The client is observed first from a general point of view and then with specific attention to detail. For example, the nurse first observes for patterns of skin lesions and then focuses on the specific characteristics of individual lesions. Instruments such as a penlight and otoscope are often used to enhance visualization. Effective inspection requires adequate lighting and exposure of the body parts being observed. Beginning nurses often feel self-conscious or embarrassed using the technique of inspection; however, most become comfortable with the technique over time. Nurses must also be sensitive to the client's feelings of embarrassment with the use of inspection and respond to this situation by discussing the technique with the client and

ELEMENTS OF THE HEALTH HISTORY

- Demographic information: name, age, gender, marital status
- Reason for seeking health care: concern that initiated visit
- Perception of health status: client's view of health
- Previous illnesses, hospitalizations, surgeries: any chronic illness or acute episodes that led to hospitalization or surgery
- Client/family medical history: illness or cause of deaths in blood relatives
- Immunizations/exposure to communicable disease: childhood immunizations or relevant immunizations of adulthood; any known exposure to communicable disease
- Allergies: prior allergic reactions to medications, food, or environmental substances
- Current medications: prescription or over-the-counter medications, including laxatives, birth control pills, pain medications
- Developmental level: evidence of accomplishing developmental tasks for age group
- Psychosocial history: sources of stress, coping mechanisms, self-concept
- Sociocultural history: role in family, relationships, occupational history, personal habits, religious beliefs
- Activities of daily living: patterns of nutrition, elimination, rest/sleep, and activity/exercise
- Review of systems: recent signs and symptoms associated with body systems

using measures such as draping in order to increase the client's comfort level.

Palpation **Palpation** uses the sense of touch to assess texture, temperature, moisture, organ location and size, vibrations and pulsations, swelling, masses, and tenderness. Palpation requires a calm, gentle approach and is used systematically, with light palpation preceding deep palpation and palpation of tender areas performed last.

NURSING ALERT

Palpation

Deep palpation is a technique requiring expertise and should not be employed by beginning nursing students without supervision.

The technique of palpation uses the hands and fingers in different ways for assessment of:

- *Temperature*: Best detected using the dorsal (back) surface of the hand
- *Texture, pulses, and swelling*: Best detected using fingertips
- *Vibration*: Best detected with the base of the fingers
- *Shape and consistency of organs or masses*: Best detected by grasping organ or mass between fingertips

Percussion **Percussion** uses short, tapping strokes on the surface of the skin to create vibrations of underlying organs. It is used for assessing the density of structures or determining the location and the size of organs in the body. Structures with relatively more air (such as the lungs) produce louder, deeper, and longer sounds with percussion than more dense, solid structures (such as the liver), which produce softer, higher, and shorter sounds.

Auscultation **Auscultation** involves listening to sounds in the body that are created by movement of air or fluid. Areas most often auscultated include the lungs, heart, abdomen, and blood vessels. Although direct auscultation is sometimes possible, a stethoscope is usually employed in order to channel the sound.

Laboratory and Diagnostic Data

Results of laboratory and diagnostic tests can be useful objective data as these values often serve as defining characteristics for various altered health states; these can also be helpful in ruling out certain suspected problems. For example, diabetic clients who are poorly controlled on diet and/or medication will usually have an elevated blood glucose level. The pattern of these types of variations is useful in determining a plan of care. In addition, the effectiveness of nursing and medical interventions and progress toward health restoration are often monitored through laboratory and diagnostic test data.

DATA VERIFICATION

Data verification is the process through which data are validated as being complete and accurate. Once the nurse completes the initial data collection, the data are reviewed for inconsistencies or omissions. This process is particularly important if data sources are considered unreliable. For example, if a client is confused or unable to communicate, or if two sources provide conflicting data, it is necessary for the nurse to seek further information or clarification. Data verification is done by examining the congruence between subjective and objective data. For example, a client might exhibit non-verbal expressions of pain (e.g., guarding a part of the body, facial grimacing) but verbally deny feeling pain.

The nurse would need to consider possible reasons for this discrepancy in findings and collect more information before formulating conclusions or planning care. Findings should also be compared with norms. Any grossly abnormal findings should be rechecked and confirmed.

DATA ORGANIZATION

After data collection is completed and information is validated, the nurse organizes, or clusters, the information together in order to identify areas of strengths and weaknesses. This process is known as **data clustering**. How data are organized depends on the assessment model used.

Assessment Models

An **assessment model** is a framework that provides a systematic method for organizing data. The use of a model helps to ensure comprehensive and organized data collection. A guiding framework also provides direction for decision making about nursing diagnoses. A number of nursing and nonnursing models are used to assist with organization of data. This section describes only a few of the many assessment models available to nurses.

Nursing Models

Nursing models have been developed to focus on a wide range of human responses to alterations in health status. These models typically include psychosocial, sociocultural, and behavioral data as well as biophysical data. Nursing models may offer the advantage of organizing information in a mode that more easily allows transition from data collection to nursing diagnoses.

Functional Health Patterns

Marjory Gordon's Human Functional Health Patterns (Gordon, 1997) is not based on a particular theory of nursing but does provide a systematic framework for data collection that focuses on 11 functional health patterns. The accompanying display presents Gordon's functional health patterns. These patterns can be used in assessment of individuals, families, and communities.

These functional health pattern areas allow gathering and clustering of information about a client's usual patterns and any recent changes in order to determine if the client's response is functional or dysfunctional. For example, the activity-exercise pattern is assessed for a client who recently experienced a stroke. Data collection would be focused on mobility and exercise patterns prior to the stroke, current muscle strength and joint mobility, and the effect of any changes on the client's lifestyle and functional ability.

Human Response Pattern

The North American Nursing Diagnosis Association (NANDA), in an effort to standardize terminology related to client problems, has developed a taxonomy of

FUNCTIONAL HEALTH PATTERNS

1. Health perception–health management pattern: Describes client's perceived pattern of health and well-being and how health is managed.
2. Nutritional-metabolic pattern: Describes pattern of food and fluid consumption relative to metabolic need and pattern indicators of local nutrient supply.
3. Elimination pattern: Describes patterns of excretory function (bowel, bladder, and skin).
4. Activity-exercise pattern: Describes pattern of exercise, activity, leisure, and recreation.
5. Cognitive-perceptual pattern: Describes sensory-perceptual and cognitive pattern.
6. Sleep-rest pattern: Describes pattern of sleep, rest, and relaxation.
7. Self-perception–self-concept pattern: Describes self-concept pattern and perceptions of self.
8. Role-relationship pattern: Describes pattern of role engagements and relationships.
9. Sexuality-reproductive pattern: Describes patterns of satisfaction or dissatisfaction with sexuality; describes reproductive patterns.
10. Coping–stress-tolerance pattern: Describes coping pattern and its effectiveness in stress tolerance.
11. Value-belief pattern: Describes goals and value and belief patterns that underlie decision making.

(From Gordon M., [1997]. *Manual of nursing diagnoses 1997–1998*. St. Louis, MO: Mosby.)

nursing diagnoses (North American Nursing Diagnosis Association, 2001). The first taxonomy was completed in 1973 and consisted of 31 diagnostic categories. This taxonomy has developed into over 100 diagnostic categories arranged in a hierarchical structure organized according to nine human response patterns. This framework suggests that a person's health status is evidenced by observable phenomena that can be classified into one of these response patterns. These human response patterns can then be used as a model for organizing data collection.

Theory of Self-Care

The theory of self-care, developed by Orem (1995), is based on a client's ability to perform self-care activities. Self-care is a learned behavior and a deliberate action in response to a need. It includes activities that an individual performs to maintain health. A major focus of this theory is the appraisal of the client's ability to meet self-care needs and the identification of existing self-care deficits. Since this theory focuses on deficits in care, it primarily addresses illness states.

Roy Adaptation Model

The Roy Adaptation Model is organized around adaptive behaviors (Andrews & Roy, 1991). The individual is considered a product of biological, psychological, and sociological influences and is in constant interaction with the environment. The ability of the person to cope with internal and external stressors determines the health status of the individual. Assessment is focused toward an individual's response to stimuli in the environment in the areas of physiological status, self-concept, role function, and interdependence.



Title of Study

"The Assessment of Recovery in Patients After Myocardial Infarction Using Three Generic Quality-of-Life Measures"

Authors

Taylor, R., Kirby, B., Burdon, D., & Caves, R.

Purpose

To evaluate the sensitivity to change of three quality-of-life measures in clients post myocardial infarction (MI).

Methods

Clients admitted to a coronary care unit over a 9-month period were selected according to the criteria of being younger than 80 years of age and having experienced a first MI. Quality of life was assessed 6 weeks and again at 6 months following the MI. Quality of life was measured by three tools: the Sickness Impact Profile, the Nottingham Health Profile, and the McMaster Health Inventory Questionnaire.

Findings

Eighty-six respondents completed the surveys at both 6 weeks and 6 months post-MI. The Sickness Impact Profile indicated slight sensitivity to change regarding body care and movement, emotional behavior, work, and eating.

Implications

Other quality-of-life indicators need to be developed to assess cardiac rehabilitation.

Taylor, R., Kirby, B., Burdon, D., & Caves, R. (1998). The assessment of recovery in patients after myocardial infarction using three generic quality-of-life measures. *Journal of Cardiopulmonary Rehabilitation*, 18(2), 139.

Nonnursing Models

Nursing, of course, neither exists nor functions in a vacuum. Nursing uses related health concepts from other disciplines, some of which are discussed next.

Body Systems Model

Approaching data collection by examining body systems is sometimes referred to as the "medical model," since it is frequently used by physicians to investigate presence or absence of disease. This method organizes data collection according to the organ and tissue function in various body systems (e.g., cardiovascular, respiratory, gastrointestinal). Although nurses often use this method as well, the body systems model does not facilitate the formulation of nursing diagnoses. In addition, psychosocial aspects of the client's status are often neglected with resultant fragmentation of care.

Hierarchy of Needs

Abraham Maslow's hierarchy of needs proposes that an individual's basic needs (physiological) must be met before progressing to higher-level needs. Maslow's framework can be used to prioritize needs. Use of a hierarchy of needs model requires initial assessment of all physiological needs, followed by assessment of higher-level needs. Using Maslow's theory, a person's needs should be addressed in the following order:

First: Physiologic needs—the basic survival needs, such as food, water, and oxygen

Second: Safety and security needs—both physical (e.g., protection from bodily harm) and psychological (e.g., security and stability) needs

Third: Need for love and belonging—humans have an innate need to be a part of a group, and to feel accepted by others

Fourth: Self-esteem needs—individuals need to feel they are valued and worthwhile

Fifth: Self-actualization needs—the need to function at one's optimal level, and to be personally fulfilled.

THINK ABOUT IT

Assessment Models

Consider the following client data:

- Breathing is rapid and labored.
- Client states "nervous about what might be wrong."
- Unable to eat or sleep for last 3 days.
- Becomes short of breath with minimal activity.
- Unable to work for 3 days. Client is afraid will not be able to return to work.

Where would each observation be included using the various models described? Which of these models do you feel most comfortable using? Why?

DATA INTERPRETATION

Data clustering facilitates recognition of patterns, and determination of further data that are needed. **Data interpretation** is necessary for identification of nursing diagnoses.

DATA DOCUMENTATION

Accurate and complete recording of assessment data are essential for communicating information to other health care team members. In addition, documentation is the basis for determining quality of care and should include appropriate data to support identified problems.

Types of Assessment Formats

Health care agencies may choose from a variety of assessment forms for documentation depending on the type of agency, the population served by the facility, and the primary reasons for documentation. For example, clients seeking health care in a clinic or physician's office might be asked to complete a brief self-questionnaire, while a client admitted to an acute-care facility for labor and delivery might be asked to provide only information directly related to pregnancy and child care needs. Four types of documentation formats include open ended, checklist, combination, and specialty. See Figure 6-2 for an example of a form used in occupational nursing.

Open-Ended Formats

The open-ended format for documentation allows the nurse to write a narrative description of observations (see Figure 6-3). This format is more time-consuming for the nurse, but allows flexibility in recording findings.

Checklist Formats

Formats that include checklists facilitate documentation by summarizing findings in an abbreviated form (see Figure 6-4). They also provide more consistency in the recording of information and reduce the likelihood of omitting relevant information. However, checklists may discourage nurses in obtaining elaboration about observations from clients that require further explanation. For example, if a checklist indicates that mobility is impaired, further explanation is required in order to determine the extent of the impairment and thus plan the necessary interventions.

Combination Formats

Combination formats often allow the convenience of a checklist together with space to document a complete narrative description of any significant or abnormal findings (see Figure 6-5). Some agencies provide cues on the form to alert personnel when further informa-

tion is needed. This format provides for some consistency in recording data while allowing flexibility for documenting specific information.

Specialty Formats

Specialty areas such as outpatient surgery, labor and delivery, and psychiatric facilities may use abbreviated formats focused directly on assessment needs for the particular service provided. In addition, specialty assessment forms may be included together with comprehensive assessment forms for clients at particular risk for various conditions (e.g., falls, impaired skin integrity).

Documentation of assessment data is essential as a means of communication among health care team members to assure accurate problem identification, determination of appropriate client outcomes, and continuity of care.

The Minimum Data Set (MDS)

The Minimum Data Set (MDS) was developed by the Health Care Financing Administration (HCFA) to promote the development of a comprehensive care plan for every resident of Medicare/Medicaid certified nursing homes. As such, the MDS is a standardized assessment instrument used in all long-term care facilities that are funded by HCFA. The MDS is a comprehensive assessment tool designed to collect data on the following resident characteristics:

- Activities of daily living (ADLs)
- Medical needs
- Mental status
- Therapy use (American Nurses Association, 2000)

NURSING CARE PLAN: ASSESSMENT

Martin Bell has been admitted to an acute-care facility after complaining of chest pain of increasing intensity over the last 3 days. Mr. Bell is 37 years old, is 68 inches tall, and weighs 235 lb. He states that he becomes short of breath with minimal activity. The nurse observes that his skin is pale and he is diaphoretic (sweating). Mr. Bell reports use of laxatives for frequent constipation and use of ibuprofen for occasional headaches or muscular aches and pains. He smokes 2 packs of cigarettes per day and reports infrequent use of alcohol. He lives with his wife and three young children and works as a truck driver, which he describes as very stressful.

- Which of the three types of assessments discussed in this chapter is most appropriate at the time of his admission?
- Distinguish between the subjective and objective data presented about Mr. Bell.
- Organize the data presented using a functional health pattern model.
- What further data should be collected at this time?

Application: Assessment in the Industrial Clinic

The following is an example of an occupational health history used in industrial settings.

I. Current Job:

A. What is your current job title? _____

B. How long have you had this job? _____

C. What are specific tasks you perform on the job? _____

D. Are you exposed to any of the following on your present job?

- | | | |
|--|--|--|
| <input type="checkbox"/> Chemicals | <input type="checkbox"/> Infectious agents | <input type="checkbox"/> Stress |
| <input type="checkbox"/> Dusts | <input type="checkbox"/> Loud noise | <input type="checkbox"/> Vapors, gases |
| <input type="checkbox"/> Extreme temperature changes | <input type="checkbox"/> Radiation | <input type="checkbox"/> Vibrations |

E. Do you think you have any work-related health problems?

If so, describe: _____

F. How would you describe your satisfaction with your job?

Very satisfied Satisfied Somewhat satisfied Dissatisfied Very Dissatisfied

G. Have there been any recent changes in your job or work hours?

H. Do you use protective equipment/clothing on your job?

If so, list items used: _____

II. Past Work Experience:

Please provide the following information, starting with your first job:

Job Title	Dates Held	Brief description of job	Exposures	Injuries/Illnesses

Figure 6-2 Application: Assessment in the Industrial Clinic

HEALTH HISTORY

Name _____ Date _____ Time _____

Demographic Data: Date of birth _____ Gender _____ Marital status _____

Reason for Seeking Health Care: _____

Perception of Health Status: _____

Previous Illness/Hospitalization/Surgeries: _____

Client/Family Medical History:

Addiction (drugs/alcohol) _____	Diabetes _____	Mental disorders _____
Arthritis _____	Heart disease _____	Sickle cell anemia _____
Cancer _____	Hypertension _____	Stroke _____
Chronic lung disease _____	Kidney disease _____	Other _____

Immunizations/Exposure to Communicable Disease: _____

Allergies: _____

Home Medications: _____

Developmental Level: _____

Psychosocial History:

Alcohol use: _____

Tobacco use: _____

Drug use: _____

Caffeine intake: _____

Self-perception/Self-concept: _____

Sociocultural History:

Family structure _____

Role in family _____

Cultural/ethnic group _____

Occupation/work role _____

Relationships with others _____

Activities of Daily Living:

Nutrition: Type of diet _____ Usual weight _____

Eating patterns _____

Types of snacks _____

Food likes/dislikes _____

Fluid intake: Type _____ Amount _____

Elimination (usual patterns): Urinary _____ Bowel _____

Sleep/Rest:

Usual sleep patterns _____

Relaxation techniques/patterns _____

Activity/Exercise:

Usual exercise patterns _____

Ability to perform self-care activities _____

Review of Systems:

Respiratory _____

Circulatory _____

Integumentary _____

Musculoskeletal _____

Neurosensory _____

Reproductive/Sexuality _____

Health Maintenance Activities:

Usual source of health care _____

Date of last exam (physical, dental, eye) _____

Other health maintenance activities _____

Figure 6-3 Sample Assessment Form: Open-Ended

SYSTEMS ASSESSMENT (May be completed by RN or LPN)		Nursing Diagnosis (Must be completed by RN)
Cardio-vascular	<input type="checkbox"/> Chest Pain Rhythm: <input type="checkbox"/> Regular Radial <input type="checkbox"/> Palpable Dorsalis <input type="checkbox"/> Palpable Edema: <input type="checkbox"/> Present <input type="checkbox"/> Orthopnea <input type="checkbox"/> Irregular Pulses: <input type="checkbox"/> Non-palpable Pedis: <input type="checkbox"/> Non-palpable <input type="checkbox"/> Pitting <input type="checkbox"/> Hypertension Type: <input type="checkbox"/> Pounding <input type="checkbox"/> Other <input type="checkbox"/> Other <input type="checkbox"/> Non-pitting <input type="checkbox"/> Pacemaker <input type="checkbox"/> Thready <input type="checkbox"/> Absent <input type="checkbox"/> Apical Pulse <input type="checkbox"/> Weak	
Respiratory	<input type="checkbox"/> Cough Chest <input type="checkbox"/> Symmetrical Breath <input type="checkbox"/> Labored Breath <input type="checkbox"/> Clear all lobes <input type="checkbox"/> Productive Appearance: <input type="checkbox"/> Asymmetrical Pattern: <input type="checkbox"/> Non-labored Sounds: <input type="checkbox"/> Equal & Bilateral <input type="checkbox"/> Non-productive <input type="checkbox"/> Dyspnea <input type="checkbox"/> Crackles <input type="checkbox"/> Orthopnea <input type="checkbox"/> Rhonchi <input type="checkbox"/> Wheezes	
Cardiopulmonary	** 1. Mobility Status: <input type="checkbox"/> Ambulatory <input type="checkbox"/> Ambulatory with Assist <input type="checkbox"/> Bedrest <input type="checkbox"/> Transfer with Assist <input type="checkbox"/> Walker 2. Assistive Devices: <input type="checkbox"/> None <input type="checkbox"/> Cane <input type="checkbox"/> Wheelchair <input type="checkbox"/> Crutches <input type="checkbox"/> Prosthesis <input type="checkbox"/> Pillows # _____ <input type="checkbox"/> Other _____ 3. Limitations <input type="checkbox"/> None <input type="checkbox"/> Weakness <input type="checkbox"/> Fatigue <input type="checkbox"/> Other _____ 4. Do you have enough energy for desired activity? <input type="checkbox"/> Yes <input type="checkbox"/> No Describe _____ 5. Activities of Daily Living: I=Independent A=Assist D=Dependent _____ Feeding _____ Bathing _____ Grooming Describe _____ _____ Toileting _____ Dressing _____ Other _____	<input type="checkbox"/> Activity Intolerance <input type="checkbox"/> Airway Clearance. Ineffective <input type="checkbox"/> Breathing Pattern. Ineffective <input type="checkbox"/> Decreased Cardiac Output <input type="checkbox"/> Activity Intolerance. Potential <input type="checkbox"/> Gas Exchange Impaired <input type="checkbox"/> Home Maintenance <input type="checkbox"/> Management. Impaired <input type="checkbox"/> Physical Mobility. Impaired <input type="checkbox"/> Self Care Deficit (Specify) <input type="checkbox"/> Other (Specify)
Musculo-skeletal	** <input type="checkbox"/> Pain <input type="checkbox"/> Cramping Muscle strength: (S=Strong W=Weak N=None) <input type="checkbox"/> Joint Stiffness <input type="checkbox"/> Spasms Grips: <input type="checkbox"/> Right <input type="checkbox"/> Left <input type="checkbox"/> Swelling <input type="checkbox"/> Tremors Pushes: <input type="checkbox"/> Right <input type="checkbox"/> Left	
Neurological	** <input type="checkbox"/> Headache/Pain Pupil Size: <input type="checkbox"/> PERL Level of Consciousness: <input type="checkbox"/> Alert Oriented to: <input type="checkbox"/> Person <input type="checkbox"/> Motor Disturbances <input type="checkbox"/> Other <input type="checkbox"/> Stuporous <input type="checkbox"/> Place <input type="checkbox"/> Seizures Right _____ <input type="checkbox"/> Semicomatose <input type="checkbox"/> Time <input type="checkbox"/> Numbness Left _____ <input type="checkbox"/> Comatose <input type="checkbox"/> Event <input type="checkbox"/> Tingling <input type="checkbox"/> Combative <input type="checkbox"/> Anxious <input type="checkbox"/> Confused	
	** 1. Visual Impairment <input type="checkbox"/> None <input type="checkbox"/> Wears Glasses 4. Communication/Language Barrier: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Contacts 5. Level of Education: <input type="checkbox"/> Blind _____ Right _____ Left Grade _____ 2. Hearing Impairment <input type="checkbox"/> None <input type="checkbox"/> Hard of Hearing 6. Pain/Discomfort: <input type="checkbox"/> Deaf _____ Right _____ Left Describe: _____ <input type="checkbox"/> Uses Hearing Aid _____ Right _____ Left 3. Speech Impairment A. Precipitating Factors: <input type="checkbox"/> None <input type="checkbox"/> Cannot Express Describe: _____ <input type="checkbox"/> Slurring <input type="checkbox"/> Cannot Understand B. How is pain controlled? <input type="checkbox"/> Mute <input type="checkbox"/> Tracheostomy Describe: _____ <input type="checkbox"/> Stutters <input type="checkbox"/> Laryngectomy	<input type="checkbox"/> Pain <input type="checkbox"/> Pain Chronic <input type="checkbox"/> Communication. Impaired <input type="checkbox"/> Verbal <input type="checkbox"/> Knowledge Deficit (Specify) <input type="checkbox"/> Injury. Potential for <input type="checkbox"/> Sensory/Perception. Altered (Specify) <input type="checkbox"/> Thought Processes. Altered <input type="checkbox"/> Unilateral Neglect <input type="checkbox"/> Other (Specify)
Integumentary	<input type="checkbox"/> Normal Temperature: <input type="checkbox"/> Hot Describe: <input type="checkbox"/> Decubitus <input type="checkbox"/> Bruises <input type="checkbox"/> Pale <input type="checkbox"/> Warm <input type="checkbox"/> Rashes <input type="checkbox"/> Scars <input type="checkbox"/> Flushed <input type="checkbox"/> Cool <input type="checkbox"/> Wounds <input type="checkbox"/> None Visible <input type="checkbox"/> Cyanotic Turgor: <input type="checkbox"/> Good <input type="checkbox"/> Lesions <input type="checkbox"/> Other <input type="checkbox"/> Jaundiced <input type="checkbox"/> Fair <input type="checkbox"/> Other <input type="checkbox"/> Poor <input type="checkbox"/> Skin Intact	
Nutritional / Metabolic	1. Special Diet: <input type="checkbox"/> Yes <input type="checkbox"/> No Describe: _____ 2. Frequency of Meals: Describe: _____ 3. Recent Changes in Appetite / Eating / Patterns? <input type="checkbox"/> Yes <input type="checkbox"/> No Describe: _____ 4. Have you experienced <input type="checkbox"/> Indigestion <input type="checkbox"/> Vomiting <input type="checkbox"/> Difficulty Chewing <input type="checkbox"/> Choking with Meals current/recent <input type="checkbox"/> Nausea <input type="checkbox"/> Sore Mouth <input type="checkbox"/> Difficulty Swallowing <input type="checkbox"/> Full Feeling in Throat Describe: _____ 5. Recent Weight Loss/Gain? <input type="checkbox"/> Yes <input type="checkbox"/> No Describe: _____	<input type="checkbox"/> Body Temperature. Potential Altered <input type="checkbox"/> Fluid Volume Deficit <input type="checkbox"/> Fluid Volume Excess <input type="checkbox"/> Swallowing Impaired <input type="checkbox"/> Infection. Potential for <input type="checkbox"/> Nutrition. Less than Body Requirements. Altered <input type="checkbox"/> Nutrition. More than Body Requirements. Altered <input type="checkbox"/> Oral Mucous Membrane. Altered <input type="checkbox"/> Skin Integrity. Impaired <input type="checkbox"/> Skin Integrity. Potential Impaired <input type="checkbox"/> Other (Specify)
HEALTH PATTERNS ASSESSMENT (May be completed by RN or LPN)		
Gastro-intestinal	General <input type="checkbox"/> Well Nourished Oral <input type="checkbox"/> Dry Bowel <input type="checkbox"/> Present <input type="checkbox"/> Ostomies Appearance: <input type="checkbox"/> Malnourished Mucosa: <input type="checkbox"/> Moist Sounds: <input type="checkbox"/> Absent <input type="checkbox"/> Gastrostomy <input type="checkbox"/> Obese <input type="checkbox"/> Nasogastric <input type="checkbox"/> Jejunostomy	

Figure 6-4 (continued)

Patients At Risk to Develop Pressure Sores (May be completed by an LPN)

Identify any patient at risk to develop pressure sores by assessing the seven clinical condition parameters and assigning a score. Patients with intact skin, but scoring 8 or greater, should have the Nursing Diagnosis "Potential Impairment of Skin Integrity." Directions: Choose the number which best describes the patient's status. Total the seven numbers.

Clinical Condition Parameters	Score	Clinical Condition Parameters	Score	Clinical Condition Parameters	Score
General physical condition (health problem)		Mobility (extremities)		Skin/Tissue Status	
Good (minor)	0	Full active range	0	Good (well nourished/skin intact)	0
Fair (major but stable)	1	Limited movement with assistance	2	Fair (poorly nourished/skin intact)	1
Poor (chronic/serious not stable)	2	Move only with assistance	4	Poor (skin not intact)	2
		Immobile	6		
Level of Consciousness (to commands)		Incontinence (bowel and/or bladder)		Nutrition (for age and size)	
Alert (responds readily)	0	None	0	Good (eats/drinks adequately—3/4 of meal)	0
Lethargic (slow to respond)	1	Occasional (less than 2x in 24 hours)	2	Fair (eats/drinks inadequately – at least 1/2 meal)	1
Semi-Comatose (responds only to verbal or painful stimuli)	2	Usually (more than 2x in 24 hours)	4	Poor (unable/refuses to eat/drink – less than 1/2 meal)	2
Comatose (no response to stimuli)	3	No Control	6		
Activity					
Ambulant without assistance	0				
Ambulant with assistance	2				
Chairfast	4				
Bedfast	6				
					Total

HEALTH PATTERNS ASSESSMENT		(May be completed by RN or LPN) cont.	Nursing Diagnosis (Must be completed by RN)
Genito-urinary	Description per _____ Nurse _____ Patient Urine Color: <input type="checkbox"/> Clear <input type="checkbox"/> Hematuria <input type="checkbox"/> Bladder Distention <input type="checkbox"/> Suprapubic Catheter <input type="checkbox"/> Dark <input type="checkbox"/> Cloudy <input type="checkbox"/> Foley Catheter <input type="checkbox"/> Urostomy <input type="checkbox"/> Other <input type="checkbox"/> Dialysis Access _____		
Elimination	Description per _____ Nurse _____ Patient 1. Bowel: <input type="checkbox"/> No Problems <input type="checkbox"/> Diarrhea <input type="checkbox"/> Pain <input type="checkbox"/> Blood in stool <input type="checkbox"/> Constipation <input type="checkbox"/> Incontinence <input type="checkbox"/> Hemorrhoids <input type="checkbox"/> Other Describe: _____ 2. Bladder: <input type="checkbox"/> No Problems <input type="checkbox"/> Incontinence <input type="checkbox"/> Frequency <input type="checkbox"/> Burning <input type="checkbox"/> Nocturia <input type="checkbox"/> Retention <input type="checkbox"/> Dribbling <input type="checkbox"/> Dysuria <input type="checkbox"/> Urgency <input type="checkbox"/> Other Describe: _____ 3. Interventions: <input type="checkbox"/> None <input type="checkbox"/> Laxatives <input type="checkbox"/> Suppositories <input type="checkbox"/> Enemas <input type="checkbox"/> Other Describe: _____		<input type="checkbox"/> Constipation <input type="checkbox"/> Diarrhea <input type="checkbox"/> Incontinence. Bowel <input type="checkbox"/> Incontinence. Functional <input type="checkbox"/> Incontinence. Total <input type="checkbox"/> Urinary Elimination. Altered <input type="checkbox"/> Urinary Retention <input type="checkbox"/> Other (Specify) _____
Reproductive	Male <input type="checkbox"/> Penile Discharge <input type="checkbox"/> Pain <input type="checkbox"/> Inguinal Mass <input type="checkbox"/> Penile Implant <input type="checkbox"/> Other <input type="checkbox"/> Tenderness <input type="checkbox"/> Scrotal Mass <input type="checkbox"/> Breast Lumps <input type="checkbox"/> STD's (Sexual Transmitted Diseases) Female LMP _____ Last Pap Smear _____ Pain with: _____ Pregnant _____ <input type="checkbox"/> Para _____ <input type="checkbox"/> Itching <input type="checkbox"/> Breast Lumps <input type="checkbox"/> Menstruation <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Gravada _____ <input type="checkbox"/> Abnormal Bleeding <input type="checkbox"/> PMS <input type="checkbox"/> Intercourse <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Contraceptive _____ <input type="checkbox"/> Discharge _____ <input type="checkbox"/> Other _____		<input type="checkbox"/> Role Performance. Altered <input type="checkbox"/> Sexual Dysfunction <input type="checkbox"/> Sexuality Patterns. Altered <input type="checkbox"/> Rape Trauma Syndrome <input type="checkbox"/> Body Image Disturbance <input type="checkbox"/> Other (Specify) _____
Role Relationship	1. Home Environment: <input type="checkbox"/> Lives with Spouse <input type="checkbox"/> Lives Alone <input type="checkbox"/> Lives with Family <input type="checkbox"/> Lives with Friend 2. Who do you rely on for emotional support? <input type="checkbox"/> Spouse <input type="checkbox"/> Family <input type="checkbox"/> Friend <input type="checkbox"/> Self <input type="checkbox"/> Other Describe: _____ 3. How does your illness/hospitalization affect your family/significant others? Describe: _____		<input type="checkbox"/> Communication Impaired <input type="checkbox"/> Verbal <input type="checkbox"/> Family Processes. Altered <input type="checkbox"/> Grieving. Anticipatory <input type="checkbox"/> Parenting. Altered <input type="checkbox"/> Social Interaction Impaired <input type="checkbox"/> Social Isolation <input type="checkbox"/> Violence. Potential for self-directed or directed toward others <input type="checkbox"/> Role Performance. Altered <input type="checkbox"/> Fear <input type="checkbox"/> Other (Specify) _____
Coping/Stress	1. Have you had any recent changes in your life (job, move, divorce, death, major surgeries, recent abuse)? <input type="checkbox"/> Yes <input type="checkbox"/> No Describe: _____ 2. Do you feel you are dealing successfully with stresses associated with this change? Describe: _____		<input type="checkbox"/> Sleep Pattern Disturbance <input type="checkbox"/> Other (Specify) _____
Sleep/Rest	1. Sleep: <input type="checkbox"/> No problem <input type="checkbox"/> Difficulty falling asleep <input type="checkbox"/> Difficulty staying asleep <input type="checkbox"/> Does not feel rested after sleep Other _____ 2. What helps you sleep?		<input type="checkbox"/> Anxiety <input type="checkbox"/> Fear <input type="checkbox"/> Powerlessness <input type="checkbox"/> Self Esteem Disturbance <input type="checkbox"/> Other (Specify) _____
Self Perception	1. What concerns you most about your illness/hospitalization? Describe: _____ 2. Does your illness and/or hospitalization affect your sexuality/body image? <input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Spiritual Distress <input type="checkbox"/> Other (Specify) _____
Values/Beliefs	1. Is religion important in your life? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Religion/Faith 2. Do you have special religious request during this hospitalization? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Notify Volunteer Services for Clergy Describe: _____		
Safety	1. All areas with ** should be considered for FPP. 2. FPP should automatically be instituted for pts. who have/are: A) fallen previously B) confused, disoriented or combative C) chemical or physical restraints required		

Figure 6-4 (continued)

ADMISSION ASSESSMENT

Date _____ Time _____

Baseline Data: Ht _____ Wt _____ T _____ P _____ R _____ BP _____

Admitted from: Home _____ ER _____ Other _____

Mode of Transport: Stretcher _____ W/C _____ Amb _____

Allergies _____

Home Meds: _____

Mental Status

Alert/Oriented	Yes	No	_____
Confused	Yes	No	_____
Anxious	Yes	No	_____
Comatose	Yes	No	_____
Combative	Yes	No	_____
Other _____			

Comment

Elimination

GI: Constipation	Yes	No	_____
Frequency	Yes	No	_____
Laxatives	Yes	No	_____
Other _____			
GU: Frequency	Yes	No	_____
Burning	Yes	No	_____
Incontinent	Yes	No	_____
Other _____			

Comment

Communication

Speaks English	Yes	No	_____
Aphasic	Yes	No	_____
Speech Impediment	Yes	No	_____

Comment

Sleeping

Unable to fall asleep	Yes	No	_____
Awakens frequently	Yes	No	_____
Sleep meds	Yes	No	_____
Naps	Yes	No	_____

Comment

Sensory

Hearing Impaired	Yes	No	_____
Visually Impaired	Yes	No	_____
Amputation	Yes	No	_____
Hemiplegia	Yes	No	_____
Paraplegia	Yes	No	_____

Comment

ADL

Assistance needed for:

Ambulation	Yes	No	_____
Eating	Yes	No	_____
Bathing	Yes	No	_____
Dressing	Yes	No	_____
Eliminating	Yes	No	_____
Turning	Yes	No	_____
Other _____			

Comment

Diet/Nutrition

Diet at Home _____

Likes/Dislikes _____

Appetite _____

Skin

Location

Warm/Dry	Yes	No	_____
Abrasions/Bruises	Yes	No	_____
Laceration/Scar	Yes	No	_____
Reddened Areas	Yes	No	_____
Decubitus Ulcers	Yes	No	_____
Burns	Yes	No	_____
Rash/Scaling	Yes	No	_____
Diaphoretic	Yes	No	_____

Other _____

Color: Pale Normal Cyanotic

Treatments in Progress

Denture

Denture	Yes	No	_____
---------	-----	----	-------

Glasses

Glasses	Yes	No	_____
---------	-----	----	-------

Contact Lenses

Contact Lenses	Yes	No	_____
----------------	-----	----	-------

Personal Habits:

Tobacco use	Yes	No	_____
			(quantity)

Alcohol use	Yes	No	_____
			(quantity)

Chief Complaint: _____

Other Assessment Data: _____

Figure 6-5 Sample Assessment Form: Combination

KEY CONCEPTS

- Assessment includes collection, verification, organization, interpretation, and documentation of data.
- The nurse uses the process of assessment to establish a database about the client, to form an interpersonal relationship with the client, and to provide the client with an opportunity to discuss health care concerns.
- Assessment can be comprehensive, focused, or ongoing, depending on the health care setting and needs of the client.
- The two types of data collected during the assessment process are subjective (data from the client's point of view) and objective (observable and measurable data that are obtained through both the physical examination and laboratory and diagnostic tests).
- Although a variety of sources should be used in data collection, the client is the primary source of information.
- Assessment models such as Gordon's Functional Health Patterns, NANDA's Human Response Patterns, Orem's Theory of Self-Care Model, Roy's Adaptation Model, the body systems model, and Maslow's hierarchy of needs model ensure comprehensive data collection and organization.
- Data are collected through the interview, health history, symptom analysis, physical examination, and laboratory and diagnostic tests.
- The three stages of assessment interview are the introduction, working, and closure phases.
- A comprehensive health history is useful in determining the client's functional health patterns, responses to changes in health status, and alterations in lifestyle.
- The elements of the health history are demographic information; reason for seeking health care; perception of health status; previous illnesses, hospitalizations, and surgeries; client/family medical history; immunizations/exposure to communicable disease; allergies; current medications; developmental level; psychosocial history; sociocultural history; activities of daily living; and review of systems.
- The purposes of the physical examination are to gather baseline data, confirm data obtained in the interview and health history, and evaluate progress toward established goals. The examination includes the techniques of inspection, palpation, percussion, and auscultation.

- Accurate and complete documentation of assessment findings is essential for communication to other health care team members and may be recorded on a variety of assessment tools, such as open-ended, checklist, combination, and specialty formats.

CRITICAL THINKING ACTIVITIES

1. Write S in the blank if the data listed is subjective and O if the data is objective:

__Temperature 103.2	__Right upper quadrant pain
__Nausea	__Swelling in ankles
__Hematocrit 33%	__Itching
2. Change each of the following closed questions to open-ended questions:
 - a. Are you able to take care of yourself at home?
 - b. Is your cough productive?
 - c. Are you satisfied with your health status?
 - d. Is your chest pain sharp or dull?
3. Millie Jones is a new employee in the corporation in which you are employed as a nurse. What categories of information would you need to include for a complete health history of Ms. Jones?
4. List the four assessment techniques and give an example of how each is used in a physical examination.
5. In reviewing data collected from Mr. Robbins, a client admitted to the adult acute-care unit, you note his statement that he takes his blood pressure medication as prescribed. His blood pressure is very high (190/110). His wife does not remember the prescription being filled for over 2 months. What would you say to Mr. Robbins to clarify this incongruence?
6. Mr. Larsen, age 72, is visiting the clinic with a complaint of difficulty urinating. What type of assessment is most appropriate for this situation?

WEB RESOURCES

- American Nurses Association
www.nursingworld.org
- Health Care Financing Administration
www.hcfa.gov
- North American Nursing Diagnosis Association
www.nanda.org

Nursing Diagnosis



The two important things I did learn were that you are as powerful and strong as you allow yourself to be, and that the most difficult part of any endeavor is taking the first step.

—Davidson (in Schaff, 1990)

COMPETENCIES

1. Describe nursing diagnosis as a nursing function.
2. Explain the purposes of nursing diagnoses.
3. List the components of a nursing diagnosis.
4. Explore characteristics of the nursing diagnosis taxonomy.
5. Describe the process of developing a nursing diagnosis.
6. Identify errors that can occur in the development of a nursing diagnosis.
7. Discuss the limitations of a nursing diagnosis.
8. Explore barriers that can affect the use of a nursing diagnosis.
9. Describe strategies to overcome the barriers to using nursing diagnosis.
10. Describe how a nursing diagnosis enables the delivery of holistic or comprehensive nursing care.
11. Explain how a nursing diagnosis enhances accountability and empowerment in the nursing profession.

KEY
TERMS

cluster
cues
defining characteristics
diagnosis
etiology

medical diagnosis
nursing diagnosis
taxonomy of nursing
diagnoses

The **nursing diagnosis** is the second step in the nursing process and is the clinical judgment about individual, family, or community (aggregate) responses to actual or risk health problems, wellness states, or syndromes. This judgment is based on a critical analysis of the assessment data. The purpose of a nursing diagnosis is to effectively communicate the health care needs of individuals and aggregates among members of the health care team and within the health care delivery system. Society tends to interpret nursing through the use of nursing language. When a nursing diagnosis is a part of the client's plan of care, the nurse is able to communicate the client's needs to other professionals involved in that care. These needs encompass physiologic, role function, self-concept, interdependence, and spiritual dimensions. In order to determine individualized therapeutic nursing interventions, the nurse must first collect and organize assessment data before developing appropriate nursing diagnoses.

This chapter describes the nature of a nursing diagnosis, its purposes, and the components of a nursing diagnostic statement. It also discusses the process involved in developing a nursing diagnosis and methods through which nurses can avoid errors in the formulation of nursing diagnoses. This chapter concludes with strategies for overcoming barriers to the use of a nursing diagnosis in the clinical setting.

WHAT IS A NURSING DIAGNOSIS?

Diagnosis is the science and art of identifying problems or conditions. Although this process has been linked primarily with physicians, it is also used by members of other professions, such as nurses, lawyers, social workers, mechanics, psychologists, and teachers. Though the term *nursing diagnosis* may convey multiple meanings, “in effect, nursing diagnosis defines nursing practice” (Sparks & Taylor, 1994, p. 32H).

There are many definitions of nursing diagnosis that have evolved over the past decades. At the ninth North American Nursing Diagnosis Association (NANDA) conference, the following definition of nursing diagnosis was approved:

A clinical judgment about individual, family or community responses to actual and potential health problems/life processes. Nursing diagnoses provide the basis for selection of nursing interventions to achieve

outcomes for which the nurse is accountable (NANDA, 1996, p. 8).

Additional definitions of nursing diagnosis abound in the nursing literature. It is clear that although all definitions are not exactly alike, there are similar attributes among them, such as a focus on client-centered problems; the promotion of nursing accountability; an awareness of the human response to health problems; the formation of clinical judgments about individuals, families, or communities; and the development of nursing interventions that a nurse is licensed to enact. Following are selected descriptions of nursing diagnoses that reflect the historical evolution of the concept:

- “A creative approach to nursing involves a nursing diagnosis and the design and means for carrying out a plan for the care of an individual person. There are five areas of patients’ needs on which the nursing diagnosis is based . . . treatment and medication, personal hygiene, environmental, guidance and teaching and human or self needs” (Fry, 1953, p. 301).
- “Use of the term diagnosis is gaining acceptance as the logical end product of nursing assessment” (Gebbie & Lavin, 1974, p. 250).
- “A nursing diagnosis is a statement that describes the human response (health state or actual/potential altered interaction pattern) of an individual or group which the nurse can legally identify and for which the nurse can order the definitive interventions to maintain the health state or to reduce, eliminate, or prevent alterations” (Carpenito, 1989, p. 5).
- “Nursing diagnosis is defined in the Roy Adaptation Model as a judgment process resulting in a statement conveying the person’s adaptation status” (Roy & Andrews, 1991, p. 37).
- “Nursing diagnosis provides the basis for selection of nursing interventions to achieve outcomes for which the nurse is accountable” (NANDA, 1996, p. 8).

Comparison of Nursing and Medical Diagnoses

It is important to have a clear understanding of the nature of a nursing diagnosis as compared to a medical diagnosis. Clarification of this point is necessary to distinguish between the nursing and medical professions and the potential legal ramifications.

Delineation of “What is the nature of nursing?” versus “What is the nature of medicine?” is critical. In order

to practice nursing, nurses need to know what it is that they do. Nursing diagnoses assist nurses in defining their scope of practice just as medical diagnoses assist physicians in defining their scope of practice. In addition, the use of diagnoses in nursing and medicine enables clarification of the legal boundaries for practice.

Medicine uses the term *medical diagnosis* and nursing uses the term *nursing diagnosis* to identify problems relating to a client's health status:

- **Medical diagnosis** is the terminology used for a clinical judgment by the physician that identifies or determines a specific disease, condition, or pathologic state.
- **Nursing diagnosis** is the terminology used for a clinical judgment by the professional nurse that identifies the client's or aggregate's actual, risk, wellness, or syndrome responses to a health state, problem, or condition.

COMPARISON OF SELECTED NURSING AND MEDICAL DIAGNOSES

Nursing	Medicine
<i>Ineffective Breathing Pattern</i>	• Chronic Obstructive Pulmonary Disease
<i>Activity Intolerance</i>	• Cerebrovascular Accident
<i>Acute Pain</i>	• Appendectomy
<i>Body Image Disturbance</i>	• Amputation
<i>Risk for Altered Body Temperature</i>	• Strep Throat

See the accompanying display for a comparison of nursing and medical diagnoses.

It is important to emphasize that the term *nursing diagnosis* has been used in three contexts: “the process of diagnosis, the product of diagnosis or individual diagnoses, and the taxonomy of diagnoses” (Wooldridge, Brown, & Herman, 1993, p. 51). The *process* of diagnosis is identified as the second step of the nursing process. In this step, the nurse collects data, validates and critically analyzes the data, clusters the data into groups, and identifies the client, family, or community health problems or conditions. The *product* of diagnosis is the diagnostic label that is assigned to the identified problem. The *taxonomy* of diagnosis is a classification system in which nursing diagnoses are organized according to client responses to specific conditions.

There are both similarities and differences between medical and nursing diagnoses. The similarities include (1) using the diagnostic process, with “process” imply-

ing purpose, organization, and creativity (Bevis, 1978); (2) using cognitive, interpersonal, and psychomotor skills; (3) collecting and critically analyzing assessment data; (4) evaluating outcomes to ascertain continuation, resolution, or change of identified diagnosis; and (5) performing within legal dimensions and standards of the respective profession. An example of these similarities can be illustrated by considering Alan Brown, a client who has a medical diagnosis of asthma. The physician and nurse would both collect assessment data on respiratory status. The physician would use this information to treat the disease of asthma and the nurse would use this information to focus on Mr. Brown's response to the disease, which would result in a nursing diagnosis of *Ineffective Breathing Pattern*.

Nursing diagnoses are different from medical diagnoses in (1) purpose, (2) goals, and (3) therapeutic interventions. The *purpose* of a nursing diagnosis is to focus on the human response or responses of the individual family or community to identified problems or conditions. Medical diagnoses center on the disease state or pathological condition. For example, if the medical diagnosis for Sheila Barrington is breast cancer, appropriate nursing diagnoses may include *Fear*, *Deficient Knowledge* related to treatment measures, *Anticipatory Grieving*, *Body Image Disturbance*, *Powerlessness*, and *Ineffective Coping*. In addition, the *goals* (aims, intent, or ends) that accompany these nursing diagnoses differ, as do the specific, individualized therapeutic nursing *interventions* (nursing actions to promote or restore health and enhance general well-being).

HISTORICAL PERSPECTIVE

The term *nursing diagnosis* has been in the literature since the early 1950s. Fry (1953) identified that nursing diagnosis is integral to the plan of nursing care and is an important tool for individualizing client care. However, these ideas were slow to gain momentum despite the interests of several nurse theorists and the focus on client-centered problems in the 1960s and the 1970s. In 1973, the First National Conference for the Classification of Nursing Diagnoses convened in St. Louis, Missouri. Nurses met at that time and “began the formal effort to identify, develop, and classify nursing diagnoses” (NANDA, 1996, p. 107). In 1982, at the fifth national conference, the organization was renamed the North American Nursing Diagnosis Association (NANDA) (Kim, McFarland, & McLane, 1984). Since its inception, NANDA continues to hold conference meetings every 2 years.

Additional endorsement for nursing diagnosis came from the American Nurses Association (ANA) in 1973 in the publication entitled *Standards of Nursing Practice* (ANA, 1973). Ongoing discussions occurred in the nursing literature, with increasing support evident by the 1980s for nursing diagnosis and the diagnostic process. The ANA

continued to support nursing diagnosis as the second step of the nursing process through publication of *Nursing: A Social Policy Statement* (ANA, 1995) and *Standards of Clinical Nursing Practice* (ANA, 1998). See the accompanying display for the standard of care related to nursing diagnosis. At the 13th conference in 1998, NANDA developed 21 new nursing diagnoses and revised 37 nursing diagnoses by clarifying existing diagnoses and their definitions, defining their characteristics, and related factors. Following the biennial conference in April 1994, the Taxonomy Committee identified the need to revise the structure of Taxonomy I. During the 14th biennial conference in April 2000, NANDA adopted the taxonomy, Taxonomy II. “Taxonomy II was designed to be multiaxial in its form, thereby substantially improving the flexibility of the nomenclature and allowing for easy additions and modifications” (NANDA, 2001, p. 212). With the publication of these standards, the nurse has both a professional and legal obligation to practice as defined by the professional organization for nurses.

DIAGNOSIS AS A STANDARD COMPONENT OF CARE: ANA STANDARDS

Standard II. Diagnosis

The nurse analyzes the assessment in determining diagnoses. Guidelines: Diagnoses must be:

- Based on data collected during assessment of client
- Validated with client, significant others, and health care providers
- Documented so that they can be used in further development of expected outcomes and plan of care

(Data from American Nurses Association. [1998]. *Standards of clinical nursing practice*. [2nd ed.]. Washington, DC: Author.)

Research

With the inception of the first conference on nursing diagnoses, NANDA supported research endeavors on the development of a nursing diagnosis classification system. The first type of research conducted was identification studies, where the clinician repeatedly observed a condition in order to label a nursing diagnosis. At the sixth conference in 1986, Fehring identified the need for two standardized research methodologies for data collection: (1) diagnostic content validity (DCV), retrospective evidence from experts on the characteristics of a given label; and (2) clinical diagnostic validity (CDV), prospective evidence on the characteristics from a clinical perspective (Whitley, 1999). In 1989, NANDA sponsored an invitational conference on research methodologies for generating and validating existing diagnoses and to develop new methodologies to direct future studies. Although there is an abundance of DCV studies, only a few clinical studies have been conducted because

the CDV model is more complicated to execute. *Nursing Diagnosis: The Journal of Nursing Language & Classification* is the official publication of NANDA. The journal was first published in 1989 to promote the development,



Title of Study

“The Congruence of Nursing Diagnoses and Supporting Clinical Evidence”

Authors

Roberts, B. L., Madigan, E. A., Anthony, M. K., & Pabst, S. L.

Purpose

The purpose of this study was to measure the congruence of nursing diagnoses and the supporting clinical evidence of clients transferred from intensive care to medical-surgical units.

Methods

A secondary analysis of 890 clients 40 years of age and older were assessed within 24 hours of transfer from intensive care to medical-surgical units. The nursing diagnoses documented in the client’s chart were compared to supporting clinical evidence from subjects, the client’s record, and interviews with subjects and care givers. Using the kappa statistic, the congruence between nursing diagnoses and clinical evidence ranged from 0.1% for altered thought processes to 10% for impaired physical mobility and potential for injury. It was noted that there were diagnoses made for self-care deficits or sensory alterations—when clinical evidence for these visual diagnoses was available. The findings highlight that it is not clear whether nurses in this study failed to recognize the clinical evidence to make a nursing diagnosis or whether they made a diagnosis but failed to record it in the client’s record. Other variables to consider in this study are the client’s acuity level, the complexity of clinical information, and the nurse’s overload of critical clinical data.

Implications

This study supports the fact that more research needs to be done to examine how NANDA-approved diagnoses are used in clinical practice to identify client’s health problems, select interventions, and evaluate outcomes of care.

Roberts, B. L., Madigan, E. A., Anthony, M. K., & Pabst, S. L. (1996). The congruence of nursing diagnoses and supporting clinical evidence. *Nursing Diagnosis*, 7(3), 108–115.

refinement, and utilization of nursing language and classification.

Roberts, Madigan, Anthony, and Pabst (1996) conducted a secondary analysis study to examine the congruence between nursing diagnoses and clinically relevant data of clients being transferred from intensive care to medical-surgical units. The results of this study showed that diagnoses were not made or were made less frequently than indicated by the supporting clinical evidence (see the Research Focus). One of the findings indicated that a system still needs to be developed for determining that clients being observed have the diagnosis being studied and that nurses accurately identify all relevant diagnoses in the clinical setting.

Whitley (1999) suggests the development of a “research agenda” to promote research in a coordinated fashion since interest about nursing diagnoses has spread in the international community, at a time when a common nursing language is needed to strengthen nursing’s bases for practice. In 1998, the NANDA Board instituted an ad hoc research committee to coordinate nursing diagnosis research and funding and to develop a “research agenda.”

PURPOSES OF NURSING DIAGNOSIS

Nursing diagnosis is unique in that it focuses on a client’s *response* to a health problem, rather than on the problem itself, and it provides the structure through which nursing care can be delivered. Although these characteristics have always been in existence within nursing, they were unidentified prior to the mid-20th century. One of the requisites of a profession is a unique body of knowledge or frame of reference (Adams, 1983). Wooldridge, Brown, and Herman (1993) “propose that nursing diagnoses collectively, as contained within a taxonomy, provide a central focus for conceptualization of the domain of nursing” (p. 51). Clearer conceptualization of knowledge unique to nursing increases both professional accountability and autonomy (Carpenito, 1995). Therefore, nursing diagnosis contributes to the professional status of the discipline.

Nursing diagnosis also provides a means for effective communication. It is generally agreed among nurses, health care practitioners, and other health care professionals that there is a need for a common language within the health care sector. A mutual vocabulary that can be used for describing practice, research, and education benefits both the profession and the consumer. With this language, collaboration and international exchanges regarding nursing and health care are possible and benefit from “common definitions of the phenomena of concern within the discipline” (Fitzpatrick & Zanotti, 1995, p. 42). In addition, communication about nursing diagnoses is possible through computer search. The *Cumulative Index to Nursing and Allied Health*

Literature (CINAHL) has listed the term *nursing diagnosis* since 1983 (Dougherty, Jankin, Lunney, & Whitley, 1993).

Holistic client, family, and community-focused care are facilitated with the use of nursing diagnosis. The list of NANDA-approved nursing diagnoses (NANDA, 2001) for clinical use provides assistance for the nurse in individualizing care and developing comprehensive therapeutic nursing interventions. Quality care and continuity of care are enhanced with identified nursing diagnoses as part of the client’s plan of nursing care. The accompanying display illustrates the value of applying nursing diagnosis to a home health care situation.

Nursing diagnoses also have the potential of providing an avenue for theory development and nursing research. Dougherty, Jankin, Lunney, and Whitley (1993) published a listing of theory and research-based articles on accepted nursing diagnoses from 1950 to 1993.

Nursing diagnosis has an important impact on the health care delivery system: “Nursing diagnoses provide a method for synthesizing and communicating nurses’ observations and judgements” and “the ability to communicate the health needs of clients can influence funding of preventive and comprehensive health care services” (Gordon, 1994, p. 12).

APPLICATION: HOME HEALTH CARE SETTING

Individualizing care of the home health client is an important function of nursing diagnosis. For example, the following questions can be used as a guide in developing nursing interventions as a response to the nursing diagnosis of *Compromised Family Coping*; related to a caregiver appearing to be unable to assist a client with management of a health problem:

- Is the client experiencing difficulty with the response being received from the caregiver about the type and level of care needed?
- Has the caregiver expressed concern or anxiety about performing certain functions for the client?
- Does the care performed by the caregiver for the client yield satisfactory results in terms of alleviation of symptoms?
- What changes have occurred within the family situation that have altered the dynamics between the client and caregiver?

In summary, nursing diagnosis allows for empowerment of the profession of nursing, facilitates effective communication, and provides a means to individualize nursing care. Nursing diagnosis is essential to clinical practice and education and pivotal for theory development and research.

Nursing Diagnoses and Diagnostic-Related Groups

Diagnostic-related groups (DRGs) were developed and implemented in the health care industry in 1983 as a response to escalating health care costs in America. Diagnostic-related groups were developed on the basis of the medical model of identifying signs and symptoms that then result in the formulation of medical diagnoses. Therefore, this reimbursement system is centered on medical diagnoses, not nursing diagnoses. As a result, this federally regulated system lacks a mechanism for direct financial reimbursement based on nursing diagnoses.

Over the years, in light of the fact that the nursing process is more than just a response to medical diagnosis (Caterinicchio, 1984), there have been attempts to identify nursing's contribution to the over 400 different DRGs. In these studies, efforts have mostly been directed at attempting to isolate nursing care delivered to the client (McKibbin, Brimmer, Clinton, & Galliher, 1985; Wolf, Lesic, & Leak, 1986). Through the use of elaborate formulas, nursing care costs have been derived for many of the DRGs. However, few studies have evaluated the relationship between nursing diagnoses and DRGs.

One of the best attempts to identify nursing costs has been described by Adams (1983). At one hospital, a computerized client classification system that integrates client acuity with client care plans and nursing diagnoses has been developed (Adams, 1983). Through the use of this system, direct cost accounting of nursing care is possible, nurses must explore every avenue to be appropriately compensated for their share of the health care dollar.

According to Fitzpatrick (1995), if the nursing profession does not have and use a common language, nurses will be unable to assign a monetary status to their

services for reimbursement. At present, consensus still needs to be established by the profession for use of nursing diagnosis language. With agreement on what nurses define as client problems or conditions, the profession will be able to establish a system that reimburses nurses for what they contribute to the health care industry.

COMPONENTS OF A NURSING DIAGNOSIS

There are several formats that have been used to structure nursing diagnosis statements. Two formats that are frequently seen in the nursing literature are the two- and three-part statements. The two-part statement is NANDA approved and is used by most nurses, in large part because of its brief and precise format. The three-part statement is preferred by those nurses desiring to strengthen the diagnostic statement by including specific manifestations, an attribute that is not possible through the use of the two-part format.

The Two-Part Statement

The components of a nursing diagnosis typically consist of two parts. Hence, the nursing diagnosis is often described as a "two-part statement." The first component is a problem statement or diagnostic label that describes the client's response to an actual, possible, and risk health problem or a wellness condition. Table 7-1 presents the list of NANDA-approved nursing diagnoses.

The second component of a two-part nursing diagnosis is the etiology. The **etiology** is the related cause or contributor to the problem. The diagnostic label and etiology are linked by the term *related to* (RT). Examples of nursing

TABLE 7-1
NANDA-Approved Nursing Diagnoses: Taxonomy I to Taxonomy II

<i>Taxonomy I Nursing Diagnosis</i>	<i>Taxonomy II Nursing Diagnosis</i>
Exchanging	
Altered nutrition: More than body requirements	Imbalanced nutrition: More than body requirements
Altered nutrition: Less than body requirements	Imbalanced nutrition: Less than body requirements
Altered nutrition: Risk for more than body requirements	Risk for imbalanced nutrition: More than body requirements
Risk for infection	Risk for infection
Risk for altered body temperature	Risk for imbalanced body temperature
Hypothermia	Hypothermia
Hyperthermia	Hyperthermia
Ineffective thermoregulation	Ineffective thermoregulation
Dysreflexia	Autonomic dysreflexia
Risk for autonomic dysreflexia	Risk for autonomic dysreflexia
Constipation	Constipation
Perceived constipation	Perceived constipation
Diarrhea	Diarrhea

(continues)

TABLE 7-1 (continued)**NANDA-Approved Nursing Diagnoses: Taxonomy I to Taxonomy II**

<i>Taxonomy I Nursing Diagnosis</i>	<i>Taxonomy II Nursing Diagnosis</i>
Bowel incontinence	Bowel incontinence
Risk for constipation	Risk for constipation
Altered urinary elimination	Impaired urinary elimination
Stress incontinence	Stress urinary incontinence
Reflex urinary incontinence	Reflex urinary incontinence
Urge incontinence	Urge urinary incontinence
Functional urinary incontinence	Functional urinary incontinence
Total incontinence	Total urinary incontinence
Risk for urinary urge incontinence	Risk for urge urinary incontinence
Urinary retention	Urinary retention
Altered tissue perfusion (specify type: renal, cerebral, cardiopulmonary, gastrointestinal, peripheral)	Ineffective tissue perfusion (specify type: renal, cerebral, cardiopulmonary, gastrointestinal, peripheral)
Risk for fluid volume imbalance	Risk for imbalanced fluid volume
Fluid volume excess	Excess fluid volume
Fluid volume deficit	Deficient fluid volume
Risk for fluid volume deficit	Risk for deficient fluid volume
Decreased cardiac output	Decreased cardiac output
Impaired gas exchange	Impaired gas exchange
Ineffective airway clearance	Ineffective airway clearance
Ineffective breathing pattern	Ineffective breathing pattern
Inability to sustain spontaneous ventilation	Impaired spontaneous ventilation
Dysfunctional ventilatory weaning response	Dysfunctional ventilatory weaning response
Risk for injury	Risk for injury
Risk for suffocation	Risk for suffocation
Risk for poisoning	Risk for poisoning
Risk for trauma	Risk for trauma
Risk for aspiration	Risk for aspiration
Risk for disuse syndrome	Risk for disuse syndrome
Latex allergy response	Latex allergy response
Risk for latex allergy response	Risk for latex allergy response
Altered protection	Ineffective protection
Impaired tissue integrity	Impaired tissue integrity
Altered oral mucous membrane	Impaired oral mucous membrane
Impaired skin integrity	Impaired skin integrity
Risk for impaired skin integrity	Risk for impaired skin integrity
Altered dentition	Impaired dentition
Decreased adaptive capacity: Intracranial	Decreased intracranial adaptive capacity
Energy field disturbance	Disturbed energy field

Communicating

Impaired verbal communication

Impaired verbal communication

Relating

Impaired social interaction

Impaired social interaction

Social isolation

Social isolation

Risk for loneliness

Risk for loneliness

Altered role performance

Ineffective role performance

Altered role performance

Ineffective role performance

(continues)

TABLE 7-1 (continued)
NANDA-Approved Nursing Diagnoses: Taxonomy I to Taxonomy II

<i>Taxonomy I Nursing Diagnosis</i>	<i>Taxonomy II Nursing Diagnosis</i>
Relating (continued)	
Altered parenting	Impaired parenting
Risk for altered parenting	Risk for impaired parenting
Risk for altered parent/infant/child attachment	Risk for impaired parent/infant/child attachment
Sexual dysfunction	Sexual dysfunction
Altered family processes	Interrupted family processes
Caregiver role strain	Caregiver role strain
Risk for caregiver role strain	Risk for caregiver role strain
Altered family processes: Alcoholism	Dysfunctional family processes: Alcoholism
Parental role conflict	Parental role conflict
Altered sexuality patterns	Ineffective sexuality patterns
Valuing	
Spiritual distress (distress of the human spirit)	Spiritual distress
Risk for spiritual distress	Risk for spiritual distress
Potential for enhanced spiritual well-being	Readiness for enhanced spiritual well-being
Choosing	
Ineffective individual coping	Ineffective coping
Impaired adjustment	Impaired adjustment
Defensive coping	Defensive coping
Ineffective denial	Ineffective denial
Ineffective family coping: Disabling	Disabled family coping
Ineffective family coping: Compromised	Compromised family coping
Family coping: Potential for growth	Readiness for enhanced family coping
Potential for enhanced community coping	Readiness for enhanced community coping
Ineffective community coping	Ineffective community coping
Ineffective management of therapeutic regimen: Individual	Ineffective therapeutic regimen management
Noncompliance (specify)	Noncompliance (specify)
Ineffective management of therapeutic regimen: Families	Ineffective family therapeutic regimen management
Ineffective management of therapeutic regimen: Community	Ineffective community therapeutic regimen management
Effective management of therapeutic regimen: Individual	Effective therapeutic regimen management
Decisional conflict (specify)	Decisional conflict (specify)
Health-seeking behaviors (specify)	Health-seeking behaviors (specify)
Moving	
Impaired physical mobility	Impaired physical mobility
Risk for peripheral neurovascular dysfunction	Risk for peripheral neurovascular dysfunction
Risk for perioperative-positioning injury	Risk for perioperative-positioning injury
Impaired walking	Impaired walking
Impaired wheelchair mobility	Impaired wheelchair mobility
Impaired transfer ability	Impaired transfer ability
Impaired bed mobility	Impaired bed mobility
Activity intolerance	Activity intolerance
Fatigue	Fatigue
Risk for activity intolerance	Risk for activity intolerance
Sleep pattern disturbance	Disturbed sleep pattern
Sleep deprivation	Sleep deprivation

(continues)

TABLE 7-1 (continued)**NANDA-Approved Nursing Diagnoses: Taxonomy I to Taxonomy II**

<i>Taxonomy I Nursing Diagnosis</i>	<i>Taxonomy II Nursing Diagnosis</i>
Diversional activity deficit	Deficient diversional activity
Impaired home maintenance management	Impaired home maintenance
Altered health maintenance	Ineffective health maintenance
Delayed surgical recovery	Delayed surgical recovery
Adult failure to thrive	Adult failure to thrive
Feeding self-care deficit	Feeding self-care deficit
Impaired swallowing	Impaired swallowing
Ineffective breastfeeding	Ineffective breastfeeding
Interrupted breastfeeding	Interrupted breastfeeding
Effective breastfeeding	Effective breastfeeding
Ineffective infant feeding pattern	Ineffective infant feeding pattern
Bathing/hygiene self-care deficit	Bathing/hygiene self-care deficit
Dressing/grooming self-care deficit	Dressing/grooming self-care deficit
Toileting self-care deficit	Toileting self-care deficit
Altered growth and development	Delayed growth and development
Risk for altered development	Risk for delayed development
Risk for altered growth	Risk for disproportionate growth
Relocation stress syndrome	Relocation stress syndrome
Risk for disorganized infant behavior	Risk for disorganized infant behavior
Disorganized infant behavior	Disorganized infant behavior
Potential for enhanced organized infant behavior	Readiness for enhanced organized infant behavior

Perceiving

Body image disturbance	Disturbed body image
Chronic low self-esteem	Chronic low self-esteem
Situational low self-esteem	Situational low self-esteem
Personal identity disturbance	Disturbed personal identity
Sensory/perceptual alterations (specify: visual, auditory, kinesthetic, gustatory, tactile, olfactory)	Disturbed sensory perception (specify: visual, auditory, kinesthetic, gustatory, tactile, olfactory)
Unilateral neglect	Unilateral neglect
Hopelessness	Hopelessness
Powerlessness	Powerlessness

Knowing

Knowledge deficit (specify)	Deficient knowledge (specify)
Impaired environmental-interpretation syndrome	Impaired environmental interpretation syndrome
Acute confusion	Acute confusion
Chronic confusion	Chronic confusion
Altered thought processes	Disturbed thought processes
Impaired memory	Impaired memory

Feeling

Pain	Acute pain
Chronic pain	Chronic pain
Nausea	Nausea
Dysfunctional grieving	Dysfunctional grieving
Anticipatory grieving	Anticipatory grieving
Chronic sorrow	Chronic sorrow

(continues)

TABLE 7-1 (continued)
NANDA-Approved Nursing Diagnoses: Taxonomy I to Taxonomy II

<i>Taxonomy I Nursing Diagnosis</i>	<i>Taxonomy II Nursing Diagnosis</i>
Feeling (continued)	
Risk for violence: Directed at others	Risk for other-directed violence
Risk for self-mutilation	Risk for self-mutilation
Risk for violence: Self-directed	Risk for self-directed violence
Post-trauma syndrome	Post-trauma syndrome
Rape-trauma syndrome	Rape-trauma syndrome
Rape-trauma syndrome: Compound reaction	Rape-trauma syndrome: Compound reaction
Rape-trauma syndrome: Silent reaction	Rape-trauma syndrome: Silent reaction
Risk for post-trauma syndrome	Risk for post-trauma syndrome
Anxiety	Anxiety
Death anxiety	Death anxiety
Fear	Fear
	New to Taxonomy II
	Risk for falls
	Risk for powerlessness
	Risk for relocation stress syndrome
	Risk for situational low self-esteem
	Self-mutilation
	Risk for suicide
	Wandering

(Used with permission from North American Diagnosis Association. [2001]. *Nursing diagnoses: Definitions and classification 2001–2002*. Philadelphia: Author.)

diagnoses are *Disturbed Body Image* RT loss of left lower extremity and *Activity Intolerance* RT decreased oxygen-carrying capacity of cells. Descriptive words or terms may be added to clarify specific nursing diagnoses. These descriptive words are called qualifiers and include Acute, Chronic, Decreased, Deficient, Depleted, Disturbed, Dysfunctional, Enhanced, Excessive, Impaired, Increased, Ineffective, Intermittent, Potential for, and Risk. These terms specify a degree of qualification for the identified nursing diagnosis and are placed (used) before the problem statement.

The Three-Part Statement

The nursing diagnosis can also be expressed as a three-part statement. As in the two-part statement, the first two components are the diagnostic label and the etiology. The third component consists of **defining characteristics** (collected data that are also known as signs and symptoms, subjective and objective data, or clinical manifestations). In the three-part nursing diagnosis format, the third part is joined to the first two components with the connecting phrase “as evidenced by” (AEB). Defining characteristics list the relevant clinical manifestations, such as signs or symptoms for the identified client problem and the related etiology. Defining characteristics are

identified for each NANDA-approved diagnosis. These characteristics continue to evolve as they are reviewed and updated at the biennial conference. It is important to emphasize that defining characteristics may assist the nurse in identifying client goals, measurable client outcome criteria, and relevant nursing interventions.

Some nurses believe that the three-part statement strengthens the diagnostic process. However, other nurses prefer the two-part statement and refer to the defining characteristics as part of the original database. Table 7-2 depicts the components and relationship of the one-, two-, and three-part statements. Although the most commonly used format is the two-part statement, it is beneficial for the nurse to be knowledgeable about the use of the three-part statement for development of a nursing diagnosis. See Table 7-3 for a comparison of selected approved NANDA diagnoses in the two- and three-part statements.

CATEGORIES OF NURSING DIAGNOSES

Nursing diagnoses may be classified into three categories: actual, risk, and wellness. The most common nursing diagnoses used are actual and risk diagnoses.

TABLE 7-2
Comparison of One-, Two-, and Three-Part Nursing Diagnosis Statements

One-Part Statement	Two-Part Statement	Three-Part Statement
Part 1: Wellness condition/state to be enhanced (no Related to, no etiology, and no defining characteristics)	Part 1: Problem Related to Part 2: Etiology (no defining characteristics)	Part 1: Problem Related to Part 2: Etiology Part 3: Defining characteristics

TABLE 7-3
Examples of Nursing Diagnoses Expressed in Two- and Three-Part Statements

Nursing Diagnosis	Two-Part Statement	Three-Part Statement
<i>Feeding Self-Care Deficit</i>	<i>Feeding Self-Care Deficit</i> RT decreased strength and endurance	<i>Feeding Self-Care Deficit</i> RT decreased strength and endurance AEB inability to maintain fork in hand from plate to mouth
<i>Ineffective Airway Clearance</i>	<i>Ineffective Airway Clearance</i> RT fatigue	<i>Ineffective Airway Clearance</i> RT fatigue AEB dyspnea at rest
<i>Anxiety</i>	<i>Anxiety</i> RT change in role functioning	<i>Anxiety</i> RT change in role functioning AEB insomnia, poor eye contact, and quivering voice
<i>Deficient Knowledge</i>	<i>Deficient Knowledge</i> RT misinterpretation of information	<i>Deficient Knowledge</i> RT misinterpretation of information AEB inaccurate return demonstration of self-injection
<i>Spiritual Distress</i>	<i>Spiritual Distress</i> RT separation from religious ties	<i>Spiritual Distress</i> RT separation from religious ties AEB crying and withdrawal

(Data from American Nurses Association. [1997]. *Standards of clinical nursing practice* [pp. 7–9]. Washington, DC: Author.)

Wellness diagnoses were adopted by NANDA 1996, and Carpenito (1995) described possible nursing diagnoses.

- *Actual diagnoses* are those problems identified by the nurse that are already in existence. Actual diagnoses may include *Excess Fluid Volume* related to (RT) intravenous infusion therapy overload and *Anxiety* RT unknown results of breast biopsy.
- *Risk diagnoses* are identified by the nurse in situations in which problems might occur but are not currently in existence. Examples of risk diagnoses may include *Risk for Poisoning* RT increased mobility of infant and failure to have house childproofed and *Risk for Deficient Fluid Volume* RT excessive number of stools.
- *Wellness diagnoses* identify the individual or aggregate condition or state that may be enhanced by health-promoting activities. These consist of a one-part statement (no “related to” phrase) that uses the label “Potential for Enhanced” followed by the state the nurse desires to enhance. Examples of wellness diagnoses may include *Readiness for Enhanced Community Coping* and *Readiness for Enhanced Spiritual Well-Being*.

TAXONOMY OF NURSING DIAGNOSIS

The **taxonomy of nursing diagnoses** is the type of classification under which the diagnostic label is grouped based on which human response the client is demonstrating to the actual or perceived stressor. Rather than consult the alphabetical listing of NANDA diagnoses, some nurses might find it more helpful to review the NANDA listing by pattern of human response. This listing is called the NANDA Taxonomy II and organizes the NANDA-approved nursing diagnoses under the corresponding human response category. The NANDA nursing diagnosis taxonomy is composed of nine patterns of human response:

- Exchanging
- Communicating
- Relating
- Valuing
- Choosing
- Moving
- Perceiving
- Knowing
- Feeling

Although the word *taxonomy* may be somewhat overwhelming for the beginning practitioner, remember it is

only an organizational framework and one should not be intimidated by it. Rather, view this approach as another way to find appropriate nursing diagnoses for clients on the basis of the classification of human response.

STEPS IN DEVELOPING A NURSING DIAGNOSIS

1. Data cues are collected from the assessment phase.
2. Data cues are validated and examined.
3. Data cues are interpreted and assigned a meaning through the use of critical thinking.
4. Data are grouped into clusters.
5. The NANDA list is consulted.
6. The first part of the nursing diagnosis statement is written.
7. Related to (RT) factors are identified.
8. Phrases from steps 6 and 7 are combined to form a two-part nursing diagnosis.

(Data from American Nurses Association. [1998]. *Standards of clinical nursing practice* [2nd ed.] [p. 9]. Washington, DC: Author.)

DEVELOPING A NURSING DIAGNOSIS

The development of a nursing diagnosis is a systematic process in which certain activities need to be executed. The accompanying display illustrates the steps in the development of nursing diagnoses.

Assessing Database

In the assessment phase, the nurse collects data cues from the client. **Cues** are small amounts of data that are applied to the decision-making process. Nurses should be attentive to the cues gathered from the interview, health history, symptom analysis, physical examination, and laboratory and diagnostic data since they increase the index of suspicion and stimulate further observation of additional sets of cues. Examples of cues might be poor skin turgor, parched lips, dry skin, decreased urine output, and complaint of thirst. The expert nurse immediately processes these cues and determines a nursing diagnosis, plans client outcomes, and implements therapeutic nursing interventions. The novice nurse must proceed more cautiously and use additional time to process these data cues.

Validating Cues

After reviewing the data cues, the nurse validates that information and examines it carefully (see Figure 7-1). In the example of Mr. Zachary, the nurse determines if the information is accurate and complete. This process



Figure 7-1 This nurse is validating the cues collected from this client during the assessment phase.

involves verifying subjective and objective data. Verification can be done by interviewing Mr. Zachary again and reassessing data cues, for example, weighing him and measuring abdominal girth.

Interpreting Cues

Through interpretation of data cues and use of critical-thinking strategies, the nurse assigns a meaning to the data cues. In order to interpret Mr. Zachary's subjective and objective data cues, the nurse should ask the following questions:

THINK ABOUT IT

Identifying Data Cues

What are the relevant data cues that can be gathered from the following assessment data for Peter Zachary, age 44?

Subjective Data

- "I am the father of two boys."
- "I paint houses for a living."
- "I go to church every Sunday."
- "I always seem to be hungry, and I eat five or six times a day."
- "I've gained 12 pounds this year."

Objective Data

- Client is 5 feet 10 inches and weighs 204 pounds.
- Protruding abdomen over belt and waist of pants.
- Double chin.
- Fleshy loose upper arms.
- Dimpling of buttocks.
- One bowel movement every other day.
- Vital signs: HR 92; BP 130/80; R 17; T 98.9°F.
- Red scaly patches on skin.
- Nonproductive cough.
- Birthmark right upper hip.

- What is this information telling me?
- Is there a pattern?
- Can this information be put together?
- Is the information falling into a logical arrangement?
- Is the information forming natural groupings?

Critical Thinking in Nursing Diagnosis

Contemporary nursing practice, with its focus on nursing diagnoses, interventions, and outcomes, requires critical thinking (Pesut & Herman, 1999). Interpreting data cues is one example of critical thinking that the nurse must do on a daily basis when working with clients. Specifically, the synthesis of information that takes place when interpreting data cues demonstrates how essential it is for the nurse to think critically. Interpreting Mr. Zachary's cues is pivotal for correctly diagnosing his actual, or at-risk problem, or wellness state. The accompanying display provides questions that are helpful in developing appropriate diagnoses.

Clustering Cues

Once the cues have been collected, validated, and interpreted, the data are then grouped into clusters. A **cluster** is a set of data cues in which relationships between and among cues are established to identify a specific health state or condition. Related pieces of information about the client are grouped together. Conclusions are drawn from the data cues. One piece of information by itself can be misleading. This idea is analogous to the assembly of a jigsaw puzzle. One puzzle piece by itself does not give an accurate idea of the picture. In the same way, one data cue (or piece of assessment data) does not have much relevance by itself. When more pieces of the puzzle are put together or when more data assessment cues are put together, the nurse may

have a beginning idea of what the puzzle picture or the client's health looks like.

In Mr. Zachary's situation, data cues that can be clustered together include: Subjective: "I always seem to be hungry and I eat five or six times a day" and "I've gained 12 pounds in the past year." Objective: weight 204 pounds, protruding abdomen, double chin, fleshy loose upper arms, and dimpling of buttocks.

Consulting NANDA List of Nursing Diagnoses

After the data have been organized into clusters, the nurse needs to consult the NANDA list to ascertain similarities and differences between the clusters and NANDA diagnoses. The clustered data are then matched with a particular NANDA diagnosis. In Mr. Zachary's case, the NANDA-approved diagnosis is *Imbalanced Nutrition: More Than Body Requirements*.

Writing the Nursing Diagnosis Statement

The nursing diagnosis selected from the NANDA list becomes the diagnostic label, the first part of the diagnosis statement. Etiologies are also identified from the NANDA list. The appropriate etiology is selected and joined to the first part of the statement with the "related to" phrase. Because the NANDA list of nursing diagnoses is constantly evolving, there may be times when no etiology is provided. In such cases, the nurse should attempt to describe likely contributing factors to the client's condition. In a two-part statement, the nursing diagnosis for Mr. Zachary would be *Imbalanced Nutrition: More Than Body Requirements* RT excessive food intake. The three-part statement would be *Imbalanced Nutrition: More Than Body Requirements* AEB weight gain, increased appetite, excess adipose tissue, and increased abdominal girth.

CRITICAL THINKING EXERCISE

The following questions should be considered by the nurse in the development of a nursing diagnosis:

- Do I have enough data to formulate a nursing diagnosis?
- Are any data missing?
- Is there any information on my database that seems incomplete or uncertain?
- Should I talk to the client and family again?
- What data fit together or have something in common?
- What specific cues from the client made me form this conclusion?
- What elements of this situation/condition/problem are able to be enhanced or resolved by therapeutic nursing interventions?
- What elements need to be referred to another discipline (e.g., medicine, social services, dietary)?



NURSING TIP

Nursing Diagnosis Process

The nursing diagnosis must be developed from the data, never the other way around. You should not try to fit a client to a nursing diagnosis but rather select the appropriate diagnosis from the data cues presented by the assessment of the client. Failure to do this may result in errors in developing a nursing diagnosis.

AVOIDING ERRORS IN DEVELOPING A NURSING DIAGNOSIS

Following is a discussion of common errors that may occur in the process of developing nursing diagnoses.

Problem with Assessment Data

There is an underlying assumption that nurses have adequate assessment skills and are knowledgeable about what data need to be collected. However, this is not always the case. The novice nurse may have only rudimentary assessment skills and limited clinical experience. Experienced nurses are challenged to keep current and sometimes are ill-equipped to collect appropriate assessment data. Because of the potential for these deficits, there may be errors made when writing a nursing diagnosis related to an incomplete database or inappropriately collected assessment data. When assessment data are missing, regardless of the cause, the end result is either an omission of nursing diagnoses, inaccurate diagnoses, or incorrect qualifying statements about the diagnoses.

Incomplete Collection of Assessment Data

Incomplete collection can occur when the nurse has neither had nor taken the time to appropriately address all subjective and objective data. For example, during admission of a new client to a health care facility, a nurse is interrupted during the data collection and fails to return to finish the admission process at the end of the shift.

Restricted Data Collection

Restricted data collection occurs when a client is unable or unwilling to provide the necessary data. An example would be a newly admitted client with a cerebrovascular accident who has impaired speech and can only provide limited assessment data.

Failure to Validate Data

Failure to validate occurs when the nurse does not confirm previously collected data. An example would be failure by the nurse to recheck an admission blood pressure that was elevated. A follow-up blood pressure may have revealed a transient elevation due to the stress of the admission process.

Misinterpretation of Data

Misinterpretation can occur when the meaning attached to the data is incorrect. An example would be a client who comes to the ambulatory care clinic and

THINK ABOUT IT

Errors in Data Interpretation

Your client, a 35-year-old married man with two children, has been discharged home following an appendectomy. During your first two visits to assess the healing of the incision, you notice that the client seems reluctant to leave his bed and expresses minimal interest in topics other than the television programs he has been watching. When you inquire about his attempt to participate in leisure activities with his wife and children, he shrugs his shoulders and appears bored with the discussion. On the basis of this assessment, you formulate a nursing diagnosis of *Deficient Diversional Activity* RT client's lack of engagement in recreational activities. If you were to determine on your third visit that the client has refrained from these kinds of activities because of his fear of reopening the incision, how would you reconcile the discrepancy between the assessment data gathered and the nursing diagnosis that was developed? Do you think that your values relating to this client's conduct may have played a role in the misinterpretation of the data and the resulting nursing diagnosis?

presents with several signs and symptoms, including a reported 4-pound weight gain that month. Further investigation indicates this finding is not related to increased adipose tissue but, rather, is associated with fluid retention that accompanies an edematous state.

Inappropriate Data Clustering Associated with Lack of Clinical Knowledge

Inappropriate data clustering may occur when the nurse lacks sufficient theoretical and clinical expertise and knowledge to appropriately cluster data cues. An example would be the client who visits an industrial clinic with complaints of flulike symptoms, stomach cramps, and vomiting. The nurse attributes the vomiting to the influenza, but further analysis indicates that, in addition to this condition, this client is actually manifesting symptoms of a toxic reaction to prescribed drug therapy that is causing the vomiting.

Incorrect Writing of the Nursing Diagnosis Statement

Incorrect writing of the statement can occur when the nurse does not follow the guidelines for formulating a two- or three-part statement. An example would be in the two-part statement *Imbalanced Nutrition: Less Than Body Requirements* RT renal disease. Renal disease is a medical diagnosis, and, according to the guidelines, the etiology

must be a human response that the nurse is licensed and competent to treat. This diagnosis would be better stated as *Imbalanced Nutrition: Less Than Body Requirements* RT inadequate intake of an appropriate renal diet.

In conclusion, when the nurse makes premature conclusions without allowing sufficient time for analysis and interpretation of data, the subsequent care plan may be inappropriate for the client (Dobrzyń, 1995). The Nursing Checklist provides selected questions that nurses can ask themselves in order to avoid making mistakes when developing nursing diagnoses.



NURSING CHECKLIST

Avoiding Common Diagnostic Errors

When nurses are in the process of developing nursing diagnoses, the following questions should be considered:

- Am I saying the same thing twice?
- Am I using the medical diagnosis in my nursing diagnosis?
- Am I implying negligence or blaming anyone in my diagnosis?
- Have I stated the diagnosis with a client response or a client need?
- Am I making any value judgments about the client?

Values play an important role in interpretation of data, clustering of data, and ultimately the development of the diagnosis. Nurses must be cognizant of personal biases, being careful not to impose their value systems on clients. Personal prejudices should be avoided in the diagnostic statement.

Nurses must also remember to focus on the client when developing a nursing diagnosis. The problem statement is client centered, not nurse centered. Kim (1985) stated that the diagnosis plays a pivotal role in the nursing process by directing nursing actions and providing the focus for evaluating outcomes.

LIMITATIONS OF NURSING DIAGNOSIS

There are a number of limitations and professional concerns associated with nursing diagnosis. The primary concern is directed toward the lack of consensus among nurses regarding the NANDA-approved nursing diagnosis list. Criticisms about the list include disagreement over specific labels in the classification system and the perception that the list is confining, incomplete, medically oriented, and confusing. Many nurses are not familiar with the NANDA list and do not know how to

use it or feel “it doesn’t have the diagnosis” they need. It should be noted that this list is not meant to be inclusive. Development and refinement of diagnoses continue to be a focus of NANDA conferences. In addition, nurses may disagree with or refuse to use diagnoses such as noncompliance or knowledge deficit (Carpenito, 1995). In this instance, the nurse then has the choice and the right to not use these specific diagnoses.

Novice nurses need to know nursing diagnosis and nursing process in order to understand how the discipline of nursing intersects with the other health care providers. NANDA (1999) recognizes that health care is moving into an interdisciplinary, client-focused care environment that requires standardization of languages across disciplines. Many acute care facilities use an interdisciplinary care plan such as care maps and/or critical pathways to monitor client outcomes. All health care providers use the same care plan to document the client’s response to specific interventions. Common “client problems” listed on a critical pathway are written as nursing diagnoses such as **risk for infection** or **risk for injury**.

There are also legal considerations concerning the use of nursing diagnoses. Nurses are accountable for their actions and must document their interventions. If a nursing diagnosis is inappropriate or a nursing diagnosis list is incomplete and, as a result, the interventions are inappropriate or lacking, the nurse is liable for these errors in clinical judgment. These errors can be avoided by collecting comprehensive assessment data and by critically analyzing these data.

OVERCOMING BARRIERS TO NURSING DIAGNOSIS

According to Iyer, Taptich, and Bernocchi-Losey (1994), objections to using nursing diagnoses include: (1) nurses are more overworked than ever and have less time to spend with clients; (2) care is still organized around the medical diagnosis and nurses are involved in the completion of tasks based on this focus; (3) nurses are afraid they may be ridiculed for using nursing diagnoses; and (4) the nursing diagnosis list does not always fit the client situation. Carlson-Catalano (1993) asserted that health care agency administrators and health care practitioners dominate nursing’s focus and activities. This domination may contribute to the devaluation of the nursing diagnosis language and promote the use of the medical diagnosis.

NANDA’s language is still relatively new (approximately 25 years) compared to modern medical language that has existed for several hundred years. Some nurses would rather wait until the NANDA listing is complete before they use it. However, it is unrealistic to think that a system such as NANDA should not be used until it is completed. The ever-changing health care scene dictates that nurses participate in evolving methods to communicate within the health care industry.

Another barrier to the use of nursing diagnoses is the numerous approaches for application that are found in the nursing literature. Due to these various methods, it may be difficult for nurses to choose “one” method that they feel comfortable with. Nurses may also be unable and unwilling to use nursing diagnoses because of incomplete knowledge about the process and disagreements about wording. As a result, they elect not to participate at all.

After identifying the existence of barriers to the use of nursing diagnoses, it is possible to design strategies to overcome them. According to Carlson-Catalano (1993), the only way society will understand professional nursing is through the language used by nurses. Nursing diagnoses serve as a language that can be shared among the entire community of nurses (Carlson-Catalano, 1993). Familiarity with this language empowers the nurse to communicate more effectively with other nurses and health care team members. Effective communication, in turn, improves the accuracy in nursing diagnoses. Ultimately, the quality of care should improve and the costs associated with that care should decrease. Due to the fact that many acute-care facilities are asking nurses to do more with fewer resources, nurses are challenged to learn more efficient ways of performing their duties. Nurses’ time is spent more efficiently if less time is spent deciphering meanings of words.

Health care agency administrators and medical staffs need to be more supportive of the use of nursing diagnoses in their respective settings. In a survey by Thomas and Newsome (1992), findings suggested that institutional support makes a difference in the nurses’ use of nursing diagnoses. As the nursing profession becomes more confident in the use of the language, nurses will speak more sincerely and enthusiastically about nursing diagnoses. Increased professional confidence will then empower nurses to become more supportive of each other and less subject to ridicule.

THINK ABOUT IT

Nursing Diagnosis: A Standard Language

- How do you think nursing diagnoses assist nurses with communication among themselves?
- How do nursing diagnoses influence communication among nurses and other health care professionals?

When a nurse encounters client situations that do not readily fit the nursing diagnosis language, every attempt should be made to describe the phenomena. The nurse may be on the threshold of documenting the need for a new, as-yet-undiscovered nursing diagnosis.

As nurses collaborate on the refinement of nursing diagnoses, it may be possible to agree on certain aspects of the language. The achievement of this goal will end the use of multiple approaches and will make choices



NURSING CHECKLIST

Strategies for Optimizing the Use of Nursing Diagnosis

Nurses should implement the following strategies when working with nursing diagnoses:

- Agree on a common language.
- Acknowledge and embrace the fluid nature of the language of nursing diagnosis.
- Discuss the purpose and value of nursing diagnosis with administrators and medical staff.
- Support colleagues when they use nursing diagnosis language.
- Adopt a positive attitude toward the principles and taxonomy of nursing diagnosis.
- Be willing to add to the existing body of knowledge by describing unusual nursing phenomena.
- Participate in conferences, workshops, and other educational activities that advance and promote nursing diagnosis.
- Continue communicating with other nurses about nursing diagnosis

APPLICATION: WRITING NURSING DIAGNOSIS

Mr. Lowder is a 62-year-old male who was admitted last night through the emergency room because of difficulty breathing. He was also experiencing some difficulty voiding. His lower extremities are very swollen. History reveals he smokes one pack of cigarettes a day and has done this for the past 45 years. His vital signs are P 112; R 30; BP 172/96; T 101.1°F. He has an eighth-grade education, attends church every week, is estranged from his daughter, and says, “I hate hospitals because my mother died in one.”

1. From the data cues in this case study, group data into clusters.
2. Look at the NANDA list of diagnoses and see which diagnoses “fit” best with your data clusters.
3. Write the first part of the NANDA diagnosis for each cluster.
4. Attempt to identify etiological (related to) factors for the list you started in step 3.
5. Write two-part nursing diagnosis statements by combining steps 3 and 4.
6. Identify whether the nursing diagnoses on your list are actual, possible, risk, or wellness-oriented nursing diagnosis statements.
7. Prioritize the nursing diagnoses.

less complicated. Enhanced communication among nurses in everyday settings and among professionals who convene nationally and internationally to exchange ideas about nursing diagnoses is essential.

Most nursing educational programs now offer standardized content related to nursing diagnoses. In addition, experienced nurses need opportunities to review principles of nursing diagnoses, especially since so many are working in settings that tend to favor medical diagnoses and focus on achievement of tasks by the nurse (Brackstone, 1993). See the Nursing Checklist for a list of strategies that are helpful in overcoming barriers to the use of nursing diagnoses.

KEY CONCEPTS

- Nursing diagnosis is the second step in the nursing process and is the clinical judgment about individual, family, or community (aggregates) responses to actual or risk problems, wellness states, or syndromes.
- Through the efforts of NANDA and ANA, the identification and validation of nursing diagnosis as the second step of the nursing process has been substantiated and forms the basis for professional accountability.
- Nursing diagnosis contributes to a clearer conceptualization of knowledge unique to nursing, improved communication among nurses and other health care professionals, promotion of individualized client care, and support for theory development and nursing research.
- Nursing diagnoses can be written as either two-part statements (diagnostic label and etiology) or three-part statements (diagnostic label, etiology, and defining characteristics).
- The NANDA nursing diagnosis taxonomy is composed of nine human response patterns: exchanging, communicating, relating, valuing, choosing, moving, perceiving, knowing, and feeling.
- The process of developing a nursing diagnosis includes analysis of assessment cues, validation of cues, interpretation of cues, clustering of data, consulting NANDA's list of approved nursing diagnoses, and writing the nursing diagnosis statement.
- When the nurse is knowledgeable about the components of the nursing diagnosis process and is equipped to develop the diagnostic statement, the nurse is able to make appropriate decisions regarding therapeutic nursing interventions.
- To avoid committing errors in the nursing diagnostic process, nurses should ensure that the data collection is complete, that the interpretation of the data is accurate and based upon the nursing and not the medical diagnosis, and that the client's response to a health problem is amenable to therapeutic nursing interventions.
- The barriers that have been identified as preventing the use of nursing diagnosis in a more universal manner are the constraints on the time nurses can devote to client care; the continuing organization of health care according to medical diagnosis; the misunderstanding and ridicule that nurses can encounter when using nursing diagnoses; the nonapplicability of the list of nursing diagnoses to every client situation; the constantly evolving refinement of the nursing diagnosis language; and the availability of numerous approaches for formulation and application of nursing diagnoses.
- Although barriers to the use of nursing diagnosis may be present, they may be overcome by employing specific strategies such as agreeing on a common language; supporting colleagues' attempts to use nursing diagnoses; adopting a nonjudgmental attitude; and continuing to communicate with other nurses at national and international levels.

CRITICAL THINKING ACTIVITIES

1. Nate Jefferson, a nursing student, was reviewing his client's chart. The list of nursing diagnoses included in the chart seemed to describe him well. However, something disturbed him about the list. The list he reviewed appears below. What is your response to this list? Identify the nursing diagnoses that seem to be problematic and the reasons for your conclusions.
 - a. *Impaired Swallowing* RT stasis of food in oral cavity after chewing
 - b. *Risk for Injury* RT weight and being dropped by staff
 - c. *Impaired Skin Integrity* RT infrequent repositioning by staff
 - d. *Chronic Confusion* RT Alzheimer's disease
 - e. *Acute Pain* RT pain in right foot
2. Mr. Tyler is a 37-year-old client who limps into the clinic with pain in the right foot and swelling in the extremity. He is 5 feet 6 inches tall and weighs 275 pounds. While consulting the approved NANDA list of diagnoses, develop initial nursing diagnoses based on these data.
3. Alison Jones, RN, performs the nursing assessment and physical exam on Mr. Evans, a newly admitted client. Due to an emergency at home, Ms. Jones must leave and Dolores Smythe, RN, is assigned to care for Mr. Evans. Discuss possible sources of errors and ways to avoid them in planning Mr. Evans's care.
4. *Impaired Physical Mobility* is an approved NANDA diagnosis. List several etiologies that are appropriate for this diagnosis. Develop a two-part nursing diagnostic statement.

5. Select one strategy to overcome barriers to using nursing diagnoses. Describe how you would use this strategy in your clinical setting.
6. John Babcock, RN, asks: “What’s all the fuss about nursing diagnoses?” What would your response to him be?
7. Nursing diagnoses empower the nursing profession. Money is usually associated with power. Discuss how the use of nursing diagnoses affects both power and reimbursement in the nursing profession.

WEB RESOURCES

Health Informatic Standard—Nursing

<http://www.mcis.duke.edu/standards/specialties/nursing.htm>

North American Nursing Diagnosis Association (NANDA)

<http://www.nanda.org/>

NANDA to NIC Linkages

<http://medixb.webnet.net/CARE/NURSING/nandanic.html>

Outcome Identification and Planning



Four steps to achievement: plan purposefully, prepare prayerfully, proceed positively, pursue persistently.

—William A. Ward

COMPETENCIES

1. Explain the purposes of outcome identification and planning.
2. Describe the four elements of the planning component.
3. Describe the characteristics of goals and expected outcomes.
4. Discuss the five components in the construction of goals and expected outcomes.
5. Describe common problems in planning nursing care.
6. Explain the three categories of nursing interventions.
7. Describe the use of the plan of care in the outcome identification and planning step of the nursing process.
8. Discuss strategies for overcoming barriers to effective planning of nursing care.

KEY
TERMS

collaboration
consultation
criteria
dependent nursing
intervention
discharge planning
expected outcome

goal
independent nursing
intervention
initial planning
interdependent nursing
intervention
long-term goal

nursing intervention
nursing order
ongoing planning
plan of care
planning
rationale
short-term goal

Planning, the third step of the nursing process, includes the formulation of guidelines that establish the proposed course of nursing action in the resolution of nursing diagnoses and the development of the client's plan of care. Preceding this step is the collection of assessment data and the formulation of nursing diagnoses. After a nurse thoroughly assesses a client and determines the client's unique nursing diagnoses (or problems), a plan of action is developed with specific goals to resolve the nursing diagnoses or health problems of the client. Following the planning component, the nursing process continues with implementation of nursing interventions and evaluation of the client's plan of care.

The four critical elements of planning include:

- Establishing priorities
- Setting goals and developing expected outcomes (outcome identification)
- Planning nursing interventions (with collaboration and consultation as needed)
- Documenting

This chapter explains the planning component of the nursing process. The purpose, as well as the entire process, of the planning concept is illustrated with theory and examples. Strategies for effective planning of quality nursing care are described together with problems frequently encountered in this stage of the nursing process. The role of critical thinking in planning and outcome identification is emphasized.

PURPOSES OF OUTCOME IDENTIFICATION AND PLANNING

The American Nurses Association (1998), in its *Standards of Clinical Nursing Practice*, identifies outcome identification and planning as essential principles for ensuring the delivery of competent nursing care and outlines these components in terms of their significance within the nursing process. Although the overall purpose of a client's plan of care should be to maintain or improve health at an optimal level, planning is a framework on which to base scientific nursing practice.

OUTCOME IDENTIFICATION AND PLANNING AS A STANDARD COMPONENT OF CARE: ANA STANDARDS

Standard III. Outcome Identification

The nurse identifies expected outcomes individualized to the client.

Guidelines

Outcomes should be:

- Based on diagnoses
- Documented in measurable terms
- Developed with the client and health care providers
- Realistic and achievable

Standard IV. Planning

The nurse develops a plan of care that prescribes interventions to attain expected outcomes.

Guidelines

Planning should:

- Be individualized to the client's needs and status
- Be developed with the client, significant others, and health care providers
- Be documented
- Promote continuity of care

(Used with permission from American Nurses Association. [1998]. *Standards of Clinical Nursing Practice*. (2nd ed.). Washington, DC: Author.)

Therefore, the purposes of the planning component of the nursing process are to provide adequate direction to ensure quality nursing care for individual clients, to present a vehicle to improve staff communication, and to provide continuity in the delivery of individualized, quality nursing care to all clients.

PROCESS OF OUTCOME IDENTIFICATION AND PLANNING

The five steps of the nursing process are at the very core in using scientific reasoning for the delivery of individualized, quality nursing care in any setting (Doenges,

Moorhouse, & Geissler, 1997). The ability to make appropriate decisions based on a strong knowledge base and problem-solving strategies is an expected behavior of the professional nurse.

Critical Thinking

More specifically, professional nurses are expected to think critically to process data and to make convincing, intelligent decisions concerning the planning, management, and evaluation of health care for their clients (Prechter, 1993). By combining the critical-thinking skills inherent in the nursing process with the client's identified nursing diagnoses, the nurse can focus on resolving the client's nursing diagnoses with greater proficiency.

The planning of nursing care occurs in three phases: initial, ongoing, and discharge. Each type of planning contributes to the coordination of the client's comprehensive plan of care. **Initial planning** involves development of beginning of care by the nurse who performs the admission assessment and gathers the comprehensive admission assessment data. Because of progressively shorter lengths of hospitalization, initial planning is important in addressing each prioritized problem, identifying appropriate client goals, and correlating nursing care to hasten resolution of the client's problems. **Ongoing planning** entails continuous updating of the client's plan of care. Every nurse who cares for the client is involved in ongoing planning. As new information about the client is gathered and evaluated, revisions may be formulated and the initial plan of care becomes further individualized to the client. **Discharge planning** involves critical anticipation and planning for the client's needs after discharge.

Planning is sequential, dynamic, and future-oriented. Planning includes establishing priorities, identifying goals and expected outcomes, developing nursing interventions, and documenting the client's plan of care. Appropriate guidelines are used to prioritize urgent needs. The client's nursing diagnoses are determined and then ranked by mutual agreement of the nurse and client or significant others. The planning component continues with thorough examination of this prioritized list of nursing diagnoses and determination of the client's goals and desired expected outcomes. After a clear picture is obtained regarding the diagnoses and goals, the nursing interventions can be planned to achieve the desired outcomes.

In the planning phase, the nurse organizes "thought processes for clinical decision making" (Doenges et al., 1997). To think critically is to examine an issue purposefully from a goal-directed perspective. Critical thinking "is based on principles of science and scientific method" (Alfaro-LeFevre, 1998). Therefore, critical thinking is a useful procedure in the development of objectives and in the formulation of a blueprint to achieve those objectives. The formulation of objectives is accomplished by using valid and reliable data previously gathered during the assessment component of the nursing process.

Establishing Priorities

The establishment of priorities is the first element of planning. In establishing priorities, the nurse examines the client's nursing diagnoses and ranks them in order of physiological or psychological importance. This method organizes a client's nursing diagnoses into an operational format for the planning of nursing care. These diagnoses should be mutually ranked by the nurse and client or family and significant others. Involving the client in shared decision-making power helps motivate the client and gives the client a feeling of control, which inspires successful achievement of each goal (Doenges et al., 1997).

When an individual client has more than one diagnosis, the nurse and client need to establish priorities to identify which nursing diagnosis will be addressed initially in the plan of care (Carpenito, 1999). By communicating this decision-making process to other members of the health care team, the nurse encourages an orderly approach to the achievement of optimal health for each client.

Various guidelines are used in the establishment of priorities for determining which nursing diagnosis will be addressed initially. The client's basic needs, safety, and desires, as well as anticipation of future diagnoses must be considered. One of the most common methods of selecting priorities is the consideration of Maslow's hierarchy of needs, which requires that a life-threatening diagnosis be given more urgency than a non-life-threatening diagnosis. Once the basic physiological needs (e.g., respiration, nutrition, hydration, elimination) are met to some degree, the nurse may consider needs on the next level of the hierarchy (e.g., safe environment, stable living condition) and so on up the hierarchy until all the client's nursing diagnoses have been prioritized.

THINK ABOUT IT

Prioritizing Nursing Diagnoses

Mr. Clyde Morrison, an elderly homeless client, was admitted to the hospital with a medical diagnosis of malnutrition. Identified nursing diagnoses include *Imbalanced Nutrition, Less Than Body Requirements* related to inability to procure appropriate food; *Constipation* related to inadequate fluid intake; and *Disturbed Body Image* related to feelings of inadequacy and inability to live up to identified standards. What should the priority ranking of this client's nursing diagnoses be?

A useful guide for the beginning nursing student would be to examine each nursing diagnosis, determine its level of need, and rank the need in order of priority. Table 8-1 illustrates this process.

Another consideration in the designation of priorities is client preferences. If at all possible, the client

TABLE 8-1
Ranking Nursing Diagnoses

Nursing Diagnosis	Maslow's Hierarchy of Needs	Rank
Anxiety related to hospitalization	Safety and security	Moderate
Ineffective Coping	Self-esteem	Low
Ineffective Airway Clearance related to excessive secretions	Physiological	High

should always be involved in the decision-making process of establishing priorities. If the nurse and the client do not mutually set priorities, there may be a contradictory course of direction and motivation, which may lead to noncompliance and nonresolution of the client's nursing diagnoses. The client must participate in the identification of priorities so that the nature of the problem, as well as the client's values, are reflected in the selected course of action.

An additional point regarding the establishment of priorities is the anticipation of future diagnoses. Nursing diagnoses of low and moderate priorities often involve the prevention of anticipated potential or risk diagnoses. Although potential nursing diagnoses may not be a current threat to the client, their seriousness may require that the nurse consider the development of nursing interventions directed toward prevention of the problem. For example, a client in the Postanesthesia Care Unit may have a high-priority nursing diagnosis of *Ineffective Breathing Pattern* related to the anesthesia and sedative drugs. Despite the fact that the client currently has no problem in this area, this diagnosis is indeed the basis for the Postanesthesia Care Unit protocol of monitoring the client closely.

Establishing priorities does not mean that one diagnosis must be totally resolved before giving attention to another diagnosis. Nursing interventions for several diagnoses may be carried out simultaneously. However, at times, it is crucial that the nurse and client correctly identify the order of priority of the client's nursing diagnoses so that maximum effort can be directed toward resolution of the most urgent diagnosis. Table 8-2 illustrates this process.

Establishing Goals and Expected Outcomes

After assessing the client, formulating nursing diagnoses, and establishing priorities, the nurse sets goals and identifies and establishes expected outcomes for each nursing diagnosis. The purposes of setting goals

TABLE 8-2
Prioritizing Nursing Diagnoses with Accompanying Nursing Implications

Priority	Diagnosis	Nursing Implications
High	<i>Ineffective Breathing Pattern</i>	<ul style="list-style-type: none"> Assess breath sounds. Auscultate lungs. Monitor vital signs. Reposition client.
Moderate	<i>Risk for Impaired Skin Integrity</i>	<ul style="list-style-type: none"> Perform comprehensive skin assessment. Keep skin clean and dry. Provide turning schedule.
Low	<i>Ineffective Coping</i>	<ul style="list-style-type: none"> Assist to identify problem. Encourage keeping daily journal. Teach client strategies for expressing feelings.

and expected outcomes are to provide guidelines for individualized nursing interventions and to establish evaluation criteria to measure the effectiveness of the nursing care plan.

A **goal** is an aim, an intent, or an end. A goal is a broad or globally written statement describing the intended or desired change in the client's behavior, response, or outcome. An **expected outcome** is a detailed, specific statement that describes the methods through which the goal will be achieved. It includes aspects such as direct nursing care and client teaching.

THINK ABOUT IT

Setting Mutual Priorities

Mr. Jules Gordon has been admitted with third-degree burns of approximately 80% of his body. He is particularly concerned with the nursing diagnosis of Body Image Disturbance related to scarring and disfigurement, whereas the nurse's major concern is with the nursing diagnosis of Deficient Fluid Volume related to fluid shifts because it is far more life-threatening. In this situation, the nurse's and client's priorities are not set mutually because they have separate primary goals. This situation is leading to conflict and a hindrance of goal accomplishment. What are some ways that this situation can be approached so that both nursing diagnoses may be resolved?

Writing Goals

Written goals need to be constructed clearly. Clear, precise terminology improves the chances that goals will be achieved. When goals are clearly written, their establishment provides direction for the nursing plan of care and for determination of effectiveness in the evaluation of nursing interventions. A guideline is provided for the desired change in the client, and the client has a clear idea of the direction to be taken for achieving resolution of each nursing diagnosis. Goals establish appropriate evaluation criteria to measure the effectiveness of planned nursing interventions for the resolution of the client's individual nursing diagnoses.

Goals should be established to meet the immediate, as well as long-term prevention and rehabilitation, needs of the client. A **short-term goal** is a statement written in objective format demonstrating an expectation to be achieved in resolution of the nursing diagnosis in a short period of time, usually in a few hours or days. A **long-term goal** is a statement written in objective format demonstrating an expectation to be achieved in resolution of the nursing diagnosis over a longer period of time, usually over weeks or months (Alfaro-LeFevre, 1997). See the accompanying display for examples of short-term and long-term goals.

SHORT- AND LONG-TERM GOALS

Nursing Diagnosis: Chronic pain related to rheumatoid arthritis

Short-term (focused on etiology)	<ul style="list-style-type: none"> • Verbalizes the presence of pain • Identifies factors that influence the pain experience • Client or significant other administers pain medication appropriately
Long-term (focused on the problem)	<ul style="list-style-type: none"> • Verbalizes comfort

Another consideration is the accuracy in identifying the etiology of the problem. If the etiology of the problem is incorrectly identified, the client may meet the short-term goal but the problem will not be resolved. Thus, it is important to correctly identify the etiology of the problem.

Setting long-term goals is important in successful discharge planning. It assists in coordinating all health care team members to accomplish the same overall purpose, that is, client discharge. Coordination promotes continuity of care into settings such as restorative care or home health (see the accompanying display).

Expected Outcomes

After the goal is established, the expected outcomes can be identified based on the goal. Given the client's

unique situation and resources, expected outcomes are constructed to be:

- Realistic
- Mutually desired by the client and nurse
- Attainable within a defined time period

These desired outcomes are the measurable steps toward achieving the previously established goals (Doenges et al., 1997). Because nursing care is based on a holistic approach, expected outcomes may be written in the spiritual, emotional, physiological, developmental, and social dimensions. An expected outcome depicts measurable behavioral change or evidence of change in the client when the goal has been met. Several expected outcomes may be required for each goal. Expected outcomes are used in the evaluation process by providing a standard for comparison to determine if the client successfully accomplished the goal.

APPLICATION: RESTORATIVE CARE SETTING

Rosa Martinez is recovering from orthopedic back surgery in a restorative care facility. A nursing diagnosis of *Risk for Disuse Syndrome* related to immobilization due to skeletal traction has been identified. The following factors need to be considered in writing the short-term and long-term goals for this client:

- Immediate needs: Maintenance of elimination patterns, promotion of skin integrity, preservation of effective breathing patterns, and minimization of long-term immobility
- Rehabilitative needs: Resumption of normal musculoskeletal function, ability to use assistive devices correctly, increase in activity tolerance, and enhancement of self-esteem and well-being

The short-term goals should focus on maintenance of physiological patterns involving elimination, skin integrity, respiration, and mobility. The long-term goals should concentrate on the client's return to maximal functional capability and independence.

In the construction of both goals and expected outcome objectives, essential components include: subject, task statement, criteria, the conditions (if necessary), and time frame (Doenges et al., 1997). When goals and outcomes are written clearly, the nurse can select nursing interventions to ensure that the client's baseline data are thoroughly assessed, individual client needs are identified, and appropriate approaches are used in the plan of care.

Usually, each nursing diagnosis has one global goal and several expected outcomes. In writing the goal statement, the nurse considers the nursing diagnosis for the formulation of a suitable client behavior that illustrates reduction or alleviation of the nursing diagnosis.

Nursing Process Highlight

NURSING DIAGNOSIS: Disturbed Sleep Pattern

Goal: Client will sleep uninterrupted for 6 hours.

EXPECTED OUTCOMES

- Client will request back massage for relaxation.
- Client will set limits to family and significant other visits.

NURSING DIAGNOSIS: Ineffective Tissue Perfusion: Peripheral

Goal: Client will have palpable peripheral pulses in 1 week.

EXPECTED OUTCOMES

- Client will identify three factors to improve peripheral circulation.
- Client's feet will be warm to touch.

These concepts are demonstrated in the Nursing Process Highlight.

Each component of an appropriately written goal is discussed in the following paragraphs. For clarity of each concept, examples are provided with related discussion. The examples are designed with the intent of developing skills in the construction of goals.

APPLICATION: SUBJECT

Examples

1. By Saturday, the client will ambulate the entire length of the hallway three times a day.
2. The client will demonstrate the technique for self-administration of insulin by Friday.
3. The client will take own radial pulse and obtain the same results as the nurse by Saturday.
4. By Friday, the client will plan a low-salt diet for 24 hours in accordance with the diet plan left by the dietitian.

Question

Who is to achieve the desired behavior in each of the preceding examples?

Because the plan of nursing care is based on the client, the subject is the client.

Subject

The component to be considered initially in writing a goal is the subject. The subject identifies the person who will perform the desired behavior or meet the goal. In a client-centered plan of nursing care, the client is the person who needs to achieve a desired change in behavior. See the accompanying display for an application of the subject component.

Task Statement

The next component in writing goals is the task statement or the action verb. This component describes what the client (or subject) will do to obtain an expected change in behavior. The task statement enables the evaluator to determine achievement of observable behavior. When the actual behavior is stated as a task statement that can be clearly and directly measured, the nurse can determine whether the client is demonstrating achievement of the goal.

Only one task statement should be used for each goal. It is clearer to write separate goals than to try to accurately measure a combination of tasks. See the accompanying display for an application of the task statement.

APPLICATION: TASK STATEMENT

Examples

1. By Saturday, the client will ambulate the entire length of the hallway three times a day.
2. The client will demonstrate the technique for self-administration of insulin by Friday.
3. The client will take own radial pulse and obtain the same results as the nurse by Saturday.
4. By Friday, the client will plan a low-salt diet for 24 hours in accordance with the diet plan left by the dietitian.

Question

What is the action that the subject or client is expected to do in each of the preceding examples?

The examples demonstrate exactly what the subject, or client, is to perform ("will ambulate"; "will demonstrate"; "will take"; "will plan").

Criteria

The next essential component is the criteria of a goal. **Criteria** are standards used to evaluate whether the behavior demonstrated indicates accomplishment of the goal. Criteria may be written in a variety of ways. Criteria may include:

- A time limit
- Amount of activity

- Important characteristics of accurate performance
- Description of the performance to be followed

The nurse should specify the precise performance to be considered acceptable in accomplishment of the goal.

It is not always possible to specify a criterion with as much detail as one would like; however, the nurse should continue to communicate precise criteria as explicitly as possible. To provide better direction to the client, the nurse considers how well the client, family member, or significant other should perform the task. See the accompanying display for an application of criteria.

APPLICATION: CRITERIA

Examples

1. By Saturday, the client will ambulate the entire length of the hallway three times a day.
2. The client will demonstrate the technique for self-administration of insulin with aseptic technique.
3. The client will take own radial pulse and obtain the same results as the nurse by Saturday.
4. By Friday, the client will plan a low-salt diet for 24 hours in accordance with the diet plan left by the dietitian.

Question

What are the standards that will be used to evaluate the client's achievement of the objective in each of the preceding examples?

The examples indicate the standards used to evaluate whether the behavior demonstrated by the client indicates that the goal has been reached. The criteria in example 1 include a time limit and the amount of activity.

Example 2 demonstrates important characteristics of performance accuracy by stating "with aseptic technique."

Example 3 sets standards of performance accuracy and includes a time limit.

Example 4 includes a time limit and a sample plan to be followed.

Conditions

The next component to be included in writing proper goals is the conditions under which the client should perform or demonstrate mastery of the task. Although this component is optional in terms of writing goals, conditions may provide clarity and assist the client in demonstrating the expected behavior. The conditions may include the experiences that the client is expected to have before performing the task. See the accompanying display for an application of conditions.

Time Frame

The last component to be included in writing goals appropriately is the time frame in which the client should perform or demonstrate mastery of the task.

APPLICATION: CONDITIONS

Examples

1. By Saturday, the client will ambulate the entire length of the hallway three times a day with the use of a walker.
2. The client will restrict fluids to 1000 ml daily beginning today.
3. The client will take own radial pulse and obtain the same results as the nurse by Saturday.
4. By Friday, the client will plan a low-salt diet for 24 hours in accordance with the diet plan left by the dietitian.

Question

What are the conditions under which the activity must be performed in each of the preceding examples?

Example 1 states the conditions with which the activity must be performed ("with the use of a walker"). Example 4 cites the condition by which the activity must be performed ("in accordance with the diet plan left by the dietitian").

Problems Frequently Encountered in Planning

Nursing students, as beginners in the use of the nursing process, often fall into some common pitfalls when applying the steps to practice. These pitfalls are described with the intent of providing a clear direction for the use of this process and proposing suggestions for avoiding these common errors.

In regard to writing goals, the errors frequently observed in this component involve improper format. Format errors include goals that are nurse-centered instead of client-centered, unrealistic, negative rather than positive, generically copied from a reference and not individualized to the client, unmeasurable, nonspecific, nonbehavioral, vague, wordy, and without a time frame.

Another challenge in the development of goals and expected outcomes is the establishment of appropriate time frames for accomplishment of the intended results. Although this component may be difficult at first to master, nursing students should practice writing goals that are realistic and include appropriate time frames using available literature and resources to gain expertise. It is preferable for a goal to include an excessively short, rather than an excessively long, time frame, because the goal is brought to attention in the evaluation process more frequently. By inserting the time frame "daily" for specific goals, the expected outcome will be brought up frequently for evaluation. Through a process of building on continued professional growth and experience, students and beginning

nurses will become more adept and realistic in applying the nursing process to client situations.

Finally, novices as well as experienced nurses tend to make decisions for clients in a paternalistic fashion by deciding what is best for the client without input from the client. To correct this problem, the nurse must establish a trusting nurse-client relationship that promotes mutual understanding and caring. The nurse should encourage clients to make their own decisions regarding health care.

Planning Nursing Interventions

Once the goals have been mutually agreed on by the nurse and client, the nurse should use a decision-making process to select appropriate nursing interventions. A **nursing intervention** is an action performed by a nurse that helps the client to achieve the results specified by the goals and expected outcome. These terms are based on scientific principles and knowledge from behavioral and physical sciences. Usually, several nursing interventions are developed for each of the goals identified for the client (Sparks & Taylor, 1993). It is important to identify as many nursing interventions as possible so that if one proves to be unsuitable, others are readily available. The interventions are prioritized according to the order in which they will be implemented.

With the inclusion of scientific problem solving and critical thinking, the delivery of quality, individualized nursing care is greatly enhanced. Through critical thinking, sound conclusions are reached in the selection of nursing interventions to prevent, reduce, or eliminate the nursing diagnoses or problems. The nurse studies the entire issue thoroughly in the planning component of the nursing process by examining the assessment data and nursing diagnoses, analyzing the client's goals and expected outcomes, and selecting which nursing interventions should be used from a multitude of possibilities to ensure the delivery of quality nursing care for each client.

Several factors can assist the nurse in selecting nursing interventions. Just as the client's goals can be derived from the nursing diagnosis, the nursing interventions can be developed from the etiology of each nursing diagnosis. The effective nurse plans interventions that are directed toward the cause of the client's nursing diagnosis or problem. For example, for a client with angina who may have the nursing diagnosis of *Pain* related to myocardial ischemia, an appropriate nursing intervention would be to help the client conserve energy (i.e., bedrest).

The nurse may use various guidelines in selecting appropriate nursing interventions. These guidelines include the individual nurse practice acts, state boards of nursing standards, and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) standards for nursing care. Other determining factors of appropriate nursing interventions include whether

an action is realistic in terms of the abilities of the client and nurse, and if it is compatible with available resources, the client's values and beliefs, and other therapies planned for the client.

In determining which nursing interventions to use, the nurse should critically consider the consequences and the risks of each intervention. After considering these factors, the nurse selects those that are most likely to be effective with the minimum of risk. Table 8-3 applies the guidelines for selection of appropriate nursing interventions for a specific nursing diagnosis.

After setting the goals and planning the appropriate nursing interventions, the nurse writes nursing orders to communicate the exact nursing interventions that are to be implemented for the client. A **nursing order** is a statement written by the nurse that is within the realm of nursing practice to plan and initiate. These statements specify direction and individualize the client's plan of care. For example, a health care practitioner's order to force fluids must be specified in the nursing order as the number of milliliters per hour or per shift (e.g., 100 ml/h or Day shift = 800 ml; Evening shift = 800 ml; Night shift = 400 ml).

TABLE 8-3
Nursing Interventions: Selection Guidelines

<p><i>Nursing Diagnosis:</i> Acute Pain related to myocardial ischemia</p> <p><i>Goal:</i> Client will resume normal activities of daily living.</p> <p><i>Expected Outcome:</i> Client will verbalize relief of pain.</p>	<p><i>Etiology:</i> Myocardial ischemia</p> <p>Nursing Interventions:</p> <ul style="list-style-type: none"> • Assess pain characteristics such as location, quality, severity, duration, onset, relief. • At first signs of pain, instruct client to relax and discontinue activity. • Instruct client to take sublingual nitroglycerin. • If pain continues after repeating doses every 5 minutes for a total of three pills, notify the health care practitioner or nurse practitioner. • Administer oxygen as prescribed. • Note time interval between episodes of pain. • Maintain bed rest and quiet environment to decrease oxygen demands. • Give analgesic medications as prescribed. • Offer assurance and emotional support by explaining all treatments and procedures and by encouraging questions.
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Ensuring that nursing orders are well written requires several essential elements. These elements include: the nursing order date, action verb, detailed description, time frame, and signature (Wilkinson, 1998). See the accompanying display for a summary of the elements of a nursing order.

ELEMENTS OF NURSING ORDERS

- **Date:** The date on which the order is written. This information is updated to reflect review and revision.
- **Action verb:** Directs the nurse's action. Examples of action verbs are *explain*, *demonstrate*, and *auscultate*.
- **Detailed description:** Precisely clarifies what the nurse's action will be. This phrase explains what, when, where, and how.
- **Time frame:** Describes when, how often, and how long the nursing order is to be performed.
- **Signature:** Indicates the nurse who writes the order. This element implies legal and ethical accountability.

The type of nursing order written is determined by the client problem. The nurse is responsible for writing nursing orders that involve health promotion, observation, prevention, and treatment (Wilkinson, 1998). Table 8-4 gives examples of types of nursing orders.

Categories of Nursing Interventions

Nursing interventions are classified according to three categories: independent, interdependent, and dependent. **Independent nursing interventions** are nursing actions initiated by the nurse that do not require direction or an order from another health care professional. These interventions are sanctioned by professional nurse practice acts derived from licensure laws. In many states, the nurse practice acts allow independent nursing interventions regarding activities of daily living, health education, health promotion, and counseling. An example of an independent nursing intervention is the nurse's action to elevate a client's edematous extremity.

Interdependent nursing interventions are those actions that are implemented in a collaborative manner by the nurse with other health care professionals. **Collaboration** is a partnership in which all parties are valued for their contribution. Collaboration is used to gather data, plan, implement, evaluate, and gain objectivity by examining another's viewpoint. Interdependent nursing interventions allow the client's nursing diagnoses to be resolved on the basis of recommendations of

TABLE 8-4
Types of Nursing Orders

Type	Description	Example
Health promotion	Nursing orders that encourage behaviors leading to a higher level of wellness	Teach the importance of a daily exercise regimen.
Observation	Nursing orders that include observations regarding potential complications as well as observations of client's current responses	Auscultate lungs q4h.
Prevention	Nursing orders that direct nursing care in the reduction of risk factors or the prevention of complications	Turn, cough, and deep breathe q2h.
Treatment	Nursing orders that include teaching, referrals, or physical care necessary in the treatment of an existing problem	Refer client to occupational therapist for assistance with skills for activities of daily living.

an interdisciplinary health care team approach. For example, a client care conference or a discharge planning committee uses an interdisciplinary approach that includes health care members such as a nursing supervisor, a home health care nurse, a dietitian, a social worker, a physical therapist, and occasionally a physician. The nurse assumes the responsibility of being both the primary coordinator of the client's plan of nursing care and intermediary of interdepartmental collaboration (Doenges et al., 1997).

In addition to collaboration, the planning of interdependent nursing interventions may also include consultation. **Consultation** is a method of soliciting help from a specialist in order to resolve nursing diagnoses. The need for consultation arises when an individual nurse identifies a problem that cannot be solved using own knowledge, skills, or resources. In the management of the client's plan of care, nurses may consult with other health care personnel including health care practitioners, clinical nurse specialists, nutritionists, physical therapists, and social workers. Nurses frequently consult to verify assessment data or to obtain clinical advice: for example, discussing the effects of chemotherapy on a client's self-esteem with an oncology clinical nurse specialist.

Consultation can be informal or formal. An informal consultation may simply involve another health care practitioner's ideas regarding a nursing problem. Some agencies have a formal protocol for the consultation of

a health professional and may require that certain forms be completed. Steps in formal consultation reflect a logical sequence, and include:

- Identifying the problem
- Collecting all relevant data
- Selecting a suitable consultant
- Communicating unbiased data regarding the problem
- Discussing recommendations with the consultant
- Incorporating the recommendations into the client's plan of care

The consultation process often generates new approaches to the client's individualized plan of care. Acquiring supplementary knowledge may help in ensuring that the best conceivable plan of care is being developed. In addition, nurses who have sought the help of a consultant are presented with an opportunity to learn from the recommendations for future situations.

Dependent nursing interventions are those actions that require an order from another health care professional. An example of a dependent intervention is administration of a medication. Although this intervention requires specific nursing knowledge and responsibilities, it is not within the realm of legal nursing practice in many states to prescribe medications. The nurse may not order medications but, when administering them, the nurse is responsible for knowing the classification, the pharmacologic action, normal dosage, adverse effects, contraindications, and nursing implications of the drugs. Therefore, dependent nursing interventions must always be guided by appropriate knowledge and judgment. It should be noted that many state nurse practice acts sanction advanced practice registered nurses to prescribe medications. In those states, prescriptive authority is an independent intervention for nurses in advanced practice. Figure 8-1 illustrates the three categories of nursing interventions.

All nursing interventions require critical thinking in making appropriate nursing judgments. Alfaro-LeFevre (1998) states that the development of critical reasoning skills by nurses is a progressive process that requires a dedication to examine common health problems, participate in diverse clinical experiences, and prepare for delivery of care in clinical settings. Given the emphasis on critical thinking in the planning step of the nursing process, the nurse does not automatically carry out a health care practitioner's order without due consideration. All requested orders are given consideration for their appropriateness. An in-depth knowledge base is necessary to recognize an error and seek clarification. The use of rationales helps the nurse practice decision making and substantiate judgments. The rationales should accompany the nursing intervention or nursing order statement on the written plan of nursing care. A **rationale** is an explanation based on theories and scientific principles of natural and behavioral sciences and the humanities.

Evaluating Care

Evaluating care involves determining the client's progress toward achievement of expected outcomes. Effective planning is essential if evaluation is to be effective. In other words, the planned outcomes are the yardsticks by which effectiveness of therapies are evaluated. If there is no stated expectation of care (i.e., client outcome), how can progress be measured?

NURSING OUTCOMES CLASSIFICATION (NOC)

Measuring outcomes in nursing began with Nightingale, who relied on mortality statistics as an indicator of quality of care for British soldiers in the



A



B



C

Figure 8-1 Examples of Types of Nursing Interventions: (A) Independent (B) Interdependent (C) Dependent

Crimean War. Nightingale proved that the mortality rate for soldiers declined as a result of improved sanitation (Oermann & Huber, 1999). Recently, there has been increased emphasis by the nursing community on evaluating outcomes. Nurse researchers (Mass & Johnson, 1997) at the University of Iowa have developed classifications of client outcomes, the Nursing Outcomes Classification (NOC). The NOC provides a standardized language that can be used to measure the effects of nursing practice on client outcomes. Just as the North American Nursing Diagnosis Association (NANDA) and the Nursing Interventions Classifications (NIC) are continuing to develop standardized nursing language relative to diagnosis and intervention, NOC is striving toward a similar goal of standardized language for classifying nursing interventions. An outcome classification system can be used to enhance decision-making in clinical practice and research.

Linking nursing interventions to improved client outcomes through scientific research is important. Nurse researchers who are observing, measuring, and studying client outcomes believe that outcomes indicate the quality or effectiveness of the nursing interventions provided. Porter-O'Grady (1999) states that nurses need to provide empirical evidence of the "insights and intuition of their practice" (p. 7). Strengthening the links between nursing interventions and client outcomes will benefit not only clients, but nursing as well. Having solid research evidence that documents the effectiveness of nursing care on client outcomes will influence political and financial decisions relative to nursing. "By measuring patient outcomes, nurses can answer two pivotal questions; Do our patients benefit from our care? And if so, how?" (Oermann & Huber, 1999, p. 41).

The NOC taxonomy focuses on function, physiology, psychosocial aspects, health knowledge and behavior, and perceived self-health and family health. The NOC system, which defines over 190 client outcomes that are sensitive to nursing interventions, allows nurses to evaluate client status over time.

PLAN OF CARE

The **plan of care** is a written guide that organizes data about a client's care into a formal statement of the strategies that will be implemented to help the client achieve optimal health. Nursing care plans usually include components such as assessment, nursing diagnoses, goals and expected outcomes, nursing interventions, and evaluations. The nurse begins the nursing care plan on the day of admission and continually updates and individualizes the client's plan of care until discharge.

The plan of care directs the efforts of the entire health care team regarding each client. This plan promotes the health care team's delivery of quality, holistic,

individualized, and goal-oriented care to the client. Attention to a comprehensive assessment of the entire person allows for a holistic approach. Individualization is enhanced by continuous reviewing and updating of the plan of care. A carefully formulated written plan of care prioritizes problems and addresses short- and long-term needs of the client. JCAHO standards state that each client will be assessed and reassessed according to the health care facility policy (JCAHO, 2000). The written plan of care authenticates activities of assessment by maintaining written records and providing evidence of nursing interventions, the client's response to nursing interventions, and changes in the client's condition.

Although plans of care differ in various institutions from handwritten to computerized forms, they all have the same basic elements in common. The plan of care is realistically designed and customized to each individual client's health status and is the final result of the planning component of the nursing process. The nursing plan of care documents health care needs, coordinates nursing care, promotes continuity of care, encourages communication within the health care team, and promotes quality nursing care.

There are several types of care plans. These different types include student-oriented, standardized, institutional, and computerized care plans. The student-oriented care plan promotes learning of problem-solving skills, the nursing process, verbal and written communication skills, and organizational skills. This comprehensive care plan has great depth for teaching the process of planning care. Educational programs vary, but usually the student-oriented care plan begins with assessment and proceeds in a sequential manner until it concludes with the plan of care evaluation.

The standardized care plan is a preplanned, preprinted guide for the nursing care of client groups with common needs. This type of care plan generally follows the nursing process format (i.e., problem, goals, nursing orders, and evaluation). The nurse may use standardized care plans when a client has predictable, commonly occurring problems. Individualization may be accomplished by the inclusion of additional handwritten notes on unusual problems.

Institutional nursing care plans are concise documents that become a part of the client's medical record after discharge. The Kardex nursing care plan is an example of this type of care plan and is frequently used. The institutional nursing care plan may simply include the problem, goal, and nursing action. In addition, the Kardex nursing care plan may be expanded to include assessment, nursing diagnosis, goal, implementation, and evaluation. Figure 8-2 provides an example of an institutional care plan.

Computers are used for creating and storing nursing care plans and can generate both standardized and individualized nursing care plans. The nurse selects appropriate diagnoses from a menu suggested by the computer, which then lists possible goals and nursing

NURSING DIAGNOSIS	NURSING INTERVENTIONS	EVALUATION
Ineffective breathing pattern R/T operative site/incisional pain.	1. Auscultate breath sounds q 4h. & PRN 2. Assist Opt. to TCDB q 2h while awake.	1. Lung clear on auscultation. 2. "It doesn't hurt as much to cough today."
Potential for infection R/T surgical incision & indwelling catheter	Assess for s/s of infection q 4h.	T-100.2°, incision site warm & pink, non-edematous. "It really hurts under the bandage."
Altered bowel elimination R/T abdominal surgery.	1. Restart oral fluids gradually. Offer clear liquids frequently 2. Observe for abd. distension & evaluate tolerance when pt. begins taking fluids/foods.	Unable to tolerate oral fluids - vomited p taking pre chips.

Figure 8-2 Handwritten Institutional Care Plan

interventions. The nurse has the option of reading the client's plan of care from the computer screen or printing out an updated working copy. Figure 8-3 presents an example of a computerized nursing care plan.

STRATEGIES FOR EFFECTIVE CARE PLANNING

In planning quality nursing care for each client, the nurse assumes responsibility for the coordination of total nursing care. The nurse coordinates the participation of various health care team members to implement their recommendations into the delivery of quality nursing care. Critical thinking assists the nurse in establishing collaborative relationships with other members of the health care team and managing complex nursing systems.

An important strategy for effective planning is clear communication of the client's plan of care to other health care personnel.

THINK ABOUT IT

Coordination of Care

Mr. Eduardo Rodriguez has been admitted with arthritis. His left knee is extremely edematous, and the health care practitioner has ordered heat application of 100°F to the left knee four times a day for 2 hours. In considering the appropriateness of this order, the nurse detects an error regarding the time frame because heat produces maximum vasodilation in 20 to 30 minutes to dissipate the edema; further application of heat may lead to a rebound phenomenon of tissue congestion and vessel constriction, as well as potential burns. At this point, the nurse needs to seek clarification of the order from the health care practitioner. What would be appropriate methods of handling this situation?

The nurse must always communicate the plan of care in clear, precise terms. Avoid using vague terminology such as *improved*, *adequate*, and *normal*.

resolution of all nursing diagnoses, the nursing plan of care that is individualized can improve health to the client's optimal level.

KEY CONCEPTS

- The outcome identification and planning component of the nursing process is a sequential, orderly method of using problem-solving skills and critical thinking to formulate a nursing plan of care to resolve nursing diagnoses.
- The planning component of the nursing process includes establishing priorities, setting goals, developing expected outcomes, selecting nursing interventions, and documenting the plan of care.
- The purposes of outcome identification and planning are to provide direction for nursing care, to improve staff communication, and to provide continuity of nursing care.
- The establishment of priorities may be guided by such factors as endangerment of well-being, Maslow's hierarchy of needs, client preferences, and anticipation of future diagnoses.
- Setting goals and expected outcomes provides guidelines for directing nursing interventions and establishes evaluation criteria by deciding on goals that illustrate a desired change in the client's behavior.
- Goals and expected outcome objectives include the components of subject, task statement, criteria, conditions, and time frame.
- Two common problems frequently encountered in planning in regard to goals are the improper format and unrealistic and nonmeasurable qualities of this component.
- In planning nursing care, the nurse uses an expansive scientific knowledge base and critical thinking to select independent, interdependent, and dependent nursing interventions guided by local and federal standards of care.
- The plan of care documents health care needs, coordinates nursing care, promotes continuity of care, encourages communication within the health care team, and promotes quality nursing care.
- Strategies for effective care planning include communication of the client's plan of care within the health care team, establishment of a realistic plan of care, and formulation of measurable and future-oriented goals.

CRITICAL THINKING ACTIVITIES

1. Decide whether the following statements are client-centered and place a mark in front of all client-centered goals.
 - _____ 1. The nursing assistant will ambulate client in the hall three times a day by Saturday.
 - _____ 2. Will teach the client to plan a low-fat diet for 24 hours.
 - _____ 3. The client will describe two purposes of a low-fat diet by Wednesday.
 - _____ 4. Will encourage the client to walk the entire length of hallway two times a day by Thursday.
2. Decide whether the following statements have action verbs for their task assignment and place a mark in front of all goals with action verbs.
 - _____ 1. The client will know five reasons for proper nutrition.
 - _____ 2. The client will be able to state where diabetic injection equipment may be purchased after discharge.
 - _____ 3. The client will explain the purpose of maintaining asepsis in daily dressing changes by Wednesday.
 - _____ 4. The client will understand how to change dressings on abdomen.
3. Indicate whether the following statements have criteria and place a mark in front of all goals with criteria.
 - _____ 1. The client will describe two purposes of the low-salt diet by Friday.
 - _____ 2. The client will know the cause of low blood sugar.
 - _____ 3. The client will understand the importance of returning for follow-up visits to the health care practitioner.
 - _____ 4. The client will demonstrate crutch walking the entire length of the hallway twice a day.
4. Decide whether the following statements have conditions and place a mark in front of all goals with conditions.
 - _____ 1. The client will describe two purposes of the low-salt diet by Friday.
 - _____ 2. The client will know the cause of low blood sugar.
 - _____ 3. The client will understand the importance of returning for follow-up visits to the health care practitioner.
 - _____ 4. The client will demonstrate crutch walking.
5. Decide whether the following statements have time frames and place a mark in front of all goals with time frames.
 - _____ 1. The client will describe two purposes of the low-salt diet by Friday.
 - _____ 2. The client will know the cause of low blood sugar.
 - _____ 3. The client will understand the importance of returning for follow-up visits to the health care practitioner.
 - _____ 4. The client will demonstrate crutch walking.

MULTIPLE CHOICE QUESTIONS

6. The plan of nursing care includes:
 - a. Client assessment data, medical treatment regime and rationales, and diagnostic test results and significance
 - b. Doctor's orders, demographic data, and medication administration and rationales
 - c. Collected documentation of all team members providing care for your client
 - d. Client's nursing diagnoses, goals and expected outcome objectives, and nursing interventions
7. When establishing priorities of a client's plan of nursing care, the nurse should rank the highest priorities to life-threatening diagnoses and the lowest priorities to:
 - a. Safety-related needs
 - b. The client's social, love, and belonging needs
 - c. Needs of family members and friends who are involved in plan of care
 - d. Needs of client regarding referral agencies
8. What is the main purpose of the expected outcome?
 - a. To describe the education plans to be taught to the client
 - b. To describe the behavior the client is expected to achieve as a result of nursing interventions
 - c. To provide a standard for evaluating the quality of health care delivered to the client during the hospital stay
 - d. To make sure that the client's treatment does not extend beyond the time allowed under the diagnosis-related group system
9. What are the essential components of an expected outcome?
 - a. Nursing diagnosis, interventions, and expected client behavior
 - b. Target date, nursing action, measurement criteria, and desired client behavior
 - c. Nursing action, client behavior, target date, and conditions under which the behavior occurs
 - d. Client behavior, measurement criteria, conditions under which the behavior occurs, and target date
10. Which guideline is most appropriate when developing nursing interventions?
 - a. Choose actions that a nurse can perform without leaving the unit or consulting with medical staff.
 - b. Make intervention statements specific to ensure continuity of care.
 - c. Write interventions in general terms to allow maximum flexibility and creativity in delivering nursing care.
 - d. Make sure that nursing care activities receive priority over other aspects of the treatment regime.

WEB RESOURCES

American Nurses Association

www.nursingworld.org

Iowa Nursing Intervention Classification (NIC)

www.medixb.webnet.net/CARE/NURSING/nic.html

Unified Nursing Language

www.faculty.de.gcsu.edu/~jsewell/data/data/tsld027.htm

Implementation



The great thing in this world is not so much where we are, but in what direction we are moving.

—Holmes (in Wilson, 1994)

COMPETENCIES

1. Describe the purposes of the implementation step of the nursing process.
2. Explore the types of skills required for effective implementation.
3. Discuss various implementation activities that nurses execute as directed by the nursing plan of care.
4. Explain the nurse's roles and responsibilities in the delegation of care to assistive personnel and its impact on implementation.
5. Identify the specific types of nursing interventions that are implemented by the nurse and the characteristics of each type.
6. Discuss the importance of documentation in the implementation process.

**KEY
TERMS**

delegation
 discharge planning
 implementation
 nursing intervention
 protocol
 rationale
 standing order

Implementation, the fourth step in the nursing process, involves the execution of the nursing plan of care derived during the planning phase of the nursing process. It involves completion of nursing activities to accomplish predetermined goals and to make progress toward achievement of specific outcomes. The execution of the implementation phase of the nursing process, as with the other phases of the process, requires a broad base of clinical knowledge, careful planning, critical thinking and analysis, and judgment on the part of the nurse.

This chapter discusses the purposes of implementation, the specific skills associated with effectively implementing the nursing plan of care, and the activities involved in this process. Although identified as the fourth step of the nursing process, the implementation phase begins with assessment and continually interacts with the other steps in the process to reflect the changing needs of the client and the response of the nurse to those needs.

THINK ABOUT IT**Implementation Activities**

When you think of the activities performed by nurses on a daily basis, what specific actions come to mind? How would you categorize the level of skill that is required for each activity? How comfortable would you feel executing all of these activities yourself?

**PURPOSES OF
IMPLEMENTATION**

Implementation is directed toward a fulfillment of client needs that results in health promotion, prevention of illness, illness management, or health restoration in a variety of settings including acute care, home health care, ambulatory clinics, or extended care facilities. It also involves the delegation of tasks to staff members and assistive personnel and documentation of the specific activities executed by the nurse and the client's response to these activities.

The American Nursing Association (1998), in its *Standards of Clinical Nursing Practice*, describes the standards applicable to implementation in terms of both a standard of care and standards of professional performance. Adherence to these standards requires that the nurse have a current knowledge base, be proficient with technical and communication skills, and use sound judgment in determining safe and efficient use of personnel and materials.

**REQUIREMENTS
FOR EFFECTIVE
IMPLEMENTATION**

The implementation phase of the nursing process requires cognitive (intellectual), psychomotor (technical), and interpersonal skills. These skills serve as competencies through which effective nursing care can be delivered and are used either in conjunction with each other or individually as required by the client and the specific needs of the situation.

Cognitive skills enable nurses to make appropriate observations, understand the rationale for the activities performed, and appreciate the differences among individuals and how they influence nursing care. Critical thinking is an important element within the cognitive domain because it helps nurses to analyze data, organize observations, and apply prior knowledge and experiences to current client situations.

Proficiency with psychomotor skills is necessary to safely and effectively perform nursing activities. Nurses must be able to handle medical equipment with a high degree of competency and to perform skills such as administering medications and assisting clients with mobility needs (e.g., positioning and ambulating).

The use of interpersonal skills involves communication with clients and families as well as with other health care professionals. The nurse-client relationship is established through the use of therapeutic communication that helps ensure a beneficial outcome for the client's health status. Interaction between members of the health care team promotes collaboration and enhances holistic care of the client.

**IMPLEMENTATION
ACTIVITIES**

Nursing implementation activities include:

- Ongoing assessment
- Establishment of priorities
- Allocation of resources
- Initiation of nursing interventions
- Documentation of interventions and client response

These activities are interactive and each is discussed in further detail.

Ongoing Assessment

The nursing plan of care is based on the initial assessment data collected by the nurse and the nursing diagnoses derived from those data. Because a client's condition can change rapidly, or new data may become available through interaction with the client, ongoing assessment is necessary to validate the relevance of proposed interventions. Goals, expected outcomes, and interventions may need to be altered as new data are collected or progress toward outcomes is evaluated. Although a focused assessment should be completed during the initial interaction with the client, continuous observations during the implementation process allow for adaptations to be made to better individualize care.

It is not unusual for nursing diagnoses to change or to be resolved in a short period of time. For example, the nursing care plan for Mrs. Cline, a preoperative client, might include an intervention to teach her about the use of a patient-controlled analgesia (PCA) pump. As the use of this equipment is being demonstrated, the nurse observes that Mrs. Cline is unable to depress the button easily with the fingers of her right hand. Mrs. Cline informs the nurse that she forgot to mention that her joints swell occasionally and she has very little strength in her hand during these times. This information is essential for both developing a nursing diagnosis concerning Mrs. Cline's impaired physical mobility and determining appropriate teaching methods for use of the PCA pump.

THINK ABOUT IT

Relationship between Assessment and Implementation

Mrs. James, who has been diagnosed with diabetes, will be discharged from the hospital within a few days. The expected outcome in the nursing plan of care is that Mrs. James will correctly and accurately withdraw the prescribed amount of insulin and inject her own insulin. While implementing this teaching intervention, you observe that Mrs. James is unable to visualize the correct amount of insulin to withdraw in the syringe because of her impaired vision. How does the assessment of her response to the expected outcome affect your interventions related to the teaching strategies that need to be implemented with the client?

Ongoing assessment demands attention to verbal and nonverbal cues from the client and requires knowledge of expected responses to specific interventions. If nurses observe that responses are different from those expected, this assessment data can lead to a change in expected outcomes and accompanying interventions.

Ongoing assessment is of equal importance in home health care or extended care settings when contact with skilled health care providers might occur less frequently and the length of time that the care is required varies (see the accompanying display). The nurse's assessment and clinical judgment often determine whether the client needs continued care or referral to other health care providers.

APPLICATION: EXTENDED CARE SETTING

An important element in the ongoing assessment of clients in the extended care setting is the appraisal for the risk of falls. The following questions can help the nurse determine the seriousness of this risk.

- Which medications are currently prescribed for the client, and what are their effects on the central nervous system?
- Are elimination problems such as incontinence being experienced?
- Has the mental status of the client recently changed in terms of orientation to time and place?
- Does the client's level of mobility require ambulatory assistance devices such as a cane, walker, or wheelchair?
- If the client has previously experienced a fall, what were the conditions under which it occurred?

Establishment of Priorities

Following ongoing assessment and review of the problem list, priorities are determined for implementation of care. Priorities are based on:

- Which problems are deemed most important by the nurse, the client, and family or significant others
- Activities previously scheduled by other departments (e.g., surgery, diagnostic testing)
- Available resources

The change-of-shift report can also be a valuable tool in determining priorities. A client's condition and variables in the clinical setting can change quickly and frequently—especially in acute care settings—requiring that the nurse exercise strong clinical judgment and maintain flexibility in organizing care. For example, the nursing care plan for Mr. Jenkins, who had hip replacement surgery, might reflect a priority nursing diagnosis of *Impaired Physical Mobility* with interventions focused toward learning to ambulate. When the nurse listens to Mr. Jenkins' breath sounds on a particular morning, it is noted that his breathing is more labored and crackles can be auscultated in the lung bases. This assessment is noted on the change-of-shift report, and the priorities of interventions change to focus on this new development.

Time management is important whether the nurse is caring for one client or a group of clients. It is helpful to make a list of tasks that need to be accomplished throughout the day and to create a worksheet outlining a target time for these activities. Those activities with specified times for completion should be scheduled first. For example, medications usually allow a narrow time frame for administration and must be scheduled at specific times on the worksheet. An example of a worksheet that outlines a plan for activities is shown in Table 9-1. The time allotted for activities depends on the complexity of the task and the amount of assistance required by the client. An example of a worksheet for a group of clients is presented in Table 9-2.

Allocation of Resources

Before implementing the nursing plan of care, the nurse reviews proposed interventions to determine the level of knowledge and the types of skills required for safe and effective implementation. The assessment provides data for determining if an activity can be per-

formed independently by the client, can be completed with assistance from family, or requires assistance of health care personnel.

Delegation of Tasks

The registered nurse is legally responsible for all nursing care given. Whereas some interventions are complex and require the knowledge and skills of a registered nurse, other interventions are relatively simple and can be delegated to assistive personnel. **Delegation** is the process of transferring a selected nursing task in a situation to an individual who is competent to perform that specific task. It must be remembered that, although some activities can be assigned to other health care personnel, the registered nurse remains accountable for appropriate delegation and supervision of care provided by these individuals. In general, registered nurses are authorized by law to both provide nursing care to clients directly and supervise and instruct others to deliver this care. Further, the registered nurse is empowered to delegate selected tasks to either licensed or unlicensed nursing personnel (see Figure 9-1).

Decisions about delegation are guided by the needs of the client, the number and type of available personnel, and the nursing management system of the unit or agency. In performing delegated tasks, nursing students must either determine if the intervention is one that they have performed with supervision and can safely accomplish independently or is one for which assistance is needed.

The first consideration in determining the most appropriate nursing personnel to administer care is client safety. Nurse practice acts dictate to some extent which tasks can be legally delegated. For example, administration of blood or blood products is not an act

TABLE 9-1
Sample Worksheet of Nursing Activities (One Client)

Time	Activity
6:45 am	Listen to change-of-shift report.
7:00	Perform head-to-toe assessment of client, including vital signs.
7:10	Check routine medication times.
7:30	Chart assessment findings.
8:00	Serve breakfast. While client eats breakfast, review chart for new laboratory test data,
8:30	Record I&O after breakfast; remove breakfast tray.
8:40	Gather supplies for hygiene. Assist with AM care.
9:15	Assist up to chair. Show films about diabetic skin care.
10:00	Document interventions and observations on chart.
10:15	Review care plan for any needed revisions.
10:30	Report status of client to charge nurse. Attend inservice on IV care.
11:45	Take and record vital signs.



Figure 9-1 The registered nurse is responsible for delegating nursing tasks to other members of the health care team.

TABLE 9-2
Sample Worksheet of Nursing Activities (Group of Clients)

	7 AM	8 AM	9 AM	10 AM	11 AM	NOON
351 Hughes	V/S assess		Meds	Assist to chair	V/S Meds	Meds
352 Parsons	V/S assess	Feed	To PT	D/C plan	V/S	Telem. strip
353 Crowson	V/S assess	Ck. PTT results	Meds; Amb. in hall	Show video	BP sit/stand Meds	Telem. strip
354 Robinson	V/S assess	q2h I/O	Meds	q2h I/O		q2h I/O
355 Temple	Pre-op OR on call		Meds			
356 Anderson	V/S assess	NPO	Meds	V/S Gastro		Meds

Abbreviations: Amb., ambulate; BP, blood pressure; D/C, discharge; I/O, input/output; NPO, nothing by mouth; OR, operation room; PT, physical therapy; PTT, partial thromboplastin time; telem, telemetry; V/S, vital signs

THINK ABOUT IT

Delegation

Your employer, a large acute care hospital, has hired consultants to examine the cost of care expended in the facility and recommend a more cost-effective system. These consultants recommend decreasing the number of both registered nurses and licensed practical/vocational nurses and increasing the responsibilities of unlicensed assistive personnel. As a registered nurse in charge of the care of medical-surgical clients, what questions would you ask regarding this proposal? In what ways do you think your responsibilities would increase because of this situation? Do you think your responsibilities would decrease significantly? What impact would this proposal have on the ethical delivery of care to clients, specifically the nurse's need to cause no harm and promote good?

that can be legally delegated to licensed practical nurses or unlicensed assistive personnel in most states. Other activities, such as assisting clients with activities of daily living (ADL, those activities performed by a person usually on a daily basis), ordering supplies, or transcribing orders, can often be safely delegated to other personnel.

If delegation of a particular activity is legally allowed, the nurse should validate the knowledge and skill level of personnel before delegation. If uncertain about the level of competence of an individual to perform an activity, the nurse should not delegate the task even though it might be legally performed by that level of personnel. The registered nurse is held accountable to delegate only such care that can safely be done by the other individual and would be performed with the same level of competency and respect for state laws and regulations as would be evident in the nurse's performance of this care.

Types of Management Systems

Wise use of resources dictates that tasks be assigned to the most cost-effective level of personnel who can safely and proficiently perform the activity. The nursing management system often determines the numbers and types of personnel available. Changes in health care delivery in recent years have resulted in an increasing emphasis on cost containment and have subsequently created several unique management models. The redesign of the workplace in many health care agencies has included cross-training of employees, with nurses frequently assuming responsibilities formerly assigned to other health care providers. For example, nurses might draw blood for laboratory tests, perform electrocardiograms, or administer respiratory treatments, as care is focused around the client rather than the various departments in the agency. Nurses in community health settings have traditionally exercised a variety of roles in their practice. As health care delivery continues to evolve in this country, a variety of innovative approaches will emerge to better meet the needs of clients. The most common management systems currently used include functional nursing, team nursing, primary nursing, total client care, modular nursing, and case management.

Functional Nursing

The functional nursing approach divides care into tasks to be completed and uses various levels of personnel depending on the complexity of the assignment. Each member of the staff performs his or her assigned task for each client. For example, one nurse may assess each client and document findings and another may give all medications and treatments. Another nurse may be assigned to complete client teaching or **discharge planning** (process that enables the client to resume self-care activities before leaving the health care environment). One nursing assistant might serve all trays and collect

intake and output records for each client while another is responsible for giving baths or making beds.

The advantage of this system is that a large number of clients can be cared for by a relatively small number of personnel. In addition, it allows the use of less skilled (and less expensive) personnel for some tasks and allows personnel to be used in areas for which they have special knowledge or skill. However, this system can also result in fragmented and depersonalized care and may invite omissions in care because no *one* person is responsible for the total care of the client.

Team Nursing

The team nursing approach uses a variety of personnel (professional, technical, and unlicensed assistants) in the delivery of nursing care. The registered nurse is leader of the team and is responsible for supervision of the team, as well as planning and evaluating the results of caregiving activities. This management system uses professional nurses for skilled observations and interventions and provision of direct care to acutely ill clients, while licensed practical nurses care for less acutely ill clients, and nursing assistants are responsible for serving trays, making beds, and assisting the nurses with other tasks. This management system is frequently used because it is cost-effective and provides more individualized care than the functional approach.

Primary Nursing

In the primary nursing management system, the professional nurse assumes full responsibility for total client care for a small number of clients. Although care may be delegated to nurse associates for shifts when the primary nurse is not in attendance, the primary nurse maintains responsibility for total client care 24 hours a day (see Figure 9-2). The primary nurse sets health care goals with the client and plans care to meet those goals. The principal advantage of this approach is the continuity of care inherent in the system. Primary nursing is most effective with a total staff of registered nurses, which makes this system expensive to maintain.

Total Client Care and Modular Nursing

Total client care and modular nursing are variations of primary nursing. Although these systems imply that one nurse is responsible for all the care administered to a client, responsibility for the client actually changes from shift to shift with the assigned caregiver. This system uses both registered nurses and licensed practical nurses; the registered nurses are assigned to more complex client situations. A unit manager or charge nurse typically coordinates activities on the unit. Modular nursing attempts to assign caregivers to a small segment or “module” of a nursing unit, ensuring that clients are cared for by the same personnel on a regular basis.

Case Management

In the case management system, the nurse assumes responsibility for planning, implementing, coordinating, and evaluating care for a given client, regardless of the client’s location at any given time. This approach is often used when care is complex and a number of health care team members are involved in providing care. Generally, a case management plan, or critical pathway, is developed (based on the norm or typical course of the condition), and the nurse evaluates the progress of the client in relation to what is expected, investigating and following up on any variance in the time required or the amount of improvement noted. Although the case load for the individual nurse might be smaller (thus making this approach expensive), continuity of care and collaboration are enhanced.

THINK ABOUT IT

Nursing Management Systems

If you were a *client* in a hospital, which management style would you prefer? Why?

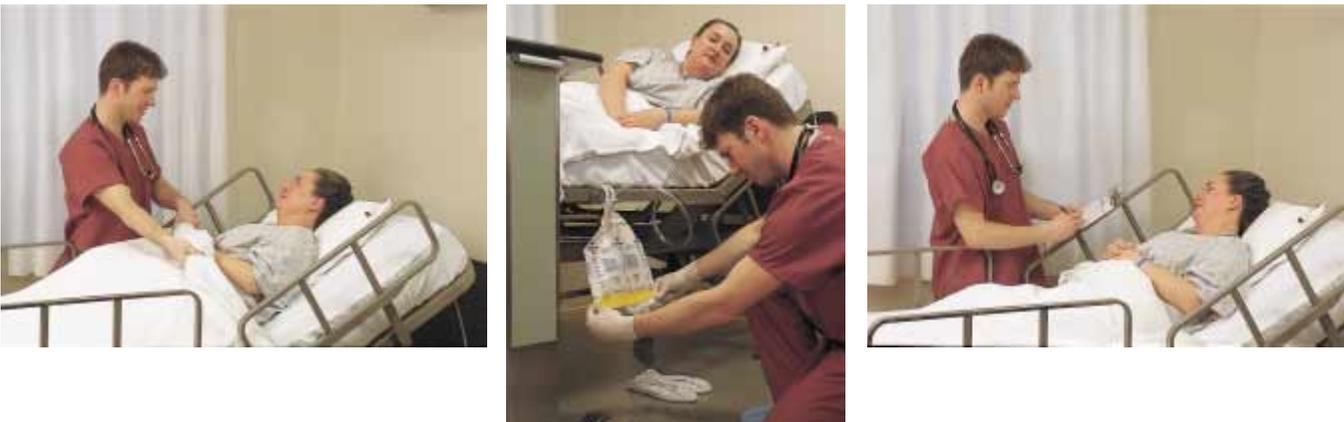


Figure 9-2 Delivery of client care occurs via the primary nursing management system. This primary nurse is responsible for meeting the total health care needs of this client.

Nursing Interventions

After reviewing the client's current condition, verifying priorities, and examining resources, the nurse should be ready to initiate nursing interventions. A **nursing intervention** is an action performed by the nurse that help the client to achieve the results specified by the goals and expected outcomes. All interventions must conform to standards of care. Nurses should understand the reason for any intervention, the expected effect, and any potential problems that may result. Understanding the reason for a nursing intervention is the hallmark of a professional nurse, in that the nurse is using logic and/or scientific reasoning as the basis of practice. Nursing interventions are a blend of science (rational acts) and art (intuitive actions). It is important for novice nurses to identify the **rationale** (the fundamental principle) of all interventions in order to implement theory-based practice. Prior to implementation, it is necessary to determine exactly:

- What is to be done
- How it is to be done
- When it should be done
- Who will do it
- How long it should be done

Interventions are determined by and directed toward the cause of the problem or factors contributing to the nursing diagnosis and may vary for clients with similar nursing diagnoses depending on realistic expected outcomes for the individual. Consideration should be given to client preferences, the developmental level of the client, and availability of resources. In addition, the health care practitioner's orders often have an impact on nursing interventions by imposing restrictions on factors such as diet or activity.

Types of Nursing Interventions

Nursing interventions are written as orders in the care plan and may be nurse-initiated, health care practitioner-initiated, or derived from collaboration with other health care professionals. These interventions can also be categorized as independent, dependent, or interdependent, depending on the authority required for initiation of the activity.

Interventions can be implemented on the basis of standing orders or protocols. A **standing order** is a standardized intervention written, approved, and signed by a health care practitioner that is kept on file within health care agencies to be used in predictable situations or in circumstances requiring immediate attention. Nurses can implement standing orders in these situations after they have assessed the client and identified the primary or emerging problem. For example, nurses in an ambulatory clinic or home health care agency may have standing orders for administering certain medications or ordering laboratory tests when indicated, or a health care practitioner may establish standing orders on an inpatient unit that specify certain medications that can be administered

for common complaints such as headache. Table 9-3 provides an example of standing orders used for client preparation for a barium enema.

A **protocol** is a series of standing orders or procedures that should be followed under certain specific conditions. They define what interventions are permissible and under what circumstances the nurse is allowed to implement the measures. Health care agencies or individual health care practitioners frequently have standing orders or protocols for client preparation for diagnostic tests or for immediate interventions in life-threatening circumstances. These protocols prevent needless duplication of writing the same orders repeatedly for different clients and often save valuable time in critical situations.

Nursing Interventions Classification

The Iowa Intervention Project has developed a taxonomy of nursing interventions that includes both direct and indirect activities directed toward health promotion and illness management (Iowa Intervention Project, 1993). This taxonomy, the Nursing Interventions Classification (NIC), is a standardized language system that describes nursing interventions performed in all practice settings. "NIC offers a standardized language that communicates the nature and worth of the work we do. Without it, nursing will remain in jeopardy" (Eganhouse, Comi-McCloskey, & Bulechek, 1996). NIC is a method for linking nursing interventions to diagnoses and client outcomes (McCloskey, Bulechek, & Eoyang, 1999).

The format for each intervention is as follows: label name, definition, a list of activities that a nurse performs to carry out the intervention, and a list of background readings (McCloskey & Bulechek, 1996) (See Table 9-4). NIC offers standardized language for research on nursing interventions and is a promising tool for determining reimbursement for nursing services.

TABLE 9-3
Example of Standing Orders

Date	Physician's Orders
8/1	Standing Orders for Barium Enema
	<i>Prior to test:</i>
	Clear liquid supper evening prior to test
	16 oz citrate of magnesia 6 PM
	Ducolax tabs iii at 8 PM
	NPO after midnight
	Enemas until clear AM of test
	<i>Following test:</i>
	Milk of magnesia 30 ml PO

TABLE 9-4
Nursing Interventions Classification (NIC) Taxonomy

	Domain 1	Domain 2	Domain 3	Domain 4	Domain 5	Domain 6
LEVEL 1: DOMAINS	1. Physiological: Basic Care that supports physical functioning	2. Physiological: Complex Care that supports homeostatic regulation	3. Behavioral Care that supports psychosocial functioning and facilitates lifestyle changes	4. Safety Care that supports protection against harm	5. Family Care that supports the family unit	6. Health System Care that supports effective use of the health care delivery system
LEVEL 2: CLASSES	<p><i>A Activity and Exercise Management:</i> Interventions to organize or assist with physical activity and energy conservation and expenditure</p> <p><i>B Elimination Management:</i> Interventions to establish and maintain regular bowel and urinary elimination patterns and manage complications due to altered patterns</p> <p><i>C Immobility Management:</i> Interventions to manage restricted body movement and the sequelae</p>	<p><i>G Electrolyte and Acid-Base Management:</i> Interventions to regulate electrolyte/acid-base balance and prevent complications</p> <p><i>H Drug Management:</i> Interventions to facilitate desired effects of pharmacologic agents</p> <p><i>I Neurologic Management:</i> Interventions to optimize neurologic functions</p> <p><i>J Interventions to provide care before, during, and immediately after surgery</i></p>	<p><i>O Behavior Therapy:</i> Interventions to reinforce or promote desirable behaviors or alter undesirable behaviors</p> <p><i>P Cognitive Therapy:</i> Interventions to reinforce or promote desirable cognitive functioning or alter undesirable cognitive functioning</p> <p><i>Q Communication Enhancement:</i> Interventions to facilitate delivering and receiving verbal and nonverbal messages</p>	<p><i>U Crisis Management:</i> Interventions to provide immediate short-term help in both psychological and physiological crises</p> <p><i>V Risk Management:</i> Interventions to initiate risk-education activities and continue monitoring risks over time</p>	<p><i>W Childbearing Care:</i> Interventions to assist in understanding and coping with the psychological and physiological changes during the childbearing period</p> <p><i>X Lifespan Care:</i> Interventions to facilitate family unit functioning and promote the health and welfare of family members throughout the life span</p>	<p><i>Y Health System Medication:</i> Interventions to facilitate the interface between client/family and the health care system</p> <p><i>a Health System Management:</i> Interventions to provide and enhance support services for the delivery of care</p> <p><i>b Information Management:</i> Interventions to facilitate communications among health care provider</p>

(continues)

TABLE 9-4 (continued)
Nursing Interventions Classification (NIC) Taxonomy

Domain 1	Domain 2	Domain 3	Domain 4	Domain 5	Domain 6
<p><i>D Nutrition Support:</i> Interventions to modify or maintain nutritional status</p> <p><i>E Physical Comfort Promotion:</i> Interventions to promote comfort using physical techniques</p> <p><i>F Self-Care Facilitation:</i> Interventions to provide or assist with routine activities of daily living</p>	<p><i>K Respiratory Management:</i> Interventions to promote airway patency and gas exchange</p> <p><i>L Skin/Wound Management:</i> Interventions to maintain or restore tissue integrity</p> <p><i>M Thermoregulation:</i> Interventions to maintain body temperature within a normal range</p> <p><i>N Tissue Perfusion Management:</i> Interventions to optimize circulation of blood and fluids to the tissue</p>	<p><i>R Coping Assistance:</i> Interventions to assist another to build on own strengths, to adapt to a change in function, or to achieve a higher level of function</p> <p><i>S Client Education:</i> Interventions to facilitate learning</p> <p><i>T Psychological Comfort Promotion:</i> Interventions to promote comfort using psychological techniques</p>			

From McCloskey, J. C. & Bulechek, G. M. (1999). *Nursing interventions classification (NIC): Iowa intervention project* (3rd ed.). St. Louis, MO: Mosby.

Nursing Intervention Activities

Nursing interventions include:

- Assisting with ADL
- Delivering skilled therapeutic interventions
- Monitoring and surveillance of response to care
- Teaching
- Discharge planning
- Supervising and coordinating nursing personnel

Implementing nursing interventions requires that consideration be given to client rights, nursing ethics, and the legal implications associated with providing care.

Clients have the right to refuse any intervention. However, the nurse must explain the rationale for the intervention and possible consequences associated with refusing treatment. If the intervention refused was health care practitioner-initiated, the health care practitioner should be informed of the refusal of care. Ethical standards require that clients be afforded privacy and confidentiality. Matters related to a client's condition and care should be discussed only with individuals directly involved with the client's care, and any discussion should be held in a location where information cannot be overheard by visitors or bystanders. From a legal standpoint, the nurse must ensure that the authority for prescribing any intervention has been satisfied and that applicable standards of care are maintained during implementation of all nursing interventions.

Activities of Daily Living

Clients frequently need assistance with ADL such as bathing, grooming, ambulating, eating, and eliminating. The goal for most clients is to return to self-care or to regain as much autonomy as possible. The nurse's role is to determine the extent of assistance needed and to provide support for ADL while at the same time fostering independence. Ongoing assessment is important for determining the appropriate balance between ensuring safety and promoting independence. For example, maintaining personal grooming is important for purposes of hygiene and comfort as well as for promoting self-esteem. The nurse must always provide privacy when assisting clients with personal hygiene. If these tasks are assigned to other personnel, adequate supervision is imperative to ensure compliance with these principles.

Therapeutic Interventions

Therapeutic nursing interventions are those measures directed toward resolution of a current problem and include activities such as administration of medications and treatments, performing skilled procedures, and providing physical and psychological comfort. Written orders must be verified before implementing interventions requiring prescriptive authority. Reassessment of the client is also needed to determine if the intervention remains appropriate. In addition, a nurse must also

NURSING ALERT

If nurses have never performed a specific procedure or feel unsure about their ability to safely perform the skill, they must always secure assistance before implementation.

understand the rationale, expected effects, and possible complications that could result from any intervention.

Monitoring and Surveillance

Observation of the client's response to treatment is an integral part of implementation of any intervention. Monitoring and surveillance of the client's progress or lack of progress are essential in determining the effectiveness of the plan of care and for detection of potential complications. Specific interventions require specific monitoring activities; however, typical monitoring activities include observations such as vital signs measurement, cardiac monitoring, and recording of intake and output.

Teaching

A key element in health promotion and illness management is the counseling of clients to help them modify their behaviors in response to potential health risks and actual health alterations. As part of this teaching process, nurses must also discuss the rationales for the interventions that are included in the nursing plan of care.

Numerous opportunities arise every day for informal teaching related to client care. For example, teaching clients about the medications they are taking and possible side effects should occur routinely as medications are administered. Similarly, as nurses perform assessment activities, the sharing of observations with the client can be informative in terms of what characteristics are desirable and what observations are sources of concern. This knowledge can be valuable to a client when self-monitoring.

Effective teaching requires insight into the client's knowledge base and readiness to learn. Realistic teaching goals and learning outcomes should be set on the basis of these factors. It is also desirable to include the family or significant others in teaching plans. A suitable learning environment should be created that is non-threatening and allows active participation by the client. Nurses should be careful to use terminology easily understood by the client. It is important that learning outcomes are validated to be sure that clients can safely and effectively care for themselves on discharge.

Discharge Planning

Preparation for discharge begins at the time of admission to a health care facility. As the average length of



Title of Study

“Nursing Outcome Indicator: Preventing Falls for Elderly People”

Authors

Bezon, J., Echevarria, K. H., & Smith, G. B.

Purpose

To design and test interventions that prevent falls in elderly people.

Methods

In the study group (consisting of 115 subjects), each participant received a complete nursing assessment and a fall risk appraisal. The clients' risk factors determined which nursing interventions were implemented. Interventions used in this study included medication education, reducing medications, correcting visual and auditory impairments, providing assistive devices (e.g., walkers, canes) to people with a history of previous falls, and exercise to increase strength and flexibility.

Findings

Prior to implementation of the fall prevention program, 26% of the participants had fallen. During the initial year of the program, 3% experienced falls.

Implications

This study demonstrated that it is possible to decrease falls in the elderly through nursing interventions.

Bezon, J., Echevarria, K. H., & Smith, G. B. (1999). Nursing outcome indicator: Preventing falls for elderly people. *Outcomes Management for Nursing Practice* 3(2), 112–117.

stay in acute care settings continues to decrease, early discharge planning becomes imperative. Expected outcomes dictate the type of planning required and the interventions necessary to attain the desired outcomes. Interventions directed toward discharge planning include activities such as teaching and consultation with other agencies (e.g., home health, rehabilitation facilities, nursing homes, social services) concerning follow-up care. Teaching related to any changes in diet, medications, or lifestyle must be implemented; any barriers or problems in the home environment must be resolved before discharge. Some agencies employ personnel with the primary responsibility of teaching or discharge planning for groups of clients; however, the nurse who is car-

ing for the individual client is also responsible for ensuring that all appropriate interventions have been implemented before discharge.

Supervision and Coordination of Personnel

The management style and type of facility, as well as the needs of the client, determine the scope of interventions associated with supervision and coordination of client care. In a health care facility in which nurses are assigned clients within a total client care management system, responsibilities for supervision might be minimal, whereas facilities that use a variety of ancillary personnel for certain client activities might require a large percentage of time devoted to supervision of care. In home health care, for example, the primary role of the professional nurse might be supervision of personnel who provide assistance with ADL. Although a nurse might delegate certain tasks to other personnel, it is still the nurse's responsibility to ensure that the task was completed according to standards of care and to note the response of the client in order to evaluate progress toward expected outcomes.

Regardless of management style or type of facility, coordination of client activities among various health care providers remains the nurse's responsibility. For example, in acute care settings, the nurse needs to coordinate client activities around the schedule of diagnostic tests or physical therapy. Scheduling of procedures, therapy, treatments, and medications for a number of clients often requires considerable organizational skills, creativity, and resourcefulness.

Evaluating Interventions

An important step to assure the delivery of quality care is evaluation of nursing interventions. One approach to determining the efficacy of nursing interventions is by evaluating clients' achievement of expected outcomes. The Nursing Intervention Classification (NIC), previously described in this chapter, provides a systematic method for linking nursing activities to client outcomes. When treatment can be shown to directly improve client outcomes, both nursing and health care consumers benefit.

Another taxonomy, the Nursing Outcomes Classification (NOC) has been specifically designed to evaluate nursing interventions. NOC provides a common language for measuring client responses to nursing interventions.

Documentation of Interventions

Communication concerning implementation of interventions must be provided through written documentation and should also be verbally conveyed when responsibility of the client's care is transferred to another nurse. The nurse is legally required to record all interventions

and observations related to the client's response to treatment. This not only provides a legal record but also allows valuable communication with other health care team members for continuity of care and for evaluating progress toward expected outcomes. In addition, written documentation provides data necessary for reimbursement for services and tracking of indicators for continuous quality improvement.

The recording of information can be in the form of either checklists, flow sheets, or narrative summaries. A complete description must be provided if there are any deviations from the norm or if any changes have occurred.

Verbal interaction among health care providers is also essential for communicating current information about clients. Nurses who delegate the delivery of client care to assistive personnel must be careful to elicit their feedback related to activities completed and the client's response to any interventions. In addition, assistive personnel should be alerted as to what additional data are meaningful, and these data should be conveyed to the nurse responsible for the client's care. For example, if a nursing assistant observes that Mrs. Robbins, hospitalized with a deep vein thrombosis of the left leg, is having difficulty swallowing and has eaten very little, this information should be reported to the nurse. This is especially important if the behavior is a new occurrence and not a part of the established problem list, because the nurse might not otherwise seek this information.

Communication between nurses generally occurs at the change of shift, when the responsibility for care changes from one nurse to another. Nursing students must communicate relevant information to the nurse responsible for their clients when they leave the unit. Information that should be shared in the verbal report includes:

- Activities completed and those remaining to be completed
- Status of current relevant problems
- Any abnormalities or changes in assessment
- Results of treatments (i.e., client response)
- Diagnostic tests scheduled or completed (and results)

All communication—written and/or verbal—must be objective, descriptive, and complete. The communication includes observations rather than opinions and is stated or written so that an accurate picture of the client is conveyed. For example, if it is noted that a client is less alert today than yesterday, the *behavior* that led to that conclusion should be documented. This observation can be objectively and descriptively communicated by the statement: “Does not respond unless firmly touched; quickly returns to sleep.” This description results in a more complete picture of the client than simply stating: “Less alert today.” Thorough and detailed communication of implementation activities is fundamental to ensuring that client care and progress toward goals can be adequately evaluated.

KEY CONCEPTS

- The implementation step of the nursing process is directed toward meeting client needs and results in health promotion, prevention of illness, illness management, or health restoration and also involves delegation of nursing care activities to assistive personnel and documentation of the implementation activities performed.
- Implementation requires cognitive, psychomotor, and intellectual skills to accomplish goals and make progress toward expected outcomes.
- Implementation activities include ongoing assessment, establishment of priorities, allocation of resources, initiation of specific nursing interventions, and documentation of interventions and client responses.
- Ongoing assessment is necessary for determining effectiveness of interventions and for detection of new problems.
- Changing variables in clients and the environment demand clinical judgment and flexibility in organizing care.
- Time management skills are essential in implementing client care.
- The nurse maintains responsibility for care delegated to other health care personnel.
- The most common management systems currently used include functional nursing, team nursing, primary nursing, total client care, modular nursing, and case management.
- Interventions can be nurse-initiated, health care practitioner-initiated, or collaborative in origin, and thus are considered dependent, independent, or interdependent.
- Nursing Interventions Classification (NIC) is a system for sorting, labeling, and describing nursing interventions.
- Nursing interventions include assisting with activities of daily living, skilled therapeutic interventions, monitoring and surveillance of response to care, teaching, discharge planning, and supervision and coordination of nursing personnel.
- Communication concerning interventions should be provided verbally and in writing.

CRITICAL THINKING ACTIVITIES

1. Label each of the following nursing interventions as dependent (dep.), independent (ind.), or interdependent (int.).
 - _____ a. Applying a heating pad to a shoulder for 20 minutes
 - _____ b. Administering a pain medication as needed following surgery
 - _____ c. Turning a client with impaired mobility every 2 hours

- _____ d. Teaching a client about side effects of a medication
- _____ e. Assisting a client with oral care
- _____ f. Sending an order for a diagnostic laboratory test
- _____ g. Reviewing and conveying abnormal lab test results
- _____ h. Starting intravenous fluids
- List five implementation activities and give an example of each.
 - List two reasons for documentation of client care.
 - Situation:* Mary Long, age 42, has come to the clinic because of recurrent chest pains (although symptom-free at this time). Although there is a strong family history of heart disease, she has no personal history of heart problems. She is approximately 60 lb overweight and you determine that her lifestyle is rather sedentary and her diet high in fat content. She lives at home with her husband. Her children no longer live at home. Although she works part-time as a receptionist, her favorite activity is cooking.
Her health care practitioner mentions diet, exercise, and weight control as long-term activities, orders a series of tests to be done as an outpatient, and gives her a prescription for nitroglycerin tablets for chest pain.
What interventions do you think will be necessary and appropriate for Mrs. Long? How would you organize priorities for Mrs. Long?
 - Consider your most recent clinical experience. How could you have organized your time more effectively? Apply these same time management principles to your study time. How could you arrange your time more efficiently?
 - The next time you are in a clinical agency, examine your client's record for the previous 8 hours. Does it provide a vivid and accurate description of the client? How could the written documentation be improved?
 - Ask a nurse what activities occupy most of his or her time. What activities does the nurse most enjoy? What does the nurse least enjoy? Compare this nurse's perceptions with your own ideas.
 - How does the Nurse Practice Act in your state address delegation? Does the definition specifically address the registered nurse's role in supervising other nursing personnel? Licensed practical nurse's role? Delegation of nursing care to others? Has the Board of Nursing in your state established rules on delegation? If so, what do these rules allow? If not, how is the issue of delegation of nursing care addressed?
 - You are caring for Mr. Sims, who has had a stroke. The care plan includes the following activities and interventions:
 - Up in chair at bedside 3 times a day for at least 30 minutes
 - Assist bed bath/assist with eating
 - CT of head at 10:00 am
 - Strengthening exercises per physical therapy at 9:00 am
 - Routine medications at 9:00 am and 1:00 pm
 You are responsible for total client care for Mr. Sims. Write a plan of your activities with Mr. Sims.

WEB RESOURCES

- American Nurses Association
www.nursingworld.org
- North American Nursing Diagnosis Association
www.nanda.org/
- University of Iowa Nursing Outcomes Classification Project
www.nursing.uiowa.edu/noc/

Evaluation



Any profession which doesn't monitor itself becomes a technology.
—Phaneuf (in Gillies, 1994)

COMPETENCIES

1. Explain the purposes of evaluation in professional nursing practice.
2. Describe the components of comprehensive evaluation in nursing.
3. Identify the steps through which evaluation is conducted.
4. Describe the three types of evaluation.
5. Discuss the relationship between evaluation and accountability.
6. Discuss the significance of multidisciplinary collaboration in evaluating aspects of client care.

**KEY
TERMS**

evaluation
nursing audit
outcome evaluation
peer evaluation
process evaluation
structure evaluation

Evaluation is the fifth step in the nursing process and involves determining whether the client goals have been met, have been partially met, or have not been met. Even though it is the final phase of the nursing process, evaluation is an ongoing part of daily nursing activities that determines the effectiveness of those activities in helping clients achieve expected outcomes. Evaluation is not only a part of the nursing process, but it is also an integral process in determining the quality of health care delivered. In addition to discussing evaluation as part of the nursing process, this chapter also describes the role of evaluation in delivering quality care.

This chapter discusses the purposes, components, and methods of evaluation. The relationship between evaluation and quality of care is described.

EVALUATION OF CLIENT CARE

Evaluation is the measurement of the degree to which objectives are achieved. Therefore, evaluating the care provided to clients is an essential part of professional nursing. “Evaluation is a planned, systematic process . . . [that] compares the client’s health status with the desired expected outcomes” (Kenney, 1995, p. 195). The American Nurses Association (1998), in its *Standards of Clinical Nursing Practice*, designates evaluation as a fundamental component of the nursing process (see the accompanying display).

The purposes of evaluation include:

- To determine the client’s progress or lack of progress toward achievement of expected outcomes
- To determine the effectiveness of nursing care in helping clients achieve the expected outcomes
- To determine the overall quality of care provided
- To promote nursing accountability (discussed later in this chapter)

Evaluation is done primarily to determine whether a client is progressing—that is, experiencing an improvement in health status. Evaluation is not an end to the nursing process, but rather an ongoing mechanism that assures quality interventions. Effective evaluation is done periodically, not just prior to termination of care. Evaluation is

EVALUATION AS A STANDARD COMPONENT OF CARE: ANA STANDARDS

Standard VI: Evaluation

The nurse evaluates the client’s progress toward attainment of outcomes.

Guidelines

Evaluation must:

- Be performed as a systemic process
- Occur on an ongoing basis
- Lead to revision of the plan of care when needed
- Involve the client, significant others, and other members of the health care team
- Be documented

From American Nurses Association. (1998). *Standards of clinical nursing practice*. (2nd ed.). Washington, DC: Author. Reprinted with permission of the author.

closely related to each of the other stages of the nursing process. The plan of care may be modified during any phase of the nursing process when the need to do so is determined through evaluation. Client goals and expected outcomes provide the criteria for evaluation of care.

COMPONENTS OF EVALUATION

Evaluation is a fluid process that is dependent on all the other components of the nursing process. As shown in Figure 10-1, evaluation affects, and is affected by, assessment, diagnosis, outcome identification and planning, and implementation of nursing care. Table 10-1 shows how evaluation is woven into every phase of the nursing process. Ongoing evaluation is essential if the nursing process is to be implemented appropriately. As Alfaro-LeFevre (1998) states:

When we evaluate early, checking whether our information is accurate, complete, and up-to-date, we’re able to make corrections *early*. We avoid making deci-

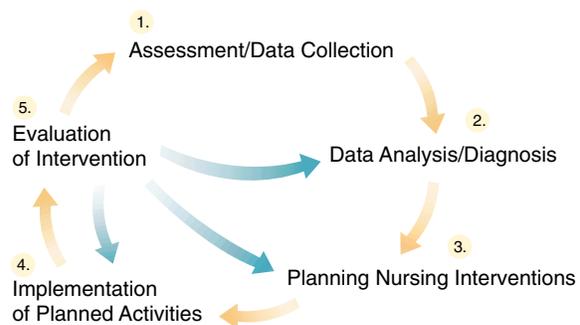


Figure 10-1 Relationship of Evaluation to Nursing Process

TABLE 10-1
Interaction between Evaluation and the Other Phases of the Nursing Process

Nursing Process Phase	Evaluation Focus
Assessment	Data collection was thorough and complete. Data were collected from multiple, varied sources. Data were relevant to client needs. Appropriate methods were used to obtain data. A systematic, organized method was used in collecting data.
Diagnosis	Nursing diagnoses were client-centered, accurate, and relevant. Each nursing diagnosis was complete. Nursing diagnoses were comprehensive. Diagnoses were based on the collected data. Nursing diagnoses guided planning and implementation of care.
Outcome identification and planning	Expected outcomes were relevant to nursing diagnoses. Objectives were prioritized. Outcomes were realistic and achievable. Resources (including team members) were used efficiently. Nursing plans were documented.
Implementation	Team members followed the plan of care. Necessary resources were available. Nursing actions assisted client in meeting expected outcomes. Client achieved expected outcomes.

(Data from Gillies, D. A. [1994]. *Nursing management: A systems approach* [3rd ed., pp. 511–535]. Philadelphia: Saunders; Kenney, J. W. [1995]. Evaluation. In P. J. Christensen & J. W. Kenney [Eds.], *Nursing process: Application of conceptual models* [4th ed., pp. 195–207]. St. Louis, MO: Mosby.)

sions based on outdated, inaccurate, or incomplete information. Early evaluation enhances our ability to act safely and effectively. It improves our *efficiency* by helping us stay focused on priorities and avoid wasting time continuing useless actions. (p. 22)

There are specific criteria to be used in the process of evaluation. The evaluation criteria must be planned, goal-directed, objective, verifiable, and specific (that is, strengths, weaknesses, achievements, and deficits must be considered).

Techniques

Effective evaluation results primarily from the nurse's accurate use of communication and observation skills. Both verbal and nonverbal communication between the nurse and the client can yield important information about the accuracy of the goals and expected planned outcomes and the nursing interventions that have been executed for resolution of the client's problems. The nurse needs to be sensitive to clients' willingness or hesitation to discuss their responses to nursing actions and must use the techniques of therapeutic communication to collect all necessary data.

The nurse must be sensitive to changes in the client's physiological condition, emotional status, and behavior. Because these changes are often subtle, they require astute observational skills on the part of the nurse. Observation occurs through use of the senses. In other words, what the nurse sees, hears, smells, and feels when touching the client all provide clues to the client's current health status.

Sources of Data

Evaluation is a mutual process occurring among the nurse, client, family, and other health care providers. Both subjective and objective data are used in evaluating the client's status. Asking clients to describe how they feel results in subjective data. Objective data consist of observable facts, such as laboratory values and the client's behavior. When a nurse communicates an assessment of a client's response to an actual or potential health problem, clients and families are empowered to discuss their concerns and questions. When feedback is given, the nurse must avoid being defensive, because that attitude may cause clients or families to avoid being open and honest. As a result, they may only say what they think the nurse wants to hear or they may

completely refuse to participate in the evaluation process. The nurse's verbal and nonverbal communication establishes the atmosphere in which clients and families freely share their comments, both positive and negative.

Goals and Expected Outcomes

The effectiveness of nursing interventions is evaluated by examination of goals and expected outcomes. Goals provide direction for the plan of care and serve as measurements for the client's progress or lack of progress toward resolution of a problem.

Realistic goals are necessary for effective evaluation. These goals must take into consideration the client's strengths, limitations, resources, and the time frame for achievement of the objectives. Examples of client strengths are educational background, family support, and financial resources (for instance, money to purchase medications and foods that support the prescribed interventions). Examples of client limitations are delayed developmental level, poverty, and unwillingness to change (lack of motivation).

METHODS OF EVALUATION

The nurse who successfully evaluates nursing care uses a systematic approach that ensures thorough, comprehensive collection of data. Evaluation is an orderly process consisting of seven steps, which are explained here.

Establishing Standards

Specific criteria are used to determine whether the demonstrated behavior indicates goal achievement. Standards are established before nursing action is implemented. Evaluation of criteria examines the presence of any changes, direction of change (positive or negative), and whether the changes were expected or unexpected.

Collecting Data

Assessment skills are used to gather data pertinent to goals and expected outcomes. The nurse must be proficient in assessment skills for effective, comprehensive evaluation to occur. Evaluation data are collected to answer the following question: Were the treatment goals and expected outcomes achieved?

Determining Goal Achievement

Data are analyzed to determine whether client behaviors indicate goal achievement. This process is validated through analysis of the client's response to the specific

nursing interventions that are developed in the plan of care. For example, these data can take the form of either physiological responses (such as the client's being able to cough productively in order to promote effective breathing patterns) or psychosocial responses (such as the client's being able to verbalize concerns about an impending surgical procedure in order to alleviate anxiety).

Relating Nursing Actions to Client Status

Nursing interventions are examined to determine their relevance to the client's needs and nursing diagnoses. Efficient nursing actions are those that address pertinent client needs and are proven to be primary factors in helping clients appropriately resolve actual or potential problems.

Judging the Value of Nursing Interventions

Critical-thinking skills are employed to determine the degree to which nursing actions have contributed to the client's improved status. These skills enable the nurse to apply an analytical focus to the client's responses to the nursing interventions and thus to evaluate the benefits of those actions and identify additional opportunities for change.

Reassessing the Client's Status

The client's health status is reevaluated through use of assessment and observation skills. Evaluation focuses on the client's health status and compares it with baseline



NURSING CHECKLIST

Evaluating Nursing Care

Following are guidelines useful in analyzing the application of the nursing process:

- Assessment was thorough and accurate.
- Nursing diagnoses were relevant.
- Client and family participated in goal setting.
- Goals were specific, measurable, and realistic.
- Nursing actions addressed client's problems.
- Client and family participated in evaluation.
- Evaluation was ongoing and resulted in a revised plan of care as the client's status changed.
- Plan of care was revised according to the client's needs.
- Documentation reflected the client's status, including responses to nursing interventions.

data collected during the initial assessment. Omissions or incomplete data within the database are identified so that an accurate picture of the client's health status is obtained.

Modifying the Plan of Care

If the evaluation data indicate a lack of progress toward goal achievement, the plan of care is modified. These revisions are developed through the following process: reassessment of the client; formulation of more appropriate nursing diagnoses; development of new or revised goals and expected outcomes; and implementation of different nursing actions or repetition of specific actions to maximize their effectiveness (for instance, client teaching). See the Nursing Checklist for guidelines for evaluating effective application of the nursing process to client care.

Evaluation is performed by every nurse, regardless of the practice setting. For example, the home health nurse evaluates the care provided regularly throughout the client's relationship with the agency. Evaluation of the home care client is carried out in order to determine whether the care was delivered in an effective and efficient manner, to modify the plan of care as needed, and to decide when the client is ready for discontinuation of home care services. The accompanying display provides an example of evaluation performed by the home health care nurse.

Critical Thinking and Evaluation

Evaluation is a critical thinking activity. It is a deliberate mechanism used to analyze and make judgments. Nurses need to remain objective when evaluating client care in order to modify care based on reason rather than emotion. One critical thinking strategy, juxtaposing, is described as "putting the present state condition next to the outcome state in a side-by-side contrast"

APPLICATION: EVALUATION IN THE HOME HEALTH CARE SETTING

When evaluating the effectiveness of care, the home health care nurse can use the following questions to examine client achievement of expected outcomes:

- Were the goals realistic in terms of client abilities and time frame?
- Were there external variables (for example, housing problems, impaired family dynamics) that prevented goal achievement?
- Did the family have the resources (for example, transportation) to assist in meeting the goals?
- Was the care coordinated with other providers to facilitate efficient delivery of care?

(Pesut & Herman, 1999, p. 93). Nurses use juxtaposing throughout evaluative activities by comparing client responses to expected behaviors. They make conclusions about whether expected outcomes have been met. In order to make such conclusions, assessment data is needed to determine client progress toward achievement of objectives. Evaluation involves analysis and is much more complex than merely answering questions.

EVALUATION AND QUALITY OF CARE

Evaluation is performed at the individual and institutional levels. For example, individual evaluation focuses on the client's achievement of goals and also on the individual nurse's delivery of care. Quality and evaluation are closely related. This section examines the role of evaluation in assuring the delivery of quality health care. Because it is the mechanism used by nurses in determining the need for improvement, evaluation assists in the provision of quality care. The aspects that need to be evaluated to determine the quality of health care are:

- Appropriateness (the care provided adhered to standards and resulted in achievement of goals)
- Clinical outcomes
- Client satisfaction
- Cost-effectiveness
- Access to care
- Availability of resources

Quality management involves constant, ongoing evaluation (monitoring of activities).

Elements in Evaluating the Quality of Care

Organizational evaluation examines the agency's overall ability to deliver quality care. Evaluation can be classified according to what is being evaluated: the structure, the process, or the outcome. Table 10-2 provides an overview of the types of evaluation. Figure 10-2 illustrates the variables to be assessed in each type of evaluation.

Structure Evaluation

Structure evaluation is a determination of the health care agency's ability to provide the services offered to its client population. This type of evaluation focuses on assessing the systems by which nursing care is delivered (Barnum & Kerfoot, 1995). Structure evaluation examines the physical facilities, resources, equipment, staffing patterns, organizational patterns, and the agency's qualifications for staff. The majority of problems with providing effective health care stems from

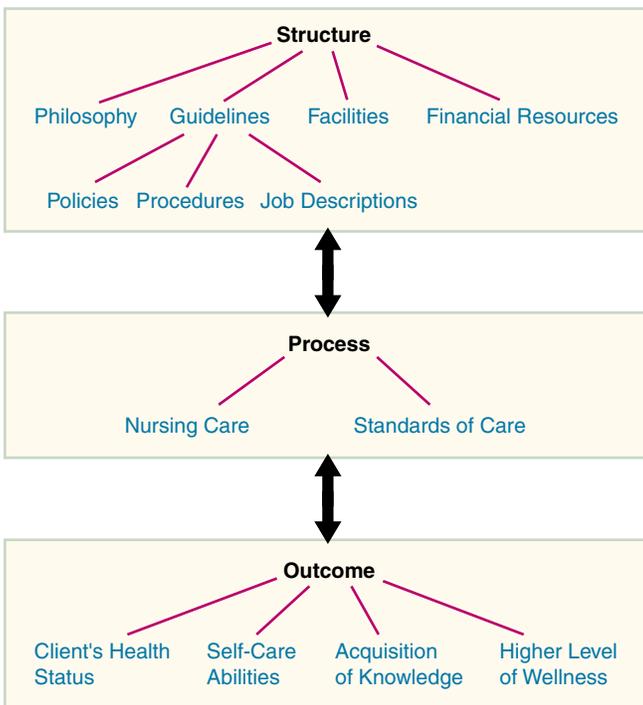


Figure 10-2 Elements within Each Type of Evaluation

problems in the structural area. The purpose of structure evaluation is to identify any system errors, which can then be corrected.

Structure evaluation involves determining whether client care meets legal and professional standards. A frequently used method to evaluate whether the agency provides care within legal parameters is a review of policy and procedure manuals to check for compliance with regulations.

Process Evaluation

Process evaluation is the measurement of nursing actions by examination of each phase of the nursing process. This type of evaluation is done to determine whether nursing care was adequate, appropriate, effective, and efficient. Nursing interventions are judged to be effective when use of the action results in the desired outcome. A nursing intervention is determined to be efficient through analysis of the intervention's cost-benefit ratio (Gillies, 1994). Process evaluation determines the nurse's ability to establish an environment that promotes the client's health. See Table 10-2 for sample questions used during process evaluation.

Outcome Evaluation

Outcome evaluation is the process of comparing the client's current status with the expected outcomes. This type of evaluation examines all direct care activities that affect the client's health status. According to Kenney (1995), "Outcome evaluation, though difficult, is the

most meaningful way to judge the effectiveness of nursing interventions" (p. 200).

Outcome evaluation focuses on changes in the client's health status. A basic question to ask when evaluating the outcome is: Has the expected change occurred? Such changes may include "modifications of symptoms; signs; knowledge; attitudes; satisfaction; skill; and compliance with treatment regimen" (Gillies, 1994, p. 517). Another variable assessed during outcome evaluation is the client's self-care ability. Has the client demonstrated an improved ability to care for self? Does the client verbalize knowledge related to self-care needs? See Table 10-2 for suggested approaches to performing outcome evaluation.



Title of Study

"Managing the Outcome of Infection: Nosocomial Infection Initiative"

Author

Houston, S.

Purpose

To demonstrate that the incidence of nosocomial pneumonia can be reduced by changing clinical practice.

Methods

This study was conducted on clients who had cardiovascular surgery. A tool was designed to identify clients who were at high risk for developing pneumonia. Clients scoring higher than the cut-off rate on the scoring tool were placed on a newly designed protocol for pneumonia prevention. Two clinical practices, handwashing and suctioning techniques, were selected as the variables for evaluating (by use of a checklist) clinicians' skills.

Findings

Within 1 year following implementation of the protocol, the pneumonia rate for cardiovascular surgery clients decreased by 37%.

Implications

This study demonstrates that changing clinical practice affects client outcomes. Evaluation of other nursing interventions could be considered for future study.

Houston, S. (1999). Managing the outcome of infection: Nosocomial infection initiative. *Outcomes Management for Nursing Practice*, 3(2), 73-77.

TABLE 10-2
Types of Evaluation

Purpose	Data Sources	Sample Evaluation Questions
Structure Evaluation		
Measures the adequacy of facility to meet needs of clients.	Policy and procedure manuals	Does the orientation program provide nurses with information relevant to the needs of their assigned areas?
	Job descriptions (including qualifications)	
	Staffing patterns	Do the nursing policies adhere to legal requirements?
	Credentials of staff	Are nursing policies easily accessed by staff?
	Written care plans	Do staffing patterns reflect ability to meet acuity needs of clients?
	Orientation programs	
Process Evaluation		
Measures the adequacy of nursing activities in implementing the nursing process.	Client interviews	Is every client assessed by a nurse upon admission to the agency?
	Demonstration of client's skills and knowledge	Is the plan of care individualized for each client?
	Documentation in client's record of nursing actions performed	Is the nursing care based on identified client needs? Is the client's response to the nursing actions documented?
Outcome Evaluation		
Compares client's progress to expected outcomes.	Observation of client	Does the client demonstrate new knowledge or skills?
	Client interview	Is there documented evidence of client progress toward achievement of expected outcomes?
	Chart audits	Is there documentation of the client's abilities to cope with the problem after discharge?
	Written discharge plans	

(Data from Barnum, B. S., & Kerfoot, K. M. [1995]. *The nurse as executive* [4th ed., pp. 236–248]. Gaithersburg, MD: Aspen; Gillies, D. A. [1994]. *Nursing management: A systems approach* [3rd ed., pp. 511–535]. Philadelphia: Saunders; Kenney, J. W. [1995]. Evaluation. In P. J. Christensen & J. W. Kenney [Eds.], *Nursing process: Application of conceptual models* [4th ed., pp. 195–207]. St. Louis, MO: Mosby.)

Nursing Audit

A **nursing audit** is the process of collecting and analyzing data to evaluate the effectiveness of nursing interventions. A nursing audit can focus on implementation of the nursing process, client outcomes, or both in order to evaluate the quality of care provided. Nursing audits examine data related to:

- Safety measures
- Treatment interventions and client responses to the interventions
- Preestablished outcomes used as basis for interventions
- Discharge planning
- Client teaching
- Adequacy of staffing patterns

Audits are based on components such as institutional policies; federal, state, and local regulations; accreditation standards; and professional standards (see Figure 10-3). Audits assist in identifying strengths and weaknesses that, in turn, provide direction for areas needing revision. Corrective action plans are developed in accordance with the audit results.

Peer Evaluation

Another method of evaluating quality of care is **peer evaluation** (also referred to as *peer review*), the process by which professionals provide to their peers critical performance appraisal and feedback that are geared toward corrective action. According to the ANA (1988):



Figure 10-3 Influences Affecting Nursing Audit

Peer review in nursing is the process by which practicing Registered Nurses systematically assess, monitor, and make judgments about the quality of nursing care provided by peers, as measured against professional standards of practice. (p. 3)

In 1984, Lucille Joel postulated that peer review is the basis of nursing's autonomy and self-governance (Joel, 1984). This perspective is still very relevant in today's health care climate. By evaluating itself, nursing is demonstrating an essential criterion by which professions are recognized. Peer evaluation promotes both professional and individual accountability.

The quality of nursing care is strongly evident to coworkers and nurses who are expected to assess the work of their peers. "Peer review is an essential mechanism for evaluating the judgment and performance of clinical providers" (Wakefield, Helms, & Helms, 1995, p. 11).

Such judgment may result in one of the following outcomes:

- Destructive: Complaints and attacks that undermine morale and cohesiveness
- Constructive: Positive feedback that improves the quality of care

Peer evaluation can be destructive if the parties involved begin to personalize the process, misunderstand the purpose, or deliver feedback in an unfeeling and



NURSING TIP

Objective Peer Evaluation

To make peer evaluations more effective, focus on observable behaviors rather than on the individual's personality. A focus on the personality can be threatening and counterproductive to the evaluation process.

THINK ABOUT IT

Peer Evaluation and Friendship

Your coworker is also a close friend. You are assigned to perform a peer evaluation with her. Before the process begins, she asks you to be especially lenient when evaluating her performance. When collecting information about the quality of her work, you discover that she is often hurried and unorganized, a practice that results in her providing only mediocre care. You know that if the evaluation is not above average, your friend will likely experience disciplinary action from her supervisor. In view of your friendship, what do you do in this situation?

PRINCIPLES OF EFFECTIVE PEER EVALUATION

Effective peer evaluation:

- Improves the quality of client care
- Promotes professional growth
- Is timely, frequent, and ongoing
- May be formal or informal, verbal or written
- Is not anonymous
- Is objective—that is, addresses specific behavior
- Is not linked to financial rewards (salary raises) or promotional opportunities
- Needs to be documented

(Data from Cohen, B., Berube, R., & Turrentine, B. [1996]. A peer review program for professional nurses. *Journal of Nursing Staff Development*, 12 (1), 13.)

EVALUATION AND ACCOUNTABILITY

Accountability means assuming responsibility for one's actions. Evaluation enhances nursing accountability by providing a mechanism for assisting the nurse to define, explain, and measure the results of nursing actions. Accountability is increased by ongoing evaluation; nurses are continually checking their own progress against predetermined standards.

Accountability is an integral part of professional nursing practice and is an important method through which commitment to quality client care can be demonstrated. "Nurses are accountable for designing effective care plans, implementing appropriate nursing actions, and judging

nonobjective manner. Peer evaluation can be threatening when guidelines have not been established for the process and when the assessment focuses on emotions and personalities instead of on behaviors. Conversely, peer evaluation is constructive when the focus remains on quality improvement and encourages the continued growth and learning of all the parties involved. The accompanying display provides principles that promote the use of objective, nonbiased peer evaluation.

the effectiveness of their nursing interventions” (Kenney, 1995, p. 195). In other words, nurses are accountable, for their judgments, decisions, and actions, to:

- Clients, families, and significant others
- Colleagues
- Employers
- The general public (society)
- The nursing profession
- Themselves

Nurses demonstrate their commitment in a variety of ways, including:

- Maintaining expertise in skills
- Participating in continuing education programs
- Achieving and maintaining certification
- Participating in peer evaluation

NURSING CARE PLAN

The Client Experiencing Self-Care Deficits and Risk for Injury

Case Presentation

Mr. Bobby Magee was admitted yesterday with right-sided weakness. His medical diagnosis is cerebral vascular accident (CVA). He is 68 years of age and resides alone in the house on his farm where he and his wife lived for 40 years. She died last year. He reports that he is right-handed and has difficulty holding a fork.

Assessment

- “I can’t handle this milk carton with only one hand.”
- “I do not like to use that walker. It gets in my way.”
- Gait unsteady and shuffling
- Asymmetrical strength in arms and legs
- Unable to hold fork in right hand

Nursing Diagnosis #1

Feeding Self-Care Deficit related to weakness in right hand and inability to hold fork.

Expected Outcomes

The client will:

1. Attend a teaching session on feeding himself with his left hand at 1000, on 2/12.
2. Practice using adaptive spoon at 1400 on 2/12.
3. Use adaptive spoon for meals beginning with breakfast on 2/13.

Interventions/Rationales

1. Present a teaching session “Feeding oneself with the nondominant hand” at 1000, on 2/12. *For clients recovering from illness and/or injury, information about adapting to limitations fosters independence.*
2. Provide the client with four foods of differing textures, adaptive spoons, and apron for a practice session at 1400, on 2/12. *Providing practice time reinforces skills learned and fosters an improved confidence level in the learner.*
3. Notify the dietary department to include a left-hand adaptive spoon with breakfast tray on 2/13. *Using adaptive devices provides safety and promotes independence.*
4. Encourage client to feed self independently at each meal, beginning 2/13. *Recognizing and commending success promotes positive self-esteem.*
5. Assist client with food preparation and feeding as needed at each meal, beginning 2/12. *Assistance preserves strength and avoids tiring the client, promotes safety, and decreases frustration as the client strives for independence.*

Evaluation

1. Mr. Magee attended teaching session on 2/12, asked questions, and participated in the practice session.
2. Goal partially met. Mr. Magee practiced using a spoon in his left hand to feed himself oatmeal, soup, ice cream, and canned peaches on 2/12. Successful self-feeding with all foods except soup. Continue practice, reevaluate 2/19.
3. Goal partially met. On 2/13, fed self 75% of each meal, using adaptive spoon. Continue. Reevaluate on 2/15.

(continues)

NURSING CARE PLAN**The Client Experiencing Self-Care Deficits and Risk for Injury
(continued)****Nursing Diagnosis #2***Risk for Injury: Falls* related to unsteady, shuffling gait.**Expected Outcomes**

The client will:

1. Participate in physical therapy evaluation of mobility strengths and weaknesses on 2/11 at 1100.
2. Attend a muscle-strengthening class on 2/12 at 1600.
3. Perform all strengthening exercises prescribed BID at 1000 and 1600, beginning 2/13.

Interventions/Rationales

1. Request physical therapy consultation for appropriate assistive devices, strengthening exercises, and gait training on 2/11. *Collaboration with other health care providers provides the best care for the client.*
2. Escort client to muscle-strengthening class on 2/12 at 1600. *Provides safety and support as the client begins to learn new skills.*
3. Assigned caregiver will record each exercise, number of repetitions, and client response BID. *Documenting client progress toward the achievement of goals aids in outcome attainment and evaluation of care.*

Evaluation

1. Goal not met. Appointment not kept on 2/11. Dental emergency. Continue. Reevaluate 2/15.
2. Goal not met. Unable to evaluate on 2/12. Continue. Reevaluate on 2/15.
3. 2/15: Goal met. Client attended muscle-strengthening class and has performed exercises as prescribed two times each day.

**MULTIDISCIPLINARY
COLLABORATION
IN EVALUATION**

Evaluating the quality of care provided is a responsibility shared among members of the health care team. In addition to those directly involved (the health care providers, clients, and families), others interested in the outcomes of evaluation include the community and third-party payers (both public and private reimbursement organizations).

An ongoing monitoring process is implemented to evaluate quality of care. Ideally, every discipline monitors its own quality efforts. No single discipline is responsible for all-inclusive evaluation of client care. However, in most health care agencies, nurses are actively involved in monitoring evaluation activities. Many agencies have nurses on staff who function either as quality management coordinators, utilization review evaluators, or both.

When health care providers from all the relevant disciplines are involved in evaluation, the result is decreased fragmentation of care. The team approach mandates active involvement of all care providers in the evaluation of quality care. Multidisciplinary evaluation helps promote a continuum of care for the client, from the preadmission phase to discharge planning and follow-up care.

KEY CONCEPTS

- Evaluation, the fifth step in the nursing process, involves determining whether the client goals have been met, have been partially met, or have not been met.
- The purposes of evaluation are to determine the client's progress or lack of progress toward achievement of client objectives, to judge the value of nursing actions in helping clients to achieve objectives, to determine the health care agency's overall ability to deliver care in an effective and efficient manner, and to promote nursing accountability.
- Evaluation is based primarily on the skills of communication and observation.
- Evaluation is a mutual, ongoing process occurring among the nurse, client, family, and other health care providers.
- The effectiveness of nursing interventions is evaluated by examination of goals and expected outcomes that provide direction for the plan of care and serve as standards by which the client's progress is measured.
- Evaluation is an orderly process consisting of seven steps: establishing standards; collecting data related to the goals and expected outcomes; determining goal achievement; relating nursing actions to client status; judging the value of nursing interventions in assisting clients to achieve goals and objectives;

reassessing the client's status; and modifying the plan of care if necessary.

- There is a relationship between quality management and evaluation. Evaluation is necessary in the provision of quality care because it is the mechanism used by nurses in determining how to improve care.
- Structure evaluation judges a health care agency's ability to provide the services offered to its client population.
- Process evaluation measures nursing actions by examining each phase of the nursing process to determine the effectiveness of the actions in helping clients meet expected outcomes and goals.
- Outcome evaluation compares the client's current status with the expected outcomes and examines all direct care activities that affect the client's status.
- A nursing audit can focus on implementation of the nursing process, client outcomes, or both in order to evaluate the quality of care provided.
- Peer evaluation (peer review) is the process by which professionals provide to their peers performance appraisal feedback geared toward corrective action.
- Evaluation enhances professional nursing accountability by providing a mechanism for assisting the nurse to define, explain, and measure the results of nursing actions.
- Evaluating the quality of care is a shared responsibility among members of the health care team.

CRITICAL THINKING ACTIVITIES

1. When does evaluation of nursing care occur?
2. Describe the three types of evaluation and compare them in terms of purpose and methodology.
3. How does evaluation promote the individual nurse's accountability?
4. State specific ways in which a nurse can perform process evaluation.
5. What are the advantages of peer evaluation?
6. Develop criteria for conducting a nursing audit related to client safety in an extended-care facility.

WEB RESOURCES

American Nurses Association

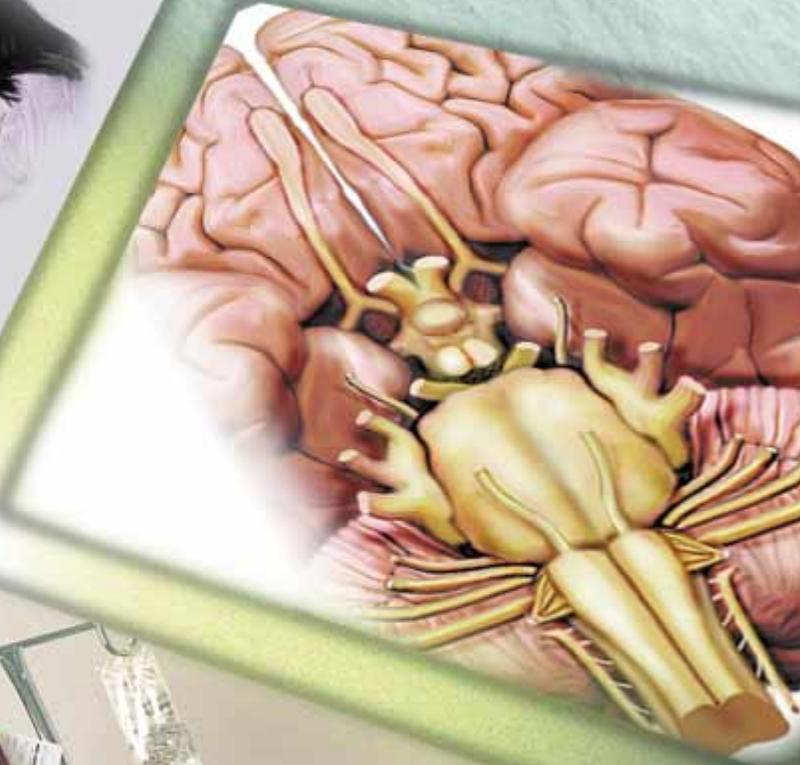
<http://www.nursingworld.org>

Joint Commission on Accreditation
of Healthcare Organizations

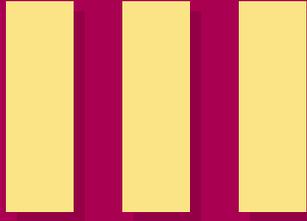
<http://www.jcaho.org>

National Committee for Quality Assurance

<http://www.ncqa.org>



Unit



The Therapeutic Nature of Nursing

- 11** Nursing, Healing, and Caring
- 12** Therapeutic Communication
- 13** Client Education
- 14** Nursing and Complementary/Alternative Treatment Modalities

Nursing, Healing, and Caring



Above all, nursing is caring.

—Diers (1986)

COMPETENCIES

1. Discuss the therapeutic value of nursing.
2. Explore the value of nursing care in today's technologically advanced health care system.
3. Compare selected perspectives on the relationship between caring and nursing.
4. Identify the three phases of the therapeutic relationship.
5. Discuss therapeutic use of self.
6. Identify the characteristics of a therapeutic relationship.
7. Discuss the use of the nursing process as a therapeutic modality.
8. Explore the various roles in which nurses function.

KEY
TERMS

active listening
attending behaviors
catharsis
client advocate
depersonalization
empathy
empowerment

healing
nurse-client relationship
orientation phase
paraverbal communication
presence
rapport
role

termination phase
therapeutic
therapeutic relationship
therapeutic use of self
working phase

This chapter presents information about caring—the fundamental value in nursing. The relationship between caring and nursing is explored and nursing’s impact on healing is examined. The nurse-client relationship is discussed, and the stages of this relationship are described with attendant nursing goals and behaviors frequently exhibited by clients.

NURSING’S THERAPEUTIC VALUE

Nursing is both an art and a science that leads to therapeutic outcomes in clients. The term **therapeutic** describes actions that are beneficial to the client.

Definition of Nursing

According to the American Nurses Association (ANA) (1995), nursing is defined as “the diagnosis and treatment of human responses to actual or potential health problems” (p. 9). This definition places nursing’s focus on the individual experiencing a health problem rather than on the problem (or disease) itself—that is, on caring for clients as they deal with health issues. Fitzpatrick (1983) perceives nursing “as facilitating the developmental process toward health, thereby helping clients to more fully develop their human potential” (p. 296). The idea of helping persons to grow and achieve their potential is pivotal in nursing.

The Canadian Nurses Association (1986), similarly, describes nursing as a caring relationship that helps the client achieve and/or maintain an optimal level of health.

Nursing: A Blend of Art and Science

Nursing creates therapeutic change through the application of scientific principles. As the science of nursing has rapidly progressed over the past decade, nurse theorists have formulated various frameworks by which to organize nursing’s unique body of knowledge. While continuing to expand its theoretical base, nursing must remain firmly rooted in its essence—caring. In other

words, nursing does not rely on science alone. The “art” of nursing refers to the caring, compassionate manner in which interventions are performed. “Nursing art is defined as helping patients create coherence in lives threatened by illness and change” (LeVasseur, 1999, p. 48). A prerequisite for the nursing art is the nurse’s commitment to helping the client; this trait is also referred to as intentionality. As Isenalumhe (2000) states:

Therapeutic use of self marks the art of nursing as different from the science of nursing. . . . The theories, concepts, and standard procedural techniques for clinical performance or practice in any profession constitute its scientific base. . . . The art of nursing can be learned, through shared, as well as hands-on, experience. (p. 25)

Purposes of Nursing

A **therapeutic relationship** is one that benefits the client’s health status. The therapeutic relationship is based on the belief that a person has a natural drive toward optimal health. Caring—being willing and able to nurture others—is an attribute of the effective nurse. Curing rids the client of the disease or disability; caring nurtures the person even if the disorder is incurable. When it is understood that complete, or perhaps even partial, recovery is not possible, nursing goals focus on facilitating comfort by alleviating pain and promoting as much client autonomy as possible.

CARING BEHAVIORS DEMONSTRATED IN NURSING PRACTICE

- Demonstration of concern
- Anticipation of client needs
- Providing preprocedural information
- Alleviation of anxiety and fear
- Effective communication
- Responding to client requests

(Data modified from Dingman, S. K., Williams, M., Fosbinder, D., & Warnick, M. [1999]. Implementing a caring model to improve patient satisfaction. *Journal of Nursing Administration*, 29(12), 30–37.)

Nursing promotes healthy lifestyle behaviors, prevents the development of illness and/or injury, and restores individuals to their optimal level of functioning.

Another purpose of nursing is to improve client satisfaction with the delivery of health care services. Consumer satisfaction greatly influences where services are provided. “Nurse caring is an important predictor of patient satisfaction” (Dingman, Williams, Fosbinder, and Warnick, 1999, p. 30). Nurses who demonstrate caring behaviors enhance the quality of care provided; thus, clients are more satisfied with the care delivered in a caring, compassionate manner. The accompanying display lists some specific caring behaviors.

Nursing: A Healing Modality

As stated by LeVasseur (1999), “Nurses endeavor to nurse patients through an illness to a satisfactory outcome, whether this is regaining health and function or coping with disability or the ultimate transition of a peaceful death” (p. 61).

Nursing is a humanistic discipline that provides care from a holistic framework. Seeing and responding to the client as a whole person instead of a disease, disorder, or case leads to complete care of the total person.

Healing is the process of recovery from illness, accident, or disability. This return to an optimum level of functioning may occur rapidly or gradually. Healing encompasses the physical, emotional, and spiritual domains of individuals. Nursing and caring are essential components in the healing process. See Chapter 15 for further discussion of nurses as healers.

CARING: AN INTEGRAL COMPONENT OF NURSING

Caring is a universal value that directs nursing practice. Leininger (1981) defines caring in the nurse-client relationship as “the direct (or indirect) nurturant and skillful activities, processes, and decisions related to assisting people to achieve or maintain health.” Even though clients cannot always be cured, caring is ongoing within the nurse-client relationship.

There are numerous concepts relative to caring in nursing. Some major ideas related to caring have been postulated in Watson’s Theory of Human Caring, Leininger’s Theory of Transcultural Caring, and Benner’s Novice to Expert model. Table 11-1 provides an overview of these concepts. Watson’s 10 carative factors are fully described in Chapter 2. The following

TABLE 11-1
Perspectives of Caring in Nursing

Theorist	Theory	Major Concepts
Watson	Theory of Human Caring	<ul style="list-style-type: none"> • Caring is central to nursing practice. • Emphasis is on the dignity and worth of individuals. • Each person’s response to illness is unique. • Caring is demonstrated interpersonally. • Caring involves a commitment to care and is based on knowledge.
Leininger	Transcultural Care Theory	<ul style="list-style-type: none"> • Caring is the essence of nursing. • Caring is universal, occurring in all cultures. • Caring behaviors are determined by and occur within a cultural context.
Benner	Novice to Expert	<ul style="list-style-type: none"> • Caring is central to all helping professions. • Caring is the foundation of being. • People and interpersonal concerns are important. • Caring is communicated through actions. • Problem-solving is a major component of caring. • Advocacy is caring.

(Data from Benner, P. [1984]. *From novice to expert: Excellence and power in clinical nursing practice*. Menlo Park, CA: Addison-Wesley; Benner, P., & Wrubel, J. [1988]. Caring comes first. *American Journal of Nursing*, 8[4], 1072–1075; Leininger, M. [1994]. *Transcultural nursing: Concepts, theories, and practices*. Columbus, OH: Greyden Press; Watson, J. [1999]. *Nursing. Human science and human care: A theory of nursing*. Norwalk, CT: Appleton-Century-Crofts; Watson, J. [1979]. *Nursing: The philosophy and science of caring*. Boston: Little, Brown.)

CARING BEHAVIORS THAT OCCUR IN DIFFERENT CULTURES: LEININGER'S TRANSCULTURAL CARE THEORY

Comfort	Protection
Empathy	Personalized help
Tenderness	Surveillance
Attention	Presence
Support	Trust
Compassion	Nurturance
Love	Restoration
Touch	Instruction

(Data modified from Leininger, M. [1994]. *Transcultural nursing: Concepts, theories, and practices*. Columbus, OH: Greyden Press.)

carative factors are directly related to the science of caring (Watson, 1999):

- Developing a humanistic-altruistic value system
- Nurturing faith-hope
- Cultivating sensitivities to one's self and others

Leininger identifies several behaviors as caring and states that these behaviors occur in various cultures; see the accompanying display.

Caring—being willing and able to nurture others—is a hallmark of the effective nurse. Caring occurs when a nurse acts in a genuine, authentic manner with the client. The professional mask is removed, allowing the nurse to respond in a compassionate manner. Providing emotional support is central to the act of caring.

Caring is more than an intuitive process; it can be learned both intellectually and interpersonally. One learns caring by interacting with others who demonstrate caring. When nurses exhibit caring behaviors, they are serving as role models—to students, colleagues, clients, and families. Caring is a process and an art that requires commitment and knowledge. Caring is a combination of behaviors and attitudes. The way in which nursing actions are implemented expresses caring. Specific behaviors that indicate caring are provision of information, relief of pain, spending time with clients and families, and promoting client autonomy. Treating each client in a dignified, courteous manner is the true expression of caring. Touch is an effective method for communicating a sense of caring (Figure 11-1). Touch, no matter how well intended, may sometimes be misinterpreted by a client. Therefore, it is wise to avoid touching clients who are suspicious, hostile, or very confused. Dingman et al. (1999) described the following as nursing behaviors that demonstrate caring:

- Introduce self to client.
- Call clients by their preferred names.
- Spend time with the client to review the plan of care.

THINK ABOUT IT

Importance of Caring

A television commercial for a real estate agency stated “People don't care how much you know till they know how much you care.” Do you think this statement is applicable to nursing? Why? Why not?

Care in the High-Tech Environment

Caring is the soul of nursing. It is what clients want and need most from nurses. Although technological advances have resulted in many possibilities in health care, the major risk of reliance on technology is that clients can be perceived as objects. The focus of attention becomes the disease, instead of the individual experiencing the illness. The professional nurse treats each client with respect and dignity because “persons in a technologically driven health care system will feel the need to be comforted, listened to, and treated with the utmost dignity and respect” (Bernardo, 1998, p. 47). **Depersonalization** is the process in which individuals are treated as objects instead of people. Some dehumanizing actions are checking on the equipment and not the person, failing to respond to the client, or communicating a lack of interest in what the client says. Nursing care counteracts depersonalization by seeing that “technology can be used so that care is person focused rather than technologically focused” (Bernardo, 1998, p. 41). (Figure 11-2).

The reason people are admitted to acute care facilities is to receive nursing care. Most diagnostic testing, treatment procedures, and some surgical interventions can be performed in outpatient settings such as clinics



Figure 11-1 Clapping the client's hand is one way to communicate through touch.



Figure 11-2 Nursing is caring. It is showing concern for and interest in the client. Identify behaviors of the nurse that demonstrate caring.

or physicians' offices. While receiving care, people want to be treated with compassion. The nontechnical element of care makes clients feel cared for as individuals; the use of high-touch activities communicates caring. As society continues to place a high value on technology, caring is often undervalued. Nursing makes a crucial contribution by valuing both care *and* technology. Ideally, "in the best of nursing practice, science and technology are only the tools for caring" (Benner & Wrubel, 1989, p. 211). Nursing care counteracts depersonalization by emphasizing a client's individuality. It is through caring that the nurse humanizes the client. Simpson (1999) states, "no matter how advanced we get technologically, humans and human interaction are at the core of everything that humans do" (p. 33).

THINK ABOUT IT

Caring and Client Control

What are some *specific* ways the nurse can help the client regain control of the situation?

NURSE-CLIENT RELATIONSHIP

Caring is communicated interpersonally, thus the vehicle for communicating a caring intent is the nurse-client relationship. The **nurse-client relationship** is the one-to-one interactive process between client and nurse that is directed at improving the client's health status or assisting in problem solving. The primary goal of the relationship is the client's achievement of therapeutic outcomes. The nurse-client relationship is a planned process that focuses on meeting the needs of the client. There are many differences between the therapeutic nurse-client relationship and a social relationship as shown in Table 11-2.

The interactive process between client and nurse greatly influences the client's progress in healing. Peplau (1952), the first nurse theorist to define nursing as an interpersonal process, viewed the nurse-client relationship as the basis of nursing. Interpersonal skills are the foundation for establishing the therapeutic relationship. Only through interacting does the nurse have the ability to adequately assess the client's needs, teach methods for best meeting those needs, empower the client to achieve goals, and evaluate the outcome of nursing interventions.

Phases of Therapeutic Relationship

The three phases of the nurse-client relationship are orientation, working, and termination. These phases overlap and influence each other. Each phase is characterized by specific client behaviors and nursing goals. Figure 11-3 illustrates the phases of the interactive relationship.

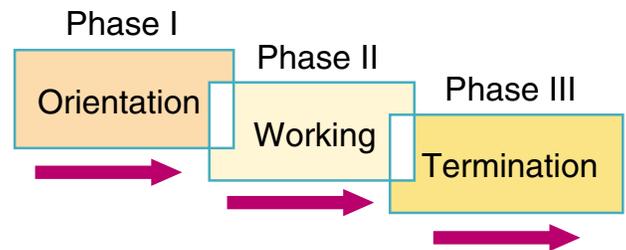


Figure 11-3 Phases of Nurse-Client Relationship

TABLE 11-2
Comparison of Social and Therapeutic Relationships

Social

- Is spontaneous, just happens.
- Is mutually beneficial.
- Often has no planned agenda.
- Is based on mutual interests.
- Each participant expects to be liked by the other.
- Problems are shared.
- Communication is spontaneous.

Therapeutic

- Is planned and goal-directed.
- Seeks to meet client's needs.
- Is based on theory.
- Privileged information is available to health care provider.
- Client is emotionally vulnerable.
- Client must be accepted as is.
- Communication is planned.
- Has clear-cut boundaries.

Orientation Phase

The **orientation** (or introductory) **phase** is the first stage of the therapeutic relationship, in which the nurse and client become acquainted with each other, establish trust, and determine the expectations of the other. Usually, the only knowledge the client and nurse have of each other is preconceived ideas. The nurse gets to know the client as an individual by giving up biases and judgmental thoughts. This stage is especially important because it is the time in which the foundation for the relationship is established.

The most important nursing goal during the orientation phase is to assess the client—to determine the client's needs, knowledge base, strengths and limitations, coping mechanisms, and support system. Often clients do not express their needs directly; behavior is the only clue to their needs. The nurse's goal is to determine the real meaning of the behavior and to assess the client's perception of the most crucial needs and problems.

To reduce a client's anxiety and promote trust, the nurse provides some specific information. Information the client should receive during the orientation phase includes:

- Nurse's name
- Nurse's role
- Confidentiality and its parameters
- Reasons the nurse must ask questions

The usual response of the client in the orientation stage is anxiety, which can result from several factors:

- Fear of the unknown
- Pain or distress
- Unfamiliar environment
- Undergoing unfamiliar, often painful, procedures
- Loss of freedom

As a result of the client's insecurity, anxiety escalates. Because anxiety is communicated interpersonally, the

nurse should project a calm, relaxed attitude during every interaction with the client to decrease anxiety.

Another behavior frequently exhibited by the client during the orientation stage is testing. The client attempts to determine the degree of the nurse's trustworthiness. Through behavior, the client is asking:

- Is the nurse truly willing to help?
- Is the nurse competent to help?
- Is the nurse reliable and trustworthy?

The nurse answers such questions through consistent, reliable behavior which promotes the development of trust.

THINK ABOUT IT

Management of Anxiety

Remember the last time you were anxious. What methods helped you calm down? Think of some specific actions that would reduce the client's anxiety level during the orientation phase.

Working Phase

The **working phase** is the second stage of the therapeutic relationship in which problems are identified, goals are established, and problem-solving methods are selected. Actions are chosen after carefully considering both the consequences of actions and the client's values. It is necessary to consider the client's value system when determining problem-solving methods. Client participation increases when consideration of values is incorporated into care planning. See Chapter 16 for a complete discussion of the concepts of culture, one of which is a system of dominant values.

The client engages with the nurse in active problem solving to achieve mutually developed outcomes. The nurse seeks to maximize the client's success in problem solving. Behaviors that indicate the client is in the working phase are:

- Asking questions about own problems
- Seeking clarification from the nurse
- Being attentive to instructions
- Asking for more information about his role in recovery

Nursing goals to be achieved during the working phase are to:

- Reevaluate goals and related activities as new information arises
- Support realistic problem-solving activities of the client

THINK ABOUT IT

Confidentiality in the Therapeutic Relationship

Nurses have an ethical and legal responsibility to protect client confidentiality. Consider what you would do in each of the following situations:

- You are assisting Ms. Adams with her AM care when she says, "Isn't it just terrible about Mr. Denton across the hall? I heard his tests came back negative. What are his chances of making it?"
- Your neighbor asks you if a mutual friend is being treated for AIDS.
- In a crowded elevator at work, you overhear two coworkers discussing a client's condition

Termination Phase

The **termination phase** is the third and final stage of the of the therapeutic relationship. It focuses on the evaluation of goal achievement and effectiveness of treatment. It is important that the client has been prepared for the final stage of the relationship by encouraging discussion of feelings. Some clients welcome this final phase, whereas other clients who have become overly dependent on their nurse will be more resistant to saying goodbye. Planning for termination is actually initiated during the beginning of the relationship. A relationship that ends abruptly is likely to place the client at risk for difficulties such as increased:

- Anxiety levels
- Frustration
- Suspiciousness
- Unwillingness to engage in future relationships with health care providers

Evaluation is the primary goal for the client and nurse in the third stage of the nurse-client relationship. Questions to be answered include:

- Were the goals meaningful?
- Were the goals realistic?
- Were the client and family actively involved?

The following nursing checklist can be used to evaluate skill in establishing a therapeutic nurse-client relationship.



NURSING CHECKLIST

Establishing Therapeutic Relationships

- Introduce self on initial contact
- Explain own role
- Develop groundwork for trust
- Establish therapeutic boundaries
- Determine client's perception of problem(s)
- Understand client's expectations of care
- Communicate at client's level of comprehension
- Involve client in evaluating treatment

THERAPEUTIC USE OF SELF

The interpersonal process between nurse and client is a therapeutic process because interventions are planned and implemented to benefit the client. The nurse's most effective tool for bringing about positive change is the **therapeutic use of self**, a process in which nurses deliberately plan their actions and approach the relationship

with a specific goal in mind before interacting with the client. The nurse's most effective tool for demonstrating caring is not some technologically sophisticated machine with lights and alarms but rather one's self. Figure 11-4 illustrates therapeutic use of self. Therapeutic use of self is "an opportunity for the nurse to be with persons at a human-to-human level" (Bernado, 1998, p. 48). The term **presence** refers to the process of "just being with" another. According to Bulechek and McCloskey (1985), presence is "a therapeutic tool of the nurse . . . an intervention instrument by merely remaining physically present with the patient" (p. 31).

Therapeutic use of self involves verbal and nonverbal communication. Just as important as what one says is *how* one says it. In this deliberate, planned approach, the nurse communicates a sense of caring and willingness to help: the nurse is committed to helping clients find ways to help themselves. The nurse's true expression of humanistic concern for a client is shown by taking the time to simply "be with" the client. Watson (1988) describes therapeutic use of self as the transpersonal aspect of nursing, that is, "an intersubjective human-to-human relationship in which the person of the nurse affects and is affected by the person of the other. Both are fully present in the moment and feel a union with the other" (p. 32).



Figure 11-4 In this situation, what factors indicate that rapport has been established between nurse and client?

CHARACTERISTICS OF THERAPEUTIC RELATIONSHIPS

“The route to therapeutic support for any client starts with establishing a positive relationship” (Isenalumhe, 2000, p. 25). To establish therapeutic relationships, the nurse must possess certain interpersonal skills (listed in the accompanying display), in order to encourage the client’s expression of feelings.

CHARACTERISTICS OF THERAPEUTIC NURSES

Warmth	Compassion
Hope	Self-awareness
Rapport	Flexibility
Trust	Risk-taking
Empathy	Active listening
Acceptance	Nonjudgmental
Humor	approach

The term **catharsis**, which refers to the relief experienced from verbalizing one’s problems, is illustrated in Figure 11-5. This “getting things off one’s chest” is a universal experience that is therapeutic for individuals experiencing anxiety.

Nurses use interpersonal skills to help clients meet their needs. A discussion of each characteristic follows.

Warmth

Warmth means exhibiting positive behaviors toward the client. Respect, genuine interest, caring—all are expressions of warmth. The nurse who demonstrates warmth is

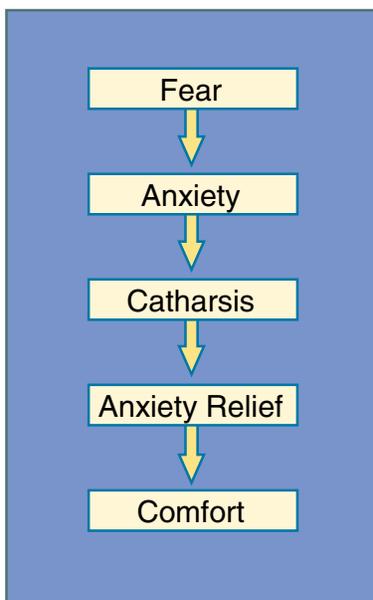


Figure 11-5 Cycle of Catharsis

approachable and available rather than aloof. Warmth means projecting a friendly, interested attitude without overwhelming the client with a false sense of cheerfulness. The nurse demonstrating warmth responds to the client as one human being to another. The therapeutic nurse is approachable and available yet maintains objective boundaries.

Hope

Hope means anticipating the future by helping clients look realistically at their potential. Hope is strengthened by relationships with others; social isolation reinforces a sense of despair. Many clients, especially those with great losses, experience distress, despair, and hopelessness. The reemergence of hope may be a gradual process. Hope is not to be confused with false reassurance. “Hope is the energy source that allows individuals to plan, act, and achieve” (Forbes, 1994, p. 6). See chapter 15 for a discussion of hope and spirituality.

THINK ABOUT IT

Hope Versus False Reassurance

Consider the following example of false reassurance. Mrs. Ngyuen is awaiting results of diagnostic testing that will confirm or deny the suspected diagnosis of cancer. She says to her nurse, “I think it’s taking a long time to get the results. Something must be wrong.” The nurse replies, “Oh, don’t worry, everything’s going to be just fine!”

- What do you suppose motivated the nurse’s response?
- What will be the impact of the nurse’s behavior on Mrs. Ngyuen?

Rapport

Rapport is a bond or connection between two people that is based on mutual trust. Such a bond does not just happen spontaneously; it is planned by the nurse who purposefully implements behaviors that promote trust. The nurse sets the tone of the relationship by creating an atmosphere in which the client feels free to express feelings. When seeking to establish trust, the nurse recognizes the client as a unique individual and reinforces that individuality. In other words, actions that humanize the client are therapeutic. To establish rapport, the nurse’s actions show that the client is considered important. Actions are implemented to boost the level of the client’s self-esteem. Nonverbal interventions are of utmost importance in helping establish rapport. Interacting with family and significant others is also helpful in establishing rapport with the client (Figure 11-6). Recognizing the importance of the family’s influence on the healing process allows the nurse to bond with those who will encourage and support the client.



Figure 11-6 Through interaction with the client's family, how can the nurse help the client obtain optimal health?

RESEARCH FOCUS

Title of Study

“Outcomes of Nurse Caring as Perceived by Individuals with Spinal Cord Injury During Rehabilitation”

Author

Lucke, K. T.

Purpose

To describe the meaning and consequences of nurse caring from the perspective of people with spinal cord injuries (SCI) during their rehabilitation.

Methods

A comparative analysis was done of subjects' responses to structured interview questions. Participants were interviewed at various stages of rehabilitation.

Findings

Nurses were perceived as caring when they had knowledge, interpersonal skill, technical skill, and competence. The nurses identified as caring assisted clients with SCI in achieving relevant outcomes during rehabilitation.

Implications

This study illustrates an ethical obligation of nurses working with SCI clients to demonstrate caring behaviors and form a working partnership with the clients. Caring relationships encouraged the emergence of hope, enabled clients to engage in self-care, and fostered feelings of dignity in the clients.

Lucke, K. T. (1999). Outcomes of nurse caring as perceived by individuals with spinal cord injury during rehabilitation. *Rehabilitation Nursing*, 24(6), 247–253.

Trust

Trust must be present for help to be given and received. A therapeutic relationship is firmly rooted in trust. How does the nurse promote a trusting relationship? Three major activities will facilitate the development of trust: *consistency*, *respect*, and *honesty*. Table 11-3 lists actions that facilitate the development of trust. Being consistently trustworthy is an expression of the nurse's personal integrity and builds the foundation for nursing effectiveness.

Empathy

Empathy—understanding another person's perception of the situation—is a key element in the therapeutic relationship. The phrase “Walk a mile in my shoes” describes empathy well. The empathic nurse understands that the client's perception of the situation is real to the client. By perceiving clients' understanding of their own needs, the nurse is better able to assist clients in determining what will work best. Empathy enables the nurse to assist the client to become a fully participating partner in treatment rather than a passive recipient of care.

Through empathy, the nurse validates the experiences of the client. The challenge for the nurse is to see the world from the client's perspective with as much understanding as possible. Empathy is not the same as sympathy. Sympathy is rarely therapeutic; in fact, a barrier occurs when the nurse is caught in sympathy and becomes paralyzed by the expression of pity. For example, through empathic listening does the nurse encourage the client to find meaning in his experience and move on to problem solving.

Acceptance

Accepting the client as a person worthy of dignity and respect is basic to providing nursing care. Acceptance means accepting and working with clients, even those

TABLE 11-3
Trust: Essential Behaviors

Consistency	Respect	Honesty
Follow through on plans.	Call client by name.	Ask client about personal preferences.
Adhere to schedule.	Provide clear explanations.	Keep any promises.
Seek out client for extra time to interact.	Recognize own strengths and limitations.	Maintain confidentiality.
Be straightforward/ no hidden motives.	Listen to client.	Be flexible in responding to requests.

THINK ABOUT IT

Acceptance of Clients

Think of some client behaviors that you may not approve of, such as smoking, using alcohol, refusing to comply with treatment, or aborting a fetus. Even when clients engage in behavior that nurses think is wrong, bad, or immoral, those clients still have a legal and ethical right to quality nursing care. How will you respond when caring for someone whose behavior opposes your basic values?

who sometimes exhibit undesirable behaviors. It is extremely important for the nurse to show acceptance of the client while setting limits on unhealthy or undesirable behavior. The accepting nurse conveys the message that the client does not have to put on a front. The client knows it is safe to be genuine because of the nurse's acceptance. Acceptance means caring for individuals whose value system may differ greatly from that of the nurse and not expressing shock or surprise at the client's behavior.

Active Listening

Active listening (listening that focuses on the feelings of the individual who is speaking) is the basic skill for interpersonal effectiveness. Active listening is facilitated by **attending behaviors**, a set of nonverbal listening skills that conveys interest in what the other person is saying. These behaviors allow the nurse to show caring, concern, and acceptance. Behaviors such as sitting down, maintaining eye contact, facing the client, and head nodding facilitate the development of trust. Active listening requires the nurse to turn down inner dialogue. Total attention must be focused on what the client is saying.

Also, it is important for the nurse to avoid looking rushed or distracted. The primary message that is communicated through active listening is the nurse's concern and intent to assist in problem solving. Active listening is required in *every* nurse-client relationship.

The active listener is cognizant of all three elements of communication: the *verbal, paraverbal, and nonverbal*. The verbal message is *what* is said. **Paraverbal communication** is the way in which a person speaks, including voice tone, pitch, and inflection, and the nonverbal message is body language. The active listener pays attention to all three aspects to hear the true intent of the communicator. Active listening means that the nurse focuses on the feelings behind the words, *not* just the words themselves. It is important for the nurse to note any incongruities between the client's verbal and nonverbal messages. For example, if the client says, "Oh, I'm just fine!" and is slumped over with head hanging down, there is an incongruity—the behavior and the words do not match.

The client's expression of feelings demonstrates trust in the nurse. This expression of trust must be recognized and respected. By listening carefully to the client,

TABLE 11-4
Outcomes of Active Listening

Establishment of rapport
Expression of genuine concern
Communication of intent to assist in problem solving
Promotion of comfort level
Decreased level of anxiety
Client empowerment for self-care
Learning is facilitated

the nurse is able to learn what the client perceives as the most crucial problem. *Listening is the first step in personalizing care for each client.* Listening can improve client outcomes. Table 11-4 lists outcomes of active listening.

Humor

Humor is another characteristic of therapeutic nurses. The use of humor as a therapeutic intervention is not a new concept for nurses. Nightingale (1860) recognized the influence of the mind on the body and acknowledged humor as an important nursing intervention.

As shown in Figure 11-7, humor can assist in establishing a relationship because it helps break the ice, decreases fear, and establishes trust. Humor is a medium for sharing; thus, it can be used to strengthen the therapeutic relationship.

Humor is defined to a great deal by one's cultural background, so it is imperative that the nurse be sensitive to the client's interpretation and use of humor. A humor assessment can be conducted by noting:

- What makes the client smile or laugh
- The use of jokes by clients
- Type of humor expressed by the client

Humor is a powerful tool for coping. Humor helps individuals to relieve stress and to express anger in a socially acceptable manner.

Nurses turn to humor to defuse the stress of the life-and-death situations that they face on a daily basis. Although humor can relieve tension and stabilize high-stress situations, it must be used with caution. It can be dangerous and destructive if used carelessly. See chapter 14 for guidelines on using humor with clients.

Compassion

Compassion is truly caring about what happens to another person. Kindness and genuine concern are demonstrated through compassionate acts. Some



Figure 11-7 Note the exchange of laughter between client and nurse. What are some therapeutic outcomes facilitated by the nurse's deliberate use of humor?

behaviors that communicate the nurse's compassion include:

- Acting on the belief that everyone is equally deserving of care.
- Treating individuals with dignity.
- Respecting a client's privacy—simple acts such as keeping the client covered and knocking on the door before entering the room show compassion.

Other examples of compassion are a nurse caring for the homeless in a shelter or holding the hand of a person with acquired immunodeficiency syndrome (AIDS).

Self-Awareness

Self-awareness is necessary for the nurse to be therapeutic. Being aware of one's feelings is the first step in developing therapeutic behavior. Knowledge of one's assets is necessary in that effective nurses are able to identify their own skills and abilities. Conversely, only after identifying deficits in knowledge and skills can the nurse initiate necessary improvements. This process of analyzing one's strengths and limitations is an ongoing basic part of learning. The therapeutic nurse knows that learning is a lifelong process that contributes to growth—personally and professionally. Self-awareness allows the nurse to remain objective, that is, separate

enough to distinguish one's own feelings and needs from those of the client.

Nonjudgmental Approach

Nonjudgmental behavior must be used if nursing interventions are to be therapeutic. Nonjudgmental means acting without biases, preconceptions, or stereotypes. Nonjudgmental nurses do not evaluate the client's moral values nor tell the client what to do; these nurses accept people as they are. Nonjudgmental nurses do not stereotype people, nor expect others to behave in certain ways because they belong to a certain group. Judgment influences perceptions because people tend to see what they expect to see. According to Sayer (1992, p. 48):

We see individuals as being representative of a social group. Here our own stereotypes and prejudices about the group come into play. Individuals may be seen as a representative of race, age group, socioeconomic level, gender, occupation, or disability. They will then be given the characteristics we believe people in that group have.

Judgmental behavior based on biases can interfere with the therapeutic value of nursing interventions. It is nontherapeutic for nurses to allow biased views that stem from personal values to influence their actions. The initial assessment of clients is often influenced by preconceived ideas.

Becoming nonjudgmental is an ongoing process. In a classic article, Blumenstock (1970, p. 37) stated:

Becoming nonjudgmental is hard work and a life time process, for none of us is ever free of judgmental feelings arising from our own evolving values. Thus, each of us is always in a state of "becoming."

There are several steps in becoming nonjudgmental:

- The first step is the most difficult—recognizing that one's thoughts are biased and prejudicial.
- Second, to change, nurses must accept their own feelings.
- The third step is identifying the source of the negative feelings—not to blame but to gain an understanding of the origins.

To counter such negative feelings, learn about different cultures. Getting to know people with diverse cultural backgrounds expands the knowledge base and helps one become more tolerant and open-minded.

Flexibility

Flexibility is another trait necessary for nurses to create a therapeutic relationship. A flexible nurse is one who is ready for the unexpected—knowing that every day is filled with unplanned events and situations. The flexible

nurse is able to adapt by “taking things in stride” and making necessary adjustments. Some of the unexpected events require immediate actions. The flexible nurse is able to establish priorities by determining which needs are urgent and which can be tended to later. Staying calm during a crisis is characteristic of the flexible nurse.

Risk-Taking

Risk-taking is a behavior that leads to innovative problem solving. To become effective risk-takers, nurses must give themselves permission to try something new, to step outside the ordinary, and to not be bound by tradition or fear. The result is creative solutions to problems. Successful risk-takers give themselves credit for trying something new regardless of the outcome. Smart risk-takers learn from those risk-taking ventures that are less than successful. They do not allow themselves to become complacent, content to stay at a comfortable plateau.

THERAPEUTIC VALUE OF THE NURSING PROCESS

The nursing process provides a framework for the delivery of compassionate care. It gives direction by organizing the nurse’s actions: assessing, diagnosing, planning, implementing, and evaluating.

The nursing process itself is therapeutic because it focuses on the client’s response to illness, disease, or disability rather than just on the problem. By focusing on the caring aspects, the nursing process helps nursing define its practice. Professional accountability is reinforced by the use of this process, which is client-centered. When functioning within the parameters of the nursing process, the nurse assumes a variety of roles.

NURSING ROLES

A **role** is a set of expected behaviors associated with a person’s status or position. Role includes behaviors, rights, and responsibilities. Nurses function in a variety of roles every day (see the accompanying display). Often roles overlap, which may lead to a conflict in expectations or responsibilities. A discussion of some predominant nursing roles follows.

NURSING ROLES

Caregiver	Change agent
Counselor	Team member
Teacher	Resource person
Client advocate	

Caregiver

The caregiver is the role most commonly associated with nursing by the general public. In the role of caregiver, the nurse provides direct care when clients are unable to meet their own needs. Specific activities characteristic of the caregiver role include feeding, bathing, and administering medications.

Counselor

When acting as a counselor, the nurse assists clients with problem identification and resolution. The counselor facilitates client action and does *not* tell clients what to do but assists clients to make their own decisions. Counseling is done to help clients increase their coping skills. Clients are frequently counseled in stress management, how to deal with chronic conditions, grief and bereavement. Effective counseling is holistic, in that it addresses the individual’s emotional, psychological, spiritual, and cognitive dimensions.

Teacher

Teaching is an intrinsic part of nursing. The nurse views *each* interaction as an opportunity for education; both client and nurse can learn something from every encounter with each other (Figure 11-8). Teaching by nurses can be formal, informal, intentional, or incidental. See Chapter 13 for information on increasing effectiveness of the teacher role.

Client Advocate

A **client advocate** is a person who speaks up for or acts on behalf of the client. Advocacy empowers clients to be partners in the therapeutic process rather than passive

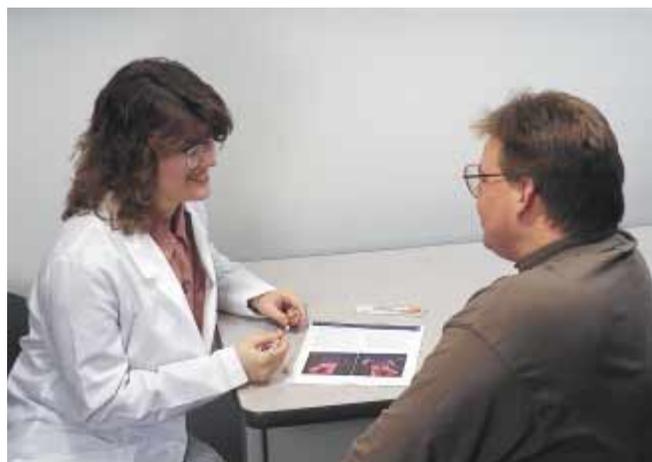


Figure 11-8 In this situation, the nurse is instructing the client on self-administration of medication before hospital discharge.

recipients of care. The relationship that encourages client empowerment is one of mutual participation by client and nurse. Clients and families are actively involved in establishing goals.

Frequently, clients and families do not communicate their concerns to physicians but will do so to the nurse with whom a bond has been established. Nurses function as client advocates by listening and communicating the expressed concerns to other health care providers and including those concerns into care planning.

Change Agent

Nurses who function in the role of change agent recognize that change is a complex process. The nurse change agent is proactive (takes the initiative to make things happen) rather than reactive (responding to things after they have happened). Change should not be done in a random manner. It should be planned carefully and implemented in a deliberate way to facilitate the client's progress.

Team Member

A vital role of the nurse is that of team member. The nurse does not function in isolation but rather works with other members of the health care team. Collaboration requires the nurse to use effective interpersonal skills and promotes continuity of care. See Chapter 12 for a discussion of the communication skills applicable to promoting healthy relationships with clients and colleagues.

Resource Person

The nurse functions as a resource person by providing skilled intervention and information. Identifying resources and making referrals as needed also fall under the auspices of this role. Nurses must consider the client strengths and access to resources, including physical, intellectual, economic, social, and environmental.

client problems, and communicate acceptance of the client.

- Nursing is an interpersonal process between someone who needs help in meeting needs and someone who is competent to assist in meeting those needs.
- The three interwoven phases of the nurse-client relationship are orientation, working, and termination.
- Therapeutic use of self is a process in which nurses deliberately plan their actions and approach the relationship with a specific goal in mind before interacting with the client.
- Several interpersonal characteristics and skills can be developed to increase the therapeutic value of a nurse's interventions. These include warmth, hope, rapport, trust, empathy, acceptance, active listening, humor, compassion, awareness, nonjudgmental attitude, flexibility, and risk-taking.
- The nursing process is the framework for providing compassionate care.
- Nurses function in a variety of roles when working with clients. The roles overlap and have specific responsibilities.

CRITICAL THINKING ACTIVITIES

1. Interview professional nurses. Ask them to identify specific ways they demonstrate caring.
2. Briefly write your philosophy of health, including your beliefs about healing and caring.
3. Talk with a family member who has been ill. Ask that person what promoted healing for them.
4. Analyze your next interaction with a client and determine:
 - a. Which attending behaviors you used
 - b. Other actions that let the client know you were actively listening
 - c. How you actualized the concept of therapeutic use of self
5. Some nurses believe it is "unprofessional" to laugh with clients, even when laughter is a natural response. What do you think of nurses using humor? Answer the following to help you decide:
 - a. What are the risks of using humor with clients?
 - b. Name two benefits of implementing humor with a client.
 - c. Answer the following true/false quiz:
 - _____ Humor has no place in health care.
 - _____ Humor is universally defined—what is funny to one person is funny to all.
 - _____ Medical research shows laughter results in positive physiological benefits.
 - _____ It is unprofessional to laugh when a client shares a funny experience with you.
 - d. Identify a situation in which humor has helped you cope with an anxiety-provoking situation.

KEY CONCEPTS

- Caring is the fundamental value in nursing.
- Today's "high-tech" environment requires that nurses provide humanistic caring.
- The therapeutic nurse-client relationship is the one-to-one interactive process between client and nurse that is directed at improving the client's health status or assisting in problem solving.
- Therapeutic relationships differ from social relationships in that they are deliberately planned, focus on

WEB RESOURCES

American Nurses Association

www.nursingworld.org

American Holistic Nurses Association

www.ahna.org

Center for Human Caring (Watson's Theory)

www.hsc.colorado.edu

Therapeutic Communication



I learn a great deal by merely observing you, and letting you talk as long as you please, and taking note of what you do not say.

—T. S. Eliot

COMPETENCIES

1. Explain the process of communication.
2. Describe the modes of communication.
3. Discuss the types of communication.
4. Describe the benefits of communicating with other health care professionals.
5. Discuss the principles of therapeutic communication.
6. Identify approaches that facilitate therapeutic communication between nurses and clients.
7. Explore the barriers to effective therapeutic communication.

KEY
TERMS

aphasia
artifact
auditory channel
channel
chronemics
communication
encoding
feedback
group communication
group dynamics

intrapersonal
communication
kinesthetic channel
message
metacommunication
nonverbal message
organizational
communication
paraverbal cue
perception

proxemics
receiver
sender
small group ecology
therapeutic communication
verbal message
visual channel

Communication is the fundamental element of the nurse-client relationship, client teaching, case management, staff development, and all the activities performed by nurses. In order to be an effective communicator, the nurse must be aware of the different levels on which communication is conducted between nurses and clients and among members of the health care team.

This chapter discusses the communication process, modes of communication, types of communication, and barriers to therapeutic interaction. Knowledge of these aspects of communication helps the nurse establish a therapeutic relationship with the client and thereby achieve successful outcomes of care.

THE COMMUNICATION PROCESS

Communication, the process of transmitting thoughts, feelings, facts, and other information, includes verbal and nonverbal behavior. Stuart & Laraia (1998) describe communication as every aspect of behavior and, therefore, more than simply transmitting or imparting facts. Meaning must be assigned to those facts for communication to occur. All people engage in the dynamic process of communication. In fact, people cannot *not* communicate.

In nursing, communication is the vehicle for establishing a therapeutic relationship with a client. There would be a void if the nurse did not relate to clients—if there were no fondness, no closeness, no bonding. In fact, communication *is* the relationship between nurse and client (Stuart & Laraia, 1998). The quality of the relationship between the nurse and the client is directly associated with the quality of communication between them.

Components of the Communication Process

The five major components of the communication process are sender, message, channel, receiver, and feedback (Figure 12-1). This model provides a framework for understanding the process of communication.

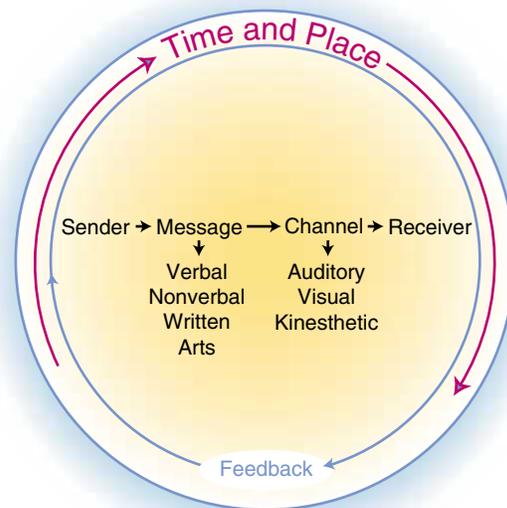


Figure 12-1 A Communication Model

The Sender

The communication process begins when a person, known as the **sender**, generates a message. Messages stem from a person's need to relate to others, to create meanings, and to understand various situations. Messages are generated by external factors, such as what the sender sees, hears, touches, tastes, or smells. However, the sender also perceives internal stimuli that generate messages. Examples of internal stimuli that affect communication include hunger, fatigue, or the mental activities of thinking and fantasizing (i.e., self-talk). The source (or encoder) is the stimulus, such as the idea, event, or situation. **Encoding** involves the use of language and other specific signs and symbols for sending messages.

The Message

The **message** is a stimulus produced by a sender and responded to by a receiver. Messages may be verbal, nonverbal, written materials, and arts. Verbal and nonverbal transmissions of messages are discussed at length later in this chapter.

The Channel

The **channel** is the medium through which a message is transmitted. There are three major communication channels: visual, auditory, and kinesthetic. The **visual channel** is sight, observation, and perception. The **auditory channel** consists of spoken words and cues. The **kinesthetic channel** refers to experiencing sensations. These channels are described in Table 12-1. Each person has a dominant channel that influences communication.

THINK ABOUT IT

Your Dominant Channel

To determine which channel—visual, auditory, or kinesthetic—is your dominant mode, ask yourself these questions. How do I learn best: by seeing, hearing, or doing? When people speak, what do I pay most attention to: their appearance, their words, or their actions?

The Receiver

The **receiver** is the person who intercepts the sender's message. Receiving is influenced by complex physiological, psychological, and cognitive processes.

The physiological component involves the process of hearing. Intact, healthy ears, as well as those areas of the brain involved in the hearing process, enable the receiver to hear messages. Good eyesight allows for the reception of messages via the visual channel. Likewise, homeostasis in those bodily structures where touch is applied allows for reception of those stimuli.

The psychological process refers to mental mechanisms that affect human behavior. This component may enhance or impede the receiving process. For example,

anxiety may restrict the perceptual field, causing the client to hear, see, or feel less accurately. However, during mild and moderate levels of anxiety, the perceptual field broadens, causing the client to be more alert and to hear, see, or feel more. See Chapter 20 for a complete discussion of the relationship between anxiety and perception.

The cognitive aspect is the “thinking” part of receiving and involves interpretation of stimuli, thus converting them into meaning. The receiver assigns meaning through his own brand of perceiving and “self-talk,” or communication with oneself. Engaging in too much self-talk may cause the receiver to do a poor job of listening. Controlling this self-talk requires continuous focusing and validating of the sender's message. Through cognitive processing, the receiver decodes messages, interprets them, and then provides feedback to the sender.

Feedback

Feedback is the information the sender receives about the receiver's reaction to the message. The function of feedback is to provide the sender with information about the receiver's perception of a situation. Having this information, the sender can then adjust the delivery of the message to communicate more effectively.

Communication is reciprocal in that both the sender and receiver must be involved; the sender must transmit the message, and the receiver must provide feedback for a communication to be complete. The accompanying display lists characteristics of effective feedback.

Factors Influencing Communication

In addition to channels, there are many other variables that influence communication. The primary influential factors are discussed below.

TABLE 12-1
Communication Channels

Channel	Mode of Transmission	Congruent Words
Visual	Sight	“I see what you mean.”
	Observation	“It looks perfectly clear that . . .”
	Perception	“Show me where it hurts.”
Auditory	Hearing	“I hear you.”
	Listening	“Tell me what you mean.” “Sounds like you're saying . . .” “Tell me what you mean.”
Kinesthetic	Procedural touch	“How does that feel?”
	Caring touch	“Just the cold, hard facts.” “That is so touching.”

CHARACTERISTICS OF EFFECTIVE FEEDBACK

- Specific rather than general
- Descriptive
- Provided in a supportive, nonthreatening manner
- Given in a timely manner (as soon as possible after the behavior or the message)
- Usable and appropriate to client needs
- Clear and unambiguous
- Direct and honest

Perception

Perception is a person's sensing and understanding of the world. Perception of an event or situation is unique in that it varies from person to person. "Perceptions are influenced by our culture, socialization, education, and experience" (Ward-Collins, 1998, p. 29). They help a person determine the meaning of the words and the content of the messages being communicated. It is important for the listener to confirm what she thinks

she has heard, because interpretation of the message depends upon the hearer's perception of the message.

Cultural Context

Because behavior is learned, nonverbal communication varies from culture to culture. For example, the messages communicated by touch and eye contact depend to a great extent on one's cultural context. See Chapter 16 for a complete discussion of cultural variations related to communication.

Space and Distance

Proxemics is the study of the distance between people and objects. Each person has an invisible buffer zone or personal space. Table 12-2 describes the types of personal space. Culturally defined, this boundary alerts a person as to how close another can comfortably approach. Invasion of personal space produces discomfort, anxiety, and the fight-or-flight response. The nurse respects the client's personal space in several ways, such as not touching or moving the client's possessions unless necessary.

TABLE 12-2
Types of Personal Space

Type	Description	Nursing Implications
Intimate distance (0 to 18 inches around the person's body)	<ul style="list-style-type: none"> • Reserved for people who feel close • Vision is affected in that it is restricted to one portion of the other's body; may be distorted • Tone of voice may seem louder • Body smells noticeable • Increased sensation of body heat 	<ul style="list-style-type: none"> • Nurses often must intrude on this space to provide care • Explain intention to client • Respect client's space as much as possible • May be used for comforting and protecting • Therapeutic examples: <ul style="list-style-type: none"> —Rocking a toddler —Administering a massage —Checking vital signs (temperature, pulse, respiratory rate, and blood pressure)
Personal distance (zone extends 1.5 to 4 feet around person's body)	<ul style="list-style-type: none"> • Usually maintained with friends • Vision is clear since more of the other person is visible • Tone of voice is moderate • Sensations of body smells and heat are lessened 	<ul style="list-style-type: none"> • Better able to read nonverbal communication at this distance • Therapeutic examples: <ul style="list-style-type: none"> —Conversation between client and nurse usually occurs in this zone —1-to-1 teaching —Counseling
Social or public distance (zone extends from 4 feet and beyond)	<ul style="list-style-type: none"> • Generally used when conducting impersonal business • Communication is more formal and less intense • Sensory involvement is less intense • Increased eye contact 	<ul style="list-style-type: none"> • Therapeutic examples: <ul style="list-style-type: none"> —Making rounds —Leading a group —Teaching a class

(From Giger, J. N., & Davidhizar, R.E. [1999]. *Transcultural nursing: Assessment and intervention* [3rd ed.]. St. Louis, MO: Mosby; Johnson, B. S. [1996]. *Psychiatric-mental health nursing: Adaptation and growth* [4th ed.]. Philadelphia: Lippincott.)

Time

The study of the effects of time on the communication process is referred to as **chronemics**. The amount of time spent in communicating depends on the client's needs. Some clients will require more of the nurse's time than others. The client who is seriously ill or non-trusting may respond better to brief, frequent contact than to prolonged, infrequent contact. If the nurse is hurried during the interaction with the client, a non-verbal message of impatience may be transmitted. Keeping clients waiting conveys a message that they are unimportant. On the other hand, the nurse who is prompt and who allows time for the client to talk communicates nonverbally, "You are important to me," and "I value you as a person."

The whole communication process is influenced by time. For example, the same message received at 3:00 AM will be perceived and responded to differently at 3:00 PM.

Levels of Communication

Communication occurs at different levels, with each level influencing the others. Discussed below are the intrapersonal, the interpersonal, and group levels of communication.

Intrapersonal Level

Intrapersonal communication is the messages one sends to oneself, including self-talk, or communication with oneself. A person receiving internal or external messages organizes, interprets, and assigns meaning to the messages. Figure 12-2 illustrates the process of self-talk. The result of this process is the individual's unique way of perceiving.

The message of the speaker may differ from that heard by the receiver because of the intrapersonal communication of each. Also, self-talk can interfere with attention to others and cause much to be missed during interpersonal exchanges.

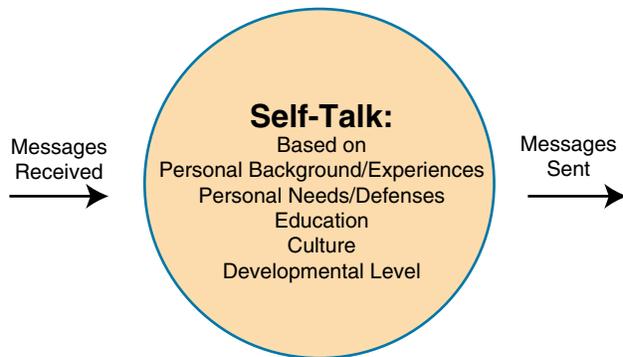


Figure 12-2 Intrapersonal Communication

Interpersonal Level

Interpersonal communication is the process that occurs between two people either in face-to-face encounters, over the telephone, or through other communication media. Interpersonal communication builds on the intrapersonal level in that each person communicating must communicate with the self in order to communicate with others. An important outcome of interpersonal communication is the development of an interpersonal relationship (see Figure 12-3). Interpersonal skills are essential competencies for nurses.

Group Communication Level

Group communication occurs when three or more people meet in face-to-face encounters or through another communication medium, such as a conference call. This level of communication is complex because of both the number of people communicating intrapersonally and interpersonally and the combinations of the people involved.

The study of the events that take place during group interaction is called **group dynamics**. The dynamics of any group can and will influence the productivity of the group. Nurses deal with groups constantly as they interact with families of clients, treatment teams, therapy groups, and committees within their health care settings (see Figure 12-4).



Figure 12-3 A Nurse Communicating with Client on the Interpersonal Level



Figure 12-4 Team Conference. What factors could improve communication in this situation?

Table 12-3 highlights some of the differences between one-to-one and small group interactions.

In dealing with groups, the nurse should be aware of the various nonverbal messages derived from the spatial arrangement of group members. For example, the leader tends to sit at the end or head of the table. Timid or uninterested participants tend to sit at the back of the room. Seating clients in a circle rather than in rows promotes interaction; drawing group members close together promotes cohesion. The study of proxemics in small group situations is called **small group ecology** and provides a potent source of nonverbal messages about participants.

A group is formed around a common purpose or goal; this common goal is the factor that leads to **cohesiveness** (bonding among group members). Several types of groups exist; see Table 12-4 for a listing of groups in which nurses usually participate. Nurse's participation in groups depends upon educational level. According to the ANA (2000), nurse generalists (those prepared at the baccalaureate level or below) may lead and/or co-lead all types of groups except psychotherapy groups. Only nurse specialists (those with graduate degrees) are to lead psychotherapeutic groups.

Since groups are interventions to improve a client's health status, it is important for nurses to refer clients to groups when necessary. Listed below are three mechanisms used by nurses to connect clients with health-promoting groups:

1. Communication—The nurse actively listens to the client to determine needs.
2. Critical thinking—The nurse uses cognitive processes to decide which groups are congruent with the client's needs.
3. Collaboration—The nurse works with multidisciplinary team members (i.e., social workers, clergy) to start the referral process.

MODES OF COMMUNICATION

Communication occurs in a variety of ways: through words, actions, or a combination of words and actions. When there is congruence (“a match”) between one's words and actions, communication is enhanced.

Verbal Messages

Verbal messages are messages communicated through words and language, either spoken or written. Verbal messages are accompanied by **paraverbal** (also referred to as *paralinguistic*) **cues**: tone and pitch of voice; speed, inflection, and volume; grunts and other nonlanguage vocalizations. Paraverbal cues embellish a verbal message, thus adding to its meaning. Paraverbal communication often influences the listener more than the actual words do. Even when the words themselves are not understood, the power of the paraverbal cues can lead to understanding. For example, when a person speaking a foreign language is angry, the paraverbal cues of yelling, shouting, grunting, or hissing through clenched teeth convey the message despite any language barrier.

Nonverbal Messages

Unspoken messages often carry more weight than verbal and paraverbal ones, and they can be more reliable. **Nonverbal messages** are messages communicated without words: that is, through body language. Much of the communication between people is nonverbal. Nurses must pay attention to nonverbal communication in order to determine the meaning of changes in client behavior. Major nonverbal aspects of communication are discussed below.

TABLE 12-3
Differences between One-to-One and Group Communication

One-to-One Interactions	Group Interactions
<ul style="list-style-type: none"> • One sender and one receiver, each with own unique perceptions. • Influenced by dynamics of creating, maintaining, and terminating a therapeutic nurse-client relationship. • Requires understanding of nurse-client relationship theory, communication theory, and an overall theoretical approach (e.g., Rogers, Peplau, Reusch). • Problem identification and problem solving are done by the client, with input from the nurse. • The nurse is the major support for the client during the interaction. • The logical outcome of one-to-one communication is the development of the nurse-client relationship. 	<ul style="list-style-type: none"> • Numerous senders and receivers, each with unique perceptions. • Influenced by group dynamics. • Requires understanding of underlying modalities as well as a theoretical framework to guide both interventions and interpretations (e.g., psychoanalytic approach, interpersonal model). • Problem identification and problem solving are done by the group, with assistance from the leader. • The group is the major support for the client during the interaction. • The logical outcomes are group cohesiveness and group productivity.

TABLE 12-4
Types of Groups

Type	Description	Examples
Task group	Focuses on achievement of a specific goal Emphasizes problem-solving and decision-making	Diabetes education group Committee to study staffing issues Student Nurses Association
Therapeutic group	Increases members' coping abilities Offers support Provides education and information	Stress management class Bereavement and grieving Exercise group (i.e., mall-walkers club)
Therapy group	Helps members learn about and change problematic behaviors Focuses on emotional and behavioral disorders	Psychotherapy group Cognitive-behavioral group
Self-help group	Focuses on a common experience of all members Often led by nonprofessionals	Weight Watchers Reach for Recovery (a group for women who have had mastectomies) Alcoholics Anonymous

THINK ABOUT IT

Elements of Communication

Nonverbal behavior is a more accurate indicator of the individual's intended message than words. Why do you think the adage "Actions speak louder than words" is true?

A client yells, "I am NOT angry!" while pounding his fist on the bedside table.

Which message—the verbal or the nonverbal—do you heed? Why?

Facial Expression

The face is the greatest conveyor of nonverbal messages. Facial expressions give clues that support, contradict, or disguise the verbal message. Many types of feelings and reactions are reflected in a person's face. Facial expressions serve as clues to emotionally charged topics and often communicate the client's need.

The eyes often belie facial expressions, because there is little voluntary control over the eyes. For example, a frightened client might say, "I am fine," and voluntarily control the muscles of the face to portray inner calm. However, the pupils of the eyes dilate widely in fear, thus alerting the receiver to the real message. Eyes, together with the use of the eyebrows and eyelashes, give numerous signals to others. They show interest, concern, sadness, dishonesty, or honesty. The eyes may also indicate shock, shyness, pleasure, displeasure, excitement, and flirtation. They exemplify all feelings: anger, happiness, sadness, and fear.

The lips also communicate several messages, such as:

- Warmth and friendliness when they smile
- Malevolence when they snarl

- Anger when they pout
- Fear when they quiver

People who do not wish to share their feelings might clamp their jaws shut or purse their lips. Anxious people often chew their bottom lips. The nurse can use such clues to understand the client's messages.

Posture

Much about an individual may be learned by observing and interpreting posture. Posture indicates anxiety, relaxation, and negative or positive self-image. Leaning forward usually indicates interest; leaning backward may communicate aversion or rejection. Standing straight and tall with chest forward generally shows confidence, while depressed, tired, or bored individuals often slump.

Gestures

Gestures refer to the movement of body parts. Shrugging the shoulder, waving the hands, tapping the feet—all add a distinct dimension to verbal communication. The nurse communicates openness and a willingness to listen by facing the client in a relaxed position, with hands resting palms up on the lap. Crossed arms pulled closely against the body may indicate nonacceptance and a lack of desire to hear the client.

Touch

Touch is a powerful nonverbal medium for communication. It can be used to soothe, comfort, and establish rapport. Touch can communicate a sense of caring—as it does when a nurse holds a person's hand during a

THINK ABOUT IT

The Meaning of Nonverbal Messages

Never assume that you know what another is saying through body language. Nonverbal messages can have several interpretations. Consider a client who has his arms crossed when you are speaking with him. What does his nonverbal behavior mean? It could be a signal that the client:

- Is shutting out your message
- Is cold and is trying to warm up
- Is sitting in a comfortable posture

Validate your interpretation of the meaning with the client.

painful procedure—or it can be perceived as intrusive or hostile. Touch should be used cautiously with clients who are:

- *Confused*: They may misinterpret the intent of the touch.
- *Aggressive*: They may see the touch as a threat and lash out.
- *Suspicious*: They may think the touch is harmful.
- *Victims of abuse*: Touch may frighten them.

The nurse must understand various cultural perceptions of touch in order to prevent problems; see Chapter 16 for discussion of the cultural significance of touch.

Physical Appearance and Artifacts

Physical appearance and **artifacts** (specific types of nonverbal messages that include items in the client's environment, grooming, or use of clothing and jewelry) convey nonverbal messages that enhance or hinder the spoken words. For example, uniforms often send nonverbal messages that stifle interpersonal exchange by setting up a boundary of superiority. For this reason, nursing uniforms are not worn in certain areas, such as pediatrics, psychiatry, and some home health settings. If worn, a uniform that is clean and pressed, along with shoes that are polished, can help inspire confidence in the caregiver.

NURSING ALERT

Interpreting Nonverbal Behavior

Never assume that a nonverbal behavior has the same meaning for everyone. Interpretation of various nonverbal aspects of communication varies among people because of developmental, cultural, and experiential factors.

Metacommunication

Metacommunication is the relationship aspect of communication. It refers to the message about the message. For example, a person who is silent is still sending out messages through nonverbal communication. Metacommunication refers to all the factors that influence how messages are received. It involves focusing on the communication process rather than only on the content. The “reading between the lines” that occurs in metacommunication allows the receiver to better understand the sender's true message (Edelman & Mandle, 1997).

TYPES OF COMMUNICATION

There are several types of communication: social, therapeutic, and formal. See Chapter 11 for a comparison of social and therapeutic relationships. Formal communication, which consists of written messages and the arts, may include lectures, reports, charting in the client's record, and public speaking. Usually, with formal communication, there is one sender transmitting messages to several others.

Interdisciplinary Communication

The health care team consists of the client and all medical personnel involved in providing care. All members of the team perform important, though different, roles in the health care delivery system (see Chapter 4 for a complete discussion of the roles of health care team members). It is important that all health care team members communicate with each other regarding assessment, intervention outcomes, and client status. The interdependent nature of teams requires thoughtful and effective communication. Breakdown of communication between different team members can interfere with the client's treatment.

Therapeutic Communication

Therapeutic communication is the use of communication for the purpose of creating a beneficial outcome for the client. The accompanying display lists characteristics of therapeutic communication. Ruesch (1961), who originated the term *therapeutic communication*, stated that the purpose is to improve the client's ability to function. Furthermore, therapeutic communication facilitates the establishment of the nurse-client relationship and fulfills the purposes of nursing (Stuart & Laraia, 1998). Therapeutic communication forms a connection between client and nurse. According to Susman (1998), “Brain scans, biochemistry, and other technology cannot replace dialogue; with its use, nurses have a unique, demanding, and irreplaceable role in caring for



Title of Study

“The Developing Nurse-Client Relationship: Nurses’ Perspectives”

Authors

Forchuk, C., Westwell, J., Martin, M., Bamber-Azzopardi, W., Kosterewa-Tolman, D., and Hux, M.

Purpose

(1) To describe the evolving nurse-client relationship from the nurses’ perspective. (2) Compare the patterns described by the participants to those in Peplau’s theory.

Methods

This was a descriptive study that used interviews that were audiotaped and transcribed for qualitative analysis using the Leninger method. Nurses and clients in newly formed relationships engaged in separate audiotaped interviews. Interactions between nurses and clients were videotaped for observation. The study setting was a tertiary care psychiatric hospital in Ontario, Canada.

Findings

Some of the relationships progressed well, and others experienced difficulties. Relationships that were working well involved frequent, regularly scheduled, private interactions. Feelings of trust developed, and clients were able to discuss problems. This study revealed the following factors in relationships: (1) *helping factors*: consistency, pacing, listening, positive initial impression, comfort, a balance of control, and client factors; (2) *hampering factors*: inconsistency and unavailability; (3) *nurses’ feelings and awareness*.

Implications

In order to be developed, therapeutic relationships require consistent, regular, and private interactions with clients. The nurses in this study emphasized the importance of listening, pacing, and consistency. The helping factors are consistent with Peplau’s theory.

Forchuk, C., Westwell, J., Martin, M., Bamber-Azzopardi, W., Kosterewa-Tolman, D., & Hux, M. (2000). The developing nurse-client relationship: Nurses’ perspectives. *Journal of the American Psychiatric Nurses Association*, 6(1), 3–10.

patients” (p. 25). Table 12-5 presents the essential elements of therapeutic communication: empathy, trust, honesty, validation, caring, a nonjudgmental approach, and use of active listening.

Refer to Chapter 11 for a more detailed discussion of therapeutic elements.

THERAPEUTIC COMMUNICATION

- Is purposeful and goal-directed
- Has well-defined boundaries
- Is client-focused
- Is nonjudgmental
- Uses well-planned, selected techniques

Principles of Therapeutic Interaction

Regardless of the type of interaction, principles and guidelines of therapeutic communication are used to direct the nurse when relating with clients. A discussion of basic principles for guiding therapeutic communication follows.

Plan to interview at an appropriate time. The time frame within which an interaction occurs influences the outcome. For example, it is unwise to plan to talk with a client during visiting hours, during change of shift, or when the client is distracted by environmental stimuli (e.g., the homebound client is watching a favorite television show). In such situations, the nurse may be rushed or the client may be preoccupied. Neither situation would be conducive to effective interaction.

Assure privacy. Clients are entitled to confidentiality. Nobody wants to discuss private matters when or where other people are listening. Privacy can be arranged by screening the client’s bed, closing the door to the room, or finding a quiet secluded place in which to talk. In the home setting, it may be necessary to ask family members or visitors for time and space to promote confidentiality.

Establish guidelines for the therapeutic interaction. During the initial contact with the client, the nurse should share certain information. This includes the nurse’s name and affiliation and the reason for or purpose of the interaction, the expected length of the contact with the client, and the assurance of confidentiality. The client needs to have this basic information, and it serves as an introduction to the development of the therapeutic nurse-client relationship.

Provide for comfort during the interaction. Discomfort can be distracting. The Nursing Checklist provides guidelines for promoting a client’s comfort in order to improve communication.

Accept the client exactly as is. Being judgmental blocks communication. Nurses who put aside personal prejudices, curiosities, feelings, and values are more receptive

TABLE 12-5
The Elements of Therapeutic Communication

Definition	Behaviors of the Nurse	Outcomes
<p>Empathy: An emotional linkage between two or more people through which feelings are communicated; involves trying to imagine what it must be like to be in another person's situation</p>	<p>Verbal comments:</p> <ul style="list-style-type: none"> • "This must make you feel sad." <p>Nonverbal actions:</p> <ul style="list-style-type: none"> • A nod of the head to indicate understanding. • Mirroring the client's facial expression in a genuine way. 	<ul style="list-style-type: none"> • Promotes understanding of the client's feelings and condition. • Enables the nurse and client to relate better. • Provides the client with clues that the nurse is following and understanding what is being said.
<p>Trust: The client's belief that the nurse will behave predictably and competently while respecting the client's needs</p>	<ul style="list-style-type: none"> • Ensure confidentiality. • Be consistent. • Do exactly what you say you will do for the client. • Arrive on time. • End the session on time. • Return when you say you will. • Be consistently friendly, open, and honest. 	<ul style="list-style-type: none"> • Provides the basis for progress during future encounters. • Sets up the foundation of the therapeutic relationship. • Makes the client feel comfortable with the nurse, rather than guarded or afraid.
<p>Honesty: The ability to be truthful, frank, and sincere</p>	<ul style="list-style-type: none"> • Provide realistic reassurance. • Avoid false reassurance. • Develop insight into the way your feelings and reactions affect the client. • Accept yourself. 	<ul style="list-style-type: none"> • Promotes the development of trust. • Enables the nurse to gain personal insight. Consequently, behavior with the client can be modified as needed.
<p>Validation: Listening to the client and responding congruently in order to be sure that the nurse and client have the same understanding of a problem or issue</p>	<p>Verbal comments:</p> <ul style="list-style-type: none"> • "So you are saying that ..." • "Let me be sure I understand what you are saying." • "Tell me what you understand about what I just said." 	<ul style="list-style-type: none"> • Clarifies communication. • Helps the client to feel accepted, respected, and understood.
<p>Caring: The level of emotional involvement between the nurse and the client</p>	<p>Nonverbal actions:</p> <ul style="list-style-type: none"> • Seeking the client out each day. • Spending quality time with the client. • Paying attention to the client's needs. • Using tactile messages, such as a pat on the back, to show support. 	<ul style="list-style-type: none"> • Makes the client feel accepted. • Provides the client with the knowledge that the nurse is willing to help.
<p>Active listening: Hearing and interpreting language, noticing nonverbal and paraverbal enhancements, and identifying underlying feelings</p>	<ul style="list-style-type: none"> • Taking time to listen. • Giving the client your undivided attention. • Making eye contact. • Responding to verbal and nonverbal leads, clues, and signals from the client. • Analyzing and validating throughout the conversation. • Suspending judgment. • Listening between the lines. • Understanding the feelings behind the facts. • Noticing discrepancies between facts and feelings. • Noticing things omitted such as topics that the client should be discussing but avoids. • Using communication principles and techniques to be a sounding board. 	<ul style="list-style-type: none"> • Promotes understanding of the client. • Allows the client to express self more freely. • Helps the client gain a better understanding of the problem(s). • Promotes problem solving by the client. • Enhances the client's self-esteem.

(From: Johnson, B. S. [1996]. *Psychiatric-mental health nursing: Adaptation and growth* [4th ed.]. Philadelphia: Lippincott; Kneisl, C. R. [1996]. Therapeutic communication. In H. S. Wilson & C. R. Kneisl, *Psychiatric nursing* [5th ed.]. Menlo Park, CA: Addison-Wesley; Varcarolis, E., & Rader, I. [1998]. *Foundations of mental health-psychiatric nursing*. [3rd ed.]. Philadelphia: Saunders.)

**NURSING CHECKLIST***Meeting the Client's Comfort Needs*

- Regulate the temperature of the environment.
- Sit in comfortable chairs.
- Provide for adequate ventilation.
- Implement measures to decrease pain.

to the feelings and behaviors of the client, regardless of content stated by the client. Nonjudgmental nurses are less encumbered by their own personal needs.

Encourage spontaneity. The nurse gathers more data when the client is talking freely. Also, the client experiences relief and freedom from worries by talking without inhibition.

Focus on the client and on the leads and clues presented. Asking questions just for the sake of talking or for the satisfaction of one's own curiosity does not contribute to effective interviewing. Therapeutic interaction involves discussing the client's problems, needs, or concerns. Therefore, allow the client to initiate the topic to be discussed; then, use techniques to focus on that topic. Pay attention to the verbal, paraverbal, and nonverbal cues and signals of the client, and focus on them when they occur.

Encourage the expression of feelings. Simply allowing the client to talk is not interviewing. Therapeutic interaction occurs when the client is permitted to voice feelings about troublesome events or interpersonal situations. Doing so requires the nurse to identify those areas that are emotionally charged and to focus on them.

Be aware of your own feelings during the interaction. The nurse's feelings influence the interaction. For example, the nurse who becomes anxious may change the subject or make comments that finalize the session. The nurse must make a conscious effort to prevent personal feelings from getting in the way of the client's progress. Identifying one's own feelings and behavior and recognizing the way they affect the client lead to better communications.

Therapeutic Approaches with Clients

In addition to using the above principles for interviewing, there are numerous techniques that are helpful in promoting therapeutic communication. It is important to use the communication techniques as tools for building relationships with clients. "I do not think therapeutic techniques matter as much as how professionals use their work to communicate a genuine, caring, and loving attitude toward someone else's pain" (Masching, 1996, p. 26). See Table 12-6 for an analysis of these techniques.

BARRIERS TO THERAPEUTIC INTERACTION

Communication barriers present real challenges to the nurse, but need not stop communication. Rather, barriers pose hurdles that the nurse is able to scale by using creative and different approaches with the client. The nurse develops strategies for overcoming barriers by use of critical-thinking skills. Common communication barriers are discussed below.

Language Differences

When English is the clients' second language, they may have problems navigating through the health care system. An inability to communicate effectively with health care providers adversely affects clients' responses to interventions. The impact of this barrier can be lessened by learning the language (or parts of it), or by using interpreters, pictures and symbols, and foreign language dictionaries. Other ways of ameliorating language problems are discussed later in this chapter.

Communication problems can also occur when everyone speaks English as a first language. For example, complex sentence structure and the different meanings of words may lead to communication difficulties. The use of value-laden terms also blocks the exchange of information, ideas, and feelings.

Cultural Differences

Various cultures and subcultures use language differently. A person's communication patterns reflect their culture. In some cultures, expression of thoughts and feelings is spontaneous and exuberant, whereas people of other cultural groups may be reserved and stoic in their verbalizations. Some of the communication variables that are culture specific include eye contact, proximity to others, direct versus indirect questioning, and the role of social small talk. See Chapter 16 for a discussion of the influence of culture on communication.

THINK ABOUT IT

Traditional sex-role beliefs support the idea that women bear the primary responsibility for family well-being. How might the gender-biased expectations of both nurse and client affect the messages communicated? What are your gender-biased expectations of women as either clients or care providers? What approaches could you take to make your communication more gender conscious?

TABLE 12-6
Therapeutic Communication Techniques

Technique	Description	Example
<i>Techniques that allow the client to set the pace</i>		
Offering self	Nurse is available, physically and emotionally Indicates nurse's willingness/intent to help Nurse's presence is reassuring; may prompt client to continue Indicates nurse's attention and interest	"I'll sit with you awhile." "Go on." "Uh-huh." Head nodding
Broad openings	Encourages client to choose topic for discussion Demonstrates respect for client's thoughts Emphasizes importance of client's needs	"What do you want to talk about?" "Can you tell me more about that?" "How have things been going?"
Silence	Gives client time to reflect Encourages client to express self Indicates interest in what client has to say Increases nurse's understanding of client's message Helps to structure and pace the interaction Conveys respect and acceptance	Sit quietly and observe client's behavior Use appropriate eye contact Employ attending behaviors Control own discomfort during quiet periods or conversation lulls
<i>Techniques that Encourage Spontaneity</i>		
Open-ended comments	Unfinished sentences that prompt client to continue Questions that cannot be answered with a one-word answer Allows client to decide what content is relevant	"Tell me about your pain?" instead of "Are you in pain?" "Tell me about your family" rather than "How many children do you have?"
Reflection	Focuses on content of client's message and feelings Repeating client's last words in order to prompt further expression Communicates nurse's interest Lets client know the nurse is actively listening	<i>Client:</i> "Do you think I should tell the doctor I stopped taking my medication?" <i>Nurse:</i> "What do you think about that?" <i>Client:</i> "I probably should. But the medicine makes me so tearful and agitated." <i>Nurse:</i> "You sound a bit agitated now."
Restating	Repeating or paraphrasing client's main idea Indicates nurse is listening to client Encourages further dialogue Gives client an opportunity to explain or elaborate	<i>Client:</i> "I told the doctor that I had problems with this medicine, but he just didn't listen to me!" <i>Nurse:</i> "Sounds like you're pretty angry at him." <i>Client:</i> "I don't sleep well anymore." <i>Nurse:</i> "You're having problems sleeping?"
<i>Techniques that focus on the client by responding to verbal, paraverbal, and nonverbal cues</i>		
Exploring	Attempts to develop in more detail a specific area of concern to client Identifies patterns or themes	"Tell me more about how you feel when you do not take your medication." "Could you tell me about one of those times when you felt so upset?"
Recognition	Nurse points out observed cues to client	"I notice that you became embarrassed when . . ." "I see that you have some pictures of the new baby."
Focusing	Questions or statements that help client develop or expand an idea Directs conversation toward key topics	"You mentioned that you are having a problem with . . ." "You say you feel nauseous a lot."

(continues)

TABLE 12-6 (continued)
Therapeutic Communication Techniques

Technique	Description	Example
Directing	Comments that elicit specific information from the client Is used to collect assessment data, not to satisfy nurse's curiosity	<i>Client:</i> "They told me I needed to see a specialist." <i>Nurse:</i> "What made them say that to you?" or "When were you told this?" or "Where were you when they told you?" or "How do you feel about seeing another doctor?"
<i>Techniques that encourage expression of feelings</i>		
Verbalizing the implied	An attempt to detect the true meaning of verbal messages	<i>Client:</i> "How much is this x-ray going to cost?" <i>Nurse:</i> "You're worried about your medical bills?"
Making observations	Nurse calls attention to behavior indicative of feelings	"You seem sad today." "You're limping as if your leg hurts."
Clarifying	Makes the meaning of client's message clear Prevents nurse from making assumptions about client's message	<i>Client:</i> "Whenever I talk to my doctor, I feel upset." <i>Nurse:</i> "Tell me what you mean by upset." <i>Client:</i> "They said I could be discharged tomorrow." <i>Nurse:</i> "Who told you this?"
<i>Techniques that encourage the client to make some changes</i>		
Confronting	Nurse's verbal response to incongruence between client's words and actions Encourages client to recognize potential areas for change	<i>Client:</i> "I am so angry at her" (stated while smiling). <i>Nurse:</i> "You say you're angry, yet you're smiling." <i>Client:</i> "I never know which of my symptoms to pay attention to. I think maybe I'm just a hypochondriac." <i>Nurse:</i> "You say you're not sure which symptoms are important, yet you knew when to come to the clinic for help."
Limit setting	Stating expectations for appropriate behavior Establishing behavioral parameters	<i>Nurse:</i> "It seems that you are feeling unsure of how to behave right now." <i>Client:</i> "What do you mean?" <i>Nurse:</i> "Well, you're asking me a lot of personal questions. The reason you're here is because you have some health problems. How can I help you tell me more clearly what brought you here to the clinic?"

(From Johnson, B. S. [1996]. *Psychiatric-mental health nursing: Adaptation and growth* [4th ed.]. Philadelphia: Lippincott; Kneisl, C. [1996]. Therapeutic communication. In H. S. Wilson & C. R. Kneisl, *Psychiatric nursing* [5th ed.]. Menlo Park, CA: Addison-Wesley; Stuart, G. W. & Laraia, M. T. [1998]. *Stuart & Sundeen's principles and practice of psychiatric nursing* [6th ed.]. St. Louis: Mosby; Sundeen, S. J., Stuart, G. W., Rankin, E. A., & Cohen, S. A. [1998]. *Nurse-client interaction: Implementing the nursing process* [6th ed.]. St. Louis: Mosby; Varcarolis, E. & Rader, I. [1998]. *Foundations of mental health psychiatric nursing* (3rd ed.). Philadelphia: Saunders.)

Gender

Sending, receiving, and interpreting messages can vary between men and women. The effect and use of nonverbal cues are often gender-dependent. For example, women tend to be better decoders of nonverbal cues, and men prefer more personal distance between themselves and others than do women (Boggs, 1999).

Health Status

One's health status affects communication. For example, the client who is oriented will communicate more reliably than a client who is delirious, confused, or disoriented. Communication is affected by sensory perceptual alterations, such as loss of vision or hearing.

Developmental Level

Failure to communicate at the client's developmental level can be a roadblock. For example, communication with children requires the use of different words and approaches than are used with adults because a child cannot think in abstract concepts. Relating at the client's own developmental level is necessary for understanding. A discussion of communicating with children is presented later in this chapter.

Knowledge Differences

All people need to be understood. Nurses consistently assess the knowledge levels of clients in order to determine the best way to correct knowledge deficits. When assessing knowledge level, the nurse should:

- Take note of the client's vocabulary
- Observe the numbers and kinds of facts the client has
- Determine the client's educational background

With this information, the nurse is able to assess the teaching needs of the client, as well as determine the method of instruction to use.

Emotional Distance

Satisfying encounters are described by words such as *rappor*t and *empathy*, and they occur when both parties are willing to be "present" as persons. Emotional distance, on the other hand, involves treating the client as a curiosity, a problem, or a disease, thus preventing satisfying interaction and possibly causing hostility. Consider, for instance, a client who is on strict isolation for an infectious disease, or someone who is confused and disoriented. By maintaining rapport with clients regardless of their status, nurses are able to decrease emotional distance.

Emotions

When the nurse or the client is anxious, communication may change, stop, or take a nonproductive course. Nurses should be aware of their own feelings and try to control them in order to ensure progress in the interview. It is important that the nurse present a calm manner in order to ease the client's apprehension and, thus, improve the quality of communication.

Daydreaming

People can hear words faster than they can speak. Therefore, the listener's mind may wander and the whole point of a message may be missed. Mind-wandering can also happen because the listener is bored or preoccupied with worrisome thoughts. Nurses can keep

themselves from daydreaming by constantly attending to what the client has to say, by staying alert, and by controlling their own thoughts.

Use of Healthcare Jargon

The use of healthcare jargon can provoke anxiety in the client. Nurses and other healthcare providers have a language unique to their subculture. Nurses who use healthcare jargon with clients are likely contributing to blocked communication. Terms or phrases such as "CBC," "prn," "intake," "BP," and "take your vitals" are often not understood or are misinterpreted by clients and families. "To health care consumers, some words are frightening or even demeaning" (Ward-Collins, 1998, p. 28). It is important that nurses use language that is easily understood and explain medical terminology so that it is comprehensible.

COMMUNICATION BLOCKS

Certain responses that would be acceptable during social conversation are not useful during therapeutic interaction. Unhelpful techniques are those that halt the progress of the interview and may result in the client's experiencing feelings of inadequacy, intimidation, or confusion. Table 12-7 describes several communication roadblocks that are to be avoided. Nurses must constantly be aware of potential barriers to effective communication between themselves, their clients, and members of the health care team, and they must develop strategies to maximize their therapeutic interactions with clients.

COMMUNICATION, CRITICAL THINKING, AND NURSING PROCESS

Critical thinking is an important part of effective communication. As Ward-Collins (1998) states, "As nurses, we need to consider ideas from all perspectives—including the exploration of conceptual meanings" (p. 28). In other words, nurses carefully formulate questions and propose answers through thinking critically. Interpersonal skills (as evidenced by effective communication) and critical thinking are competencies upon which nursing practice is based; see the accompanying display.

Assessment

The nurse theorist Peplau (1951) stated, "To encourage the patient to participate in identifying and assessing his problem is to engage him as an active partner—an enterprise of great concern to him" (p. 47). Therapeutic communication

TABLE 12-7
Communication Roadblocks

Roadblock	Definition	Examples
Reassuring	Comments that indicate to the client that concerns or fears are unwarranted.	<ul style="list-style-type: none"> • “Everything will be fine.” • “You will feel better soon.”
Agreeing	Comments that indicate that the nurse’s views are those of the client.	<ul style="list-style-type: none"> • “I agree.” • “I think you are right.”
Approving	Comments that indicate that the client’s views, actions, needs, or wishes are “good” rather than “bad.”	<ul style="list-style-type: none"> • “That’s good.” • “I think you did the right thing.”
Defending	Comments that are aimed at protecting the nurse, someone else, or something from verbal attack.	<ul style="list-style-type: none"> • “I did not say that.” • “Doctor Jones is a good doctor.” • “I am sure your father meant nothing by that comment.”
Using yes-or-no questions	Questions or comments that can be answered by the client with a Yes or No.	<ul style="list-style-type: none"> • “Are you tired?” • “Would you like some water?” • “Could we talk now?” • “Did you sleep well?”
Using stereotyped comments	“Pat” answers or clichés that indicate that the client’s concerns are unimportant or insignificant.	<ul style="list-style-type: none"> • “C’est la vie.” • “That’s the way the ball bounces.” • “It will all come out in the wash.”
Changing focus	Switching to a topic that is more comfortable to discuss.	<ul style="list-style-type: none"> • <i>Client</i>: “I wish I were dead.” • <i>Nurse</i>: “Did your wife visit today?”
Judging	Comments or actions by the nurse that indicate pleasure or displeasure with what the client says.	<ul style="list-style-type: none"> • A stern look. • Rolling the eyes. • “I like that.” • “I do not like that.”
Blaming	Accusing the client of misconduct; undermines the client’s need to be loved and accepted.	<ul style="list-style-type: none"> • “You should know better than to talk like that.” • “If you had not moved, I would have been able to complete this venipuncture.”
Belittling the client’s feelings	Indicating to the client that feelings expressed are unwarranted or unimportant.	<ul style="list-style-type: none"> • “Don’t feel that way.” • “Be a big boy and stop crying.”
Advising	Giving the client opinion or direction about solving a problem.	<ul style="list-style-type: none"> • “If I were you, I would talk to your husband about this.” • “I think you should do something for yourself for a change.”
Rejecting	Indicating to the client that certain topics are not open to discussion.	<ul style="list-style-type: none"> • “Let’s not talk about that right now.”
Disapproving	Indicating displeasure about comments or behaviors and/or placing a value on them.	<ul style="list-style-type: none"> • “That’s bad.”
Probing	Pressuring the client to discuss something before she is ready.	<ul style="list-style-type: none"> • “Why do you feel this way?” • “Why did you come to the hospital?” • “Why are you angry with your son?”

(From Johnson, B. S. [1996]. *Psychiatric-mental health nursing: Adaptation and growth*. [4th ed.]. Philadelphia: Lippincott; Kneisl, C. R. [1996]. Therapeutic communication. In H. S. Wilson, & C. R. Kneisl. *Psychiatric nursing* [5th ed.]. Menlo Park, CA: Addison-Wesley; Sundeen, S. J., Stuart, G. W., Rankin, E. A., & Cohen, S. A. [1998]. *Nurse-client interaction: Implementing the nursing process* [6th ed.]. St. Louis: Mosby; Varcarolis, E. [1998]. *Foundations of mental health-psychiatric nursing*. [3rd ed.]. Philadelphia: Saunders.)

RELATIONSHIP BETWEEN COMMUNICATION AND NURSING PROCESS

Assessment

- Asking questions to elicit key information
- Observing nonverbal behavior
- Reading medical records

Diagnosis

- Posing questions to assist in analyzing and clustering data into meaningful patterns
- Talking with client and family or significant others to determine perception of needs and problems

Planning/Outcome Identification

- Talking with clients to mutually determine areas of concern and to formulate goals and objectives
- Staff meetings with coworkers to develop plans of care
- Writing and reading plans of care

Implementation

Determination of most appropriate intervention or method of responding; calls for input from client, significant others, and/or healthcare team members

Evaluation

Critiquing the client's response to interventions; requires direct communication with client and/or significant others

is the vehicle for establishing a partnership between client and nurse. When performing the admission assessment, the nurse seeks to understand the client's entire message by focusing on both verbal and nonverbal communication. For example, note what a client is doing when stating "I have a terrible headache." What nonverbal cues support the words? Or is there an incongruity between the words and behavior? Hubert (1998) provides the following guidelines for communicating with clients during assessment:

- Use encouraging questions to help the client feel in control.
- Pay attention to the client's age, cultural background, and health status.
- Be mindful of the client's literacy level.
- Act calm and unhurried even if time is limited.

Following these guidelines facilitates communication and thereby improves the accuracy and usefulness of assessment data. Assessing the client's communication ability involves collecting data relevant to the presence of physical and psychological barriers.

Assessment of the client's ability to communicate must be ongoing. The presence of **aphasia** (impairment or

absence of language function) should not be misinterpreted as confusion. Table 12-8 describes the types of aphasia.

Nursing Diagnosis

"Accurate diagnosis is an art of communication perfected by experience" (Hubert, 1998, p. 16). This art can be achieved by establishing a therapeutic relationship with the client. By paying meticulous attention to the client's communication, nurses are able to determine pertinent needs and, thus, develop accurate diagnostic judgments. Through effective communication, the nurse develops an atmosphere in which the client feels safe to express all relevant concerns.

The North American Nursing Diagnosis Association (NANDA, 2001) defines communication as "a human response pattern involved in sending messages." Whenever a client is unable to send, receive, or interpret messages accurately, the diagnosis Impaired Verbal Communication is applicable; see the Nursing Process Highlight.

Other diagnoses that may be relevant for the person experiencing communication difficulties include the following:

- Social isolation related to impaired verbal communication
- Anxiety related to impaired verbal communication
- Self-esteem disturbance related to impaired verbal communication

TABLE 12-8
Classification of Aphasias

Broca's aphasia	Slow hesitant speech Difficulty selecting and organizing words Naming, word, and phrase repetition Writing impaired Slight comprehension defects
Wernicke's aphasia	Auditory comprehension impaired Impaired speech content Client unaware of deficits
Anomic aphasia	Unable to name objects or places Comprehension and repetition of words and phrases intact
Conduction aphasia	Difficulty repeating words, substitutes incorrect sounds for another
Global aphasia	Severe impairment of oral and written comprehension Impaired naming and repetition of words Impaired writing ability

Planning and Outcome Identification

After identifying communication problems, the nurse and client work together to develop goals and outcomes. The nurse then formulates nursing interventions to promote goal achievement. A major goal for every client is to develop an ability to communicate effectively, whether by verbalization or alternate means. See the Nursing Checklist for guidelines in dealing with language barriers.

Implementation

More than 46 million people, nearly one in five Americans, have some form of communication disorder (Matthews-Flint & Lucas, 1999). It is extremely challenging for nurses to communicate with clients experiencing communication disorders. Technological advances have led to the development of telecommunication relay services (TRS), which often can be used

with clients experiencing communication disorders. See Table 12-9 for a description of methods for communicating with clients who have special needs.

Refer to Chapter 13 for specific guidelines on communicating with children, adolescents, and elderly clients.



NURSING CHECKLIST

Overcoming Language Barriers

- Speak slowly and distinctly in a normal tone of voice.
- Use gestures or pictures to emphasize meaning of words.
- Avoid clichés, medical jargon, or value-laden terms.
- Avoid defensive or challenging body language.
- Provide reading material written in the appropriate language.
- Use an interpreter who is fluent in health care terminology.
- Speak to the client rather than to the interpreter.
- Use the same interpreter for every interaction if feasible.

Nursing Process Highlight

NURSING DIAGNOSIS Impaired Verbal Communication

DEFINITION State in which a person experiences a decreased, delayed, or absent ability to process, receive, or transmit meaning.

DEFINING CHARACTERISTICS

- Disorientation
- Inability or unwillingness to speak
- Difficulty speaking
- Difficulty expressing thoughts verbally
- Partial or total visual defect
- Stuttering or slurring of words
- Willful refusal to speak
- Unable to speak dominant language

RELATED FACTORS

- Cultural differences
- Decreased cerebral bloodflow
- Physical barrier (e.g., tracheostomy)
- Anatomical defect (e.g., cleft palate)
- Developmental differences

(From North American Nursing Diagnosis Association. [2001]. *Nursing diagnoses: Definitions & classification: 2001–2002*. Philadelphia: Author.)

NURSING ALERT

Impaired Communication

Use caution when “just talking” in the room of a comatose client. Remember *to* talk to unconscious clients rather than *about* them.

Evaluation

Evaluation of communication effectiveness involves both nurse and client. Communication is a major tool for evaluating a client’s achievement of expected outcomes. For example, the nurse observes nonverbal behavior, talks with the client, and listens actively to the client’s comments. The nurse uses critical thinking to analyze the client’s responses, as well as his or her own use of communication skills.

KEY CONCEPTS

- Communication is a vital aspect of all phases of nursing practice.
- The five components of the communication process are the sender, message, channel, receiver, and feedback.

TABLE 12-9
Communicating with Vulnerable Populations

Clients who are hearing impaired	<p>Determine if the client reads lips. If so, face the client and reduce background noise to a minimum.</p> <p>If client is using a hearing aid, check to see that it is in working order.</p> <p>Always face the client.</p> <p>Speak at a normal pace in a normal tone of voice</p> <p>Focus on nonverbal cues from the client.</p> <p>Use gestures and facial expressions to reinforce verbal messages.</p> <p>Provide pen and paper to facilitate communication if client is literate.</p>
Clients who are visually impaired	<p>When speaking to visually impaired clients, always face them as if they were sighted.</p> <p>Follow the cues of the clients in order to allow as much independence as possible.</p> <p>Look directly at the client.</p> <p>Speak in a normal tone of voice; it is demeaning to yell.</p> <p>Ask for permission before touching the client.</p> <p>Orient the client to the immediate environment.</p>
Clients who are aphasic	<p>Assess the client's usual method of communication; adapt the interaction to accommodate the client's abilities.</p> <p>Use a written interview format, letter boards, or yes/no cards.</p> <p>Allow additional time for client's responses.</p> <p>Do not answer for the client.</p> <p>Use closed (one-word response) questions when possible.</p> <p>Repeat or rephrase the comment if client does not understand.</p> <p>Speak directly to the client, not to the intermediary.</p> <p>To reinforce verbal messages, use facial expressions, gestures, and voice tone.</p>
Unconscious clients	<p>Assume the client can hear.</p> <p>Talk to the client in a normal tone of voice.</p> <p>Engage in normal conversational topics as with any client.</p> <p>Speak to the client before touching.</p> <p>Use touch to communicate a sense of presence.</p> <p>Decrease environmental stimuli (especially auditory).</p>
Confused clients	<p>Maintain appropriate eye contact.</p> <p>Keep background noises to a minimum.</p> <p>Use simple, concrete words and sentences.</p> <p>Use pictures and symbols.</p> <p>Use closed rather than open-ended questions.</p> <p>Give the client time to respond.</p>
Angry clients	<p>Use caution when communicating with a client who has a history of violent behavior or poor impulse control.</p> <p>Do not turn your back on the client. Arrange the setting so that the client is not between you and the door to the room.</p> <p>Focus on the client's body language.</p> <p>Be alert for physical indicators of impending aggression: narrowed eyes, clenched jaw, clenched fist, or a loud tone of voice.</p> <p>Model the expected behavior by lowering your tone of voice.</p> <p>Stay within the client's line of vision.</p> <p>Do not use touch.</p>

- Factors such as perception, cultural context, space and distance, and time influence communication.
- The three levels of communication are intrapersonal, interpersonal, and group.
- Using language or other symbols, the sender produces verbal, paraverbal, and nonverbal messages that are delivered through a channel (visual, auditory, or kinesthetic) to a receiver.
- Interdisciplinary communication is a type of interaction in which members of the health care team collaborate on a client's care.
- Therapeutic communication is the use of communication for the purpose of creating a beneficial outcome for the client.
- Elements of effective therapeutic communication include empathy, trust, honesty, validation, caring, and active listening.
- The nurse needs to observe specific principles and techniques in order to initiate and maintain therapeutic communication with clients.
- Barriers such as language differences, sociocultural differences, gender, health status, developmental level, knowledge differences, emotional distance, emotions, and daydreaming can pose challenges for nurses in communication with clients.
- Communication barriers can be overcome if creativity, innovation, awareness, sensitivity, and critical-thinking skills are used by the nurse.

CRITICAL THINKING ACTIVITIES

1. Explain the following statement: "Communication is reciprocal, irreversible, and continuous."
2. What are the major components of the communication process?
3. Why is it important to pay attention to nonverbal communication?
4. How do you recognize nonverbal messages?
5. Define therapeutic communication.
6. State four basic principles that direct and guide therapeutic interaction.
7. Which unhelpful techniques used by the nurse could cause the client to feel threatened?
8. Which therapeutic techniques could be used by the nurse to decrease the client's confusion?

WEB RESOURCES

- American Holistic Nurses Association
www.ahna.org
- American Nurses Association
www.nursingworld.org
- American Psychiatric Nurses Association
www.apna.org
- National Institutes of Mental Health
www.nimh.nih.gov

Client Education



Learning is not attained by chance, it must be sought for with ardor and attended to with diligence.

—Abigail Adams (in McWilliams & McWilliams, 1991)

COMPETENCIES

1. Explain the importance of client education in today's health care climate.
2. Relate principles of adult education to client teaching.
3. Identify common barriers to learning.
4. Explain how learning varies throughout the life cycle.
5. Discuss the nurse's professional responsibilities related to teaching.
6. Relate the teaching-learning process to the nursing process.
7. Describe teaching strategies that make learning meaningful to clients.

KEY
TERMS

affective domain
auditory learner
cognitive domain
kinesthetic learner
learning

learning plateau
learning style
philosophy
psychomotor domain
readiness for learning

self-efficacy
teaching
teaching-learning process
teaching strategies
visual learner

Client education is an integral part of nursing care. It is the nurse's responsibility to assist the client to identify the learning needs and resources that will restore and maintain an optimal level of functioning. This chapter offers an overview of the teaching-learning process, including learning barriers and teaching responsibilities of nurses. Client education is extremely important today in a health care environment that demands cost-effective measures. With shorter hospital stays, clients are being discharged to the home or other health care settings in more critical condition than ever before. Client education, a hallmark of quality nursing care, is a fiscally responsible intervention that encourages health care consumers to engage in self-care and to develop healthy lifestyle practices.

THE TEACHING-LEARNING PROCESS

The **teaching-learning process** is a planned interaction that promotes behavioral change that is not a result of maturation or coincidence. **Teaching** is an active process in which one individual shares information with others to provide them with the information to make behavioral changes. Teaching refers to all the activities used by a teacher to assist the learner to absorb new information; it consists of activities that promote change. Teaching is a goal-directed process that provides the opportunity for learning.

Learning is the process of assimilating information with a resultant change in behavior. Nurses and clients have shared responsibilities in the teaching-learning process. Knowledge is power. By sharing knowledge with clients, the nurse empowers clients to achieve their maximum level of wellness. The teaching-learning process will be familiar to nurses in that it mirrors the steps of the nursing process: assessment, identification of learning needs (nursing diagnosis), planning, implementation of teaching strategies, and evaluation of learner progress and teaching efficacy.

Purposes of Client Teaching

According to Edelman and Mandle (1997), the goal of health education is to help individuals achieve optimum states of health through their own actions. Teaching, one of the most important nursing functions, addresses

clients' need for information. Often, a knowledge deficit about the course of illness and/or self-care practices hinders a client's recovering from illness or engaging in health promotion behaviors. The nurse's charge is to help bridge the gap between what a client knows and what a client needs to know in order to achieve optimum health.

Client teaching is done for a variety of reasons, including:

- Promotion of wellness
- Prevention of disease/injury
- Restoration of health
- Facilitation of coping abilities

(See Table 13-1). Client education focuses on the client's ability to practice healthy behaviors. The client's ability to care for self is enhanced by effective education. As Redman (1993, p. 1) stated:

Many will agree that patients need assistance with understanding their health situations, making health care decisions, and changing health behaviors. Patient and family education has become an integral part of safe, cost-effective, quality patient care.

To be more effective teachers, nurses need a basic understanding of learning theories. There are many schools of thought (theories) about how people learn. Table 13-2 provides an overview of major learning theories.

Each nurse needs to develop an individual **philosophy** (statement of beliefs that is the foundation for behavior) of learning. When formulating a philosophy about teaching-learning, nurses need to consider the common beliefs about learning listed in the accompanying display.

BELIEFS ABOUT LEARNING

- Each individual has the capacity to learn; learning ability varies from person to person and is situational.
- The pace of learning varies with each person.
- Learning is a continuous process, occurring throughout the life cycle.
- Learning can occur in formal and informal settings and interactions.
- Learning is an individualized process.
- Learning new information is based on previous knowledge and experiences.
- Motivation and readiness are necessary for learning to occur.
- Prompt feedback facilitates learning.

TABLE 13-1
Client Education Topics

Health Promotion	Health Restoration
<ul style="list-style-type: none"> • Parenting Skills • Nutrition • Exercise • Family planning 	<ul style="list-style-type: none"> • Medication information • Community resources • Information about treatment modalities
Illness/injury prevention	Facilitating coping
<ul style="list-style-type: none"> • Immunizations • Health screenings • Smoking cessation • Breast self-examination • Safety measures (e.g., car seat/restraining devices) 	<ul style="list-style-type: none"> • Safe use of medical equipment • Dietary modifications • Information about the disease process • Counseling related to anger, grief, self-esteem • Stress management

TABLE 13-2
Overview of Learning Theories

Theorist	Description
John Watson	Learning is: A result of conditioning and experiences. Encouraged by changing the environment.
Ivan Pavlov	The learner is passive, controlled by the environment.
B. F. Skinner	Teaching is the deliberate manipulation of the environment.
Edward L. Thorndike	Learning can be transferred from one situation to another. Assessment of learner's behavior is necessary.
John Dewey	The learner must have an understanding of the goals. Education should promote learner independence.
Jerome Bruner	Learning is affected by culture and value system. The learner is an active participant in the learning process.
Robert Gagne	Learning occurs in an orderly fashion, from the simple to the complex, from the concrete to the abstract.
Albert Bandura	Behavior is regulated by internal mechanisms, such as self-efficacy.

THINK ABOUT IT

Your Beliefs about Learning

Consider the information presented in the display and Table 13-2. Which statements mirror your own philosophy about learning? Which statements are most congruent with a nursing philosophy that views clients not as recipients of care but as partners in the caring and healing process?

Facilitators of Learning

Certain fundamental principles of education can be used by nurses to facilitate client learning. Knowles (1984) stated four basic assumptions about adult learners, which are applicable to client education:

- *Assumption:* An individual's personality develops in an orderly fashion from dependence to independence. *Nursing Application:* Plan teaching-learning activities that promote client participation, thus encouraging independence; this increases client control and self-care through empowerment.
- *Assumption:* Learning readiness is affected by developmental stage and sociocultural factors. *Nursing Application:* Conduct a thorough psychosocial assessment before planning the teaching-learning activities.
- *Assumption:* An individual's previous learning experiences can be used as a foundation for further learning. *Nursing Application:* Perform a complete assessment to determine what the client already knows and build on that knowledge base.

- *Assumption:* Immediacy reinforces learning. *Nursing Application:* Provide opportunities for immediate application of knowledge and skills. Incorporate feedback as a continuous part of each nurse-client interaction.

Table 13-3 describes key learning principles.

It is a good idea to keep in mind that **learning plateaus**, or peaks in effectiveness of teaching and depth of learning, will occur in relation to the client's motivation, interest, and perception of relevance of the material. Frequent reinforcement of learning through immediate feedback and continual reassessment of effectiveness will enhance the value of the learning process for both the teacher and the learner. Making the information acquisition process as user-friendly as possible will also increase satisfaction and success. This can be done by organizing content from the simple to the complex and from the familiar to the new, making learning as creative and interesting as possible, and adopting a flexible approach to allow the learning process to be dynamic.

Barriers to Learning

Receiving information does not, in and of itself, guarantee that learning will occur. Several barriers can impede the learning process. In a nursing situation,

TABLE 13-3
Principles of Learning

Principle	Explanation
Relevance	The material should be: <ul style="list-style-type: none"> • Meaningful to client • Easily understood by client • Related to previously learned information
Motivation	Client should: <ul style="list-style-type: none"> • Want to learn • Perceive value of information
Readiness	Client should be able and willing to learn.
Maturation	Client should be developmentally able to learn and have requisite cognitive and psychomotor abilities.
Reinforcement	Feedback to learner should be: <ul style="list-style-type: none"> • Positive • Immediate
Participation	Active involvement promotes learning.
Organization	The material should: <ul style="list-style-type: none"> • Incorporate previously learned information • Be presented in sequence of simple to complex
Repetition	Retention of material is reinforced by practice, repetition, and presentation of same material in a variety of ways.

BARRIERS TO LEARNING

External Barriers

Environmental

- Interruptions
- Lack of privacy
- Multiple stimuli

Sociocultural

- Language
- Value system
- Educational background

Internal Barriers

Psychological

- Anxiety
- Fear
- Anger
- Depression
- Inability to comprehend

Physiological

- Pain
- Fatigue
- Sensory deprivation
- Oxygen deprivation

learning barriers can be classified as either internal (psychological or physiological) or external (environmental or sociocultural). Examples of these barriers are shown in the accompanying display.

The nurse must assess for the presence of barriers to facilitate the learning process. Specific assessment information is presented later in this chapter.

THINK ABOUT IT

Barriers to Learning

Do you think knowledge acquisition alone results in learning (behavior change)? Why? Why not? Consider, for example, all the information available regarding the harmful effects of smoking. Every cigarette package has a similar statement: "Warning: Cigarette smoking can cause lung cancer, heart disease, emphysema, and interfere with pregnancy." However, dissemination of this information has not led to complete cessation of smoking in our society. Why do you think this is so? What learning barriers may be interfering with smokers' taking action in response to this warning?

Domains of Learning

Bloom, in his classic work (1977), identified three areas or domains in which learning occurs: the **cognitive domain** (intellectual understanding), the **affective domain** (emotions and attitudes), and the **psychomotor domain** (motor skills). Each domain responds to and processes information in very different ways. Table 13-4 briefly describes the three domains of learning through clinical examples. What can be learned during the process of client education? "New thinking strategies, new motor skills, and new attitudes are learned in complex patterns that can promote a new performance" (Redman, 1993, p. 78).

TABLE 13-4
Domains of Learning

Domain	Definition	Clinical Example
Cognitive	Learning that involves the acquisition of facts and data. Used in problem solving and decision making.	Client states the name and purpose of prescribed medications.
Affective	Learning that involves changing attitudes, emotions, beliefs. Used in making judgments.	Client accepts that he has a chronic illness.
Psychomotor	Learning that involves gaining motor skills. Uses physical application of knowledge.	Client gives self an injection.

Nurses need to be sensitive to all three domains of learning when developing effective teaching plans and to use **teaching strategies**, or techniques to promote learning, that will tap into each of the domains. For instance, teaching a diabetic client how and why to measure the proper daily balance of insulin against glucose levels is within the cognitive domain. Helping this client learn how to self-administer insulin falls within the psychomotor domain, and seeing that the client learns to view diabetes as only one part of an entire individual stimulates the affective domain.

PROFESSIONAL RESPONSIBILITIES RELATED TO TEACHING

Through teaching, the nurse empowers clients in their self-care abilities. Teaching is the tool for providing information to clients about specific disease processes, treatment methods, and health-promoting behaviors.

Legal Aspects

The American Nurses Association, in its *Social Policy Statement* (1995), identifies health teaching as an essential function of nursing. Each state has its own definition of nursing practice; in most states, teaching is a required function of nurses. As stated by the Louisiana State Board of Nursing (1993, p. 9), “The practice of a registered nurse includes such activities as health instruction, and health counseling.”

Client teaching is also mandated by several accrediting bodies, such as the Joint Commission for

Accreditation of Healthcare Organizations (JCAHO, 1998). The American Hospital Association’s *Patient’s Bill of Rights* (1980) calls for the client’s understanding of health status and treatment approaches. Informed consent for treatment procedures can be given only by clients who are well informed. The nurse assesses the client’s level of understanding about treatment methods and corrects any knowledge deficits. The nurse is often a physician interpreter to the client—explaining in easily understood terms, clarifying, and referring.

Teaching supports behavior change that leads to positive adaptation. Thus, teaching involves decreasing the fear of change. Reducing anxiety and anticipatory stress is an important component of teaching.

Client teaching is an essential function of every professional nurse regardless of the practice setting. Table 13-5 outlines learning needs as they relate to the three phases of nursing care: primary, secondary, and tertiary. Clients who are hospitalized need information regarding their condition, the hospital environment, and expectations regarding treatment.

Documentation

The reasonable, prudent standard calls for nurses to document client education. See Chapter 23 for a discussion of this standard. From a legal perspective, if the nurse teaches the client and fails to document it, then the educational activities never occurred. Documentation of teaching promotes continuity of care and facilitates accurate communication to other health care colleagues.

Many different approaches can be used to document client teaching. Figure 13-1 provides one example of documentation for client teaching in an inpatient setting. For a sample form documenting teaching in the home setting, see Figure 13-2.

TABLE 13-5
Learning Needs in Various Phases of Care

Primary: Health Maintenance	Secondary: Diagnosis and Treatment	Tertiary: Follow-up
Disease prevention	Disease process	Care at home
Health care services availability	Methods of care and treatment	Medications Dietary modifications
Growth and development	Health care setting	Activity Rehabilitation plans
Safety First Aid		Prevention/recurrence of complications
Nutrition Hygiene		

<h1 style="margin: 0;">Tulane</h1> <p style="margin: 0;">UNIVERSITY Medical Center</p>	<h2 style="margin: 0;">PATIENT TEACHING PROTOCOL</h2>						
LEVEL: <u>Interdependent</u>							
TITLE: <u>Teaching the Patient with Diagnosis of Gastrointestinal (GI) Bleed</u>							
COMMENT KEY S = Successfully meets outcome N = Needs further instruction U = Unable to comprehend * = See Nursing Progress Note for Patient/Family Education							
OUTCOME STANDARDS TO BE MET PRIOR TO DISCHARGE:		DATE / INITIALS					
		INITIATED	MET	NOT MET			
PHYSIOLOGIC: Patient will be free of evidence of GI bleed.		/	/	/			
PSYCHOLOGIC: Patient will express fears and concerns with diagnosis of GI bleed and procedures to be performed.		/	/	/			
COGNITIVE: Patient will verbalize understanding of information presented.		/	/	/			
PATIENT LEARNING OUTCOMES (PLO)	Information to be Presented/ Patient Learning Activities	Date Time	PLO #	Initials		Comment (See Key)	
1. Patient will verbalize understanding and compliance with diagnostic procedures and treatment measures. 2. Patient will verbalize those signs/symptoms to report to nurse/M.D. 3. Patient will verbalize fears, concerns and anxieties regarding diagnosis, procedures and prognosis	1. Discuss with patient and offer literature for various tests/procedures ordered: – Colonoscopy – Barium Enema – EGD – Gastrointestinal Series (upper GI) – Sigmoidoscopy – Nasogastric Tube if applicable – NPO, clear liquids – Collection of Stool specimens for blood – Intake and output recorded – IV fluids if ordered – Medications 2. Discuss with patient those signs and symptoms to be reported: – Severe abdominal pain – Abdominal swelling – Cramping – Increased nausea/vomiting, diarrhea or bleeding – Increased weakness 3. Encourage patient to ventilate fears, feelings and concerns during hospital stay and provide emotional support prn .			Nurse	Pt.		

Figure 13-1 Documentation Form for Client Teaching: Inpatient Setting

RIVER REGION HOME HEALTH SERVICES, INC. PSYCHIATRIC NURSE PROGRESS NOTE

PATIENT NAME _____ MR# _____ IN _____ OUT _____

NURSE NAME _____ DAY _____ DATE _____

VSBP _____ T _____ P _____ R _____ WT _____ DIET _____

Nutritional Status _____ Heart/Lung Status _____

Neuro Oriented X _____ PEERL _____ Homebound Status _____

Physical Status _____

Assess Degree of Existing Problem: (1) Mild, (2) Moderate, (3) Severe

Somatic Concern _____	Emotional Withdrawal _____	Anxiety _____
Depressive Mood _____	Hostility _____	Uncooperativeness _____
Blunted Affect _____	Lack of Insight _____	Delusions _____
Suicidal Ideation _____	Motivational Disability _____	Hallucinations _____
Impaired Memory _____	Rx Non-Compliance _____	Socialization _____
Communication _____	Mannerisms & Posturing _____	
ADL's _____	Unusual Thought Concern _____	
Conceptual Disorganization _____		

SN Assessment/Intervention/Teaching: _____

Teaching: _____

Feedback to Teaching: _____

Changes: Meds/Plan of Care: _____

Aide Supervision AS/PAS: _____

Reason HHA Needed: _____

Comments Regarding Care: _____

HOME HEALTH ASSISTANT _____

Current Requisition in Home _____

Completes Assignment _____

Rapport with Patient _____

Planning: Continue Same Plan _____

Increase Visits _____

Decrease Visits _____

Discharge Planning _____

PATIENT _____

Appearance _____

Bathed Completely _____

Body Alignment _____

PT/FMY Satisfied _____

Room Tidy _____

Personal Hygiene _____

Dolpe _____

NURSE SIGNATURE

PATIENT OR CAREGIVER SIGNATURE

Figure 13-2 Documentation Form for Client Teaching: Home Health

Because client education is a standard and essential component of nursing practice, teaching interventions and the client's response must be documented. Elements for documenting client education in all practice settings include:

- Content taught
- Teaching methods used
- Who was taught (e.g., client, which family member, other caretaker)
- Client/family response to teaching activities

LEARNING THROUGHOUT THE LIFE CYCLE

One basic assumption underlies teaching effectiveness—*all people are capable of learning*. This ability to learn varies from person to person and from situation to situation. Most clients—because of anxiety, pain, or other stressors related to illness—have only limited adaptive resources. They may not have much energy or interest to invest in learning.

Learning needs and learning abilities change throughout life. The client's chronological age and developmental stage greatly influence the ability to learn. The principles of learning discussed earlier in this chapter have relevance to learners of all ages. However, teaching approaches must be modified according to the client's developmental stage and level of understanding. Specific information about teaching children, adolescents, and older adults is described in the following sections. Table 13-6 lists teaching strategies for different age groups.

Children

Readiness for learning (evidence of willingness to learn) varies during childhood according to maturational level. Responding to knowledge deficits of young children requires that the nurse work closely with the child's caretaker; including the family or significant others in teaching is essential when caring for young children.

Young children learn primarily through play, which can be incorporated into teaching activities (Figure 13-3). For example, puppets, toys, and coloring books can be effective teaching tools for the young child.

Older children can also benefit from the use of art materials and medical supplies (e.g., medicine cups, putting bandages on dolls). While the child is involved in play, the nurse is alleviating anxiety by teaching the child what to expect regarding treatment procedures.

Biddinger (1993, p. 148), in discussing the learning needs of children prior to treatment procedures, stated:

Children need preprocedural teaching. Preparation of children and parents for medical procedures usually decreases their anxiety levels, reduces their resistant behaviors, and helps them to cope. Young children respond better to health teaching when play is involved, and older children learn from age-appropriate films.

The nursing checklist provides guidelines for teaching children.

Adolescents

As children approach adolescence, they are better able to conceptualize relationships between things. Usually, reading skills and comprehension ability have

TABLE 13-6
Teaching Across the Life Span

Teaching Strategy	Nursing Implications
<p><i>Infants</i></p> <ul style="list-style-type: none"> • Be consistent in actions. • Use brightly colored toys and objects. • Role-play nurturing behavior for parent to model. 	<ul style="list-style-type: none"> • Teach the primary caregivers. • Emphasize the need for consistency in approach. <p>Learning needs: Safety; growth and development concepts; infant care; nutrition; sleep patterns; skin integrity (diaper rash)</p>
<p><i>Toddlers</i></p> <ul style="list-style-type: none"> • Play with appropriate medical equipment and supplies (e.g., Band Aids, surgical caps). • Use child's comfort toy. • Positive simple commands • Picture books • Coloring books • Puppets, dolls • Audio tapes 	<ul style="list-style-type: none"> • Involve parents to decrease child's anxiety level. • Use words easily understood by the child without being condescending. • Assess for signs of sensory overload (toddlers tire quickly); avoid trying to teach when the child is overwhelmed or irritable. <p>Learning needs: Safety; immunizations; nutrition; dental hygiene</p>

(continues)

TABLE 13-6 (continued)
Teaching Across the Life Span

Teaching Strategy	Nursing Implications
<i>Preschoolers</i>	
<ul style="list-style-type: none"> • Provide immediate reinforcers (rewards) for positive behavior (e.g., smiley-face stickers). • Encourage play. • Books and coloring books • Music; singing, audiotapes 	<ul style="list-style-type: none"> • Preschoolers often use words without fully understanding their meanings. • Feelings are expressed through actions instead of words. <p>Learning needs: Immunizations; safety; nutrition; dental hygiene; parenting skills</p>
<i>School-aged Children</i>	
<ul style="list-style-type: none"> • Toys • Computer games • Books • Demonstration • Role-play 	<ul style="list-style-type: none"> • Able to follow simple directions • Understand the use of symbols • Often seek approval by doing the “right” thing • Assess child’s reading ability. <p>Learning needs: Safety; hygiene; nutrition; socialization with peers</p>
<i>Adolescents</i>	
<ul style="list-style-type: none"> • Printed material (at appropriate literacy level) • Role-play • Demonstration 	<ul style="list-style-type: none"> • Peer approval is important; group sessions may be useful unless the material to be taught is too threatening. • Maintain privacy. • Assess for and correct any misinformation. • A sense of invulnerability leads to an “it can’t happen to me” attitude. • Emphasize immediate benefit of learning information. <p>Learning needs: Physiologic changes; sexuality (including contraception); substance abuse prevention; self-esteem; automobile safety; prevention of sports injuries</p>
<i>Young Adults</i>	
<ul style="list-style-type: none"> • Printed materials appropriate to literacy level • Discussion • Demonstration • Role-Play 	<ul style="list-style-type: none"> • Content must be perceived as relevant to young adults. • Strong need for independence; provide choices. • Encourage input into decision making. <p>Learning needs: Nutrition; exercise; stress management; time management; sexuality issues (i.e., contraception); some may need parenting skill classes.</p>
<i>Middle-aged Adults</i>	
<ul style="list-style-type: none"> • Printed materials geared to level of comprehension • Discussion • Demonstration • Role-play 	<ul style="list-style-type: none"> • Increased awareness of personal vulnerability • Generally, a recognition of the need for lifestyle changes • Assess reading skills. <p>Learning needs: Nutrition; exercise; stress management; warning signs of illness.</p>
<i>Older Adults</i>	
<ul style="list-style-type: none"> • Assess for reading skills. • Frequent repetition • Demonstration • Discussion • Assess learning style and match with corresponding materials. 	<ul style="list-style-type: none"> • May need large-print materials • Often a strong desire for independence; offer choices • Chronic illness (i.e., arthritis) may impair mobility and dexterity. • Aging does not lead to an overall decreased intelligence. <p>Learning needs: Loss and grief; disease-specific information; stress management; socialization skills; elimination patterns; dental hygiene</p>

(Adapted from Hunt, R., & Zurek, E. L. [1997]. *Introduction to community based nursing*. Philadelphia: Lippincott.)



Figure 13-3 Using play and games helps children learn and decreases their anxiety about the health care setting.

advanced, and the adolescent can understand more complex information. One of the strongest influences on an adolescent is peer support; therefore, group meetings are often useful in teaching. Nurses also teach by acting as role models. Relate to adolescents on their level by trying to understand how they think. Listening allows the nurse to hear the adolescent's feedback relative to learning needs. It is also important when teaching adolescents to focus on the present and to be aware of their need to maintain control. "Independence is crucial to adolescents. By enlisting teens as active participants in their health care and encouraging them to participate in other activities, you can increase independ-

THINK ABOUT IT

Do As I Say

The adage "Do as I say and not as I do" goes against all wisdom. Individuals learn from examples set by role models. Adolescents are especially sensitive to discrepancies between an adult's words and actions. How does this apply to you as a beginning practitioner of nursing? What messages are communicated by your health behaviors?



NURSING CHECKLIST

Guidelines for Teaching Children

- Make sure the client is comfortable.
- Encourage caregiver participation.
- Assess developmental level. Do not equate age with developmental level.
- Assess client's learning readiness and motivation.
- Assess client's psychological status.
- Determine self-care abilities of client and caregiver.
- Use play, imitation, and role playing to make learning fun and meaningful.
- Use different visual stimuli such as books, chalkboards, and videos to convey information and check understanding.
- Use terms that are easily understood by the client and caregiver.
- Provide frequent repetition and reinforcement.
- Develop realistic goals that are consistent with developmental abilities.
- Verify client's understanding of information presented.



NURSING CHECKLIST

Guidelines for Teaching Adolescents

- Show respect for adolescents by recognizing that they still have to gain the knowledge and experience of adulthood while struggling to break away from the grasp of childhood.
- Boost adolescents' confidence by asking their input and opinions on health care matters.
- Encourage adolescents to explore their own feelings about self-concept and independence.
- Be sensitive to the peer pressure many adolescents face.
- Help adolescents identify their positive qualities and build on those.
- Use language that is clear yet appropriate to the health care setting.
- Gear teaching to the adolescent's developmental level.
- Engage adolescents in problem-solving activities to encourage independent and informed decision making.

ence and decrease noncompliance" (Muscari, 1998, p. 29). The nursing checklist provides additional guidelines for teaching adolescents.

Older Adults

Aging is accompanied by many physiological changes. As a result of these changes, some older adults have perceptual impairments such as impaired vision and hearing. The nurse must assess for perceptual changes and adjust teaching materials accordingly. For example, provide large-print written material and make sure the client can hear all your instructions and directions. The nursing checklist provides guidelines for teaching older adults.



NURSING CHECKLIST

Guidelines for Teaching Older Adults

- Make sure the client is comfortable. Pain, fatigue, and hunger can impair learning.
- Assess client's learning readiness and motivation; also assess developmental level. Do not equate age with developmental level.
- Assess client's psychological status. Depression, severe anxiety, and denial interfere with learning.
- Determine client's self-care abilities.
- Use terms that are easily understood by the client. Avoid talking down to the client; a condescending, paternalistic manner impedes learning.
- Determine the time of day in which the client is better able to concentrate.
- Assess for perceptual impairments and individualize teaching strategies accordingly.

(Adapted from Beare, P. G., & Myers, J. L. [1999]. *Principles and practices of adult health nursing* [3rd ed., p. 111.]. St. Louis: Mosby.)

TEACHING-LEARNING AND THE NURSING PROCESS

The teaching-learning process and the nursing process are interdependent. Both are dynamic and consist of the same phases: assessment, diagnosis, planning, implementation, and evaluation. Figure 13-4 compares the nursing process and the teaching-learning process. See Chapter 5 for more information about the nursing process.

Assessment

The nurse should assess each learning situation for every client. Primary and secondary data sources are used by nurses for assessment of learning needs. See Chapter 6 for a discussion of these sources. Communicating with the client and family or significant others is the foundation of assessment related to learning. Several factors need to be considered during assessment, including:

- Learning styles
- Learning needs



Title of Study

“Health Teaching Needs of Clients with Serious and Persistent Mental Illness: Client and Provider Perspectives”

Authors

Payson, A. A., Wheeler, K., & Wellington, T. A.

Purpose

The purpose of this study was threefold: (1) to investigate demographic characteristics of people with serious and persistent mental illness; (2) to assess the health teaching needs of people with serious and persistent mental illness; and (3) to compare clients' and providers' perceptions of the clients' health teaching needs.

Methods

Clients of a mental health clinic were asked to volunteer in a study after an explanation of its purpose. Data were collected over 6 months. After completing a questionnaire, clients participated in focus groups to determine priority learning needs.

Findings

Ninety-three percent of participants completed the needs assessment questionnaires. The study indicated that psychiatric clients are interested in gaining more information about psychiatric illnesses and methods for solving problems.

Implications

There is a discrepancy between client-determined priority learning needs and provider-determined needs. The results support the practice of assessing clients' own perceptions of their learning needs.

Payson, A. A., Wheeler, K., & Wellington, T. A. (1998). Health teaching needs of clients with serious and persistent mental illness: Client and provider perspectives. *Journal of Psychosocial Nursing*, 36(2), 32–35.

- Potential learning needs
- Ability to learn
- Readiness to learn
- Client strengths
- Previous experience and knowledge base

Learning Styles

Each individual has a unique way of processing information. The manner in which an individual incorporates new data is called **learning style**. Some people

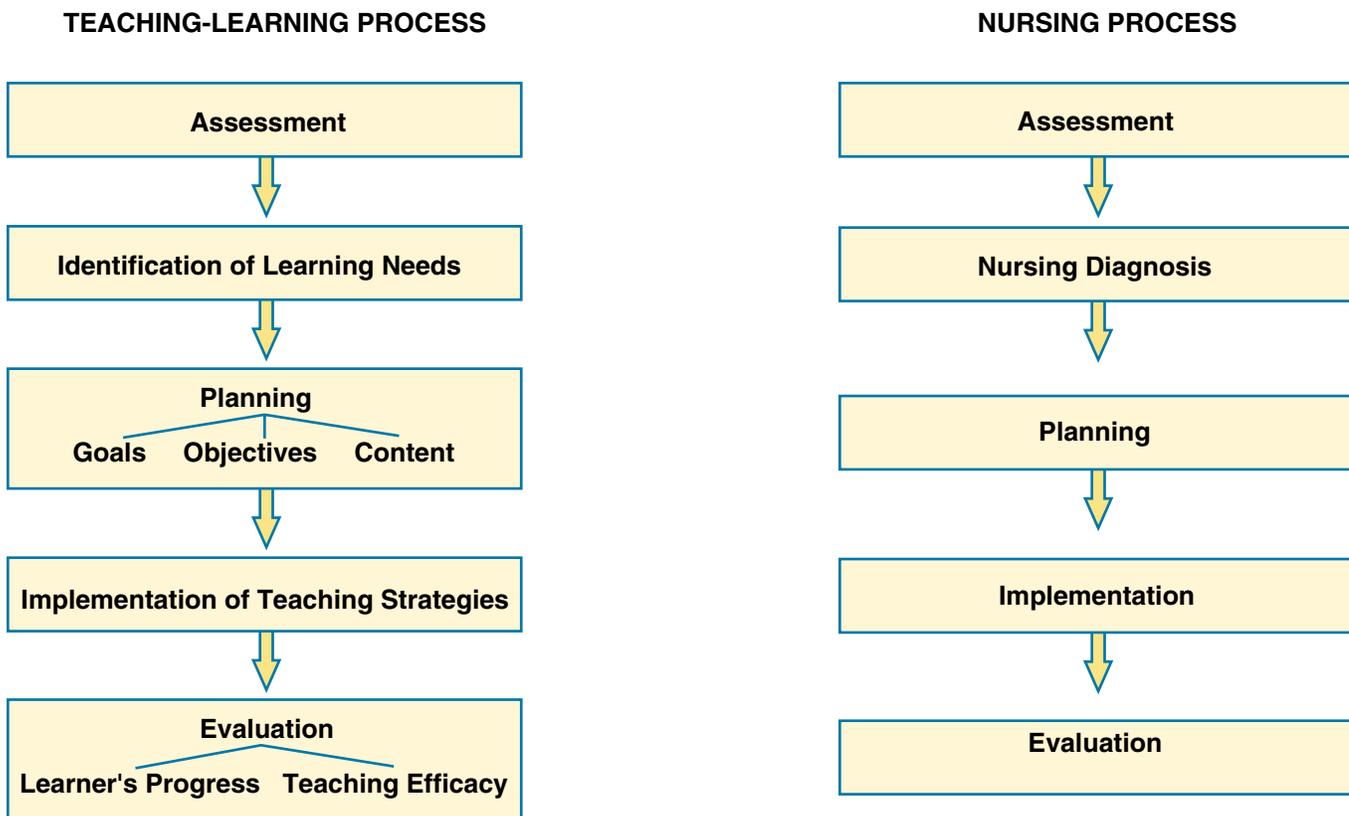


Figure 13-4 Teaching-Learning Process and Nursing Process: A Comparison

learn by processing information visually (**visual learners**), others by listening to words (**auditory learners**), and others by doing (**kinesthetic learners**). The nurse should use a variety of techniques, such as lecture, discussion, small group work, role playing, modeling, return demonstration, imitation, problem solving, games, and question-and-answer sessions, to match different learning styles of clients. A good way to discover learning style is to ask the client, “What helps you to learn?” or “What kinds of things do you enjoy doing?”

Learning Needs

Everyone who receives health care services has some need for learning. Client teaching may be indicated when a client:

- Expresses a need for information to make decisions
- Has a need for new skills
- Desires to make modifications in lifestyle
- Is in an unfamiliar environment

Comprehensive assessment is a mutual process between client and nurse. A crucial step in teaching is to determine the client’s learning needs—what the client needs to know and what the client already knows. The nurse must evaluate the client’s knowledge about the content that is to be taught. This previous knowledge can then be used as a foundation for new concepts. If the client is

NEEDS ASSESSMENT GUIDELINES

Listen to what the client’s words and actions are communicating.

- Does the client express uncertainty and/or anxiety over an upcoming procedure?
- Is the client able to tell you about medications, purposes, and side effects?
- Can the client describe necessary lifestyle modifications?
- Does the client perform self-care activities correctly?
- Is the client able to demonstrate necessary treatment procedures (e.g., colostomy irrigations, injections, blood glucose monitoring)?

misinformed, the nurse develops a remediation plan for learning. Determination of the client’s learning needs is accomplished in a variety of ways, including:

- Questioning the client directly
- Observing client behaviors
- Interacting with the client’s family or significant others

It is imperative that the nurse address the client’s immediate need for knowledge first. This is facilitated by assessing the client’s perception of learning needs and prioritizing those needs on the basis of client input and status.

Potential Learning Needs

The nurse also assesses for potential learning needs so that anticipatory planning can be done to avert a relapse in the recovery process and to maintain wellness. Some examples of anticipatory learning needs include:

- Mrs. Stone is pregnant for the first time. *Potential Learning Need:* Infant care
- Mr. Carpenter has just been diagnosed with diabetes that is currently controlled by dietary modifications. He has been told that he may have to take insulin daily in the future. *Potential Learning Need:* Self-administration of insulin

Ability to Learn

The nurse assesses the client for characteristics that will hinder or facilitate learning. One such characteristic is the client's developmental stage. For example, do not automatically assume that a client who is 34 years old has mastered the developmental tasks of earlier stages. Age is not synonymous with developmental level; observation of behavior provides the clearest clue to developmental level.

The client's maturity level greatly influences the ability to learn information. Every developmental stage is characterized by unique skills and abilities that affect the response to various teaching tools. Developmental stage greatly determines the type of data to be taught, the method(s) to be used, the language that is used, and the location for teaching. In addition to developmental stage, assessment should include evaluation of the client's cognitive skills, problem-solving abilities, and attention span.

Readiness to Learn

Another characteristic to be assessed is the client's learning readiness. Table 13-7 shows some factors that influence readiness.

Readiness is closely related to growth and development; for example, does the client have the requisite cognitive and psychomotor skills for learning a particular task? Can the client comprehend the information? Learning readiness is present when the client asks ques-

TABLE 13-7
Factors Influencing Learning Readiness

Capability	Comfort	Motivation
Maturity level	Basic physiological needs met	Care for self
Physical ability	Feelings of safety and security	Get well
Cognitive ability	Low degree (or absence of) pain	Achieve a higher level of wellness
Attitude	Pleasant surroundings with few distractions	Know and understand
		Return to work
	Rapport with caregiver	Please others
		Be a "good patient"
		Avoid complications and relapse

tions. Another indicator that the client is ready to learn is client participation in learning activities, such as actively participating in return demonstration of a dressing change. Some behaviors that indicate lack of client readiness are anxiety, avoidance, denial, lack of participation in discussion or demonstration, and lack of participation in self-care activities.

Closely related to readiness is client motivation. Individuals must believe that they need to learn the information before learning occurs. Does the client perceive relevance (meaningfulness) in the current information to be taught? If an individual sees the information as being personally valuable, the information is more likely to be learned. However, if the client does not think that the content is relevant, learning is not likely to occur. Relevance is determined individually; the nurse must assess the personal meaning of learning content for each client.

Albert Bandura, a psychologist, described the concept of **self-efficacy** (a belief that one will succeed in attempts to change behavior) as having a profound influence on motivation (1977). If clients feel they will not achieve the goals, they will lack motivation to try. To maximize motivation, keep the teaching-learning goals realistic. Break the content down into small steps that are achievable and provide feedback on the progress.

Client Strengths

Identifying the client's strengths and limitations provides a foundation for realistic expectations. An understanding of the client's strengths and weaknesses allows

THINK ABOUT IT

Checking Literacy

"Lscean uyro sdhna. Seu yver dloc rwheat."

The preceding statement is what many of your clients will see when you give them printed educational materials. Be sure to assess the client's ability to comprehend written materials, and avoid making assumptions about your clients' literacy level. Check for comprehension through return explanation of the written material.

THINK ABOUT IT

Relevance of Learning

Consider the concept of relevancy as it applies to you as a learner. What motivates you to study? How do you “psych yourself up” to learn new material? What helps you perceive material as relevant?

the nurse to plan successful teaching-learning experiences. Determination of client strengths assists the nurse in selecting appropriate teaching methods.

Previous Experience and Knowledge Base

The client has a knowledge base acquired through life experiences. Previous knowledge affects the client’s attitudes about learning and perception of the importance of information to be learned and is related to the client’s type of educational experiences.

Certainly when considering a client’s previous knowledge, the nurse recognizes that culture plays an important role in knowledge acquisition. Attitudes (which are derived from a cultural context) toward what is appropriate to learn and who should teach may require alterations in the nurse’s approach. The nurse’s sensitivity to cultural values affects every aspect of the teaching-learning process.

Nursing Diagnosis

Several nursing diagnoses can apply to the client when barriers to the learning process exist. When lack of knowledge is the primary barrier to learning, the diagnosis of *Deficient Knowledge* is applicable. For example:

- A client who does not understand how to use crutches for assisted ambulation may have the diagnosis of *Deficient Knowledge: Crutchwalking*, related to inexperience as evidenced by multiple questions and hesitancy to walk.
- A client who has had a colostomy and will be discharged soon may have a diagnosis of *Deficient Knowledge: Follow-Up Care* related to colostomy care and maintenance as evidenced by requests for information.

Deficient knowledge may also be a component of many other nursing diagnoses in which risk or impaired behavior exists. For instance, *Risk for Infection* may relate to a client’s compromised health status; this risk can be modified or reduced through certain physical and environmental changes and also through proper client education. A client presenting with a diagnosis of a *Self-Care Deficit: Bathing* may need assistance acquiring the physical supplies to remedy the deficit, as well as instruction in techniques related to present physical and mental abilities.

Planning and Outcome Identification

Informal teaching can occur in any setting at any time; formal teaching is planned and goal directed (Figure 13-5). Teaching is a goal-directed, purposeful process, which means that teaching-learning activities must be planned. Reread this chapter’s opening quotation as a reminder that learning does not just happen by chance—it is planned. Planning, an ongoing phase of the teaching process, involves consideration of the following:

- What to teach
- How to teach
- Who will teach and who will be taught
- When teaching will occur
- Where teaching will be done

“Meeting the patient educational needs of the consumer is one well-recognized aspect of quality care. Delivering quality care does not happen by chance, rather, it requires intense planning” (Patyk, Gaynor, & Verdin, 2000, p. 14).

Determination of *what* to teach is done through comprehensive assessment. The content to be taught depends greatly on the client’s knowledge base, readiness to learn, and current health status.



Figure 13-5 Nurses engage in formal and informal teaching, with both individual and group clients. (Photo courtesy of Bellevue, The Woman’s Hospital, Niskayuna, NY.)

Deciding *how* to teach involves matching teaching strategies with client's learning needs, readiness, and ability. The nurse who is an effective teacher uses methods that capture the client's interest. A variety of teaching methods can be used to match the client's learning styles.

Planning also means deciding *who* will teach the client. Effective client education is the result of a multidisciplinary effort. However, the nurse is the coordinator of the health care team's teaching activities. Responsibility for planning a comprehensive teaching approach, from admission to postdischarge, remains with the nurse. Continuity of care is greatly affected by the teaching plan. The "who" part of planning also means determining who should be taught. In addition to the individual client, the nurse must determine who else in the family needs to be taught about the illness and recovery process.

An enormous wealth of health educational materials is available to families. Appendix D provides a listing of resources for caregivers.

Timing of *when* to teach should be carefully considered. The nurse recognizes that *every* interaction with the client is an opportunity for informal teaching. Whenever a client asks a question, there is an opportunity for teaching. These windows of teaching opportunities must be used. Nothing destroys a client's motivation for learning more quickly than hearing such comments as "Ask your doctor that" or "We'll talk about that later, right now take your medicine." The best time for teaching is when the client is comfortable—physically and psychologically.

In addition to capitalizing on informal teaching time, the nurse must plan time during which formal teaching can be done. Teaching must match the pace of the client's progress. Some clients learn more quickly than others; some need more repetition. Timing of the teaching session is crucial. The more information presented, the more a client is likely to forget. Therefore, teaching sessions must be kept brief to avoid overwhelming the client. Throughout the teaching session, use repetition and frequently ask the client questions to allow you to pace the delivery of information.

The location for teaching activities must also be well-planned. *Where* teaching occurs affects the quality of learning. Some factors to be considered in determining the location of teaching include provision for privacy and availability of equipment. Selection of teaching methods is often determined by the location. For example, videos can often be used effectively in inpatient settings; however, the same information may need to be presented with flipcharts or brochures in the home setting.

An important part of planning in the teaching-learning process is goal setting. The client and family or significant others must be involved in setting goals. Mutually determined learning goals promote learning. Specific learning goals should include these elements:

- Measurable behavioral change
- Time frame
- Methods and intervals for evaluation

Teaching-learning goals must be realistic, that is, based on the abilities of the learner and the teacher.

Establishing teaching-learning goals involves setting priorities. See Chapter 18 for a description of the process of establishing goals. One way to prioritize goals is to teach the "need-to-know" information (that which is necessary for survival) before moving on to the "nice-to-know" content. For example, Mrs. Stone, who is in her first trimester of pregnancy, *must* know guidelines for diet and exercise ("need-to-know" goal); learning about infant care can occur later in the pregnancy ("nice-to-know" goal).

Teaching Vulnerable Populations

When planning to teach individuals with special needs, it is important that the usual teaching strategies be modified according to the client's individual needs. This section describes education of individuals who experience developmental delays, chronic illness, low literacy skills, and sensory impairments.

Developmental Delays

Individuals with limited cognitive abilities have a medical diagnosis of mental retardation if the IQ level is 70 or less (American Psychiatric Association, 1994). The client's learning depends upon the degree of cognitive impairment, so teaching strategies must be selected accordingly. For example, a client who has Mild Mental Retardation (IQ level of 50–70) may be able to learn by discussion of simple concepts that are stated in easily understood terms. Note that it is important to use concrete language and frequent repetition with clients in this category; the use of simple games is often effective. On the other hand, a client who is profoundly mentally retarded (IQ level below 25) may be unable to learn in the traditional sense. Frequent communication and repetition are required when working with a client with this degree of mental impairment.

Chronic Illness

Clients who experience chronic illness (such as arthritis, hypertension, diabetes, asthma) have many learning needs, both actual and potential. Some chronic disorders, such as arthritis, may impair mobility and thus interfere with learning psychomotor skills as a result of decreased flexibility and dexterity of the fingers. Other chronic illnesses, such as diabetes, require ongoing assessment of the client's level of understanding about self-care (e.g., diet, exercise, and lifestyle changes). Essential hypertension, another chronic disease process, often leads to client's noncompliance with the prescribed treatment regimen. Ongoing education related to antihypertensive medication helps improve compliance.

MANAGING PROBLEMS WITH POOR READERS

Problem

Misses meaning of words

Takes words literally

Reads slowly, tires easily, gives up

Skips unfamiliar words

Intervention

Use simple, noncomplex terms.

Avoid use of medical jargon.

Provide examples.

Use simple explanations.

Use concrete terms and avoid references to abstract concepts.

Use short segments with frequent breaks.

Provide simple organization of material.

Explain.

Review and repeat definitions.

(Adapted from Doak, C. C., Doak, L. G., & Root, J. H. [1996]. *Teaching patients with low literacy skills* [2nd ed.]. Philadelphia: Lippincott.)

Low Literacy Skills

It is imperative that nurses assess the reading and comprehension abilities of clients before using printed educational materials. The majority of health care teaching involves the use of printed materials. However, approximately one in five Americans is functionally illiterate, which translates to more than 20 million American adults who cannot read (Hunt & Zurek, 1997, p. 158). It is a common mistake to equate the highest educational level achieved with reading level. Typically, individuals read at three to five grade levels lower than their achieved educational level (Doak, Doak, & Root, 1996). The accompanying display lists some guidelines for working with clients with low literacy skills.

Sensory Impairments

Many clients have sensory impairments as a result of illness, injury, or the aging process. Effective nurses modify their teaching approaches in order to accommodate such impairments. A common mistake many people make when talking with someone who has a sensory impairment is to talk loudly. Screaming and yelling do not help the person who has auditory or visual impairments. See the accompanying nursing checklist for guidelines in working with clients who have visual, auditory, or memory impairments.

Implementation

There are several characteristics of nurses that influence the outcome of the teaching-learning process. Nursing self-awareness, an all-important first step in teaching, focuses on the concepts discussed in the following sections. The nursing checklist provides some implementation guidelines for making teaching more meaningful to clients.

Knowledge Base

It is impossible for nurses to teach if they lack the knowledge or skills that are to be taught. Staying current in knowledge and proficient in skills is the first



NURSING CHECKLIST

Guidelines for Teaching Clients with Sensory Impairments

For memory-impaired clients:

- Use repetition.
- Use a variety of cues (verbal, written, pictures, and symbols).

For visually impaired clients:

- Provide large-print materials.
- Provide prescription eyeglasses and magnifying glasses.
- Provide adequate lighting while reducing glare.

For hearing-impaired clients:

- Face the client directly when you speak.
- Use short sentences and words that are easily understood.
- Use signals to reinforce verbal information—point, gesture, demonstrate.
- Eliminate distracting noises or activities from the environment as much as possible.

For all clients:

- Encourage client involvement and participation.
- Ask for feedback and listen actively.
- Provide frequent feedback.

(Adapted from Beare, P. G., & Myers, J. L. [1998]. *Principles and practice of adult health nursing* [3rd ed.]. St Louis: Mosby.)

step to maintaining efficacy and credibility as a teacher. It is impossible for one individual to be an expert in every area of nursing. Therefore, knowing when to refer the client to others for teaching can augment learning.



NURSING CHECKLIST

Guidelines for Effective Client Teaching

- Assess client's knowledge and needs.
- Focus on client's perceived needs.
- Relate material to prior knowledge.
- Encourage client's active participation.
- Provide opportunity for immediate application of knowledge or skill.
- Expect learning plateaus to occur.
- Reinforce learning frequently.
- Provide immediate feedback to facilitate learning.
- Ensure a comfortable environment.
- Organize content from the simple to the complex, building on what the client already knows.
- Use a variety of teaching methods.
- Emphasize verbal instructions with writing and pictures.
- Stay flexible in your approach.
- Be creative!

Interpersonal Skills

Effective teaching is based on the nurse's ability to establish rapport with the client. "Information in itself does not ensure health-promoting behavior. There is no substitute for a relationship between you and your patients" (Gallagher & Zeind, 1998, p. 16AAA). The nurse who is empathic to the client shows sensitivity to the client's needs and preferences. An atmosphere in which the client feels free to ask questions promotes learning. Activities that help establish an environment conducive to learning include:

- Showing genuine interest in the client.
- Including the client in *every* step of the teaching-learning process.
- Using a nonjudgmental approach.
- Communicating at the client's level of understanding.

"Learning should take place in an environment that fosters mutual trust, respect, and helpfulness. Creating such an environment takes a conscious effort on your part" (Hansen & Fisher, 1998, p. 58). In other words, deliberately plan to communicate a sense of empathy and caring; see Chapters 11 and 12 for more information on these therapeutic factors.

Teaching Clients At Home

Clients, and their families, who are recovering at home also have significant learning needs. A primary role of the home health nurse is to teach the client how to care for himself at home; this often involves teaching family members how to provide care (Figure 13-6). Home-based clients need infor-



Figure 13-6 Preparing clients to re-enter their home environment often means including family members in the teaching process.

mation regarding their chronic illness, accident, or injury. They also need to learn how to achieve and maintain a maximum state of wellness. Accurate teaching plans for the home-based client and family are established by assessing multiple factors, some of which are listed in Table 13-8.

APPLICATION: HOME CARE

Preparing the client and family for home care begins not at the time of hospital discharge but rather with hospital admission. The nurse's effective teaching is the link to thorough follow-up care in the home. Discharge planning considers the current learning needs for clients and caregivers as well as potential needs after discharge. Thus, teaching includes consideration of community resources and possible referral.

THINK ABOUT IT

Medical Jargon and Teaching

Consider the language used by most nurses—think of the terms nurses take for granted. When you ask a client to "void," does he understand what is meant? Think of the following frequently used terms, which can easily be misunderstood by clients and families:

ambulate	defecate	dangle
NPO	vital signs	contraindicated

Listen to the language you use when communicating with clients. How can you communicate without using professional jargon?

Evaluation

Evaluation of teaching-learning is a twofold process:

1. Determining what the client has learned
2. Assessing the nurse's teaching effectiveness

TABLE 13-8
Factors Affecting Learning Needs
of Home Health Clients

Type	Example
Environmental	<ul style="list-style-type: none"> • Accessibility of home to client with physical disability • Need and availability of equipment and supplies • Space to accommodate special needs of client • Need for information about environmental cleanliness as it relates to health • Need for assistance with self-care activities
Economic	<ul style="list-style-type: none"> • Ability to purchase medications, equipment, and supplies • Available financial assistance
Support system	<ul style="list-style-type: none"> • Persons available to assist with caregiving • Caregiver's deficient knowledge regarding necessary care
Community resources	<ul style="list-style-type: none"> • Resources in the immediate area • Awareness of and access to support services • Available respite to the family

Evaluation of Learning

Evaluation, a continuous process, consists of determining what the client has learned. Is there a behavior change? Is the behavior change related to learning activities? Is further change necessary? Will continued behavior change promote health? The following strategies can be used to evaluate client learning:

- Verbal questioning
- Observation



NURSING CHECKLIST

Evaluation of Learning

- Did the client meet mutually-established goals and objectives?
- Can the client demonstrate skills?
- Have the client's attitudes changed?
- Can the client cope better with illness-imposed limitations?
- Does the family understand health problems and know how to help?

- Return demonstration
- Written follow-up (e.g., questionnaires)

The accompanying nursing checklist provides guidelines for evaluation of learning.

Evaluation of Teaching

A major purpose of evaluation is to assess the effectiveness of the teaching activities and decide which modifications, if any, are necessary. When learning objectives are not met, reassessment is the basis for planning modification of teaching-learning activities. Several activities can evaluate teaching effectiveness, including the following:

- Feedback from the learner
- Feedback from colleagues
- Situational feedback
- Self-evaluation

Evaluation is facilitated through the use of goals that are measurable and specific. Use of the accompanying nursing checklist facilitates evaluation of teacher effectiveness.

Client education has been credited with the following (Seley, 1994):

- Improved quality of care
- Shorter length of hospital stays
- Decreased chances of hospital readmission
- Greater compliance with prescribed treatment regimen

These benefits will be enhanced through nurses' continued active participation as client educators.



NURSING CHECKLIST

Evaluation of Teacher Effectiveness

- Was content presented clearly and at the client's level of comprehension?
- Was the presentation (session) interesting?
- Did the nurse use a variety of teaching aids?
- Were the teaching aids appropriate for the client and the content?
- Was client participation encouraged?
- Was the nurse supportive?
- Did the nurse communicate an interest in the client and in the material?
- Did the nurse give frequent feedback and allow for immediate return demonstration?
- Were learning objectives stated in behavioral terms (i.e., easy to evaluate)?

NURSING CARE PLAN**The Client with Ineffective Breastfeeding****Case Presentation**

Mrs. Gozalo is a 32-year-old attorney who presents to the clinic requesting help in breastfeeding her 3-day-old daughter. She states that her first few attempts at breastfeeding in the hospital were marginally successful and that her baby was given formula by the staff prior to her discharge. Since being home, she has given the baby bottled formula when she cannot get the baby to latch on and suck successfully; these unsuccessful attempts at breastfeeding have made her question whether the effort to nurse is worthwhile. She says her husband has suggested using only bottle feedings, and she is frustrated and confused but wants to be successful at breastfeeding, which she describes as “the right thing to do.”

Assessment

- Verbalizations of desire to be successful at breastfeeding
- Lack of understanding of correct latch-on procedure

Nursing Diagnosis #1

Ineffective Breastfeeding related to unsatisfactory breastfeeding process as evidenced by infant’s receiving supplemental feedings with artificial nipple, interruption in breastfeeding, maternal anxiety, and deficient knowl-

Expected Outcomes

The client will:

1. Explain and return demonstrate correct latch-on and breastfeeding procedure (cognitive and psychomotor domains)
2. Express confidence that breastfeeding will be successful (affective domain)
3. Show desire to continue efforts at breastfeeding (affective domain)

Interventions/Rationales

1. Ask client, or determine through the interview process, what teaching strategies (lecture, literary, visuals) are most likely to be effective for her, and tailor teaching accordingly. *Matching teaching strategies to learning styles and needs increases the chance of successful education.*
2. Explain briefly the mechanics of the breastfeeding process, such as milk letdown, signs of breastfeeding readiness, and signs of infant hunger and satisfaction. *Knowledge of the process of correct breastfeeding will help bring client expectations in line with reality.*
3. Demonstrate correct infant holds and maternal postures. *Proper position of both the child and mother facilitates breastfeeding.*
4. Teach client effective techniques for latch-on, such as supporting the breast to correctly position it in the baby’s mouth, and tickling the baby’s lips or cheeks to stimulate rooting. *Correct techniques greatly enhance the likelihood of latch-on.*
5. Show client video or literature demonstrating successful breastfeeding. *Seeing other mothers successfully nursing should promote confidence and maintain desire to learn correct process.*
6. Encourage client to have her husband participate in the breastfeeding process by bringing the baby to her when she cries, stroking the baby’s head while she is nursing, and burping the baby after each feeding. *Partner support and involvement in the breastfeeding process will boost client’s confidence and strengthen desire to continue breastfeeding process.*

Evaluation

Client verbalizes confidence and comfort level with attempts at breastfeeding. Client achieves correct latch-on with minimal difficulty. Client states the signs of successful breastfeeding and states that she will look for such signs as the breasts feeling less full and the infant sucking strongly and seeming content at each feeding.

KEY CONCEPTS

- Client education is done to help individuals achieve optimum states of health.
- The teaching-learning process is a planned interaction that promotes behavioral change that is not a result of maturation or coincidence.
- Teaching supports behavior change that leads to positive adaptation.
- Learning is the process of assimilating information with a resultant change in behavior.
- Learning occurs in three domains: the cognitive (intellectual), the affective (emotional), and the psychomotor (motor skills).
- Learning readiness is affected by developmental and sociocultural factors, and is a lifelong process occurring in every developmental stage.
- Elements for documenting client education include the content taught, teaching methods used, who was taught, and response of the learners.
- The teaching-learning process and the nursing process are interdependent dynamic processes.
- Evaluation of the teaching-learning process involves two aspects: (1) determination of what the client has learned and (2) efficacy of the teacher.

CRITICAL THINKING ACTIVITIES

1. Give an example of each of the three domains of learning.
2. List four barriers to learning. What nursing interventions would you implement to overcome each barrier?
3. Why is it important for the nurse to use more than one teaching method?
4. Write your own philosophy of learning.

5. What are some of your own learning needs right now? How are they being addressed?
6. Compare the teaching roles of the nurse in different practice settings, such as hospitals, extended care facilities, clinics, schools, industries, home environments, and health maintenance organizations.
7. Develop a flow sheet for client teaching to use in one of your clinical agencies.
8. Identify two learning needs of a selected client. What will you do to help the client overcome the knowledge deficits?
9. Is it ethical for a nurse to attempt to get a client to change beliefs under the guise of teaching? Think of the many areas in which your value system may conflict with the beliefs of your clients. Whose belief system is “right”? Which belief system should prevail? Should you “teach” a client the “right” attitude or belief?
10. Have you or has anyone in your family ever had a health-related learning need that was dealt with inadequately? If so: (1) Why do you think that happened? (2) How did you feel as a result?

WEB RESOURCES

- American Association of Diabetes Education
www.aadenet.org
- American Nurses Association
www.nursingworld.com
- National Institutes of Health
www.nih.gov

Nursing and Complementary/Alternative Treatment Modalities



Only nature heals.

—Hippocrates

COMPETENCIES

1. Describe the historical influences on current complementary/alternative modalities.
2. Discuss the connection between mind and body and the effect of this relationship on a person's health.
3. Identify the various mind-body, body-movement, energetic-touch healing, spiritual, nutritional, and other modalities that can be used as complementary therapies in client care.
4. Discuss the use of complementary/alternative modalities throughout the life cycle.
5. Explain the concept of the nurse as an instrument of healing in holistic nursing practice.

KEY
TERMS

acupressure	effleurage	nutraceuticals
acupuncture	endorphins	petrissage
allopathic	energetic-touch therapies	phytonutrients
alternative therapies	friction	psychoneuroimmunology
aromatherapy	healing touch	relaxation response
Ayurveda	imagery	shaman
biofeedback	integrative therapy	shamanism
bodymind	meditation	tapotement
centering	moxibustion	therapeutic massage
chakra	music-thanatology	therapeutic touch
chiropractic	neuropeptides	touch
complementary therapies	neurotransmitters	vibration

Western society tends to think of healing in terms of medical, surgical, and other technological interventions. However, in many other cultures—both past and present—healing has been promoted by faith, magic, ritual, and other nonmedical approaches.

The use of **alternative therapies** (treatment approaches that are not accepted by mainstream medical practice) and **complementary therapies** (treatment approaches that can be used in conjunction with conventional medical therapies) is becoming more prevalent among the general public. This chapter discusses complementary/alternative medicine (CAM) treatment methods that are currently being used in holistic nursing practice. Nurses are encouraged to think critically before recommending or implementing these approaches and to also be open to the possibilities that are available to help people live to their fullest potential. It is important to remember that what is considered “alternative” to one culture may be viewed as “traditional” in another, for example, Traditional Chinese Medicine and Ayurvedic medicine.

HISTORICAL INFLUENCES ON CONTEMPORARY PRACTICES

For as long as history has been recorded, people have tried to cure ills and relieve pain. Early cave drawings depict healers practicing their art. Primitive healers attributed the cause of mysterious diseases to magic and superstition; as a result, religious beliefs and health practices became intertwined.

From Ancient Tradition to Early Science

Remedies and practices that are based in ancient traditions are being rediscovered and used by contemporary holistic healers. This section discusses the impact of ancient healing practices on current use of CAM modalities.

Ancient Greece

The ancient Greek culture perceived health as the maintenance of balance in all dimensions of life. In Greek mythology, Asclepius was the god of healing. Temples (called Asclepions) were beautiful places for people (regardless of ability to pay) to rest, restore themselves, and worship. The elaborate healing system consisted of myths, symbols, and rites administered by rigorously trained priest-healers.

Influences from the Far East

Healing systems from the Far East have traditionally integrated mind, body, and spirit into a system of balanced energy between the individual and the universe. The concept of a life force or life energy permeates Eastern philosophies. The accompanying display lists the names of the life force in various cultures.

THE LIFE FORCE IN VARIOUS CULTURES

CULTURE	LIFE FORCE
Chinese	Chi
Indian	Prana
Japanese	Qi
Native American	Flow of Spirit
Mystic Christianity	Holy Spirit
Greek	Pneuma

China

The traditional Chinese healing system is based on the belief in the oneness of all things in nature. Life energy (*chi*) flows through both the universe and the person, thus creating a wholeness among all things and people. Chi provides warmth, protection from illness, and vitality. Chi flows along an invisible system of meridians (pathways) that link the organs together and connect them to the external environment and, therefore, to the universe. Illness and injury can alter the flow of this

energy. The energy flow can be influenced by stimulating points along the meridians.

Herbalism is an essential component of traditional Chinese healing practice. In seeking to promote balance, healers use herbs for dual purposes. For example, the herb *dong quai* relaxes the uterus when it is contracted and tightens it if it is too relaxed. A complete discussion of the use of herbs in contemporary health practices appears later in this chapter.

Many contemporary Western health care providers are studying and now using Traditional Chinese Medicine (TCM). These healing techniques have been used in various situations, such as with clients who are experiencing chronic pain associated with illness or injury. **Acupuncture**, one technique used in TCM, is the application of needles to various points on the body to alter the energy flow (see Figure 14-1).

India

Ayurveda, a healing system based on Hindu philosophy and Indian philosophy, embraces the concept of an energy force in the body that seeks to maintain balance or harmony. From the Ayurvedic perspective, the body and mind are filled with a vital energy (*prana*) that is the life force. “Like all enlightened healing methods, Ayurveda emphasizes prevention above curing disease” (Goldberg, 1999, p. 68). The life energy (*prana*) is transported through the body by a “wind” or *vata*. *Vata* regulates every type of movement. The accompanying display shows the types of *vata* in the human body.

The Hindu concept of chakras refers to seven primary energy centers in the physical body. A **chakra** is a concentrated area of energy. The chakras are vertically aligned through the center of the body from the crown of the head to the pelvis. Chakras influence the physical body, emotions, mental patterns, and spiritual awareness. Each chakra has specific functions and a corresponding relationship to body structures and organs; see Figure 14-2.



Figure 14-1 Acupuncture Needles Inserted for Treatment of Depression (Courtesy of Photodisc)

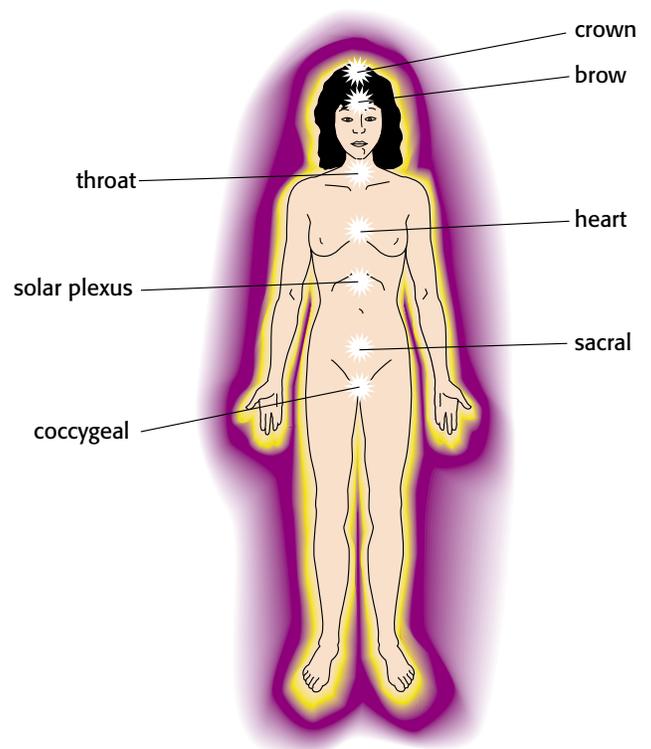


Figure 14-2 Locations of the Seven Major Chakras

VATA IN THE HUMAN BODY

Types of Vata

Regulatory Effect

Prana vata	Nervous system
Udana vata	Cognitive skills, speech, and memory
Samana vata	Digestion
Vyana vata	Circulation
Apana vata	Excretion

(Data from Goldberg, B. [1999]. *Alternative medicine: The definitive guide*. Tiburon, CA: Future Medicine Publishing.)

Prevention of illness and restoration of health through inner search and spiritual growth are the primary goals in the Ayurvedic system. Union of the Divine and the Truth occurs through the physical and meditative practice of yoga. In contemporary practice, Ayurvedic intervention may consist of yoga, herbs, diet, exercise, steam baths, cathartics, and detoxifying massage.

Shamanistic Tradition

A need to understand and explain life processes (i.e., birth, health, illness, and death) is part of being human. Ritualized practices have been used to keep peace with the great spirits, to harness their power, to promote power, and to prevent death.

Shamanism refers to the practice of entering altered states of consciousness with the intent of helping others. The **shaman** (a folk healer-priest who uses natural and supernatural forces to help others) has an extensive knowledge of herbs, is skilled in many forms of healing, and serves as guardian of the spirits. Illness is considered to be the result of spirit loss. Shamans have the power to heal by working with the spirits to encourage their full return to the individual. The shaman functions as both healer and priest and one who has access to the supernatural.

Seeking wisdom about the universe, a relationship with the creator, and avoidance of death are all accomplished through ritualized processes that are performed by the shaman. The shaman's practice incorporates special objects such as power animals, totems, and fetishes as well as ritual songs, dances, food, and clothing. Sleep deprivation, ritual chants, isolation, imagery, drumming, and hallucinogenic drugs may be used to create a trancelike state that is the vehicle through which the shaman contacts the spirit world.

ALLOPATHIC MEDICINE

Western medicine (referred to as **allopathic** medicine) is relatively new in that it was begun about 200 years ago. Its fundamental principle is that body and mind are separate entities. Allopathic medicine views the human as a collection of separate body parts. This conventional medical approach views health as the absence of disease and sees the goal of treatment as curing the disease or “fixing” the problem (such as trauma). The Western medical model focuses on ridding the body of symptoms induced by disease or injury.

The allopathic system is effective when aggressive treatment is needed for an emergency situation. State-of-the-art technology and advanced surgical techniques have become true lifesavers for many in our society. However, with its emphasis on curing symptoms, allopathic medicine overlooks the crucial role of energy, emotions, and thoughts. Conventional medicine has been less effective in treating chronic conditions such as hypertension and arthritis. “The value of alternative medicine is especially effective for people with chronic, debilitating illnesses for which conventional medicine has few, if any, answers” (Fontaine, 2000, p. 6). See Table 14-1 for a comparison of allopathic and Ayurvedic perspectives.

CONTEMPORARY TRENDS

The contemporary public perception of CAM treatment methods has been changing over the past few decades. In the late 1960s and early 1970s, the “natural,” “new age,” and “self-help” movements began to attract adherents, first among consumers and later among health

TABLE 14-1
Comparison of Allopathic and Alternative Medicine

Allopathic Perspective	Alternative Perspective
Health is absence of disease.	Health is a state of well-being characterized by mind/body balance.
Focus is on cure of disease.	Emphasis is on health maintenance and disease prevention through lifestyle choices.
Mind and body are treated as separate entities.	Mind and body are one; what affects one affects the other.
Disease results from causative agents, usually external.	Disease originates from within and is the result of imbalances that occur in response to unhealthy lifestyle and/or inner disharmonies.
Healing depends on outside agents to cure the disease.	The body has a natural ability to heal itself.
Treatment consists of drugs, surgery, and radiation.	Treatment consists of diet, exercise, herbal medicines, social support, and stress management.
Healing is aggressive, quick, and seeks to destroy the invading agents.	Healing is a slow, natural process.
The doctor plays the central role in healing.	The client has the most important role in healing (i.e., lifestyle choices).

(Data from: Fontaine, K. L. [2000]. *Healing practices: Alternative therapies for nursing*. Upper Saddle River, NJ: Prentice Hall; Froemming, P. [1998]. *The best guide to alternative medicine*. Los Angeles: Renaissance Books; Goldberg, B. [1999]. *Alternative medicine: The definitive guide*. Tiburon, CA: Future Medicine Publishing.)

care practitioners. During that time, there was a growing trend toward rejection of traditional medicine because of its perceived invasiveness, painfulness, cost, and ineffectiveness. A rekindled interest in Eastern religions, lifestyle, and medicine has fueled the development of contemporary holistic, CAM modalities. CAM therapy has a major tenet—holism—that is, the connection among mind, body, and spirit.

Ever increasing numbers of consumers who are seeking natural and safe approaches to health care are using CAM. The goals of CAM are numerous, including the following (Rimmer, 1998):

- Health promotion
- Pain relief
- Treatment of chronic illness
- Spiritual growth

There is an increasing prevalence of the use of CAM in the United States. Forty percent of those surveyed in one study (Astin, 1998) reported use of some form of alternative health care. The growing interest in complementary therapies is evidenced by the increased sale of natural substances, such as herbs and vitamins, which has become a multimillion dollar industry over the last few years (Rimmer, 1998, p. 761).

According to a survey published in 1998, up to 54% of adults (83 million people) in the United States used one or more types of alternative medicine in the previous year. Sixty percent of these health care consumers did not tell their primary care provider about their use of alternative approaches. In total, 629 million visits were made to alternative healers in 1997. Approximately \$27 billion dollars were paid by consumers as out-of-pocket expenditures on alternative therapies (Eisenberg, 1998).

Several factors have contributed to the increased use of CAM in the United States. Many health care consumers want to be more involved in their own healing and see complementary/alternative modalities as a way to promote this autonomy and control (Collins, 2000). Astin (1998) found that predictors of alternative health care use include higher education, poorer health status, certain health problems (anxiety, chronic pain, back problems, urinary tract infections, chronic fatigue syndrome, addictions, arthritis, headaches), and a holistic view of health.

Nurses are encouraged to teach clients to use the best of all systems in order to promote positive health outcomes. The term **integrative therapy** (a clinical approach that combines Western technological medicine with techniques from Eastern medicine) is becoming more prevalent in the United States. The integrative approach “neither rejects conventional medicine nor embraces alternative medicine uncritically” (Froemming, 1998, p. xi).

In 1992, the U.S. government established the Office of Alternative Medicine (OAM) at the National Institutes of Health to study the efficacy of unconventional, alternative treatment methods. The OAM is now the National Institutes of Health (NIH) National Center for Complementary and Alternative Medicine (NCCAM). Its mission is to conduct and support research and training, and to disseminate information on complementary and alternative medicine to the public and health care practitioners.

Mind-Body Medicine and Research

The traditional medical model is founded on the dualistic belief that the mind, body, and spirit are separate entities. However, **psychoneuroimmunology** (PNI), a relatively new field of science, is studying the complex relationship between the cognitive, affective, and physical aspects of humans. Psychoneuroimmunologists are investigating how the brain transmits signals along the nerves to enhance the body’s normal immune functioning. PNI research supports the idea that the human mind can alter physiology.

All body cells have receptor sites for **neuropeptides** (amino acids produced in the brain and other sites in the body that act as chemical communicators) that are released when **neurotransmitters** (chemical substances produced by the body that facilitate nerve transmission) signal emotions in the brain. Thus, it is possible for cells to be directly affected by emotions. In other words, people can affect their health by what they think and feel. The intermeshed complex system of psyche and body chemistry is now referred to as the **bodymind** (inseparable connection and operation of thoughts, feelings, and physiological functions).

HOLISM AND NURSING PRACTICE

The growth of the holistic health movement is based on acceptance of the concept that body, mind, and spirit are interconnected. Holism refers to the concept that the whole is greater than the sum of its parts. Nursing in its broadest sense (theory, concept, and practice) is truly holistic in nature. As discussed in Chapter 15, holism encompasses consideration of the physiological, psychological, sociocultural, intellectual, and spiritual aspects of each individual. Holistic nursing can be described as the art and science of caring for the whole person, knowing that each person is unique in all expressions of self. As holistic healers, nurses often employ CAM techniques to promote clients’ well-being. The accompanying display lists concepts basic to a holistic philosophy of caring.

HOLISTIC CONCEPTS

- Mind and body are one, not separate.
- People are responsible for their own choices.
- People have the power to solve their own problems.
- Well-being is multifaceted—physical, emotional, mental, and spiritual.

The Nature of Healing

The word *healing* is derived from the Anglo-Saxon word *hael*, which means to make whole, to move toward, or to become whole. It is important to establish that healing is not the same as curing (ridding one of disease) but is a process that activates the individual’s healing forces from within. As a healing facilitator, the nurse enters into a relationship with the client and can assist the client by offering to be a guide, change agent, or instrument of healing (a means by which healing can be achieved, performed, or enhanced). Gilkeson (2000) describes healing by saying, “healing potential exists in each of us . . . it is important to recognize that it is not so much that the ‘healer’ heals another person, but rather that he triggers the other person’s own self-healing potential” (p. 6).

COMPLEMENTARY/ ALTERNATIVE INTERVENTIONS

Many CAM interventions are used in holistic nursing practice. These interventions are categorized as mind-body, body-movement, energetic-touch, spiritual, nutritional, and other methodologies (see Table 14-2). Although different in technique, many of the CAM therapies have common ideological threads, as shown in the accompanying display.

CONCEPTUAL THREADS SHARED AMONG COMPLEMENTARY/ALTERNATIVE INTERVENTION METHODS

- The whole system must be considered if the *parts* of the individual are to be helped to function.
- The person is integrated and related to his or her surroundings.
- There exists some life force or energy that can be used in the healing process.
- Ritual, prescribed practice, and skilled practitioners are integral parts of holistic healing interventions.

Mind-Body: Self-Regulatory Techniques

Self-regulatory techniques are methods by which an individual can consciously control some functions of the sympathetic nervous system (for example, heart rate, respiratory rate, and blood pressure). Self-regulatory techniques include relaxation, meditation, imagery, biofeedback, and hypnosis.

Relaxation

As a result of the flight-or-flight response (see Chapter 20 for details), the body releases epinephrine, speeds up metabolism, and increases heart and respiratory

ELEMENTS OF THE RELAXATION RESPONSE

- A quiet environment
- Comfortable position
- Focused attention
- Passive attitude
- Practice

rate. Relaxation techniques offer a way for a person to reduce stress and return to a normal physiological state.

Cardiologist Herbert Benson (1975) studied the effects of meditation on individuals. He then incorporated the basic elements of meditation into the therapeutic process he called the **relaxation response**, a state of increased arousal of the parasympathetic nervous system, which leads to a relaxed physiological state. Benson employed the relaxation response with individuals experiencing high blood pressure and heart disease. While initially trying to avoid a mystical flavor in his work, Benson later discovered that the techniques were more effective if individuals focused on an inspirational prayer or phrase. The basic elements of the relaxation response are shown in the accompanying display.

“Relaxation techniques are skills anyone can use. These skills can be taught to clients when educating them about nutrition and exercise” (Grotbo, 1999, p. 24KK). One method for achieving relaxation is progressive muscle relaxation (PMR), which is the alternate tensing and relaxing of muscles (see Chapter 20 for a complete discussion of PMR). Aids to relaxation training include music or nature sounds, hypertonic saline relaxation tanks, isolation chambers, yoga, and imagery.

Nurses can use relaxation techniques in their work with clients to reduce pain and stress. Relaxation techniques are also an essential aspect of cognitive behavioral therapy when treating people with phobias, fear, and depression.

TABLE 14-2
Categories of Complementary/Alternative Interventions

Mind-Body	Body-Movement	Energetic-Touch	Spiritual	Nutritional/ Medicinal	Other
<ul style="list-style-type: none"> • Hypnosis • Imagery • Biofeedback • Meditation • Relaxation 	<ul style="list-style-type: none"> • Chiropractic • Yoga • Tai chi 	<ul style="list-style-type: none"> • Therapeutic touch • Healing touch • Massage • Acupuncture • Acupressure • Reflexology 	<ul style="list-style-type: none"> • Faith healing • Prayer • Laying on of hands • Shamanism: <ul style="list-style-type: none"> —Sand painting —Sweat lodges —Drumming 	<ul style="list-style-type: none"> • Herbs • Antioxidants • Macrobiotic diet 	<ul style="list-style-type: none"> • Humor • Pet therapy • Music • Aromatherapy

Meditation

The practice of **meditation** (quieting the mind by focusing one's attention) can bring about remarkable physiological changes. People who meditate strive for a sense of oneness within themselves and a sense of relatedness to a greater power and the universe.

A person can be guided into a meditative or relaxed state by using breath coaching (assisting client to become aware of or focus on breathing and thus slow it). Nurses can teach this modality to clients by using verbal cues, counting the client's inhalations and exhalations, and showing the client how to take slow, deep breaths. Some therapeutic benefits of meditation are:

- Stress relief
- Relaxation
- Reduced levels of lactic acid
- Decreased oxygen consumption
- Slowed heart rate
- Decreased blood pressure
- Improved functioning of immune system

To evoke the relaxation response through meditation, repeat a word or short phrase, preferably one that has special meaning to the individual. For example, some individuals repeat an affirmation or short prayer.

Imagery

Imagery is a type of thinking without words in which the senses are used to evoke one's imagination. The practitioner encourages the client to use as many of the senses as possible in order to enhance the formation of vivid images. The accompanying display presents examples of images that can be evoked by the five senses.

Imagery is not a new concept in nursing. In the mid-1800s, Nightingale wrote in *Notes on Nursing* about nurses helping the ill to alter their thoughts through images of nature, such as a bouquet of flowers (Nightingale, 1860). Visualization has been used effectively by nurses with clients of all ages in settings as varied as schools, homes, hospitals, and nursing homes (Hoffart & Keene, 1998).

Nurses can create guided imagery for many clients who are capable of hearing and understanding the nurse's suggestions of meaningful and physiologically correct images. For example, a nurse can show a chart of the stages of bone healing to a client who has suffered a fracture and ask the client to imagine this sequential activity in his or her body.

In addition to being a tool for distraction when a person is confronting pain, discomfort, and fear, imagery is also a powerful mechanism for making decisions and for altering behaviors. Imagery is also used to reduce pain and anxiety during procedures, decrease the need for medication and/or restraints, and promote relaxation (Hoffart & Keene, 1998). See Chapter 20 for directions on performing imagery and progressive muscle relaxation exercises.

NURSING ALERT

Precaution for Imagery

Imagery is not recommended for clients who are emotionally unstable.

Biofeedback

Biofeedback is a measurement of physiological responses that yields information about the relationship between the mind and the body and helps clients learn how to manipulate those responses through mental activity. It was developed by experimental psychologists and rehabilitation clinicians in the 1960s. Biofeedback allows a person to see the effect of the mind over the body. Froemming (1998) describes biofeedback as “[a] method of gaining conscious control over many bodily reactions involved in creating wellness by monitoring your own emotional state with specially designed equipment” (p. 224). While attached to sensitive devices that measure such bodily responses as skin temperature, blood pressure, galvanic skin resistance, and electrical activity in the muscles, the individual imagines stressful experiences. The person's physiological responses are then measured and recorded. Subsequent physiological responses to the relaxation response are also recorded. The individual receives an interpretation of these responses and is taught methods for practicing relaxation.

Biofeedback is used as a restorative method in rehabilitation settings to help clients who have lost sensation and function as the result of illness or injury. Biofeedback also enhances relaxation in tense muscles, relieves tension headaches, reduces bruxism (grinding of the teeth), reduces the pain of temporomandibular joint syndrome, and relieves backache. Temperature biofeedback is useful in training people to purposefully warm their hands to treat Raynaud's disease (a circulatory disorder), to lower

INCORPORATING ALL FIVE SENSES INTO IMAGERY

Visual

See the dark blue sky

Auditory

Hear the babbling brook

Kinesthetic

Feel yourself floating on a cloud

Gustatory

Taste the tartness of the freshly cut lemon

Olfactory

Smell the salt air at the ocean

blood pressure, and to prevent or relieve migraine headaches.

Hypnosis

The practice of hypnosis was once fraught with mystery and misconceptions. Currently hypnosis is becoming a more common nursing intervention. Therapeutic hypnosis induces altered states of consciousness or awareness (a trance) during which the person is more receptive to suggestion. It also enhances the client's ability to form images.

In 1955, the British Medical Association approved hypnotherapy as a valid medical intervention. The American Medical Association did likewise in 1958. Approximately 15,000 American physicians currently use hypnosis in conjunction with conventional medical interventions (Goldberg, 1999).

Therapeutic use of suggestion is the heart of hypnosis. Suggestions can be phrased directly ("You will feel more comfortable") or indirectly ("You may feel different").

Hypnosis is a potentially effective and powerful tool for altering pain, anxiety, and some physiological processes. Although hypnosis is useful as an adjunct to treatment, it does not magically cure such problems as nicotine addiction, alcoholism, and eating disorders, and should be used in conjunction with other modalities.

Nurses wishing to use hypnosis in their practice must be aware of the guidelines concerning this modality in the scope of practice as defined by the respective state boards of nursing. Advanced training in hypnosis is also necessary.

Body-Movement: Manipulation Strategies

As the name implies, body-movement therapies employ techniques for moving or manipulating various body parts to achieve therapeutic outcomes. Modalities such as movement and exercise, yoga, tai chi, and chiropractic treatment are discussed in the following sections.

Movement and Exercise

Movement, as a therapeutic intervention and health-promoting activity, is associated with athletic exercise, dance, celebration, and healing rituals. Although the primary goal of exercise is fitness (muscle strength, flexibility, endurance, and cardiovascular and respiratory health), there are many other positive outcomes of exercise (see Chapter 20 for a complete discussion of the benefits of exercise).

Nurses can help clients use movement as therapy in a variety of ways, such as range of motion exercises, water exercises, physical therapy, and stretching exercises. It is an effective method through which people of all ages can improve their level of functioning. Some of the therapeutic benefits of exercise are as follows (Rechtschaffen & Cohen, 1999):

- Improves circulation
- Enhances respiratory function
- Promotes elimination
- Stimulates the release of **endorphins** (brain chemicals that boost mood and help fight depression)
- Helps regulate metabolism
- Enhances immune function

THINK ABOUT IT

Exercise

What movement programs might you suggest to your clients? What are the factors in this decision? Does your recommendation depend on their health status?

Yoga

Many cultures believe that particular forms of movement keep the body's life forces in correct balance and flow. Yoga and tai chi are examples of ancient ritual movements that enhance overall health including spiritual enlightenment and well-being. Both of these approaches require concentration, strength, flexibility, and use of symbolic movements. The three main elements of yoga are breathing, movement, and posture. Yoga involves completing a series of postures carried out in sequential order; see Figure 14-3, which illustrates

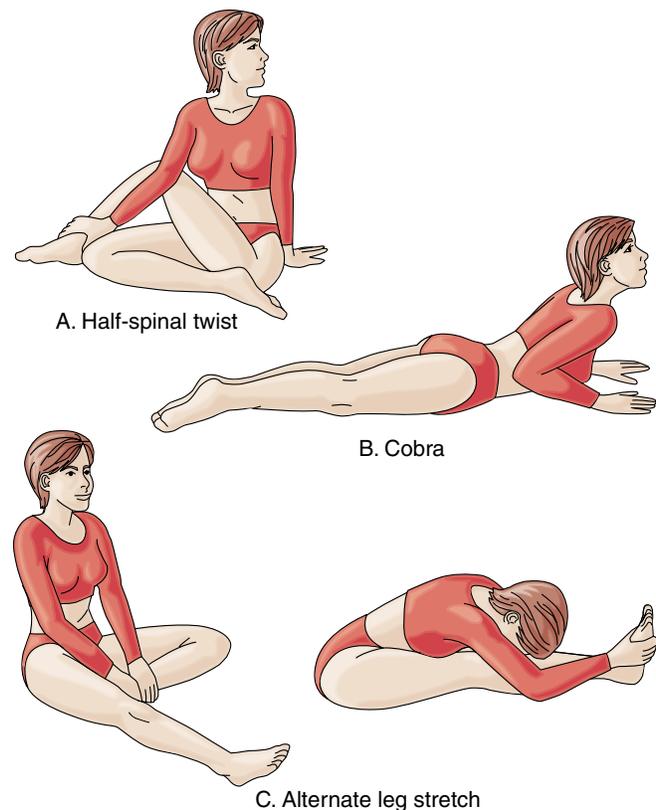


Figure 14-3 Yoga Postures

some basic yoga postures. “By promoting disciplined focus on mind and body, yoga is said to enable a greater consciousness of daily life and of its divine origins” (Cassileth, 1998, p. 249).

Yoga rejuvenates, promotes longevity and self-realization, and speeds up the natural evolution of the person toward self-enlightenment. Yoga, a form of meditative exercise, originated in India and is an essential component of Ayurvedic healing.

Tai Chi

Tai chi is based on the philosophy of the quest for harmony with nature and the universe through the laws of complementary (yin and yang) balance. When perfect harmony exists, everything functions effortlessly, spontaneously, perfectly, and in accordance with the laws of nature. If one moves to the right, then one must also move to the left. Tai chi consists of a series of sequential dancelike moves connected in a smooth flowing process.

People who regularly perform tai chi believe it enhances stamina, agility, and balance and that it boosts energy and confers a sense of well-being. Tai chi has been shown to lower blood pressure and heart rate in people in cardiac rehabilitation programs, and it is also a method for improving balance and, thus, reducing falls, especially helpful in older adults (Fontaine, 2000).

Chiropractic

The major principle underlying chiropractic therapy is that the brain sends vital energy to every organ in the body via the nerves originating in the spinal column. Disease results from interferences along that pathway; therefore, manipulation of the spinal column is useful in alleviating a variety of ills. Removing the blocks with quick thrusts and adjustments allows the body to restore its innate recuperative power.

Chiropractic is widely accepted by the medical community. Chiropractors are staff members of some medical centers/hospitals and are commissioned to military branches as health care providers (Goldberg, 1999). As with any CAM intervention, nurses should encourage clients considering the use of chiropractic services to undergo comprehensive health assessments first to rule out any contraindications.

Energetic-Touch Healing

A category of CAM therapies that has been incorporated into nursing within the past 30 years are the **energetic-touch therapies** (a group of techniques that work with the body’s energy field by the use of the hands to direct or redirect the energy to enhance balance within the field). These modalities are effective interventions for many client problems and can be used to restore harmony in all aspects of a person’s health. Energetic-touch therapies can be used with persons of all ages.

THINK ABOUT IT

Energy Field

Do you believe that people have an energy field that extends beyond the boundaries of the physical body? How would this belief affect your care of a client?

Energetic-touch therapies have their roots in traditional Chinese, ancient Eastern, and Native American philosophies. The fundamental concept is that individuals are composed of a life force, a source of energy that is not confined to physical skin boundaries. “Energywork, by its nature, brings us face to face with the spiritual” (Gilkeson, 2000, p. 3). Figure 14-4 illustrates the energy field that extends beyond a person’s physical body. Collinge (1998) lists the following as commonly accepted beliefs about energy and healing:

- All things are manifestations of energy.
- Energy comes from one universal source.
- Life depends on the movement of energy.

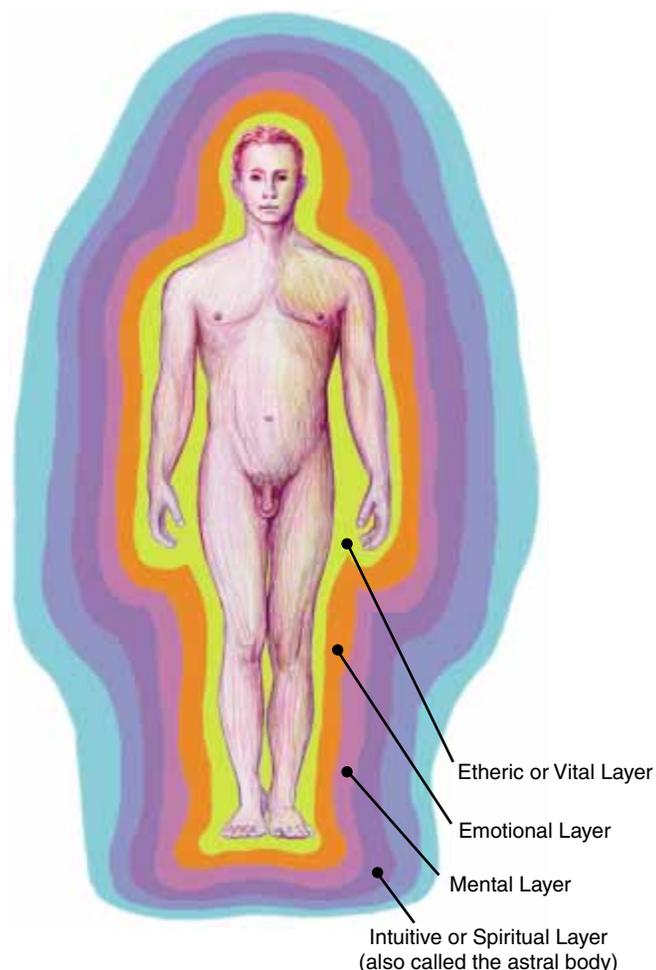


Figure 14-4 Layers of the Human Energy Field Extending Beyond the Physical Boundaries

- People consist of several energy fields that interact with the environment.
- Interpersonal relationships are influenced by energy exchanges.

An individual's energy field consists of layers of energy that are in constant flux. The energy layers can be diminished or otherwise adversely affected by any type of illness, trauma, or distress. The energy system can also be positively affected by the intentionally directed use of the hands of a practitioner.

Holistic nurses were integral in helping the North American Nursing Diagnosis Association to establish the diagnosis *Disturbed Energy Field*. See the Nursing Process Highlight for explanation of this diagnosis.

There are many energetic-touch therapies being used by nurses today. These therapies are being effectively integrated into holistic practice. "Western bodywork looks on your body as a machine in need of repair and manipulations. Eastern bodywork looks on your body as an energy field in need of constant balancing to function well" (Rush, 2000, p. 133). Massage, therapeutic touch, healing touch, reiki, jin shin jyutsu, and jin shin do are some examples. Three of those therapies—massage, therapeutic touch, and healing touch—are discussed in more detail.

Nursing Process Highlight

NURSING DIAGNOSIS Disturbed Energy Field

DEFINITION A disruption of the flow of energy surrounding a person's being that results in disharmony of the body, mind, and/or spirit.

DEFINING CHARACTERISTICS

- Movement in the energy field (wave/spike/tingling/dense/flowing)
- Sounds (tone/words)
- Temperature change (warmth/coolness)
- Visual changes (image/color)
- Disruption of the field (vacant/hold/spike/bulge)

RELATED FACTORS

- To be developed

(From North American Nursing Diagnosis Association. [2001]. *Nursing diagnoses: Definitions and classification: 2001–2002*. Philadelphia: Author.)

Touch

One of the most universal CAM modalities is touch. **Touch**, simply defined, is the means of perceiving or experiencing through tactile sensation. According to anthropologist Montague (1986), touch is the earliest sense to develop in humans and, thus, it provides a basic means of interacting with others and the environment. Tactile stimulation is necessary for survival and the healthy behavioral development of an individual (Bowlby, 1984). Touch carries with it taboos and prescriptions. It was used in all ancient cultures and shamanistic traditions for healing. The advent of scientific medicine and Puritanism led many healers away from the purposeful use of touch. Some cultures are very comfortable with physical touch; others specify that touch may be used only in certain situations within specified parameters. See Chapter 16 for a complete discussion about the phenomena of culture.

Because touch involves personal contact, the nurse must be sure to convey positive intentions. When in doubt, the nurse should withhold touch until effective communication with the client has been established. Touch has several important uses in nursing practice in that it:

- Is an integral part of assessment
- Promotes bonding between nurse and client
- Is an important means of communication, especially when other senses are impaired
- Assists in soothing, calming, and comforting
- Helps keep the client oriented

NURSING ALERT

Contraindications for Touch

It is important to know when *not* to touch. It may be difficult for persons who have been neglected, abused, or injured to accept touch therapy. Touching those who are distrustful or angry may escalate negative behaviors. Persons with burns or overly sensitive skin may not benefit from touch.

Therapeutic Massage

Therapeutic massage is the application of pressure and motion by the hands with the intent of improving the recipient's well-being. It involves kneading, rubbing, and using friction. The primary techniques used to perform a massage are described in the accompanying display.

For the past 30 years, many touch therapies have been assimilated into mainstream nursing practice. Massage therapy is now recognized as a highly beneficial modality and is prescribed by a number of physicians. In addition, many states now have licensing requirements for massage practitioners.

BASIC MASSAGE TECHNIQUES

- **Effleurage:**
 - The whole hand is used.
 - Gliding and long rhythmic strokes are used.
 - Firm, even-pressured strokes are directed toward the heart to assist blood return.
 - Lighter pressure is used when moving away from the heart.
- **Petrissage:**
 - Pressing, squeezing, kneading, and rolling movements by both hands (use entire hand) are used.
 - Deep circulation is enhanced.
 - C-shaped motions stimulate the muscle body.
 - Promotes muscle relaxation.
- **Friction:**
 - Thumb pads, heel of hand, or fingertips are used.
 - Focused, deep, circular motions are used.
 - Penetrates deeper muscle layers.
 - Is done after effleurage and petrissage.
- **Tapotement:**
 - Palms, fingertips, and knuckles are used.
 - Brisk, vigorous, rhythmic, percussive movements are used.
 - Hands alternately tap, cup, slap, and pummel muscles.
 - Invigorates and stimulates tired muscles.
- **Vibration:**
 - Very fine, rapid, shaking movements are administered by the entire hand.
 - Stimulates or relaxes muscles.

Traditionally, back rubs have been administered by nurses to provide comfort to hospitalized clients. Today, they are considered standard practice. Massage techniques can be used with all age groups and are especially beneficial to those who are immobilized. A back rub or massage can achieve many results, including relaxation, increased circulation of the blood and lymph, and relief from musculoskeletal stiffness, pain,

and spasm. Research (Beeken, Parks, Cory, & Montopoli, 1998) suggests that individuals with chronic obstructive lung disease benefit from massage therapy. The subjects in this study experienced positive changes in heart rate, oxygen saturation, and blood pressure as a result of massage. Procedure 14-1 describes the techniques involved in performing a massage. Boards of Nursing in some states (e.g., Louisiana, Massachusetts) state that it is within the scope of nursing practice for nurses to employ complementary therapies, including massage (LSBN, 1999; MBRN, 1997). The National Association of Nurse Massage Therapists (NANMT) was established in 1990 to promote professional ethical standards for nurse massage therapists. The NANMT-established standards reflect those of the American Nurses Association.

Therapeutic Touch

Therapeutic touch (TT), which is based on ancient healing practices (such as the laying on of hands), consists of assessing alterations in a person's energy field and using the hands to direct energy to achieve a balanced state. The practice of TT was developed in the early 1970s by Dolores Krieger, PhD, RN, then professor of nursing at New York University, and Dora Kunz, a noted healer. TT is based on four assumptions that are shown in the accompanying display.

The TT process is readily learned in workshops, can be done with hands either on or off the body in the energy field, complements medical treatments, and has reasonably consistent and reliable results (see Figure 14-7). Table 14-3 presents the five-phase process of TT.

The relaxation response may be apparent in the client as quickly as 2 to 5 minutes after a TT treatment has begun, and some clients may fall asleep or require less pain medication after a treatment.

Research has been documenting the effectiveness of therapeutic touch in wound healing, relaxation, and immunological functioning. A study conducted by Gordon and Merenstein (1998) shows that therapeutic touch can decrease knee pain caused by arthritis. Research

NURSING ALERT

Precautions with Massage

- Massage should be used with caution for people with heart disease, diabetes, hypertension, or kidney disease because increased circulation in these conditions may be harmful.
- Massage should never be attempted in areas of circulatory abnormalities such as aneurysm, varicose veins, necrosis, phlebitis, or thrombus or in areas of soft-tissue injury, open wounds, inflammation, joint or bone injury, dermatitis, recent surgery, or sciatica.

FOUNDATIONAL CONCEPTS OF THERAPEUTIC TOUCH

- A human being is an open energy system.
- Anatomically, a human being is bilaterally symmetrical.
- Illness is an imbalance in an individual's energy field.
- Human beings have natural abilities to transform and transcend their conditions of living.

(From Krieger, D. [1993]. *Accepting your power to heal: The personal practice of therapeutic touch*. Santa Fe, NM: Bear & Company Publishing.)

PROCEDURE 14-1

Administering Therapeutic Massage

Equipment

- | | |
|---|---|
| <ul style="list-style-type: none"> ■ Flat sheet ■ 1 or 2 pillows ■ Lotion or oil | <ul style="list-style-type: none"> ■ Bath blanket or light coverlet ■ Towel |
|---|---|

Action

1. Set room temperature at approximately 75°F. Provide low or indirect lighting, privacy, and background music.
2. Prepare the massage table or hospital bed by laying a clean sheet on the surface. Adjust the surface height.
3. Remove rings and watch. Wash hands.
4. Explain the procedure to the client.
5. Assist the client to assume either a prone, Sim's, supine, or sitting position, depending on client's condition.
6. Loosen or remove clothing from the client's back and arms. Drape the client with a sheet to cover areas not being treated directly.
7. Squeeze a small amount of lotion or oil into the palm of the hand to warm before applying to the client.
8. Begin with light to medium effleurage (see explanation in text) at lower back and continue upward following muscle groups, being careful to avoid the spine and spinal processes (see Figure 14-5). Move hands up toward the base of the neck and continue outward over the trapezius muscles with circular motions, over and around shoulders and upper arms, and return with lighter downward strokes laterally over the latissimus dorsi to the upper gluteals. Use slow rhythmic movements, keeping in contact with the skin at all times. Check pressure. Continue the effleurage for approximately 3 minutes.

Rationale

1. Maintains client's body heat, protects privacy, and promotes relaxation.
2. Both the massage table and hospital bed are adjustable so that the height of the work surface can be raised or lowered as necessary.
3. Avoids scratching the client and prevents transmission of microorganisms.
4. Prepares the client for the treatment.
5. Appropriate position enables the nurse to apply the necessary amount of pressure to the back without causing discomfort for the client.
6. Exposes parts of the back on which the massage will be performed. Draping untreated parts of the back helps keep the client warm.
7. Cold lotion or oil can cause discomfort to the client.
8. Prevents damage to internal structures, stimulates circulation, and promotes relaxation.



Figure 14-5 Effleurage from Lower Back to Base of Neck

(continues)

PROCEDURE 14-1

Administering Therapeutic Massage (continued)

9. Continue treatment if appropriate with gentle petrissage (see explanation in text) to major muscle groups in the back, shoulders, and upper arms (see Figure 14-6).



Figure 14-6 Petrissage of Shoulders

10. Use friction (see explanation in text) to particular muscle groups where tension is being held.
 11. Use tapotement (see explanation in text) to stimulate any muscle groups that may be fatigued.
 12. Finish treatment with effleurage.
 13. Wipe any excess lotion or oil from skin with towel, or use small amount of warm soap and water to clean client's skin, taking care to dry completely.
 14. Assist client into comfortable position for a period of rest or sleep.
 15. Document treatment, client's response, and skin assessment data.
9. Enhances circulation, stimulates muscles, and promotes relaxation.
 10. Penetrates deeper muscle layers, thus promoting further relaxation.
 11. Invigorates and stimulates tired muscles.
 12. Assists with relaxation and provides a sense of completion.
 13. Promotes/maintains skin integrity.
 14. Allows client to fully experience therapeutic benefit of massage.
 15. Communicates pertinent data to other members of treatment team; promotes continuity of care

participants who received TT reported significantly less pain and improved function than those in the control group.

Healing Touch

Healing touch (HT) is an energy-based therapeutic modality that alters the energy field through the use of touch. HT was developed by Janet Mentgen, a nurse, in the 1980s. In 1993, HT was established as a certification program of the American Holistic Nurses Association (AHNA). Its curriculum includes varied techniques for use of HT in general balancing of the body's energy

field, relaxation, and for specific problems such as headaches, spinal problems, and pain.

Table 14-4 lists the five steps of HT. HT recognizes the need for follow-up or sequential treatments as well as discharge planning and referral to assist the client in adequately meeting goals.

In both TT and HT, the practitioner uses **centering** (a process of bringing oneself to an inward focus of serenity) before initiating treatment. Centering is a useful tool to employ before performing any treatment or before any situation that may be stressful or difficult (such as a major school examination).

TABLE 14-3
Phases of Therapeutic Touch

Phase	Definition	Techniques
Centering	<ul style="list-style-type: none"> • Bringing body, mind, and emotions to a quiet, focused state of consciousness • Being still • Being nonjudgmental 	Become centered by use of: <ul style="list-style-type: none"> • Controlled breathing • Imagery • Meditation
Assessment (“Scanning”)	<ul style="list-style-type: none"> • Using the hands to determine the nature of the client’s energy field • Being attuned to sensory cues (e.g., warmth, coolness, static, pressure, tingling) to detect changes in client’s energy 	<ul style="list-style-type: none"> • Hold hands 2 to 6 inches away from person’s energy field while moving the hands from the head to the feet in a rhythmic, symmetrical manner.
Unruffling (“Clearing”)	<ul style="list-style-type: none"> • Facilitating the symmetrical and rhythmic flow of energy through the field 	<ul style="list-style-type: none"> • Use slightly more vigorous hand movements from midline while continuing to move in a rhythmic and symmetrical manner from the head to the feet.
Treatment (“Balancing,” “Rebalancing,” or “Intervention”)	<ul style="list-style-type: none"> • Projecting, directing, and modulating energy on the basis of the nature of the living energy field • Assisting to reestablish order in the system 	<ul style="list-style-type: none"> • Because each practitioner experiences the living energy field uniquely, the law of opposites serves as a guideline for intervening (e.g., if a pulling or drawing sensation is detected, then direct energy to the depleted area until it feels replenished). • Continue to assess, clear, and balance the field while remaining centered.
Evaluation	<ul style="list-style-type: none"> • Using professional, informed, and intuitive judgment to determine when to end the session 	<ul style="list-style-type: none"> • Reassess the field. • Elicit feedback from the client. • Give the client an opportunity to rest and integrate the process.

The phases, although learned sequentially by beginners, are dynamic and often are performed concurrently and repetitively by experienced practitioners. (Adapted from Nurse Healers-Professional Associates, Inc. [1992]. *Therapeutic touch: Teaching guidelines: Beginner’s level Krieger/Kunz method*. New York: Author.)



Figure 14-7 A nurse administering therapeutic touch to a client. Is there a therapeutic relationship between the use of TT as a therapeutic modality and the healing systems that can be traced to Far Eastern cultures?

In addition to therapeutic massage, TT, and HT, there are many other touch modalities that can be integrated into nursing practice. Some of the more common types of touch therapies are reflexology and acupressure with its many variations. These techniques involve deep-tissue body work and require advanced training for practitioners.

Shiatsu Acupressure

Shiatsu acupressure is based on East Asian philosophy and Japanese methodology. *Shiatsu*, from the word meaning “finger pressure,” differs from acupuncture, a procedure that uses needles and heat to deliver treatment. In Shiatsu, blocked energy within the client is released by application of the practitioner’s fingers, thumbs, and heel of the hands along certain pressure points (meridians). When practicing Shiatsu, nurses need to be

TABLE 14-4
Steps of Healing Touch

Step	Description	Nursing Guidelines
Initial interview	<ul style="list-style-type: none"> Provides the working base for energetic interventions and functions as an intake assessment. 	<ul style="list-style-type: none"> Introduce yourself. Explain enough about your work so that a feeling of confidence can begin to develop. Determine the main problem or reason for treatment. Identify relevant health history: hospitalizations, diseases, injuries, diagnoses, medications (past and present) including use of recreational drugs, nicotine, alcohol, caffeine, vitamins, and herbs. All of these factors can influence the energy field.
Assessment	<ul style="list-style-type: none"> In wellness, the energy flows evenly from head to toe without blocks, breaks, unevenness, or temperature variations. Any disruption of the flow reflects disharmony in that area. 	<ul style="list-style-type: none"> Approach the client from a centered state. Begin by determining the shape of the energy field by slowly scanning its outer edges. Start 3 to 4 feet away from the body and move toward it using the palms until you can determine the actual outline of the energy field. Continue the assessment by feeling the vital layer 1 to 6 inches off the skin. Identify areas in relation to the physical body where the field is different, perhaps not as vibrant or as smooth as in other areas.
Documentation	<ul style="list-style-type: none"> Begins with the initial client contact. 	<ul style="list-style-type: none"> Mentally take note of all sensations, even the ones that may seem very subtle. A picture of the energy pattern is usually easy to execute by drawing the perceived pattern on a simple outline of the body. Areas of energetic differences can be drawn in, as can injuries, swelling, scars, or the track of a pain ridge.
Intervention	<ul style="list-style-type: none"> The healer can choose many healing interventions in this sequence: therapeutic touch, full body techniques, and localized and specific techniques. 	<ul style="list-style-type: none"> During the intervention, which may last 20 to 30 minutes, all of the healer's skill and experience are used.
Completion and grounding	<ul style="list-style-type: none"> After completion of the interventions, carefully ground the client to help restore balance and promote integration. Carefully determine that the client is fully alert if the client will leave after the session. 	<p>Grounding can be done in a variety of ways, including:</p> <ul style="list-style-type: none"> Hold the feet until you sense a flow and a connection with the client and sense that the client's energy is back in the feet. Brush down the body from head to toe and down the arms toward the ground. Repeat briskly several times. Give a suggestion: "Feel your fingers, and your toes; now gently move them until you return to full awareness in this room." Reassess the energy field at this time and document the changes. Spend some time with the client to obtain feedback. Focus on what the client experienced. Talking helps the client to feel grounded.

self-aware and grounded: that is, focused on their inner energy. This focus enables the practitioner to concentrate completely on promoting the client's comfort.

Acupuncture

Acupuncture is the use of needles inserted at specific points on the body (energy pathways) to promote healing. Acupuncture is done to manipulate the energy flow throughout the body; treatment focuses on correcting the flow of *chi* (energy) when imbalances (blockages) occur. TCM practitioners believe that meridians conduct *chi* between the body's surface and internal organs. Acupuncture points are believed to stimulate the central nervous system to release chemicals into the muscles, spinal cord, and brain. These chemicals either alter the experience of pain or produce other chemicals that lessen pain (National Institutes of Health, 1997).

Acupuncture is one of the oldest, most commonly used medical procedures in the world. It originated in China over 2,000 years ago and is effective in treating a variety of health problems. Acupuncture is rapidly gaining acceptance in mainstream Western medicine. As of 1997, an estimated one-third of certified acupuncturists in the United States are medical doctors (Culliton, 1997). The use of acupuncture needles is officially approved for use by licensed practitioners. The Food and Drug Administration requires manufacturers of acupuncture needles to label them for single use only (U.S. Food and Drug Administration, 1996).

One of the major reasons Americans use acupuncture is for relief of chronic pain, especially pain caused by arthritis or low back disorders (Bullock, Pheley, Kiresuk, Lenz, & Culliton, 1997). Several studies on acupuncture have been sponsored by the NCCAM, including:

- A small randomized controlled clinical trial showed that more than half the women with a major depressive episode who received acupuncture therapy improved significantly (Allen, 1998).
- Another study found that **moxibustion** (application of heat from certain burning substances, such as herbs, at acupuncture points on the body) applied to pregnant women with breech presentations significantly increased the number of normal head-first births (Cardini & Weixin, 1998).

NURSING ALERT

Acupuncture is contraindicated for people with acute cardiovascular disorder, hemophilia, and pregnancy.

Reflexology

Reflexology is rooted in ancient healing arts. Egyptian wall paintings from approximately 2300 BC show the use of reflexology. Contemporary use of reflexology is credited to the work of William H. Fitzgerald, an American

physician, who, in the early 1900s, discovered that applying pressure to certain parts of the fingers could relieve pain in other body parts (Cassileth, 1998). In the 1930s, Eunice Ingham discovered that certain points on the feet were more responsive to pressure and provided better pain relief than points on the hand.

The fundamental concept of reflexology is that the body is divided into 10 equal, longitudinal zones that run the length of the body from the top of the head to the tip of the toes. These 10 zones are correlated with the 10 fingers and toes. The foot is viewed as a microcosm of the entire body. Reflexology theory posits that illness manifests itself in calcium deposits and acids in the corresponding part of the person's foot. Pressing specific points on the foot stimulates energy movement and produces relaxation, reduces stress, and promotes health by relieving pressures and accumulation of toxins in the corresponding body part (see Figure 14-8).

Reflexology can be used as a complementary method for managing chronic conditions such as asthma, sinus infections, migraines, irritable bowel syndrome, kidney stones, and constipation. Once the pressure points are learned, the nurse can massage the areas of the client's foot to relieve pain and produce relaxation.

THINK ABOUT IT

Application of Touch

Is there a group of people whom you can identify as being socially isolated or in distress who could benefit from one or more of the touch therapies? Consider residents of extended-care facilities, caregivers of chronically ill children or elderly parents, and hospice clients. Do you think that touch therapies can be used as routine preventive care for well populations?

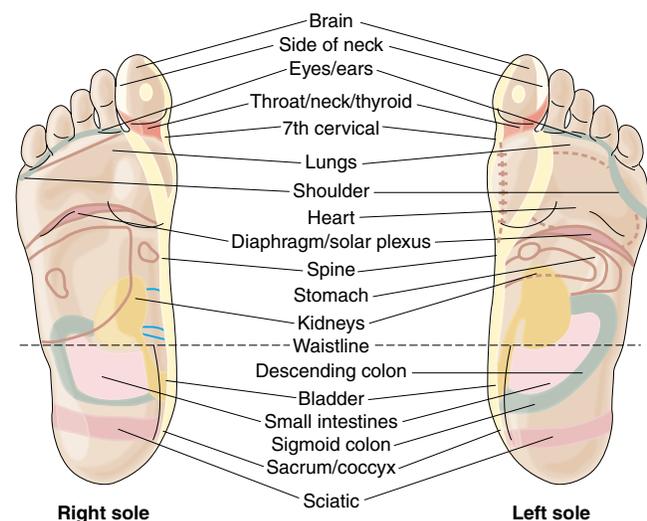


Figure 14-8 Foot Reflexology Charts (Reproduced with permission from *Better Health with Foot Reflexology*. Copyright © 1983 by Dwight C. Byers. Ingham Publishing, Inc., POB 12642, St. Petersburg, FL 33733-2642. www.reflexology-usa.net)

Spiritual Therapies

A state of wholeness or health is dependent not only on one's relationship to the physical and interpersonal environment but also to the spiritual aspects of self. See Chapter 15 for a discussion of the relationship between spirituality and health. The idea that there is a relationship between spirituality and health is not new. "At the core of many holistic modalities are spirituality and healing, which encompass a person's values, meaning, and purpose in life . . . The concept of spirit implies a quality of transcendence, a guiding force, or something outside the self and beyond the individual nurse or patient" (Dossey, 1998).

The role of the spirit in healing is witnessed in all cultures. The inseparable link between the state of one's soul (life energy or spirit) and the state of one's health is accepted by many cultures. Scientists (especially psychoneuroimmunologists) are beginning to validate that there are inner mechanisms of healing within individuals. Many of the major religions have ideologies relating to health, illness, and healing.

Health maintenance implies having a balanced spiritual life. Dossey and Dossey (1998) quote a study that examined factors contributing to successful coronary artery bypass surgery. The best single predictor of survival was the degree of religious faith and spiritual meaning in the client's life. "Over 250 studies now show that religious practice—the specific religion doesn't seem to matter—is correlated with greater health and increase longevity" (Dossey & Dossey, 1998, p. 37).

Faith Healing

At the heart of spiritual or faith healing is the practitioner's belief that one has to purify one's self and reach a state of unity with God or a Higher Power. This process, based on religious belief, is usually done through prayer. During preparation for healing, the practitioner adapts a passive and receptive mood in order to be a channel for divine power. To benefit from the healer's intervention, the ill person's belief enhances, but is not crucial, to the success of healing.

Healing Prayer

When individuals pray, they believe they are communicating directly with God or a Higher Power. Prayer is an integral part of a person's spiritual life and, as such, can affect well-being. Florence Nightingale (1860) recognized that prayer helps connect individuals to nature and the environment. Many religions adhere to established rituals for organized prayer. For example, Tibetan Buddhists use prayer wheels—wooden and metal cylinders with prayers written on them. Islam has five periods of prayer scheduled daily. Some religious groups, such as Christian Scientists, relay on prayer in lieu of conventional medical therapy due to the belief that prayer alone can heal disease (Cassileth, 1998).

"Research has shown that religious practices such as worship attendance and prayer have significant health and survival implications" (Fontaine, 2000, p. 346). Medical research is currently investigating the effects of prayer on physical health. The exact mechanism for the effect of prayer on healing is not known; see Figure 14-9. However, "people are nourished by life-affirming beliefs and philosophies. They meditate and say prayers that elicit physiological calm and a sense of peacefulness, both of which contribute to longer survival" (Fontaine, 2000, p. 346). Cassileth (1998) states:

There is no doubt about the numerous benefits of prayer and spirituality: solace in times of suffering, uncertainty, and loss; a community of people who share one's values and beliefs; principles to help guide us through difficult situations. These benefits are helpful and healing in the deepest sense of the term. (p. 312)

Larry Dossey (1998), a physician, is so strongly convinced of prayer's effect on health that he postulates that treatment plans should include prayer.

Nutritional Therapies

In the last 30 years, nutritional interventions for prevention and treatment of disease have received increased interest from consumers and health care providers. This section addresses the CAM nutritional approaches.

Nutraceuticals

Currently, many foods are being studied for their medicinal value. **Nutraceuticals** refer to any natural substances found in plant or animal foods that act as

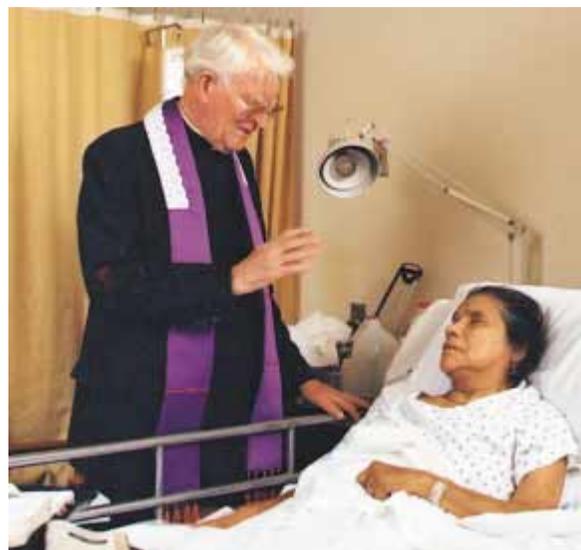


Figure 14-9 Prayer brings a sense of peace and healing to many individuals.

protective or healing agents. **Phytonutrients** refer to those chemicals found in plants; see Table 14-5 for a listing of the major phytonutrients and their actions.

Foods that are being investigated by the National Cancer Institute for possible cancer preventive qualities include carrots, celery, citrus fruits, flaxseed, garlic, licorice root, parsley, and soybeans.

The best source of nutrients is fresh whole foods, preferably eaten in their natural form. The standard Western diet lacks many essential nutrients due to processing and contains many harmful additives. In contrast, the TCM diet contains fresh, semiraw, and slightly cooked ingredients. “Ultimately, one might say there is much wisdom in the ancient Chinese view of food. The Chinese diet emphasizes natural food alchemy taking place inside the body by virtue of food enzyme activity, instead of the synthetic food alchemy that we now accept in the package processed goods the Western

consumer has been conditioned to buy” (Froemming, 1998, p. 45).

Antioxidants and Free Radicals

Vitamins C and E, and beta-carotene which converts to vitamin A, may prevent heart disease and some forms of cancer. Antioxidants exert several beneficial effects, including prevention of cancer, reduction of heart disease, and possible retardation of the aging process (Ferguson & Ferguson, 2000, p. 28). Antioxidants react with free radicals, preventing them from damaging cells and from altering DNA. Dietary antioxidants have shown to be effective in protecting the body from free radicals. “Absorbed from the intestines, these antioxidants are available to scavenge free radicals in the bloodstream as well as be absorbed into cells and lipid areas” (Ferguson & Ferguson, 2000, p. 28). Sources for

TABLE 14-5
Actions and Sources of Major Phytonutrients

Phytonutrient	Sources	Actions
Ascorbic acid	Citrus fruits, broccoli, most fruits and vegetables	Binds iron, preventing it from becoming a cancer-causing prooxidant
Capsaicin	Red chili peppers	Helps prevent carcinogens from binding with DNA at the cellular level
Catechins	Green tea, black tea	Reduces the risk of gastrointestinal cancers
Fiber lignans	Soybeans, flaxseed, nuts	Inhibits growth of tumors
Fiber pectins	Apples, pears, plums, prunes	Improves colon health; encourages growth of beneficial intestinal flora
Lycopene	Tomatoes, tomato sauce	Protects against prostate cancer; helps block UVA and UVB rays
Phytoestrogens	Soy products, alfalfa sprouts	Helps reduce menopausal symptoms; may block some cancers (i.e., breast, prostate)
Phytosterols	Plant oils, corn, sesame, soy, safflower, pumpkin, wheat	Inhibits uptake of cholesterol from foods; blocks hormonal role in cancer production
Protease inhibitors	Soybeans and soy products, eggs, cereals, potatoes	Protects against negative effects of radiation and free radical damage; prevents activation of certain genes that cause cancer
Sulfur compounds	Onions, garlic	Lowers blood pressure; improves immune system response; fights infections; antimicrobial effect; lowers cholesterol; reduces triglycerides

(Data from Froemming, P. [1998]. *The best guide to alternative medicine*. Los Angeles: Renaissance Books; Mayo Clinic. [2000]. Phytoestrogens: Getting your hormones from plants. *Women's Healthsource*; 4(2), 1–2; Weil, A. [2000]. *Eating well for optimum health: The essential guide to food, diet, and nutrition*. New York: Alfred A. Knopf.)

dietary antioxidants include vitamin C (in fruits and vegetables), beta-carotene (yellow-orange pigment in fruits and vegetables), and vitamin E (in polyunsaturated oils, butter, and eggs). The antioxidants devour free radicals (unstable molecules that alter genetic codes and trigger the development of cancer growth in cells).

Other vitamins, minerals, trace elements, and enzymes are being investigated for possible therapeutic value. See Chapter 38 for a thorough discussion of the essential vitamins, their functions, and major sources.

Macrobiotic Diet

In the 1960s, macrobiotic diets (Greek *makro* meaning long and *bios* meaning life) became popular because of the heightened interest in “natural” and more spiritual approaches to managing health and illness. The basis for macrobiotics is the Taoist concept of balance between opposites that is achieved through food intake. Food has the qualities of *yin* (associated with death, cold, and darkness) and *yang* (associated with immortality, heat, and light). For example, tropical sweet foods are yin, and meat and eggs are yang. Overindulgence in either type causes difficulties; for example, too much yin yields worry and resentment whereas too much yang leads to hostility and aggression. People need balance and, therefore, should consume foods that are neither too yin nor too yang.

Because brown rice and whole grains are categorized as balanced foods, they are major staples in a macrobiotic diet. The diet should be flexible and related to the season; it should consist of foods indigenous to the area in which the individual lives. Foods to be avoided include processed and treated foods, red meat, sugar, dairy products, eggs, and caffeine.

NURSING ALERT

Macrobiotic Diets

Children and pregnant women should use the macrobiotic diet with caution. It may not have sufficient variety and, therefore, could be deficient in vitamins D and B₁₂.

Herbal Therapy

Herbal medicine has been a powerful tool in folk healing for centuries. Medicinal herbs have been catalogued for thousands of years and have probably existed in every culture. Many drugs commonly used today were folk remedies derived from plants. For example, salicin, the active chemical ingredient found in white willow bark, has been used by TCM practitioners and Native Americans for pain relief. This same salicin is a precursor to salicylic acid, an ingredient in aspirin. Herbal medicine, also known as botanical medicine or phytotherapy, uses plant extracts for therapeutic outcomes. Many holistic practitioners incorporate the use of herbs into their practice.

NURSING ALERT

Use of Medicinal Plants

Avoid casual treatment of self or others with plants. Just because the substance is “natural” does not mean it is harmless. If not processed properly, many plants (including some herbs) can be poisonous.

Learning about herbal treatment is similar to learning pharmacology. Herbs work because of their chemical composition. Different herbs contain different compounds that can strengthen the immune system, alter the blood chemistry, or protect specific organs against disease. Peppermint oil may help relieve the symptoms of irritable bowel syndrome by exerting a relaxant effect on the muscles of the gastrointestinal tract (Pittler & Ernst, 1998). “Herbal immune system enhancers help the body fight common viral illnesses and assist in preventing the overuse of antibiotics” (Collins, 2000, p. 3). Echinacea is frequently used for its immune-enhancing properties. However, it should not be taken longer than 8 to 10 consecutive weeks due to the potential for liver toxicity.

Herbs are not cure-alls, and many take time to exert their healing properties. Generally, it is wise to use herbs for treating conditions one would ordinarily self-treat. See the accompanying display for conditions that generally respond well to herbal therapy.

CONDITIONS THAT RESPOND WELL TO HERBAL THERAPY

- Allergies
- Arthritis
- Digestive problems (indigestion, diarrhea)
- Headache
- Insomnia
- Kidney and urinary tract infections
- Menopausal symptoms
- Menstrual problems
- High or low blood pressure
- Skin disorders

Table 14-6 lists medicinal uses of commonly used herbs.

In the past decade, more than 53,000 natural products were tested by the National Cancer Institute. Approximately one-third of all new cancer therapies are derived from natural sources (Cassileth, 1998).

Herbs are not to be used indiscriminately, as their use may result in some negative outcomes. Some individuals may experience allergic reactions to certain botanicals; see the accompanying display for a listing of possible allergic reactions to herbs.

TABLE 14-6
Medicinal Value of Herbs

Herb	Medicinal Use(s)	Herb	Medicinal Use(s)
Aloe vera (<i>Aloe vera</i>)	<ul style="list-style-type: none"> Promotes wound healing Minor cuts and abrasions Burns 	Ginger (continued)	<ul style="list-style-type: none"> Stimulates circulation in feet and hands Expectorant Helps relieve indigestion and flatulence Diarrhea
Calendula (<i>Calendula officinalis</i>)	<ul style="list-style-type: none"> Promotes wound healing Cuts, abrasions Minor burns Sunburn Acne Athlete's foot Oral thrush (as a mouthwash) Vaginal thrush (as a douche) 	Ginkgo (<i>Ginkgo biloba</i>)	<ul style="list-style-type: none"> Enhances cerebral blood flow Mild depression Dementia Impotence Peripheral vascular insufficiency PMS Memory impairment
Celery seed (<i>Apium graveolens</i>)	<ul style="list-style-type: none"> Cholesterol-lowering effect Dizziness, headache Diuretic effect 	Lavender (<i>Lavandula angustifolia</i>)	<ul style="list-style-type: none"> Headache Reduces muscle spasms Increases relaxation
Chamomile (<i>Matricaria chamomilla</i> ; <i>Anthemis nobilis</i>)	<ul style="list-style-type: none"> Produces a calming effect Nausea Tension headache 	Milk thistle (<i>Silybum marianum</i>)	<ul style="list-style-type: none"> Liver disorders Hepatitis Cirrhosis Gallstones
Dandelion (<i>Taraxacum officinale</i>)	<ul style="list-style-type: none"> Produces a diuretic effect Helps decrease edema (especially that of premenstrual fluid retention) Indigestion 	Peppermint (<i>Mentha × Peperita</i>)	<ul style="list-style-type: none"> Headache Sinus congestion Digestive aid
Eucalyptus (<i>Eucalyptus globulus</i>)	<ul style="list-style-type: none"> Antibacterial Produces a decongestant effect 	Saint John's wort (<i>Hypericum pereforatum</i>)	<ul style="list-style-type: none"> Mild to moderate depression Sleep disorders Viral infections
Evening primrose (<i>Oenothera biennis</i>)	<ul style="list-style-type: none"> Atopic eczema Asthma Migraine PMS symptoms (e.g., mood swings, breast pain, and tenderness) Arthritis 	Sage (<i>Salvia officinalis</i>)	<ul style="list-style-type: none"> Antibacterial properties
Feverfew (<i>Tanacetum parthenium</i>)	<ul style="list-style-type: none"> Migraine headache 	Thyme (<i>Thymus vulgaris</i> , <i>T. serpyllum</i>)	<ul style="list-style-type: none"> Antimicrobial properties Helps relieve symptoms of common cold Antispasmodic effect on bronchioles Relieves cystitis Antifungal effect (especially as a mouthwash for oral thrush)
Garlic (<i>Allium sativum</i>)	<ul style="list-style-type: none"> Decreases cholesterol Helps protect against and treat respiratory infections Expectorant in cases of bronchitis or a cold 	Valerian (<i>Valeriana officinalis</i>)	<ul style="list-style-type: none"> Sedative effect Counters insomnia
Ginger (<i>Zingiber officinale</i>)	<ul style="list-style-type: none"> Nausea (especially effective with motion sickness and morning sickness associated with pregnancy) 	White willow (<i>Salix alba</i>)	<ul style="list-style-type: none"> Headache Fever Muscular aches and pains

Note: This information is not intended to be a guide for self-medication or the treatment of others. Consult a health care practitioner trained in the use of herbs before consuming any herb for medicinal purposes.

(Goldberg, B. [1999]. *Alternative medicine: The definitive guide*. Tiburon, CA: Future Medicine Publishing; Ody, P. [1999]. *100 great natural remedies: Using healing plants at home*. New York: Barnes & Noble; Tierra, M. [1998]. *The way of herbs*. New York: Pocket Books.)

POSSIBLE REACTIONS TO CERTAIN BOTANICALS

Botanical

- Apricot
- Arnica
- Celery
- Garlic
- Motherwort
- Tansy

Reaction

- Contact allergy
- Contact allergy
- Photosensitivity
- Systemic reaction
- Photosensitivity
- Systemic reaction

(Data from Mustalish, S. H. (2000). Avoiding allergic reactions in children from botanical medicines. *Integrative Medicine Consult*, 1, 6.)

Consumers need to be taught the following regarding herbs and allergies: to recognize the potential for developing allergic reactions to herbs; to identify the indicators of such reactions; and to immediately stop using the herb if allergic symptoms occur.

Individuals using herbs need to understand that problems can occur when taking herbal products and medications concurrently. The chemical constituents of herbs may alter the effects of some medications; see Table 14-7.

To assure client safety, nurses should:

- Ask clients about over-the-counter preparations and herbs that they take.

- Discuss the risks and benefits of the herbs taken.
- Suggest that clients purchase and use only herbal products labelled “standardized” for quality checks.

Other CAM Methodologies

The mind-body, body-movement manipulation, energetic-touch, spiritual, and nutritional treatment modalities are not the only available CAM therapies. Others, such as aromatherapy, humor, pet therapy, and music therapy, are being used as methods to improve health status.

Aromatherapy

Aromatherapy is defined as the therapeutic use of concentrated essences or essential oils that have been extracted from plants and flowers. When diluted in a carrier oil for massage or in warm water for inhalation, essences may be stimulating, uplifting, relaxing, or soothing. Essential oils help relax the mind and the body by promoting balance between the sympathetic and parasympathetic nervous systems. They stimulate the production of endorphins and rejuvenate the immune system (Froemming, 1998). “Essential oils enter the body in several ways. They can be absorbed through the skin and passed into the circulatory system. Oils can also be inhaled, passing into the bloodstream through the lungs, or by causing signals to

TABLE 14-7
Interactions Between Herbs and Medications

Herbal Product	Drug	Effect When Combined
Aloe	<ul style="list-style-type: none"> • Thiazide diuretics and corticosteroids • Cardiac glycosides and antiarrhythmic agents 	<ul style="list-style-type: none"> • Enhanced potassium loss • Potentiated by potassium loss
Belladonna	Tricyclic antidepressants, amantadine, quinidine	Increased anticholinergic effect
Brewer’s yeast	MAO inhibitor antidepressants	Increased blood pressure
Danshen	Warfarin	<ul style="list-style-type: none"> • Increased warfarin bioavailability • Increased prothrombin time
Ginkgo	Warfarin, heparin	Increased risk of bleeding
Licorice root	<ul style="list-style-type: none"> • Acetaminophen • Antihypertensives • Estrogens • Fludrocortisone • Thiazide diuretics and corticosteroids 	<ul style="list-style-type: none"> • Speeds acetaminophen excretion • Decreased antihypertensive effect • Increased estrogenic effect • Increased blood pressure • Enhanced potassium loss

(Data from Blumenthal, M., Goldberg, A., & Brinkman, J. [Eds.]. [2000]. *Herbal medicine: Expanded commission E monographs*. Newton, MA: Integrative Medicine Communications; Lilley, L. L., & Gunk, R. [1998]. Grapefruit and medication: Help your patient understand potential dangers of food–drug interactions. *American Journal of Nursing*, 98 [12], 10.)

CONDITIONS RESPONSIVE TO AROMATHERAPY

- Stress and anxiety-related problems
- Muscular and rheumatic pains
- Digestive disorders (e.g., nausea)
- Female sexual health conditions (e.g., PMS, postpartal problems, and menopausal symptoms)
- Skin conditions

be transmitted through the nervous system directly into the limbic system of the brain” (Walters, 1999, p. 16).

Aromatherapists use concentrated oils derived from roots, bark, or flowers, of herbs and other plants to treat specific ailments. The aromas cause physiological, psychological, and pharmacological reactions within a person (Schnaubelt, 1999). Aromatherapy is used to treat a variety of conditions and promote a sense of well-being; see the accompanying display.

Some essential oils have antibacterial properties and are found in a wide variety of pharmaceutical preparations. Essential oils should be used intelligently and with caution (see the Nursing Checklist).



NURSING CHECKLIST

Guidelines for Using Aromatherapy

1. Always dilute essential oils in a carrier oil.
2. Do a skin patch test for sensitivity before applying essential oils to the skin.
3. Avoid contact with the eyes.
4. Inhale essential oils only for short periods of time.
5. Store in dark glass bottles, tightly capped and away from heat and sunlight.
6. Store only in glass containers, not plastic.
7. Use only pure essential oils, not synthetics.

NURSING ALERT

Precautions with Essential Oils

Some essential oils can trigger asthma attacks or epileptic seizures, cause harm to people with cancer, or elevate or depress blood pressure. Instruct clients with asthma, cancer, epilepsy, or hypertension, or those who are pregnant to avoid the use of essential oils.

Humor

Of all the complementary interventions presented in this chapter, humor is the one that can be used most often to promote wellness. Humor is a frequently used

modality. Fritz (1998) questioned clients with chronic cancer pain about self-initiated, nondrug measures that they used to cope with pain. The clients rated laughing as the most effective type of therapy.

Humor has many therapeutic outcomes, including:

- Increased ability to cope with pain
- Enhanced immune functioning
- Reduced preprocedural anxiety

Former chairman of the Task Force in Psychoneuroimmunology at the School of Medicine at UCLA, Norman Cousins, related how he enhanced his recovery from an incurable connective tissue disorder, ankylosing spondylitis, by the daily watching of films and movies that made him laugh (Cousins, 1979). Humor can be used effectively to relieve anxiety and promote relaxation, improve respiratory function, enhance immunological function, and decrease pain by stimulating the production of endorphins.

It is important to determine the client's perception of what is humorous in order to avoid offending. Differentiation between humorous and offensive situations varies greatly from culture to culture and person to person. Nurses can use humor with clients in a variety of ways. A humor cart (portable cart or carrier filled with joke books, magic tricks, and funny videos) is easy to use and allows clients to select their own humor tools for health. The type of humor should be age-appropriate and culturally sensitive. See the Nursing Checklist.



NURSING CHECKLIST

Using Humor as a Therapeutic Intervention

1. Establish a trusting nurse–client relationship.
2. Conduct a humor assessment to determine the type of humor appreciated by the client and the client's usual response to humor.
3. Follow the client's lead in the type of humorous strategies used (i.e., jokes, satire, puns).
4. Involve the family and significant others in the humor.
5. Use humor as an adjunct, not a substitute, for pain medication.
6. Continually evaluate the humor strategy for its effectiveness.

(Data modified from Smith, N., & Oliver, N. [1998]. Using humor while caring for patients. *American Journal of Nursing*; 98(12), 14.)

Pet Therapy

The use of animals to enhance health status has a long history. In Britain in the 18th and 19th centuries, pets were used in institutions to give a sense of meaning

and purpose to people institutionalized because of developmental delays (mental retardation). Florence Nightingale (1860) stated “a small pet is often an excellent companion for the sick, for long chronic cases especially.” The therapeutic use of pets may be particularly helpful with elderly people. “Many health care professionals are finding that loneliness may be as serious as cancer and heart disease for older adults” (Fontaine, 2000, p. 391). Playing with and/or petting animals can help people feel less isolated. A study by Jennings (1998) has shown that blood pressure tends to decrease when people talk to their pets; see Figure 14-10. Pet therapy is currently used as adjunctive treatment for people in both acute and long-term care settings.

There are many uses for pet therapy. It can be implemented to help overcome physical limitations, improve mood, decrease blood pressure, and improve socialization skills and self-esteem.

Music

Music enters the bodymind through the auditory sense. Therapeutic use of music consists of playing music to elicit positive changes in behavior, emotions, or physiological response. Music complements other treatment modalities and encourages clients to become active participants in their health care and recovery.

Music is a good adjunct to use with imagery as it can add to the relaxation response and, therefore, heighten images; see Figure 14-11. Music can be used to relax



Figure 14-10 Interacting with pets can lead to therapeutic benefits.

RESEARCH FOCUS

Title of Study

“Nurses’ Perspectives on Unconventional Therapies”

Authors

Fitch, M. I., Gray, R. E., Greenberg, M., Labrecque, M., & Douglas, M. S.

Purpose

To examine nurses’ perspectives about the use of unconventional therapies.

Methods

A telephone interview approach was used to gather information about nurses’ perspectives on unconventional therapies. Twenty nurses were randomly selected from a list of nurses who had purchased a book on the use of unconventional therapies. An additional 20 nurses were sent a free copy of the same book with a request to review the book and participate in an interview. All but four of the participants worked in oncology settings. Three were occupational health nurses, and one worked in a psychiatric setting. The telephone interviews, which used open-ended questions, lasted from 15 to 45 minutes and were audiotaped.

Findings

The analysis of interview data revealed five prominent themes: (1) Information regarding unconventional therapies needs to be available. (2) Various people use unconventional therapies. (3) People seek unconventional therapies for a variety of reasons. (4) Communication about unconventional therapies needs to be open. (5) A place should be found for unconventional therapies.

Implications

People have a right to information, that information is critical for making decisions, and ultimately, decisions about health are up to the individual. All of the participants stated the need for health care providers to learn more about the unconventional therapies.

Fitch, M. I., Gray, R. E., Greenberg, M., Labrecque, M., & Douglas, M. S. (1999). Nurses’ perspectives on unconventional therapies. *Cancer Nursing*, 22(3), 238–245.

or stimulate. “Music has been used for everything from lulling infants to sleep to stirring warriors to battle” (Grotbo, 1999, p. 24)]. Music is used for celebrations, spiritual ceremonies, entertainment, and recreation.



Figure 14-11 This individual is experiencing the combined effects of music and imagery, which potentiate the relaxing effects of each modality.

In hospitals in India, traditional Indian music is used to help restore balance in body rhythms (Fontaine, 2000). The healing power of music has been extensively studied. Campbell (1998) states that Mozart's music alters the energetic fields in the human brain and thus alters an individual's inner rhythms. The basic elements of music—rhythm, pitch, and intensity—are transmitted by sensory impulses from the cochlea to the thalamus, where they are mediated, then to the cerebral cortex, affecting the autonomic nervous system (Grotbo, 1999).

Listed here are some ways in which music has been used as a therapeutic intervention (Campbell, 1998):

- Music is used by hospice nurses to reduce clients' pain and ease the transition to death.
- Neonatal nurses often use lullabies to calm infants who are on ventilators or are irritable.
- Many labor and delivery nurses provide tape players and cassettes of relaxing music to clients.
- In rehabilitation units, relaxing music is often played.
- People with rheumatoid arthritis used guided imagery and music for 18 weeks and reported a reduction in pain as well as an improved ability to ambulate.

- Children with attention deficit disorder (ADD) who listened to Mozart had better attention spans, improved mood control, decreased impulsivity, and improved social skills.

Music on audiocassette used with a tape player and headphones can be a very useful tool for clients who may be immobilized, who must wait for diagnostic tests, or who undergo the perioperative experience. Some clients request that their music and tape player accompany them during surgery. Pleasurable sounds and music can reduce stress, perception of pain, anxiety, and feelings of isolation. To promote relaxation, select music that is repetitive and low-pitched. Rhythm is most soothing when it has a 3/4 beat. Relaxation is induced by repetition of music, such as lullabies and chants. Music can also be especially useful in helping adolescent clients relax.

Although music is therapeutic for people at all stages of the life cycle, **music-thanatology** is a holistic and palliative method for use of music with dying clients. Music-thanatology is used to help dissipate obstacles to the client's peaceful transition to death.

NURSING AND COMPLEMENTARY/ALTERNATIVE APPROACHES

Nurses play an important role in educating consumers about unconventional interventions by providing information about the safety and efficacy of such methods. "In this new millennium, a major challenge facing nursing will be the promotion of integrative care in which clients use the best of CAM and conventional medicine. An integrative approach to practice will demand that nurses promote integration rather than replacement of conventional care" (Eliopoulos, 2000, p. 2). Education is a major function of nursing and is greatly needed as consumers try to determine which CAM methods to use. Consumers should be taught to recognize the signals of fraudulent practice and to avoid healers who:

- Promise immediate relief or success
- State that their way is the only sure therapy
- Refuse to work with other health care providers
- Claim to have all the answers
- Place more priority on money than the client's well-being (Tiedje, 1998)
- Use testimonials that claim amazing results
- Make statements using phrases such as "miraculous cure," "scientific breakthrough," or "secret ingredient" (Federal Trade Commission, 1998)

Other nursing interventions are to provide clients with information about the appropriate use of CAM; to protect clients from unsafe practices and practitioners; and to assist colleagues in being informed of the ever-changing knowledge base about CAM.

THINK ABOUT IT

Complementary/Alternative Treatment: To Seek It or Not?

Your close friend has AIDS and is experiencing a great deal of pain and discouragement. She wants to find alternative methods to ease the pain. She confides in you that she believes that there may be a cure available at the holistic health center. How do you best help your friend with this situation? What do you advise? Evaluate the same scenario by changing the friend to a client. Is your approach different? Do you give the same advice?

Many clients do not discuss their use of CAM techniques with their primary care providers because they fear ridicule or censure (Fontaine, 2000). It is imperative that nurses establish a setting in which clients feel free to express all issues related to their health. “When we nurses demonstrate an openness to clients’ questions and self-care ideas without judgment, we can learn a lot more about our clients and help them find the treatments that work best for them” (Collins, 2000, p. 3).

Holistic nurses individualize every intervention on the basis of the client’s unique needs. From the time before birth until the moment of death, people of all ages experience trauma, stress, and life challenges and

have needs in all dimensions. Nurses are challenged to discover and meet those needs. Table 14-8 provides suggestions for the use of complementary modalities throughout the life cycle.

Holistic nurses must maintain technical expertise, interpersonal skills, and critical thinking abilities. In addition to these requisite competencies, Fontaine (2000) states, “We need scientific principles, methods, and skills, but we also need to teach people ways to become more self-reliant as we shift in the role from caregiver to healer” (p. 17).

Nurse as Instrument of Healing

When the nurse serves as an instrument of healing, the objective is to help the clients call forth their inner resources for healing. In order to accomplish this goal, nurses must develop the following attributes:

- Knowledge base: Initially established in nursing school and then continuously expanded through life-long learning
- Intentionality: A conscious direction of goals that is essential in helping the healer to focus
- Respect for differences: Demonstrated by honoring clients’ culturally based health beliefs
- Ability to model wellness: Tending to own needs and attempting to stay as healthy and balanced as possible

TABLE 14-8
Complementary/Alternative Therapies for Use throughout the Life Cycle

Population	Recommended Complementary Therapies
Premature infants	<ul style="list-style-type: none"> • Massage (with modifications) • Energetic-touch therapies • Sound (e.g., recorded human heartbeat) • Gentle movement • Touch (stroking, skin-to-skin contact)
Infants	<ul style="list-style-type: none"> • Massage (with modifications) • Energetic-touch therapies • Music (e.g., lullabies) • Movement (e.g., rocking)
Toddlers and preschoolers	<ul style="list-style-type: none"> • Massage • Energetic-touch therapies • Music (e.g., playing and listening to songs, singing) • Movement • Play (all activities should be age-appropriate) • Humor • Imagery • Storytelling • Art/drawing • Aromatherapy (with precautions)

(continues)

TABLE 14-8 (continued)
Complementary/Alternative Therapies for Use throughout the Life Cycle

Population	Recommended Complementary Therapies
School-age children	<ul style="list-style-type: none"> • Massage • Energetic-touch therapies • Music (playing and listening) • Movement (e.g., dance) • Play (all activities should be age-appropriate) • Humor (e.g., riddles, jokes) • Imagery • Storytelling • Art/drawing • Aromatherapy (with precautions) • Hypnosis • Yoga • Tai chi • Pet therapy
Adolescents	All modalities discussed in this chapter, as appropriate to condition
Adults	All modalities discussed in this chapter, as appropriate to condition
Women during childbirth	<ul style="list-style-type: none"> • Massage (emphasis on lower back and legs) • Energetic-touch therapies • Breath coaching • Imagery • Hypnosis
Older adults	<ul style="list-style-type: none"> • Massage (lighter pressure and modifications for body's status) • Aromatherapy (with precautions) • Heat and cold applications (with precautions) • Any other modalities discussed in this chapter, as appropriate to condition and with precautions
Terminally ill	<ul style="list-style-type: none"> • Massage • Reflexology • Energetic-touch therapies • Music-thanatology • Prayer • Any other modalities discussed in this chapter, as appropriate to condition and with precautions

KEY CONCEPTS

- Ever-increasing numbers of health care consumers are using nontraditional treatment modalities.
- Psychoneuroimmunology is the study of how the body and mind are connected and how beliefs, thoughts, and emotions affect health.
- Holistic nursing practice encompasses consideration of each client as a unique and whole being with many aspects: physiological, psychological, sociocultural, intellectual, and spiritual.
- Healing is not curing but rather is regaining balance and finding harmony and wholeness as changes take place from within the individual.
- No one can heal another, but a nurse can act as a guide, support system, or instrument of healing for a client.
- Some of the mind-body modalities that nurses use are meditation, relaxation, imagery, biofeedback, and hypnosis.
- Body-movement modalities include movement and exercise, and chiropractic therapy.
- Energetic-touch therapies can be used with persons of all ages and in various stages of illness and wellness.
- Energetic-touch therapies include massage, therapeutic touch (TT), healing touch (HT), shiatsu acupressure, and reflexology.
- Spiritual therapies such as faith healing, healing prayer, and laying on of hands are helpful modalities to use in caring for clients.

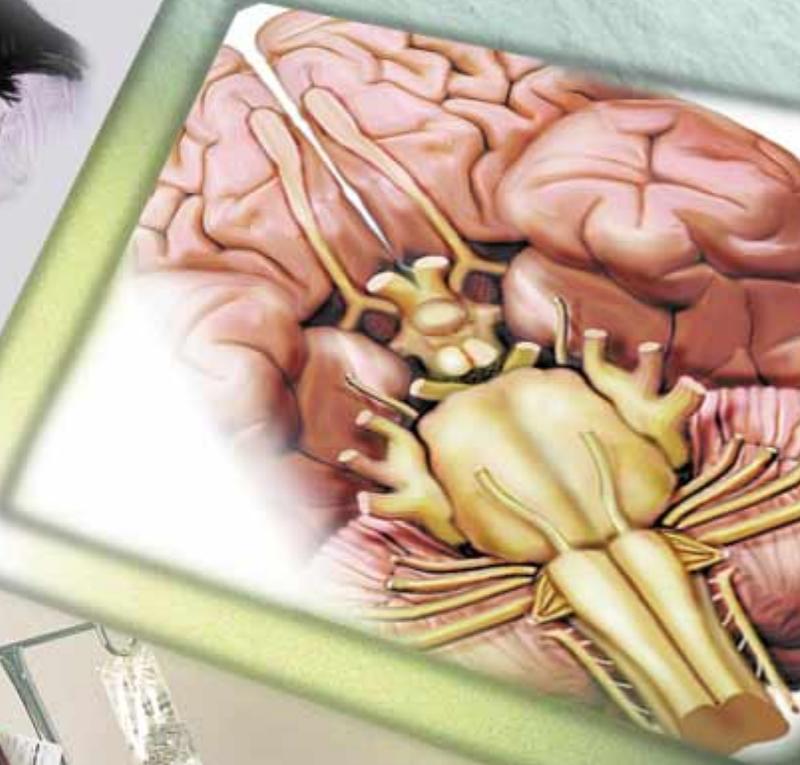
- Nutritional therapies include antioxidants, macrobiotic diets, and herbal therapy.
- Other modalities, such as aromatherapy, humor, pet therapy, and music therapy, are valuable adjuncts to conventional treatment.

CRITICAL THINKING ACTIVITIES

1. List at least two CAM therapies that would be appropriate for each of the following holistic dimensions: physical, emotional, social, and spiritual.
2. Look at the telephone book Yellow Pages to identify any complementary/alternative practitioners in your community.
3. Make a list of items that you could put on a humor cart or in a humor basket. Could you make a humor basket for under \$10.00?
4. Select a classmate and perform a guided imagery exercise with him or her. Find a quiet place and, if feasible, use soft music to enhance the experience. Then switch roles and have your partner guide you. Try doing this before a major examination. Does it make a difference? If so, how?
5. Imagine that you are assigned to care for a 6-year-old boy who does not speak your language, who is confined to bed, and whose parents must leave him for periods of time because of work obligations. During these periods he cries and is uncooperative with staff. The parents feel guilty, and everyone on your unit finds his behavior unsettling. Your nurse manager asks you to devise a care plan to meet the child's needs and help him cope. What CAM treatment modalities can you employ to deal with his anxieties? Do you need a physician's order to use them?

WEB RESOURCES

- American Holistic Nurses Association
<http://ahna.org>
- Ayurvedic Health Center
www.ayurvedic.org
- Herb Research Foundation
www.herbs.org
- MedWeb Alternative Medicine
www.gen.emory.edu/MEDWEB
- National Center for Complementary
 and Alternative Medicine
<http://nccam.nih.gov>
- University of Washington Medicinal Herb Garden
www.nlm.nlm.hig.gov



Unit

IV

The Individual and Health

- 15** Health, Holism, and the Individual
- 16** Cultural Diversity
- 17** The Life Cycle
- 18** The Older Client
- 19** Self-Concept
- 20** Stress, Anxiety, and Adaptation
- 21** Loss and Grief

Health, Holism, and the Individual



Every individual is a marvel of unknown and unrealized possibilities.

—Goethe

COMPETENCIES

1. Differentiate health, illness, and wellness.
2. Identify the theoretical models of health and their assumptions.
3. Relate the achievement of basic needs to health status.
4. Explain the relationship of variables such as lifestyle, locus of control, self-efficacy, health care attitudes, and self-concept to health behaviors.
5. Describe the three approaches to health maintenance.
6. Discuss nursing's role in health promotion.
7. Discuss the influence of a holistic viewpoint on health and health care delivery.
8. Describe the nurse's roles regarding clients' spirituality.
9. Discuss the nurse's role in promoting the sexual health of clients.

KEY
TERMS

acute illness	health promotion	self-concept
adaptation	health-seeking behaviors	self-efficacy
basic human need	heterosexuality	self-esteem
behavior	high-level wellness	sex roles
bisexuality	homeostasis	sexuality
body image	homosexuality	sexual orientation
chronic illness	illness	spiritual distress
empowerment	locus of control	spirituality
gender identity	need	transsexuality
health	psychoneuroimmunology	wellness
health-promoting behaviors	restorative care	

Health and illness can be defined in many ways. Health is a concept that includes physical and mental status, emotional well-being, and spiritual well-being. Historically, Western cultures defined health as the absence of illness. It is easier to measure illness than it is to measure health because definite parameters can be used to determine whether an individual has symptoms indicative of disease processes. What criteria are used for determining one's health? Is health merely the absence of disease, or is health more comprehensive?

In addition to examining these questions, this chapter describes health promotion activities with an emphasis on nursing's role. There is a discussion of holism, basic human needs, and the physiological, psychological, sociocultural, intellectual, spiritual, and sexual dimensions of the individual.

HEALTH, ILLNESS, AND WELLNESS

Health, the process through which a person seeks to maintain an equilibrium that promotes stability and comfort, is a dynamic process that varies according to a person's perception of well-being. The traditional definition of health as the absence of illness is a narrow concept. **Illness** is the inability of an individual's adaptive responses to maintain physical and emotional balance that subsequently results in an impairment of functional abilities. **Wellness** is the condition in which an individual functions at optimal levels. An in-depth discussion of wellness appears later in this chapter.

Health is a global term because it refers to every aspect of a person's life, including:

- Physical status
- Emotional well-being
- Social relationships
- Intellectual functioning
- Spiritual condition

Models of Health

There are several theoretical models of health, as shown in Table 15-1. These models help clarify the link between the states of well-being and illness and clients' responses to these processes.

The American Holistic Nurses' Association (1994) describes health as a maintenance of harmony and balance among body, mind, and spirit. Balance refers to **homeostasis**, which is an equilibrium among psychological, physiological, sociocultural, intellectual, and spiritual needs. The process by which a person adjusts to achieve homeostasis is called **adaptation**. When people describe their health status, basically three areas are considered:

- Presence or absence of symptoms (physical and emotional)
- How they feel (emotionally and physically)
- What they are able to do (ability to function)

Health can be studied both in individuals and in groups (e.g., families and communities). Health status is influenced by:

- Beliefs and attitudes
- Cultural factors
- Lifestyle behaviors

An individual, within the context of the family unit, gives meaning to health and makes adjustments necessitated by the illness. A family's adaptation to changes in health status is strongly influenced by each member's personal resources and social support systems.

Cultural Influence on Health

Health-related concepts evolve within the context of one's culture; that is, culture affects how an individual views health and illness. One's cultural background influences health-related behaviors and expectations of treatment when illness occurs. For example, how an individual cares for self is directly related to cultural

TABLE 15-1
Theoretical Perspectives of Health

Model	Theorist	Assumptions
Clinical model	Traditional perspective	<ul style="list-style-type: none"> • Health is absence of illness. • Individuals who are not “sick” (i.e., experiencing a disease) are healthy.
Health-belief model	Rosenstock	<ul style="list-style-type: none"> • Expectations direct behaviors that lead to fulfillment of the expectations. • Group values exert influence on beliefs about health. • Beliefs may change as a person grows and develops.
High-level wellness model	Dunn	<ul style="list-style-type: none"> • Health is influenced by the interaction between the individual, family, and community. • Health is viewed as an attempt toward achieving one’s fullest potential.
Social learning theory	Bandura Rosenstock	<ul style="list-style-type: none"> • Beliefs strongly influence actions. • Behavior is influenced by expectations and reinforcements (or incentives).
Host-agent-environment model (“Ecologic” model)	Leavell and Clark	<ul style="list-style-type: none"> • Health depends on the interaction of host, agent, and environment. • Balance among these elements results in health. • Illness occurs when there is an imbalance in one of the three elements. • Model is used most often in predicting risk of illness.
Health promotion model	Pender	<ul style="list-style-type: none"> • Model focuses on activities that improve wellness and prevent disabilities. • People use health-promoting activities when they: <ol style="list-style-type: none"> 1. Value health 2. Perceive health as being within their control 3. Can identify benefits in self-care activities 4. Have a positive perception of their own health status

(Data from Bandura, A. [1977]. *A social learning theory*. Englewood Cliffs, NJ: Prentice Hall; Becker, M. H. [1974]. The health belief model and sick role behavior. *Health Education Monogram*, 2, 409–419; Dunn, H. [1961]. *High-level wellness*. Arlington, VA: R.W. Beatty; Edelman, C., & Mandel, C. L. [1997]. *Health promotion throughout the lifespan* (4th. ed.). St Louis: Mosby-Yearbook; Leavell, H., & Clark, A. E. [1965]. *Preventive medicine for doctors in the community*. New York: McGraw-Hill; Pender, N. J. [1987]. *Health promotion in nursing practice*. East Norwalk, CT: Appleton & Lange; and Rosenstock, I. [1974]. Historical origin of the health belief model. In M. H. Becker (Ed.), *The health belief model and personal health behavior*. Thorofare, NJ: Charles B. Slack.)

norms. “It is essential for the nurse to provide cultural care by acquiring knowledge about the cultural practices and beliefs of the family and community and their effects on health” (Collins & Diego, 2000, p. 29). See Chapter 16 for a complete discussion of cultural beliefs and behaviors affecting health.

Family Influences on Health Care

Because health is defined uniquely by each client’s culture, the nurse must assess the family’s health definitions and beliefs. Generally, families are the first to identify signals of impending illness. Also, families help determine the following:

- Whether to seek treatment
- What type of treatment is appropriate
- Who should provide the treatment or care
- Where the treatment or care should be provided

Families are often the major caregivers for their relatives. Extended families and communities have traditionally acted as a buffer against excessive stress and illness. Lack of social support from family or significant others results in psychological and spiritual isolation, which negatively impacts a person’s physiological state. Thus, it is important to help clients identify, strengthen, and use their social support systems. Sometimes, families need guidance to optimize health

behaviors. Nursing assessment *must* include the client's (including the family's) perspective of the *most* pressing problem. See the Nursing Process Highlight for a listing of nursing actions that promote family collaboration.

Nursing Process Highlight

IMPLEMENTATION

Actions to Promote Collaboration with Families

1. Listen as family members express feelings.
2. Assess the extent to which family members wish to be involved in the treatment process.
3. Involve family members to the extent they desire.
4. Encourage participation in problem-solving activities.
5. Participate in family support groups.

(From Pickens, J. [1998]. Formal and informal care of people with psychiatric disorders: Historical perspectives and current trends. *Journal of Psychosocial Nursing*, 36[1], 37–43.)

Illness Perspectives

Illness means different things to different people. It is more than just the existence of physical signs and symptoms. Illness is the result of a disease (either physiological or psychological) or injury that affects functioning, and occurs when there is an inability to meet one's needs.

There are two major classifications of illness: acute and chronic. An **acute illness** is a disruption in functional ability usually characterized by a rapid onset, intense manifestations, and a relatively short duration. Acute illnesses are usually reversible. A **chronic illness** is a disruption in functional ability usually characterized by a gradual, insidious onset with lifelong changes that are usually irreversible. Chronic illnesses last a long time, frequently throughout the individual's life. An example of an acute illness is influenza. Arthritis is an example of a chronic illness. It is possible for a person to have both a chronic illness and an acute illness at the same time, for example, the person with diabetes (chronic) who also develops pneumonia (acute).

Chronic illness affects individuals across the lifespan. Up to 10% of children in the United States have a chronic illness. "The impact of these disorders become most dramatic during adolescence, and you can play a critical role in addressing their concerns and fostering more normal development in children" (Muscarelli, 1998b, p. 20). Adolescents experiencing chronic illnesses need two major nursing interventions: support and education.

Even though many elderly individuals have multiple chronic conditions, it is important to remember that chronicity is *not* an experience unique to the elderly. However, as life expectancy continues to increase, an increasing number of people are living with chronic illness. The implications for nursing are far-reaching. "As care in the home for acute and chronically ill clients continues to expand, advanced practice nurses will continue to integrate psychosocial care with physical care" (Collins & Diego, 2000, p. 28). Some of the goals of caring for people with chronic illnesses include:

- Coping with lifestyle changes and the subsequent modification of self-care activities
- Coping with long-term discomfort or pain
- Establishing or maintaining a sense of personal control
- Maintaining a positive self-esteem (Edelman & Mandle, 1997)

Wellness Perspectives

Wellness further describes health status. It allows health to be placed on a continuum from one's optimal level ("wellness") to a maladaptive state ("illness"), as shown in Figure 15-1.

Wellness is a dynamic process that is ever changing. The well person usually has some degree of illness and the ill person usually has some degree of wellness. This concept of a health continuum negates the idea that wellness and illness are opposite because they may occur simultaneously in the same person in varying degrees. The classic description of wellness was developed by Dunn in the early 1960s. According to Dunn (1961), **high-level wellness** means functioning to one's maximum health potential while remaining in balance with the environment.

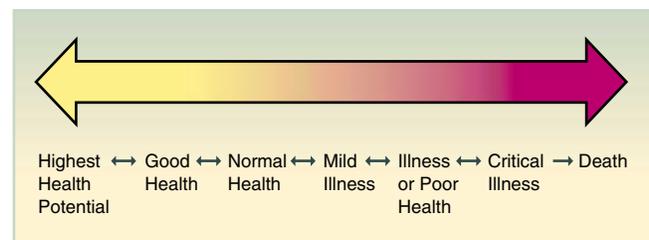


Figure 15-1 Health Continuum

HEALTH BEHAVIORS

To understand how people influence their health status, it is important to know about health behaviors. **Behavior** is defined as the observable response of an individual to external stimuli. An important concept to remember when caring for clients is that *all behavior has meaning*. In

other words, behavior is the individual's attempt to achieve satisfaction of needs. Nurses must sometimes act as detectives to determine the need(s) underlying client behavior. Thorough assessment is the key for nurses in determining the meaning of client behavior. **Health-seeking behaviors** are those activities directed toward attaining and maintaining a state of well-being.

Variables Influencing Health Behaviors

There are several variables that influence health including:

- Lifestyle
- Perceived locus of control
- Perceived ease or difficulty in accomplishing a task (self-efficacy)
- Health care attitudes
- Self-concept

Lifestyle

Individuals determine their health status through their actions (Figure 15-2). Lifestyle consists of a person's usual daily activities and routines that are acceptable practices in the person's life. Such routines and habits influence health status. For example, consumption of large amounts of caffeine, cigarette smoking, consistent intake of high-fat foods, and a sedentary routine can adversely affect health status. Lifestyles are developed within one's family and one's cultural environment. The family is the primary influence on a child's development of health-promoting (or health-defeating) behaviors.

When lifestyle modifications are necessary to improve health, many individuals have difficulty implementing the suggested changes. Individuals are less likely to comply with recommended lifestyle changes if there is a perception of increased inconvenience and cost. Also, the required degree of change in lifestyle may affect compliance. "A person is more likely to comply when he perceives the severity of an illness and his susceptibility to complications; when he believes in the reliability of his health care providers; and when he trusts the benefits of the prescribed therapy" (Muscarelli, 1998a, p. 27).

Locus of Control

Locus of control refers to individuals' sense of control over events and situations affecting their lives. A person with an external locus of control feels like a victim with little, if any, control over life events. However, a person with an internal locus of control feels able to influence significant events and occurrences affecting self, that is, they see themselves as responsible for their own lives. Thus, those with an internal locus of control are more willing to make lifestyle changes that will lead to wellness.



Figure 15-2 Through exercise, this woman is demonstrating a lifestyle choice that will enhance her health status. How would this type of behavior contribute to a person's fulfillment of basic human needs and, thus, promote wellness?

Self-Efficacy

Psychologist Albert Bandura (1977) coined the term **self-efficacy** to describe an individual's perception of one's own ability to perform a certain task. Self-efficacy has a powerful impact on initiating behavior change.

When clients are able to make informed decisions about their health behaviors and feel that they are successful in these areas, they are more likely to attempt behavior change. Thus, an essential component of nursing care is to provide opportunities for clients to achieve this level of self-motivation. For example, when teaching a

THINK ABOUT IT

Barriers to Wellness

Identify specific behaviors that promote a person's ability to stay healthy. What are some behaviors that create barriers to wellness?

client how to self-administer injections, the nurse breaks the task down into small manageable objectives and has the client do a return demonstration. The client receives immediate feedback, which encourages further success.

Self-efficacy is a form of self-confidence that leads to successful behavior performance; it is a strong influencing factor on behavior (Borsody, Courtney, Taylor, & Jairath, 1999). As described by Bandura (1986), self-efficacy encompasses two types of expectations:

1. *Outcome expectations*: Beliefs about whether behavior will produce desirable results
2. *Efficacy expectations*: Beliefs the person has about his or her own ability to perform the behavior

Health implies moving toward self-care, in other words, becoming and remaining independent. Self-responsibility, as it relates to health-promoting activities, is a fairly new concept to the majority of Americans. For years, individuals have looked to physicians to “fix things” and “make it better.” Only when individuals enter into active partnerships with their primary health care provider (nurse, physician, or other healer) will self-responsibility for health become a reality.

Health Care Attitudes

Beliefs are *powerful* shapers of behavior. Health behaviors are based on beliefs. Attitudes about health and personal vulnerability (which are initially learned in the family unit) greatly influence behavior. Socialization (which occurs within the family) influences the development of beliefs about health care. These beliefs determine the person’s willingness to participate in health care. For example, if the person believes in the use of herbs or folk healers, such nontraditional health care practices could either enhance or interfere with traditional treatment approaches.

There are some gender differences in beliefs regarding health care. U.S. men, when seeking help for health-related issues, tend to use an indirect approach. The following may interfere with a man asking for help from health care providers:

- A sense of immunity
- Difficulty in relinquishing control
- A belief that seeking help is unacceptable (Tudiver & Talbot, 1999)

Nurses must be sensitive to the fact that all clients do not share the same beliefs about health care issues. Using a nonjudgmental attitude helps the nurse to be more accepting of clients with diverse beliefs and behaviors.

Self-Concept

Self-concept is an individual’s perception of self. It includes **self-esteem** (an individual’s perception of self-worth) and **body image** (perception of physical self).

THINK ABOUT IT

The Media and Health Beliefs

The media are extremely powerful in shaping attitudes and beliefs. Here are some examples of how various media discourage health-promoting behaviors:

- Advertising foods with high sugar, salt, and fat content
- Promoting alcohol use
- Encouraging use of tobacco products

What other examples can you identify? Recently, there seems to be an emerging trend to advertise healthier lifestyles. What examples come to mind?

The relationship between self-concept and health is strong.

Self-concept influences individuals’ health behaviors in that people who think highly of themselves will tend to take care of themselves. On the other hand, a person with a negative self-concept will engage in reckless or self-destructive behaviors that endanger health. Persons with a low self-concept frequently ignore their own needs because they are perceived to be less important than the needs of other people.

Self-concept is dynamic and may change according to health status. Not only does self-concept influence health, but changes in health status may influence self-concept. For example, consider the person who has lost a limb due to amputation. This person’s self-concept would be altered as a result of the physical change.

HEALTH PROMOTION

Prior to the 1990s, most health-related research focused on behaviors that prevent illness. Currently, however, the trend among health care professionals is to emphasize behaviors that promote wellness. The United States Public Health Service (1990), in its *Healthy People 2000* initiative, focused on the individual’s responsibility in promoting health. The individual is viewed as having the ability to influence his or her own health and also that of the country. There are several approaches to health maintenance:

- Health promotion
- Health protection
- Disease prevention (United States Public Health Service, 1990)

In 1979, the U.S. Department of Health and Human Services mobilized public health agencies to work toward developing healthier Americans. This initiative, *Healthy People*, is now in its third decade and is called *Healthy People 2010* (Chrvala & Bulger, 1999). The program, coordinated by the U.S. Public Health Service, will focus efforts on

allowing equal access of all Americans to preventive health care services. Most states use the *Healthy People* framework to guide the development and implementation of local health policies and programs. *Healthy People 2010* recognizes the need to focus on improving the quality of life, as well as reducing disparities in the type of health care services received by Americans (Wilson, 1999).

Healthy People 2010 has established the four objectives that are to be emphasized through the efforts of health care agencies, both public and private, for the next 20 years; see Table 15-2.

Health Promotion Activities

Health promotion is a process undertaken to increase the levels of wellness in individuals, families, and communities. It involves activities and programs provided by nurses and other health care providers to foster lifestyle behaviors conducive to optimum health status.

HEALTH PROMOTION GOALS

- Respect and support clients' right to make decisions
- Identify and use client strengths and assets
- Empower clients to promote own health or healing

THINK ABOUT IT

Nurses as Healthy Role Models

Nurses have an opportunity to model healthy behaviors. Think about the messages many nurses communicate through certain behaviors such as smoking, overwork, and inadequate use of stress management techniques.

- Do you think nurses have an obligation to demonstrate healthy behaviors? Explain the rationale for your answer.
- What type of health-promoting behaviors do you demonstrate?

How do nurses encourage the development of healthy behaviors in clients? Providing information alone is *not* the key. The key is to motivate clients to *want* to change. The accompanying display lists major nursing goals related to health promotion.

Nurses identify high-risk individuals and determine and strengthen their social support, thus encouraging disease prevention. Clients who are attempting to adopt **health-promoting behaviors** (actions that increase well-being or quality of life) must receive support and reinforcement for their attempts.

TABLE 15-2
Healthy People 2010 Objectives

Objective	Description	Examples
Promote healthy behaviors	Focuses on behaviors resulting from personal choice	<ul style="list-style-type: none"> • Physical activity • Nutrition • Tobacco use
Promote healthy and safe communities	Addresses programs that have an impact on individual health through education and community-based programs	<ul style="list-style-type: none"> • Environmental health • Food safety • Occupational health • Injury prevention • Violence prevention
Improve systems for personal and public health	Emphasizes the need for all citizens to have access to health care services (goal: to reduce racial and ethnic disparities)	<ul style="list-style-type: none"> • Maternal, infant, and child health • Family planning • Medical product safety • Health education • Public health infrastructure
Prevent and reduce diseases and disorders	Outlines specific interventions related to chronic, prevalent health problems	<ul style="list-style-type: none"> • Cancer • Cardiovascular disease • Stroke • Arthritis • Mental illness

(Data from Chrvala, C. A., & Bulger, R. J. [1999]. *Leading health indicators for healthy people 2010: Final report*, Division of Health Promotion and Disease Prevention, Institute of Medicine; Wilson, L. M. [1999]. Healthy people—a new millennium: progress and comparison on the Healthy People 2000 and Healthy People 2010 objectives. *JONAS Healthcare Law, Ethics, and Regulation*, 1(2), 29–32.)

As beginning health care providers, nursing students are encouraged to develop their own health-promoting behaviors to be better role models for clients.

Individuals are becoming more aware of the relationship between daily behavior and health status. Types of health promotion programs can include smoking cessation, nutrition, and exercise. Changing health behaviors means focusing on the whole person within the context of the environment. “As the emphasis in health care shifts from an illness to a wellness orientation, health promotion and protection take on greater importance for all nurses” (Collins & Diego, 2000, p. 27).

Health promotion activities are holistic in nature in that they target physical and emotional health concerns. The accompanying display lists nursing activities to promote and protect mental health.

MENTAL HEALTH PROMOTION AND PROTECTION ACTIVITIES

- Guiding parents
- Teaching conflict resolution
- Supporting families through grieving and bereavement
- Using cognitive and behavioral techniques
- Teaching stress management skills
- Assessing and respecting cultural diversity
- Teaching interpersonal communication skills
- Monitoring for child abuse
- Advocating on behalf of families in need of health care

(From Collins, A. M., & Diego, L. [2000]. Mental health promotion & protection. *Journal of Psychosocial Nursing*, 38(1), 30.)

Health Protection Activities

Health protection includes a variety of activities. Prevention of accidental injury in the home, at school, and the workplace is an example. Programs that focus on occupational safety and health are designed to protect employees' health. Governmental efforts to ensure the safety of food and drug products is another example of health protection. Environmental strategies, such as water purification, sewage disposal, and air quality control, are used to protect the health of individuals and communities. As stated by Upchurch (1999, p. 254), “health-protecting behaviors can enable a person to perform activities of daily living in such a way that a happy, satisfying, and productive life result. In other words, health-protecting behaviors are ‘good’ for a person . . .”

Disease Prevention Activities

Disease prevention occurs on a continuum, from averting the development of disease to limiting its course once developed. The purpose of *primary prevention* is to

decrease the person's vulnerability to disease. Primary preventive measures include parenting education, attention to personal hygiene, and avoidance of toxins. The goal of *secondary prevention* is early detection of disease to initiate early intervention. Examples of secondary preventive activities are screening for particular diseases and preventing the spread of communicable disease. When a disease (such as a chronic condition) already exists, *tertiary prevention* is used to minimize its effects and to prevent further disability. Nurses who work in rehabilitation settings, including the home, are engaged in tertiary prevention. The focus is on **restorative care**, therapeutic interventions directed at helping clients reach and maintain their optimal level of functioning.

Nurse's Role in Health Promotion, Health Protection, and Disease Prevention

Nurses play a key role in promoting health and wellness. Through health promotion and risk reduction, the individual develops behavior patterns that promote a healthy lifestyle and reduce the risk of disease. The challenge for nurses is to find ways to motivate clients and families to develop health-promoting behaviors. When behaviors that once worked for the individual are no longer effective, the client must give up the old behaviors to be able to adopt new, healthier ones. Client teaching is a major intervention for promoting health (Figure 15-3). An essential component of teaching is encouraging clients to make necessary lifestyle changes to promote health.

Motivation is a key component of achieving and maintaining health. Nurses can better help clients engage in



Figure 15-3 To promote the health of this expectant couple and their baby, the nurse is providing information about nutritional intake during pregnancy. What incentives can the nurse offer in this situation that would encourage these clients to practice health-promoting behaviors? (Courtesy of Bellevue, The Woman's Hospital, Niskayuna, NY)

THINK ABOUT IT

Rewarding Healthy and Unhealthy Behaviors

In general, Western society does not reward health-promoting behaviors. For example, children get attention when they are sick, not well. This attention takes the form of goodies, treats, and relief from responsibilities, such as homework and chores. This attention reinforces the value of “being sick” to children. Another example of our society’s rewarding illness occurs in the workplace. Most employees are entitled to sick days, but time off is not given for “well days.” What message is communicated by such behaviors?

healthy behaviors by considering the client’s beliefs and experiences when planning care. Many factors help clients feel motivated to change health behaviors:

- Perception of self as able to succeed (self-efficacy)
- Belief that health status will improve
- Response to their attempts to change in the form of feeling healthier and receiving confirmation of these changes from others

Health Promotion and Vulnerable Populations

Risk factors that threaten the health of individuals include teen parenting, poverty, and chronic disease (Olds, Henderson, Kitzman, & Cole, 1999). The health of certain population groups is threatened. Especially vulnerable groups include:

- Children
- The elderly
- Those who are economically disadvantaged
- Those who are immunocompromised
- The homeless

THINK ABOUT IT

Inexpensive Health-Promoting Behaviors

Several behaviors, such as walking and breastfeeding, are relatively inexpensive and promote health. Think of some other examples of inexpensive behaviors that nurses can encourage people of all socioeconomic groups to incorporate into their lifestyles.

One primary variable affecting health promotion is socioeconomic status. Middle- and upper-income families are more likely to demonstrate healthy behaviors as they have the financial means to purchase nutritional foods, buy exercise equipment, and pay for recreation.

The monies of lower socioeconomic families are typically used in meeting basic needs such as food, shelter, and acute medical care. Health-promoting options must be affordable and readily available to people of all economic levels. Political involvement is one avenue for nursing to advance the health status of all. Nurses must be actively involved in shaping delivery of health care to influence the establishment of resources for underserved, disenfranchised groups.

Another variable affecting health is age. Elderly individuals tend to describe themselves as well when they are physically active, relatively free from pain, and able to maintain meaningful social ties. Maintaining independence and quality of life are of great importance for most elders. Nurses can promote self-care activities with elders to facilitate their wellness. For more discussion of working with clients in vulnerable groups, see Chapters 4 and 16.

THE INDIVIDUAL AS A HOLISTIC BEING

Due to the interwoven nature of the body and mind, it is impossible to separate physiological needs from psychosocial ones. **Psychoneuroimmunology** (the study of the complex relationship between the cognitive, affective, and physical aspects of individuals) is based on recognition of the concept that mind, body, and spirit are one. “Our biology and our minds are in constant communication” (Leighton, 1998, p. 36). For example, a person who is physically ill also experiences psychosocial disruptions. On the other hand, when a person is anxious or depressed, physical manifestations occur. “In the natural world, there is no mind–body split. Rather, mind, body, and spirit are intricately connected” (Edmands, Hoff, Kaylor, Mower, & Sorrel, 1999, p. 35.)

The practice of body–mind medicine is not new and is rooted in the origins of healing, as shown in the following examples:

- Hippocrates taught doctors to establish trust with their patients.
- Hippocrates taught doctors to observe the emotional states of patients.
- Socrates suggested that curing the soul leads to healing.
- The fundamental principle of traditional Chinese medicine is to honor the spirit (Leighton, 1998).
- Florence Nightingale recognized “the need to honor the physiological and spiritual aspects of our patients” (Dossey & Dossey, 1998, p. 35).

This holistic viewpoint guides the total care of the individual as a *complete being* rather than fragmented care focused on parts of the person. Only when nurses treat clients as individuals and not as “cases” to be “cured” do nurses respond in a holistic, caring way. A major role for nurses is to put the *caring* back into the process of healing. In the holistic model, “health is seen

as the achievement of a full and happy life characterized by social and spiritual connection, mental and emotional balance, and a healthy body” (Leighton, 1998, p. 36).

THINK ABOUT IT

Holistic Nurturing

How do you nourish each dimension of your being? In other words, how do you feed your body? Your mind? Your spirit?

NEEDS AND HEALTH

Since human beings are not merely physiological creatures, basic needs occur in the emotional, sociocultural, intellectual, and spiritual realms as well as the physiological realm. The entire person (body, mind, and spirit) is influenced by satisfaction of needs. Figure 15-4 illustrates the various human dimensions in which needs occur. A variety of needs emerge, are met, and re-emerge in each area of a person’s life.

A **need** is anything that is absolutely *essential* for one’s existence. **Basic human needs** (also known as universal needs) are those that are necessary for every person’s survival. Table 15-3 provides an overview of basic needs.

Maslow (1970) classified human needs as they occur on a tier with the most basic needs at the foundation of the hierarchy (Figure 15-5). These basic needs must be met before the individual can satisfy higher-level needs. For example, an individual who is starving must be fed before achieving the need for acceptance. An individual

TABLE 15-3
Basic Human Needs

Need	Example
Physiological	Oxygen, water, food, temperature (shelter and clothing), elimination, sleep, activity and sex
Psychological	Self-esteem, feelings of security, happiness, sadness
Sociocultural	Feelings of belonging, relationships
Intellectual	Thinking, learning
Spiritual	Being connected to others, having a sense of purpose



Figure 15-5 Maslow’s Hierarchy of Needs

with a deficient self-esteem and who is hemorrhaging must have the biologic needs met first. The satisfaction of basic needs enhances wellness. Conversely, an impairment in the satisfaction of basic needs can result in a client’s altered health status.

The following section describes basic needs related to the physiological, psychological, sociocultural, intel-

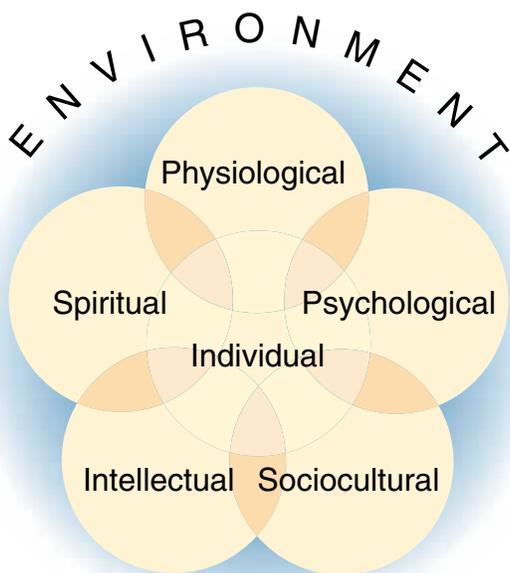


Figure 15-4 Holistic Perspective of the Individual

THINK ABOUT IT

Prioritizing Needs

Jane Thompson visits the public health clinic because of severe headaches. During the interview, the nurse practitioner learns that Jane and her three children frequently have no place to sleep because she has no income. Identify Ms. Thompson’s problems. Using Maslow’s hierarchy, which problem would be of the first priority? How do you determine which problem to address first?

lectual, spiritual, and sexual dimensions. There is extensive discussion of the nursing process as it relates to spiritual and sexual areas to demonstrate how the process can be applied to all dimensions of an individual's being.

Physiological Dimension

Providing physiological care focuses on achievement of the basic needs such as oxygenation, circulation, sleep and comfort, nutrition, and elimination. Refer to Chapters 32, 33, 38, and 39 for a thorough discussion of the nurse's role in helping meet these basic physiologic needs.

Psychological Dimension

Individuals have psychological needs for security, a sense of belonging, and self-esteem. Nursing actions that promote a sense of emotional comfort include the following:

- Treating the client as a unique individual
- Protecting confidentiality and privacy
- Using touch and personal space in a therapeutic manner
- Recognizing and respecting cultural differences
- Decreasing anxiety through stress management techniques

Goals for clients experiencing unmet psychological needs usually revolve around the following issues:

- Improve self-esteem
- Establish trusting relationships
- Develop social skills
- Cope with losses

Sociocultural Dimension

As social creatures, all people rely on others to some extent. "The need for others seems as vital to our health as food and shelter" (Leighton, 1998, p. 35). Research (Dossey & Dossey, 1998) has shown that social connection is correlated with positive health outcomes. It is difficult for some people to ask for help or to accept assistance when it is offered. It is important for nurses to assess the client's degree of dependence. Often, the nurse becomes involved in a balancing act in an effort to maintain equilibrium between the client's needs for dependence and independence.

Empowerment is a process of enabling others to do for themselves. It consists of encouraging the client to be an active participant in treatment rather than a passive recipient of care. Nurses empower clients by teaching them and their families how to develop skills for self-care and for healthier living.

Intellectual Dimension

The intellectual dimension consists of cognitive functions such as judgment, orientation, memory, and the ability to take in and process information. Refer to Chapter 36 for information on cognition and perception.

Piaget conducted landmark studies on children to determine how children think at various developmental stages; refer to Chapter 17 for a complete discussion of cognitive development throughout the life cycle.

Intellectual functioning can be impaired by multiple factors, including infection, exposure to toxins, substance abuse, trauma, and psychological problems. It is important for nurses to determine the client's intellectual abilities in order to communicate effectively. Using words that are easily comprehended by the client and implementing teaching strategies appropriate to developmental level promotes client learning.

Spiritual Dimension

Spirituality is multidimensional in that it refers to one's relationship with one's self, a sense of connection with others, and a relationship with a higher power or divine source. Spirituality assists a person in determining the sense of meaning or purpose in one's life. It is an integral component, or core, of one's being. Spirituality is somewhat difficult to define as it is determined at an individual level. A survey conducted by Moeller (1999) interviewed hospitalized clients to determine their meaning of spirituality. Some of the clients' comments included "spirituality ties my heart to my head like a ligament and is strong and flexible," and "spirituality is hope there is something better" (p. 6).

Spirituality is *not* the same as religion which refers to a set of beliefs and practices associated with a particular church, synagogue, mosque, or other formal organized group. Spirituality is a personal, individualized set of beliefs and practices that are not church related. Table 15-4 describes the characteristics of spirituality.

Factors that affect spirituality include cultural context, family, developmental stage, and health status. Families influence a person's development of spiritual beliefs. Nurses understand the importance of families in providing spiritual support and encourage the provision of that support. Spirituality evolves throughout one's life. See Chapter 17 for a discussion of the development of spirituality related to Fowler's stages of faith.

Health status can also have an impact on spiritual beliefs and vice versa. For example, when they are seriously ill, many people turn to religion for support. On the other hand, serious illness may cause some people to question their beliefs. In some cases, a person's belief system may interfere with the prescribed medical treatment regimen. For example, a person's religious or spiritual beliefs may require fasting. Acceptance or

TABLE 15-4
Characteristics of Spirituality

Characteristic	Description
Relationship with self	Knowledge of who one is and one's capabilities
Relationship with others	Caring for others when they need help Sharing of self
Harmony with nature	Knowledge of plants and animals Preserving nature Communing with nature (being outdoors)
Relationship with a higher power	Meditation Prayer Participating in religious services Performing religious rituals

(Adapted from Burkhardt, M. A. [1993]. Characteristics of spirituality in the lives of women in a rural Appalachian community. *Journal of Transcultural Nursing*, 4 [12], 12–18).

rejection of prescribed therapies may be rooted in spiritual beliefs (Figure 15-6). Table 15-5 presents an overview of the practices of selected major world religions that can relate to issues such as diet, birth, death, and health care.

Individuals with spiritually satisfying lives are those people who have a source of inner strength. Spiritual beliefs can enhance self-esteem and help protect individuals from stress. They help people adjust to stressful events such as illness.



Figure 15-6 Rituals such as the laying on of hands may be an integral part of some individuals' expressions of spirituality.

Nursing Process and Spirituality

Spiritual care is an essential component of holistic care. The International Code of Nursing Ethics (1973) calls for nurses to promote an environment that respects the client's spiritual beliefs.

Spiritual care, in addition to being an ethical duty of nurses, is now a requirement of some accreditation organizations. The right of clients to receive care that respects spiritual values was added to the Joint Commission for Accreditation of Healthcare Organizations (JCAHO) standards in 1998. In response to these criteria, some hospitals have revised policies to reflect the staff's ability to minister with persons of diverse cultural and religious backgrounds. Also, the JCAHO calls for documentation of interventions addressing clients' spiritual needs (JCAHO, 1999).

Assessment

Assessment primarily consists of observation and communication, which is based on a therapeutic nurse–client relationship. Some clients may be hesitant or embarrassed to discuss their spiritual beliefs. The nurse's presence communicates to the client that it is appropriate for clients to discuss all their concerns and issues. Presence helps establish the nurse–client relationship that is built on trust. As clients develop trust in the nurse, they are more likely to discuss sensitive issues. See the accompanying display for guidelines on assessing spiritual needs. Table 15-6 is a tool for assessing clients' spirituality.



NURSING TIP

Clues for Spiritual Assessment

Observe the client's immediate environment for clues about his or her spirituality. Are the get-well cards focused on spiritual or religious messages? Does the client and/or family pray before meals? Does the client wear any religious artifacts (medals, scapula, amulet)? Are there religious books or literature (e.g., Torah, Bible) nearby?

(Adapted from Estes, M. E. [2001]. *Health assessment & physical examination*. Albany, NY: Delmar.)

Nursing Diagnosis

Nurses must differentiate between spiritual well-being and **spiritual distress** in a client. Spiritual distress is the client's perception that their belief system, or their place within it, is threatened. Listed below are some of the ways in which spiritual distress is manifested:

TABLE 15-5
World Religions and Health Implications

Beliefs Affecting Dietary Practices	Beliefs About Birth	Beliefs About Death	Beliefs Affecting Health Care	Comments
<i>Seventh Day Adventists; Church of God</i>				
<ul style="list-style-type: none"> • No alcohol. • Coffee and tea prohibited. • Some groups prohibit meat. 	<ul style="list-style-type: none"> • No infant baptism 	<ul style="list-style-type: none"> • No last rites 	<ul style="list-style-type: none"> • Practice anointing with oil and use of prayer for those who are ill. • Some believe in divine healing. • Some groups oppose hypnosis as a therapeutic modality. • When ill, may want baptism or communion. 	<ul style="list-style-type: none"> • Literal acceptance of the Bible. • For many, Saturday is the Sabbath.
<i>Baptist</i>				
<ul style="list-style-type: none"> • Alcohol prohibited. • Some discourage consumption of coffee and tea. 	<ul style="list-style-type: none"> • No infant baptism 	<ul style="list-style-type: none"> • Believe in heaven and hell • Prayer and counseling from clergy with client and family 	<ul style="list-style-type: none"> • See physician as an instrument for God's intervention. • Oppose abortion. • Some believe in healing power of "laying on of hands." 	<ul style="list-style-type: none"> • Those who believe in predestination (see illness as "God's will") often respond passively to treatment approaches.
<i>Buddhism</i>				
<ul style="list-style-type: none"> • Alcohol and drug use discouraged. • Some sects are vegetarian. 	<ul style="list-style-type: none"> • No infant baptism • Infant presentation 	<ul style="list-style-type: none"> • Chanting of last rite at bedside immediately following death 	<ul style="list-style-type: none"> • See illness as a result of negative Karma • View cleanliness as very important • Often hesitant to receive treatment (such as surgery) on holy days. 	<ul style="list-style-type: none"> • When a death occurs, contact the priest.
<i>Roman Catholicism</i>				
<ul style="list-style-type: none"> • Mandatory fasting on Ash Wednesday and Good Friday • Optional fasting during Lenten season • During Lent, no meat on Fridays • Children and ill people exempt from fasting 	<ul style="list-style-type: none"> • Infant baptism mandatory • May be performed by anyone if child is gravely ill 	<ul style="list-style-type: none"> • Mandatory rite for anointing the sick • Last rites performed by priest • Autopsy acceptable • Organ donation/transplantation acceptable if donor is not deprived of life or functional loss 	<ul style="list-style-type: none"> • Life is viewed as sacred; abortion and contraceptive use are prohibited by church doctrine. 	<ul style="list-style-type: none"> • For many, religious articles/objects are important.

(continues)

TABLE 15-5 (continued)
World Religions and Health Implications

Beliefs Affecting Dietary Practices	Beliefs About Birth	Beliefs About Death	Beliefs Affecting Health Care	Comments
<i>Christian Science</i>				
<ul style="list-style-type: none"> • No restrictions or requirements 	<ul style="list-style-type: none"> • No baptism 	<ul style="list-style-type: none"> • No last rites • Organ donation usually opposed 	<ul style="list-style-type: none"> • View illness as a mental concept that can be changed by prayer • Reject drugs or other therapies 	<ul style="list-style-type: none"> • Will accept legally mandated immunizations. • Many will refuse all treatment (including emergency care) until they have consulted with a reader. • Usually opposed to organ donation.
<i>Church of Jesus Christ of Latter-Day Saints (Mormon)</i>				
<ul style="list-style-type: none"> • Alcohol, coffee, and tea prohibited. • Limited consumption of meat. • First Sunday of the month is time for fasting. 	<ul style="list-style-type: none"> • No baptism at birth; however, infant is blessed by clergy in church as soon as possible after birth. 	<ul style="list-style-type: none"> • No last rites. • Many want to have church elders with them when dying. • Cremation discouraged. 	<ul style="list-style-type: none"> • Medical therapy not prohibited. • Many believe in divine healing with “laying on of hands” by church elders. • Healing can occur by anointing with oil. 	<ul style="list-style-type: none"> • While hospitalized, may request Sacrament on Sunday.
<i>Hinduism</i>				
<ul style="list-style-type: none"> • Beef and veal prohibited. • Many are vegetarian. • Limited consumption of meat. • Fasting occurs on specific days of the week, according to which god the person worships. • Children are not allowed to participate in fasting. • Fasting rituals vary from complete abstinence to consumption of only one meal per day. • Fasting may occur over a 1-month period or be observed only on a holy day. 	<ul style="list-style-type: none"> • No ritual 	<ul style="list-style-type: none"> • Last rites are carefully prescribed. • Priest pours water into mouth of the dead and ties a thread around the wrist to indicate a blessing. • Family is particular about who touches the dead body. • Cremation preferred. 	<ul style="list-style-type: none"> • Illness viewed as result of sins committed in previous life. 	<ul style="list-style-type: none"> • Will accept most medical interventions.

(continues)

TABLE 15-5 (continued)
World Religions and Health Implications

Beliefs Affecting Dietary Practices	Beliefs About Birth	Beliefs About Death	Beliefs Affecting Health Care	Comments
<i>Islam</i>				
<ul style="list-style-type: none"> • Pork prohibited. • Any meat product not ritually slaughtered prohibited. • Avoidance of alcohol or drugs. • During Ramadan (ninth month of Muhammadan year), fasting occurs during daytime. 	<ul style="list-style-type: none"> • No baptism 	<ul style="list-style-type: none"> • Family must be with dying person. • Dying person must confess sins and ask forgiveness. • Family washes body. • Only family and friends may touch the body. • Usually oppose autopsy. 	<ul style="list-style-type: none"> • Faith healing unacceptable. • Ritual washing after prayer (which occurs five times a day). 	<ul style="list-style-type: none"> • May have fatalistic view that interferes with compliance to treatment plan.
<i>Jehovah's Witnesses</i>				
<ul style="list-style-type: none"> • Prohibition of any food to which blood has been added • Can consume animal flesh that has been drained 	<ul style="list-style-type: none"> • No infant baptism 	<ul style="list-style-type: none"> • No last rites • Autopsy only as required by law 	<ul style="list-style-type: none"> • Opposed to blood transfusions (including own blood, which may be banked) 	<ul style="list-style-type: none"> • No restrictions on giving blood sample • May have to obtain court order for treatment consent of child if parent(s) refuse.
<i>Judaism</i>				
<ul style="list-style-type: none"> • Dietary kosher laws must be adhered to by Orthodox believers. • Only the following meats are allowed: <ul style="list-style-type: none"> — animals that are vegetable eaters — cloven-hoofed animals — animals that are ritually slaughtered — fish that have scales and fins • Any combination of meat and milk prohibited • During Yom Kippur, 24-hour fasting • Pregnant women and those who are seriously ill are exempt from fasting. • During Passover week, only unleavened bread eaten. 	<ul style="list-style-type: none"> • No infant baptism. • Male infants are ritually circumcised on eighth day. 	<ul style="list-style-type: none"> • Body is ritually cleansed. • Burial should occur as soon as possible. • Autopsy prohibited. • No organ donation or transplantation unless approved by rabbi. 	<ul style="list-style-type: none"> • Needs imposed by illness supersede dietary laws. • During Sabbath (sundown Friday to sundown Saturday), may refuse surgical procedures. 	<ul style="list-style-type: none"> • Body parts that are surgically removed should be made available to family for burial. • If irreversible brain damage occurs, often opposed to prolongation of life.
<i>Methodist</i>				
<ul style="list-style-type: none"> • No restrictions or requirements 		<ul style="list-style-type: none"> • No last rites 	<ul style="list-style-type: none"> • Before surgery, communion may be requested. 	<ul style="list-style-type: none"> • Donation of body or body parts to science is encouraged.

(continues)

TABLE 15-5 (continued)
World Religions and Health Implications

Beliefs Affecting Dietary Practices	Beliefs About Birth	Beliefs About Death	Beliefs Affecting Health Care	Comments
<i>Pentecostal (Assembly of God)</i>				
<ul style="list-style-type: none"> • Abstinence from alcohol • Avoid consumption of anything to which blood has been added • Some avoid pork 	<ul style="list-style-type: none"> • No infant baptism 	<ul style="list-style-type: none"> • No last rites 	<ul style="list-style-type: none"> • Prayer is viewed as the tool for deliverance from illness. • Illness is considered to be God's punishment or an intrusion of Satan. 	<ul style="list-style-type: none"> • May speak in tongues
<i>Russian Orthodoxy</i>				
<ul style="list-style-type: none"> • Abstinence from meat and dairy products on Wednesday, Friday, and during Lent. • During Lent, all animal products (including dairy) are forbidden. • Fasting during Advent. • Exceptions from fasting during illness and pregnancy. 	<ul style="list-style-type: none"> • Baptism performed only by priest 	<ul style="list-style-type: none"> • Arms of the deceased are crossed and fingers set in a cross. • Opposed to autopsy and embalming. • Cremation prohibited. 	<ul style="list-style-type: none"> • Major themes include fear, sin, and punishment • Believe in divine healing but will accept medical treatment 	<ul style="list-style-type: none"> • Do not remove cross necklace unless absolutely necessary; replace as soon as possible.

Data from Carpenito, L. J. (1999). *Nursing diagnosis: Application to clinical practice* (8th ed.). Philadelphia: Lippincott; Carson, V. (1989). *Spiritual dimensions of nursing practice*. Philadelphia: Saunders; Giger, J. N., & Davidhizar, R. E. (1999). *Transcultural nursing: Assessment and intervention* (3rd ed.). St. Louis: Mosby-Yearbook; Wong, D. L. (1998). *Whaley & Wong's nursing care of infants and children* (6th ed.). St. Louis: Mosby-Yearbook.

TABLE 15-6
Spiritual Assessment Tool

Dimension	Question
Meaning and purpose	<ul style="list-style-type: none"> • What gives your life meaning? • Do you have a sense of purpose in your life? • How hopeful are you about getting better?
Inner strengths	<ul style="list-style-type: none"> • What brings you peace and joy? • What do you like about yourself? • What are your life goals? • What do you believe in?
Interconnectedness	<ul style="list-style-type: none"> • Who are the important people in your life? • Do you belong to any groups? • Can you ask others for help when you need it? • Do you participate in any religious activities? • Do you believe in God or a higher power?

(Adapted from: Dossey, B. M., Keegan, L., & Guzzetta, G. E. [2000]. *Holistic nursing: A handbook for practice* [3rd ed.]. Gaithersburg, MD: Aspen.)

- Expressed anger toward God (e.g., "It's not fair! Why is God doing this to me?")
- Inner conflict about one's beliefs (e.g., "I'm not even sure what the right thing to do is any more. Things used to be so clear.")
- Questions about the meaning of life, illness, death (e.g., "I wonder what I'm supposed to learn from all this.")
- Crying and/or sighing
- Withdrawn behaviors
- Verbal requests for spiritual assistance (e.g., "Keep me in your prayers.")

Spirituality helps individuals to find meaning in suffering. Receiving a diagnosis of a terminal condition such as cancer or acquired immunodeficiency syndrome (AIDS) often triggers a spiritual crisis.

The North American Nursing Diagnosis Association (NANDA) has established three diagnoses related to spirituality; see Table 15-7.

Planning and Outcome Identification

Planning nursing care is directed at helping clients meet their needs. A study conducted by Moeller (1999) asked clients hospitalized for treatment of psychiatric disorders to describe their experiences related to spirituality. Four themes were identified to describe spiritual

TABLE 15-7
Diagnosis Related to Spiritual Needs

Diagnosis	Definition	Related Factors
Spiritual Distress (Distress of the Human Spirit)	Disruption in the life principle that pervades a person's entire being and that integrates and transcends one's biological and psychosocial nature	<ul style="list-style-type: none"> • Belief and value system challenged (due to moral/ethical implications of treatment, intense suffering) • Separation from religious/cultural ties
Readiness for Enhanced Spiritual Well-Being	The process of an individual's developing/unfolding of mystery through harmonious interconnectedness that springs from inner strengths	Not identified by NANDA
Risk for Spiritual Distress	At risk for an altered sense of harmonious connectedness with all of life and the universe in which dimensions that transcend and empower the self may be disrupted	<p>[NOTE: Listed as "Risk Factors"]</p> <ul style="list-style-type: none"> • Energy-consuming anxiety • Low self-esteem • Illness, mental or physical • Poor relationships • Substance abuse • Loss of loved one • Inability to forgive

(Data from North American Nursing Diagnosis Association. [2001]. *Nursing diagnoses: Definitions & classification: 2001–2002*. Philadelphia: Author.)

needs during hospitalization on a psychiatric unit: comfort, companionship, conversation, and consolation. Table 15-8 describes interventions directed at meeting each need.

Planning the provision of spiritual care is directed toward "helping patient maintain their individuality without conflicting with the dominant culture . . . When you interpret the meaning of spirituality from the patient's perspective . . . your responses may be more therapeutic to your patient's immediate needs" (Sumner, 1998, p. 30).

TABLE 15-8
Meeting Spiritual Needs of Clients

Spiritual Need	Nursing Interventions
Comfort	<ul style="list-style-type: none"> • Convey a sense of caring; communicate a sense of respect.
Companionship	<ul style="list-style-type: none"> • Spend time with client. • Encourage family, significant others, and clergy to visit.
Conversation	<ul style="list-style-type: none"> • Listen actively. • Use concrete terms. • Be genuine rather than authoritative.
Consolation	<ul style="list-style-type: none"> • Be prepared for difficult questions (i.e., "Why me?") • Do not express pity or sympathy.

(Adapted from Moeller, M. D. [1999]. Meeting spiritual needs on an inpatient unit. *Journal of Psychosocial Nursing*, 37(11), 5–10.)

Implementation

Meeting spiritual needs of clients often evokes anxiety in nurses. However, it is imperative that nurses use self-awareness to prevent their own feelings from interfering with the meeting of clients' needs. According to Moeller (1999), many clients "expressed tremendous frustration in their inability to find staff who would just listen to and help them sort out their confusion . . ." (p. 7). The Nursing Checklist provides guidelines for working with clients who need spiritual intervention.

Nurses are the professionals who are there to "just listen" and communicate compassion and support. As Sumner (1998) states:

NURSING CHECKLIST *Providing Spiritual Care*

1. Listen actively. Avoid using clichés, and take the client's concerns seriously.
2. Demonstrate an interested, empathetic response to the client's comments.
3. Respect the client's beliefs. For example, allow the client to pray without interruption.
4. Provide privacy for the client to perform religious practices or rituals. For example, if the client's religious practice involves chanting, find a location where this can be done.
5. Make referrals to clergy when appropriate. Ask the client's permission first to avoid imposing own values on the client.

Often when patients are coping with life-threatening diseases, the most consistent aspect of their experience is contact with a nurse. We're present 24 hours a day, seven days a week, regardless of physical setting. When patients are at their lowest physical, mental level, and when their support systems weaken or fade away, we are there. This presence gives us an opportunity to promote spiritual health and integrity by being open to and accepting . . . spirituality" (p. 30).

Essential nursing interventions directed at spiritual needs include helping clients to find meaning in their

current situation and assisting clients to use their sources of strength.

The instillation of hope helps clients meet their spiritual needs. Hope is necessary for coping with severe stressors, such as illness. Spirituality provides a feeling that one is not alone. Nurses must determine the personal meaning of clients' experiences to help bolster spiritual support. The nurse should determine the client's source of hope, which may include the following.

- Relationships with others
- Positive emotions
- Anticipating the future
- Availability of resources

According to Smith-Stoner and Frost (1999):

No matter what his prognosis, a patient draws on hope for the energy to move forward. Even if no cure is possible, hope helps him plan his last days, act on personal desires, mend fences, and strengthen relationships. (p. 29)

Evaluation

Evaluation focuses on client achievement of expected outcomes or objectives, and on the efficacy of nursing care provided. Estes (2002) identifies the following as indicators that the client's spiritual distress has lessened:

- Acceptance of spiritual support from the source with which the client feels most comfortable
- Decrease in restlessness, insomnia, and crying
- Decrease in statements of worthlessness and hopelessness
- Verbalization of satisfaction with spiritual beliefs and the comfort provided by them

See the accompanying display that lists factors that are useful in evaluating the effectiveness of nursing interventions directed at spiritual needs.

Sexual Dimension

Sexuality is a complex human characteristic that refers not just to genital sex but to all the aspects of being male or female, including feelings, attitudes, beliefs, and behavior. It is an essential part of one's personality. Sexuality is a pervasive aspect of the total self from birth to death and is an important aspect of health for people of all ages. Sexuality includes a person's attitudes toward relationships with people of the same sex, relationships with those of the opposite sex, and about touching and being touched. The ways people dress, talk, and relate to others are indicators of their sexuality.

Sex roles are culturally determined patterns associated with being male and female. These patterns are developed as a result of cultural expectations, customs, norms, habits,



RESEARCH FOCUS

Title of Study

"Predictors of Oncology and Hospice Nurses' Spiritual Care Perspectives and Practices"

Authors

Taylor, E. J., Highfield, M. F., & Amenta, M.

Purpose

(1) To identify factors that predict nurse's spiritual care perspectives and practices. (2) To compare perspectives and practices between nurses in two subspecialties, oncology and hospice nursing.

Methods

The sample included 181 oncology nurses and 638 hospice nurses. The subjects completed the Spiritual Care Perspectives Survey by mail.

Findings

The hospice nurses reported offering spiritual care more often. In those surveyed, hospice nurses had more positive attitudes regarding spiritual caregiving than oncology nurses.

Implications

(1) The most influential factor on spiritual perspectives and practices was the spirituality of the nurse. Nurses must continue to explore how their personal spirituality contributes to their caregiving practices. (2) The adequacy of training for providing spiritual care predicted the frequency of, ability to, and comfort with spiritual caregiving. Thus, training in spiritual care should be included in curricula.

Taylor, E. J., Highfield, M. F., & Amenta, M. (1999). Predictors of oncology and hospice nurses' spiritual care perspectives and practices. *Applied Nursing Research*, 12(1), 30–37.

SPECIAL CONSIDERATIONS

Evaluation of Nursing Interventions to Promote Spiritual Health

The following factors are useful in evaluating the effectiveness of nursing care and the client's spiritual health status:

- A trusting relationship between client and nurse was established.
- The client demonstrated decreased evidence of anxiety and guilt.
- The client was encouraged to engage in spiritual practices that were not detrimental to overall health status.
- The client verbalized satisfaction with his or her own spiritual condition.

(Data from Murray, R. B., & Zentner, J. P. [1997]. *Nursing assessment and health promotion: Strategies through the life span* [6th ed., pp. 108–109]. Norwalk, CT: Appleton & Lange.

and traditions. For example, the differences between the sexes are evident in the ways infants are treated during their first days of life. Infant boys and infant girls are talked to, handled, and, many times, dressed differently. In many cultures, the role of the man is to be strong and protective, whereas the woman is expected to be passive and nurturing. Sex roles change as societal norms change and may be accepted or rejected by individuals.

Development of Sexuality

Physiological sexual development begins with conception. Chromosomes from each parent transport programming information to the embryo. During the first 6 weeks of fetal development, there is no anatomic difference between males and females. At approximately 7 to 8 weeks, if there is a high level of testosterone, testes develop. Ovaries form in fetuses with lower levels of testosterone (Guyton & Hall, 1995).

Human sexual feelings develop throughout the life span. Feelings, attitudes, and behavior related to sexuality are learned in the family of origin and reflect the cultural context. There are no universally accepted sexual values. For example, a sexual practice that is considered normal in one culture may be prohibited in another culture.

Gender Identity

Gender identity is how one views oneself as male or female in relationship to others. It is how the person decides to express sexuality in behaviors with others of the same and opposite sex. This perspective on one's sexuality is not inborn but rather evolves throughout the life span and may vary according to cultural expectations and preferences (Johnson, 1996).

Sexual orientation describes an individual's preference for ways of expressing sexual feelings. Like all human behavior, sexual behavior is complex. Sexual orientation is a dynamic lifelong process of growth. The prevailing sexual

orientation in current Western society is **heterosexuality** (sexual activity between a man and a woman). Approximately 10% of the population engages in **homosexuality** (sexual activity between two members of the same sex) (Johnson, 1996). For another 20% to 40% of the population, the sexual choice could be either male or female (Johnson, 1996). **Bisexuality** is having an equal or almost equal preference for partners of either sex. Another type of sexual orientation is **transsexuality** (the belief that one is psychologically of the sex opposite his or her anatomic gender). Many transsexual individuals will undergo surgery, hormone therapy, and psychotherapy in an attempt to restore their sexual identity and self-concept.

In many cultural groups, homosexuals, bisexuals, and transsexuals are discriminated against due to their alternative lifestyles. Nurses must respect all individuals, regardless of sexual orientation.

Needs

Sexual integrity is an integral part of a person's well-being. Even though there are no universal values about sexuality, individuals do experience some common sexual needs. The accompanying display lists specific needs related to sexuality.

HUMAN NEEDS RELATED TO SEXUALITY

- Tenderness
- Intimacy
- Sensuality
- Attachment
- Caring
- Procreation

Human Sexual Response

The human sexual response is a combination of physiological responses and emotional responses (thoughts and feelings). Masters and Johnson (1966) were the first to describe the physiological phases that occur during the sexual response. These four phases, listed in the accompanying display, are experienced by both men and women.

PHASES OF THE HUMAN SEXUAL RESPONSE

Excitement: Begins with sexual stimulation; characterized by vasocongestion of the genitals (results in vaginal lubrication and penile erection)

Plateau: Characterized by maintenance of sexual arousal and the building of excitement leading to orgasm

Orgasm: A highly pleasurable reflex characterized by muscle spasms and male ejaculation

Resolution: Characterized by a gradual return to the pre-excitement phase

Sexuality and Health

Nurses often encounter clients whose sexuality is threatened. Illness, disability, surgery, medications, and hospitalization may impair a person's sexual integrity.

Chronic illnesses such as diabetes and cardiovascular disease may negatively affect sexuality. Other conditions that may contribute to the development of sexual problems are listed in the accompanying display.

RISK FACTORS FOR SEXUAL DYSFUNCTION

Anemia	Multiple sclerosis
Anxiety	Previous traumatic sexual experience
Cigarette smoking	Prostate surgery
Concern about sexual performance	Renal failure
Depression	Spinal cord injuries
Hormonal imbalances	Substance abuse
Hyperlipidemia	Thyroid abnormalities
Hypertension	Vascular bypass surgery

Medications, especially those used to treat hypertension and depression, can also interfere with normal sexual activity; see the accompanying display. In such cases, the medication should be changed if possible. Also, clients and their sexual partners need to be informed about the cause of the problems. Chronic pain often interferes with clients' sexual functioning; they need to be taught methods for increasing their comfort level (e.g., relaxation techniques). Clients who are hospitalized may experience sexual dysfunction for a variety of reasons. For example, being in unfamiliar surroundings, separation from significant others, and loss of privacy all may interfere with sexual function. Nurses who are sensitive create an atmosphere that communicates consideration.

THINK ABOUT IT

Client's Sexual Activity

You walk into an adult client's room and find her engaged in sexual intercourse with a visitor. You know that the visitor is not the married client's husband. What should you do?

MEDICATIONS ASSOCIATED WITH SEXUAL DYSFUNCTION

Antiarrhythmics (Digoxin)	Estrogens
Anticonvulsants	Lipid-lowering drugs (Statins)
Antihypertensives	Narcotics
Antipsychotics	Tricyclic antidepressants (Clomipramine)
Beta blockers	
Diuretics	

(Data from Sadovsky, R. [1999]. Management of erectile dysfunction. *CNS, 1*[1], 79–83.)

Nursing Process and Sexuality

Sexuality is a significant part of health, whether the client is sexually active or not. Talking and listening to clients promotes intimacy. Some nurses, as well as clients, are embarrassed to talk about sexuality. It is imperative to deal with one's own feelings in order to decrease the client's discomfort. Nurses must not express shock or disapproval regarding a client's sexual practices. It is not necessary to change beliefs and attitudes, but it is necessary to suspend them in order to spare the client any judgment, directly or indirectly. A question as simple as "what sexual concerns do you have?" may be used to introduce the topic of sexuality in a nonthreatening manner.

Assessment

Discussion about sexuality must be sensitive to cultural and religious differences. The sensitive nurse will establish an atmosphere that encourages the client to freely discuss his or her concerns. Some actions that are conducive to such discussion include the following:

- Assure privacy and maintain confidentiality.
- Use simple, direct language.
- Provide explanations in terms understood by the client.
- Allow time for the clients' questions.
- Demonstrate respect by adopting a nonjudgmental attitude.
- Use open-ended questions to elicit more information.

Sexual assessment produces feelings of fear, anxiety, indignity, and loss of control in many people. These feelings may be alleviated by the sensitivity of the nurse throughout the assessment process. Remember that you are assessing a person, not just a body part, and respect the client's wishes regarding privacy.

Nursing Process Highlight

ASSESSMENT

Preparing for the Sexual Assessment

1. Review the client's medical history.
2. Greet the client and explain the assessment techniques that you will be using.
3. Assess the client's anxiety level, and provide reassurance that this is normal.
4. Ensure that the room temperature is warm and comfortable.
5. Use a quiet room that will be free from interruptions; it may be necessary to post a "do not disturb" sign on the door of the client's room or the examination room.
6. Have the client void prior to the examination.

Before beginning the genitalia examination, consider your patient’s cultural background and the beliefs that may affect the examination. For example, some cultures forbid assessment of a female by a male caregiver. The following Nursing Process Highlight describes some guidelines to use in preparing for the sexual assessment.

Diagnosis

The NANDA has established two diagnoses related to sexuality; see Table 15-9.

Planning and Outcome Identification

Nurses cannot provide holistic client care without considering the client as a person with sexual needs. In order to plan accurate delivery of nursing care, it is necessary to ask all clients, regardless of age, about their sexual history. Some nurses do not discuss sexual

concerns with adolescents due to their own values about adolescents, sexual behavior, and engaging in sexual behavior prior to marriage. In such instances, the nurses are counter-therapeutic to clients’ needs. Many nurses reflect the societal belief that elderly clients are asexual. Acting on such a belief is a disservice to the clients.

Planning takes into consideration the age-specific variations regarding the need for information on sexuality; see Table 15-10.

Planning of care also calls for consideration of the client’s history of possible sexual abuse. No client, regardless of age, should be excluded from evaluation for sexual abuse. See the accompanying display for signs of sexual abuse.

Most states have laws mandating nurses to report suspected incidences of abuse. It is important to also know the employing agency’s policies about reporting abuse and/or suspected abusive situations. It is critical that the nurse plan on establishing an environment that communicates a sense of safety to clients who may have experienced sexual abuse or exploitation

“Treatment plans need to be goal-oriented, ideally aimed at satisfying the needs of both the man and his partner. The goal(s) for treatment can be (1) having a better physiologic erection, (2) improving the patient’s self-esteem, and (3) enhancing the patient’s relationship(s)” (Sadovsky & Dunn, 1999, p. 12).

INDICATORS OF SEXUAL ABUSE

- Bruises, lacerations, scars in genital area
- Presence of STDs
- Extreme anxiety or guarding during the physical examination
- Suspiciousness or reluctance in answering questions
- Lack of eye contact

TABLE 15-9
Diagnoses Related to Sexuality

Diagnosis	Definition	Defining Characteristics	Related Factors
Sexual Dysfunction	Change in sexual function that is viewed as unsatisfying, unrewarding, inadequate	<ul style="list-style-type: none"> • Values conflicts • Changed interest in self and others • Inability to achieve desired satisfaction • Verbalization of a sexual problem • Alterations in achieving perceived sex role • Actual and/or perceived limitations as a result of disease and/or treatment 	<ul style="list-style-type: none"> • Lack of knowledge or misinformation • Abusive relationships • Physical abuse • Altered body structure or function • Lack of privacy
Ineffective Sexuality Patterns	Expressions of concern regarding his/her own sexuality	<ul style="list-style-type: none"> • Verbalized difficulties, limitations, or changes in sexual behaviors or activities 	<ul style="list-style-type: none"> • Lack of significant other • Conflict with sexual orientation • Fear of acquiring a sexually transmitted disease • Fear of pregnancy • Ineffective or absent role models • Lack of privacy • Lack of knowledge

(Data from North American Nursing Diagnosis Association. [2001]. *Nursing diagnoses: Definitions & classification: 2001–2002*. Philadelphia: Author.)

TABLE 15-10
Sexual Information: Age-specific Needs

Children	<ul style="list-style-type: none"> • Parenting skills to decrease possibility of child abuse • Children need to learn to differentiate “good” touching and “bad” touching • Teach children how to say “no” when they are uncomfortable with any touch • The importance of reporting any sexual advances to parents, teachers, or other adults
Adolescents	<ul style="list-style-type: none"> • Education about physiological changes (i.e., signs of onset of puberty; growth and development concepts) • Information on psychosocial responses to physiological changes (i.e., body image changes) • Sexual abuse prevention (including date rape) • Safe sex education (contraception, sexually transmitted disease [STD] prevention) • Information on sexual preference/orientation
Young Adults	<ul style="list-style-type: none"> • Safe sex education (contraception, STD prevention) • Establishment/maintenance of intimate relationships • Pregnancy and childbirth • Parenting skills
Middle-aged Adults	<ul style="list-style-type: none"> • Effects of aging on sexuality (e.g., menopause, erectile dysfunction) • STD prevention • Contraception
Older Adults	<ul style="list-style-type: none"> • Effects of aging on sexuality • STD prevention • Ways other than intercourse to express sexuality and to meet intimacy needs • Specific information for older women: (1) If vaginal secretions are decreased, use a water soluble lubricant. (2) Extended foreplay may help in achieving orgasm. (3) Provide a reminder that there is no pregnancy risk. • Specific information for older men: (1) Avoid factors that interfere with circulation (i.e., smoking, alcohol abuse, sedentary lifestyle). (2) Encourage dietary changes to reduce fat and cholesterol. (3) Stress management. (4) Compliance with medications prescribed for diabetes and cardiovascular disorders. (5) Need for a relaxed atmosphere and patience.

Implementation

When addressing sexual concerns of clients, there are two major nursing interventions that must be employed: communication and education.

Communication skills are necessary to assure optimal exchange of essential information regarding sexual concerns. Reminding the client that the information discussed is confidential helps reinforce a trusting relationship. Self-awareness can help improve communication and, therefore, overall effectiveness when working with sexual issues, particularly issues that can be value laden such as STDs. It is helpful for nurses to assess their attitudes toward sexual practices and STDs. Other nursing actions useful in work-

ing with clients with STDs include maintenance of a non-judgmental approach, avoiding imposing own values on the patient, and not talking down to the client.

Education is an integral part of treating clients with sexual problems. The nurse must teach prevention of sexually transmitted disease. It is also important to discuss the effects of aging on the sexual response to allay client's anxiety and to correct any misperceptions. “Safer-sex education is crucial for controlling the spread of HIV and this education is within the realm of nursing practice” (Hajagos, Geiser, Parker, & Tesfa, 1998, p. 37). If test results are positive, the partner needs to be tested and treated to prevent reinfection (Centers for Disease Control and Prevention, 1998). “It is always valuable to include the partner in discussions about sexual activity so that both can learn, understand, and agree to the treatment options” (Sadovsky & Dunn, 1999, p. 13).

Another essential education topic related to sexuality focuses on preventive measures: breast self-examination (BSE) and testicular self-examination (TSE). See Chapter 27 for details on performing BSE and TSE.

THINK ABOUT IT

Patients with Recurrent Sexually Transmitted Diseases

Ask yourself how you feel about patients who come in for treatment of recurrent STDs. Will your personal feelings influence the quality of nursing care you provide? How would you feel if such a patient showed no interest in learning about ways to avoid contracting STDs?

Evaluation

To determine the client's achievement of expected outcomes, the nurse uses observation and communication. Client and/or partner verbalizations help in evaluating

outcome achievement. The nurse observes the client and partner for expressions of intimacy. During the evaluation process, it is important that the nurse remain open-minded and nonjudgmental when working with clients who may have sex alone, with one partner of the opposite gender, with one partner or the same gender, or with several partners of either gender. Personal values can interfere with, or encourage, the client's achievement of expected outcomes and, thus, promote the client's sexual wholeness.

Because sexuality is such an integral part of individuals and their health status, it is addressed throughout the remainder of this text when relevant.

KEY CONCEPTS

- Health is a process through which the person seeks to maintain an equilibrium that promotes stability and comfort and varies depending on context and situation.
- Illness is the inability of an individual's adaptive responses to maintain physical and emotional balance and results in an impairment in functional ability.
- Wellness is the condition in which an individual functions at optimal levels and is a dynamic process that occurs in varying degrees.
- The various theoretical models of health, such as the clinical, health-belief, high-level wellness, social learning theory, the host-agent-environment, and health promotion models, help nurses to understand the relationship between the experience of health and illness and clients' behaviors in response to this process.
- The two major classifications of illness are acute and chronic. Acute illness is usually characterized by rapid onset, short duration, and intense symptoms. Chronic illness is usually characterized by a gradual insidious onset, lifelong duration, and irreversible changes.
- The satisfaction of basic human needs, such as physiological, psychological, sociocultural, intellectual, and spiritual needs, is necessary for every person's survival.
- An impairment in meeting basic needs results in an altered health status.
- A holistic viewpoint helps nurses to recognize the body-mind connection and see the client as a whole person rather than fragmented parts.
- Spirituality is the aspect of a person that seeks a sense of meaning and purpose in life and that also can provide support in times of stress.
- Sexuality affects an individual's relationships with everyone else, male and female. Sexuality evolves throughout a person's life.

- Lifestyle, locus of control, self-efficacy, health care attitudes, and self-concept are examples of variables that influence health-promoting behaviors.
- The three approaches to health maintenance (health promotion, health protection, and disease prevention) are centered on the individual's responsibility in promoting one's own health.
- Nurses play a key role in helping clients to adopt healthy lifestyles and use approaches such as role modeling and formal teaching to motivate client change.
- Nurses must focus their efforts on improving the health status of vulnerable populations.

CRITICAL THINKING ACTIVITIES

1. What are the nursing implications of Maslow's hierarchy of basic needs?
2. Critique one article from your local newspaper about a sociopolitical or economic issue that currently affects the health of the citizens in your community.
3. Select a classmate to interview. Note any relationship between attitudes and physical symptoms. Does your partner feel better physically when mentally relaxed? Vice versa?
4. Interview five people in your community. Ask them how they know when they are healthy. Compare the answers and develop a brief list of determinants of health.
5. Think about motivation and lifestyle changes. What motivates you to engage in healthy behaviors? How can you find incentives to "use" in teaching clients about the need to modify habits that affect health?
6. What do you think are the three most important issues that affect the health of Americans today? List in terms of priority.
7. What health promotion activities or programs are currently available for vulnerable populations in your community?

WEB RESOURCES

Medscape Today
www.medscape.com
 American Psychological Association
www.apa.org
 Institute of Medicine
www.iom.edu

Cultural Diversity



There is a richness to diversity that is lacking in a homogeneous environment. We need to embrace and cultivate that richness.

—Fralic (1995)

COMPETENCIES

1. Identify the concepts of culture, ethnicity, race, ethnocentrism, and stereotyping.
2. Describe dominant values in the United States.
3. Discuss the impact of culture on health beliefs and health behaviors.
4. Discuss the six organizing phenomena of culture.
5. Recognize the impact of cultural values on utilization of health care services.
6. Describe the process of transcultural nursing.
7. Explain how nurses maintain sensitivity to cultural diversity.
8. Discuss nursing strategies that ensure delivery of culturally sensitive care.

KEY
TERMS

acculturation
cultural assimilation
cultural competence
cultural diversity
culture

dominant culture
ethnicity
ethnocentrism
minority group
oppression

race
racism
stereotyping
subculture
transcultural nursing

Every aspect of one's life (including attitudes, beliefs, and values) is influenced by one's culture. Behavior, including behavior affecting health, is culturally determined. As the population of the United States continues to diversify, recognition of cultural differences and their impact on health care becomes more critical. Nurses provide health care to culturally diverse client populations in a variety of settings. Knowledge of culturally relevant information is essential for delivery of competent nursing care. This chapter discusses the various concepts related to culture, the importance of diversity in American society, the influence of culture on health, and transcultural nursing.

CONCEPTS OF CULTURE

Each individual is culturally unique. Behavior, self-perception, and judgment of others all depend on one's cultural perspective. This section discusses the concepts of culture, race, ethnicity, and stereotyping and provides an overview of the dominant cultural values in the United States. To provide holistic care, the nurse needs a thorough understanding of the following concepts.

Culture

Culture refers to knowledge, beliefs, behaviors, ideas, attitudes, values, habits, customs, languages, symbols, rituals, ceremonies, and practices that are unique to a particular group of people. This structure of knowledge, behaviors, and values provides a group with a “blueprint” or a general design for living “that guide their worldview and decision-making” (Purnell & Paulanka, 1998, p. 4).

Culture is not static nor is it uniform among all members within cultural groups. Culture represents adaptive dynamic processes learned through life experiences. People have culturally predetermined values and beliefs that may change as new information is gained. There is much diversity among cultural groups. Such differences result from individual perspectives and practices. Consider for example how a family deals with a crisis. A crisis may cause some families to become closer, whereas the same situation may cause another family to withdraw and create distance among its members.

Cultural messages are transmitted in a variety of ways such as through schools and churches. The various media are also powerful transmitters and shapers of culture.

People learn about culture through traditions. When people state “That’s how we’ve always done it,” they are describing cultural traditions. Cultural beliefs, values, customs, and behaviors are transmitted from one generation to another. Grandparents, other elders, and parents teach children cultural expectations and norms through role modeling, demonstration, and discussion (Figure 16-1).

Characteristics of Culture

Differences exist among cultural groups and among individuals within a single culture. Despite these variances, all cultures exhibit the characteristics shown in the accompanying display.

CHARACTERISTICS OF CULTURE

- *Culture is learned and taught.* Cultural knowledge is transmitted from one generation to another. A person is not born with cultural concepts but instead learns them through socialization.
- *Culture is shared.* The sharing of common practices provides a group with part of its cultural identity.
- *Culture is social in nature.* Culture develops in and is communicated by groups of people.
- *Culture is dynamic, adaptive, and ever-changing.* Adaptation allows cultural groups to adjust to meet environmental changes. Cultural change occurs slowly and in response to the needs of the group. This dynamic and adaptable nature allows a culture to survive.



Figure 16-1 Cultural expectations and traditions are shared through formal and informal activities such as meal times.

Ethnicity and Race

Ethnicity is a cultural group's perception of themselves (group identity). This self-perception influences how the group's members are perceived by others. Ethnicity is a sense of belongingness and a common social heritage that is passed from one generation to the next. Members of an ethnic group demonstrate their shared sense of identity in common customs and traits.

Race refers to a grouping of people based on biological similarities. Members of a racial group have similar physical characteristics such as blood group, facial features, and color of skin, hair, and eyes. There is often overlap between racial and ethnic groups because the cultural and biological commonalities support one another (Giger & Davidhizar, 1999). The similarities of people in racial and ethnic groups reinforce a sense of commonality and cohesiveness.

Labeling and Stereotyping

Problems arise when differences across and within cultural groups are misunderstood. Misperception, confusion, and ignorance often accompany people's expectations of others. There are numerous ways in which people are different and, thus, classified by others. See the accompanying display.

WAYS IN WHICH PEOPLE DIFFER

- Age
- Gender
- Educational level
- Language
- Occupation
- Residence (rural, urban, suburban)
- Socioeconomic status
- Religion
- Functional abilities
- Cognitive abilities
- Racial composition
- Nationality
- Family structure and ties

Members of some cultural groups have historically and globally experienced oppression in the forms of racism, sexism, and classism. The basic underlying premise of these biases is that one way is assumed to be better or "right" and every other way is inferior. **Ethnocentrism** is the belief that one's own culture is superior to all others. According to the American Nurses Association (1994):

This belief is common to all cultural groups, all groups regard their own culture as not only the best but also the correct, moral, and only way of life. This

belief is pervasive, often unconscious and is imposed on every aspect of day-to-day interaction and practices including health care. It is this attitude which creates problems between nurses and clients of diverse cultural groups. (p. 3)

Ethnocentrism results in oppression. **Oppression** occurs when the rules, modes, and ideals of one group are imposed on another group. Oppression is based on cultural biases, which stem from values, beliefs, tradition, and cultural expectations. **Racism**, a form of oppression, is defined as discrimination directed toward individuals who are misperceived to be inferior due to biologic differences.

Stereotyping is an expectation that all people within the same racial, ethnic, or cultural group act alike and share the same beliefs and attitudes. Stereotyping results in labeling people according to cultural preconceptions; therefore, an individual's unique identity is often ignored.

Dominant Values in the United States

Cultural differences refer to values, practices, and rituals that vary from those of the dominant culture. The dominant culture of the United States is composed of white middle-class Protestants of European ancestry. A **dominant culture** is the group whose values prevail within a society. The European value orientation has had an important influence on U.S. culture, as illustrated by the following dominant beliefs:

- Achievement and success
- Individualism, independence, and self-reliance
- Activity, work, and ownership
- Efficiency, practicality, and reliance on technology
- Material comfort
- Competition and achievement
- Youth and beauty

Frequently, these dominant values (which may be blatant or subtle) conflict with the values of minority

THINK ABOUT IT

Comparison of Personal Values with Dominant U.S. Values

Consider the dominant U.S. values, and compare them with your personal beliefs. For example, how do you measure success? Are you results oriented? How important are independence and self-reliance to you? Do you value material comfort? If so, what are you willing to do to gain it? How do you feel about elderly people? How do you feel about people who are physically unattractive?

groups. A **minority group** can be composed of an ethnic, racial, or religious group that constitutes less than a numerical majority of the population. Because of their cultural or physical characteristics, such groups are labeled and treated differently from others in the society. Minority groups are usually considered to be less powerful than the dominant group (Giger & Davidhizar, 1999).

People assume the characteristics of the dominant culture through **acculturation** (process of learning norms, beliefs, and behavioral expectations of a group). Acculturation is encouraged through schools and the media. Assimilation is “cultural and structural blending into a dominant entity” (Kavanaugh et al., 1999, p. 10). **Cultural assimilation** occurs when individuals from a minority group are absorbed by the dominant culture and take on the characteristics of the dominant culture.

MULTICULTURALISM IN THE UNITED STATES

“The United States, already one of the most diverse societies in the world, is becoming increasingly multicultural and multilingual” (Lester, 1998, p. 26). The U.S. population is composed of many ethnic/racial subcultures. A **subculture** is a group of people “who have experiences different from those of the dominant culture by virtue of status, ethnic background, residence, religion, education, or other factors that functionally unify the group” (Purnell & Paulanka, 1998, p. 8). It is important to note that, even though a number of these subcultures possess less than their equal shares of money, influence, and prestige, these populations are increasing at a rapid rate. “By the year 2050, white Americans’ share of the total population will decline from 75% to under 50%. In many localities so called minorities are now, in fact, the majority” (American Nurses Association, 1998, p. 5). The numbers of immigrants and refugees entering the United States from non-European countries have added to this multicultural composition within the American universal culture. Native Americans, African-Americans, Asian-Americans, and Hispanic Americans will be the most populous groups in the future. All four of these cultural groups have shown significant growth and are expected to increase. Within the next 50 years, the Asian population is expected to increase to 11%, the Black population to 16%, and the Hispanic population to 21% (Campinha-Bacote, 1999, p. 203).

Value of Diversity

Cultural diversity is the differences among people that result from ethnic, racial, and cultural variables. “Cultural diversity refers to the differences between people based on a shared ideology and value set of beliefs, norms, customs, and meanings evidenced in a way of

life” (American Nurses Association, 1994, p. 2). The United States has a vast potential of human resources, which with divergent viewpoints and behaviors, enriches the sociopolitical climate. New ideas, other viewpoints, increased problem-solving approaches, and increased tolerance are all outcomes of a diverse population. In addition to these advantages, there are also some disadvantages to living and working within such a culturally diverse environment. For example, the amount and types of variances can lead to splitting and ethnocentrism.

Cultural diversity presents special challenges for nurses who must provide care that is congruent with a person’s expectations. Nurses caring for clients who are different from themselves must remember to determine the client’s perception and significance (meaning) of the event (illness). The nurse honors each individual’s differences while understanding that culture influences how clients are viewed and treated within health care settings.

ORGANIZING PHENOMENA OF CULTURE

Cultural factors determine the worth of behaviors, whether behaviors are acceptable, and whether behaviors are incorporated into daily living. When these behavioral concepts are applied to health, they influence the individual’s expectation of health care. Diversity among cultural groups regarding expectations influences health care. The nurse must be sensitive to the client’s cultural context in order to provide care that meets individual needs. Each cultural group has the same basic organizational factors (see the accompanying display). Following is a discussion of the six organizing factors that must be considered when delivering culturally competent care. Table 16-1 presents specific examples of cultural variances in these six phenomena.

ORGANIZING PHENOMENA OF CULTURE

- Communication
- Space
- Orientation to time
- Social organization
- Environmental control
- Biological variations

Communication

Communication is the vehicle for transmitting and preserving culture. To share complete and accurate information, nurses must be aware of the cultural variances related to communication. See Chapter 12 for a complete discussion of communication.

TABLE 16-1
Application of Cultural Phenomena to Nursing Care

Cultural Group	Communication	Space	Time Orientation	Social Organization	Environmental Control	Biological Variations	Nursing Implications
African-Americans	<p><i>Language(s):</i></p> <ul style="list-style-type: none"> English <p><i>Silence:</i></p> <ul style="list-style-type: none"> Head-nodding does not necessarily mean agreement. <p><i>Eye Contact:</i></p> <ul style="list-style-type: none"> Direct eye contact is often viewed as being rude. <p><i>Other:</i></p> <ul style="list-style-type: none"> Nonverbal communication is very important. It is intrusive to ask personal questions of someone one has just met. 	<p><i>Social Distance:</i></p> <ul style="list-style-type: none"> Close, personal space <p><i>Touch:</i></p> <ul style="list-style-type: none"> Touching another's hair is sometimes viewed as offensive. 	<ul style="list-style-type: none"> Present over future Flexible concept of time 	<p><i>Family:</i></p> <ul style="list-style-type: none"> Large, extended family networks are important. <p><i>Gender Roles:</i></p> <ul style="list-style-type: none"> Women serve as both breadwinners and caretakers. <p><i>Religion:</i></p> <ul style="list-style-type: none"> Protestant (Baptist) Strong church affiliation with community <p><i>Other:</i></p> <ul style="list-style-type: none"> Social organizations are strong within communities. 	<p><i>Definition of Health:</i></p> <ul style="list-style-type: none"> Harmony with nature No separation of body, mind, and spirit <p><i>Causative Factors of Illness:</i></p> <ul style="list-style-type: none"> Disharmonious state that may be caused by demons or spirits Can be prevented by nutritious meals, rest, and cleanliness 	<p><i>Dietary Practices/ Preferences:</i></p> <ul style="list-style-type: none"> Foods slow-cooked in added fat Some pregnant African-Americans engage in pica (ingestion of non-food items, such as laundry starch). <p><i>Increased Susceptibility:</i></p> <ul style="list-style-type: none"> Lactose intolerance Keloid formation Sickle cell anemia Hypertension Cancer (especially stomach and esophageal) Coronary heart disease 	<ul style="list-style-type: none"> Encourage involvement of extended family. Know that a folk healer (or herbalist) may be consulted before individual seeks out traditional treatment. Clarify meaning and intent of client's words. Validate the meaning of client's nonverbal behavior. Avoid rigidly scheduling care procedures; be flexible with use of time.
Asian-Americans	<p><i>Language(s):</i></p> <ul style="list-style-type: none"> Chinese (especially Mandarin) Japanese Korean Vietnamese English 	<p><i>Social Distance:</i></p> <ul style="list-style-type: none"> Avoid physical closeness <p><i>Touch:</i></p> <ul style="list-style-type: none"> Usually do not touch others during conversation 	<ul style="list-style-type: none"> Present 	<p><i>Family:</i></p> <ul style="list-style-type: none"> Highly value immediate and extended family Family unit is very structured and hierarchical. 	<p><i>Definition of Health:</i></p> <ul style="list-style-type: none"> A state of physical and spiritual harmony with nature A balance between positive and negative energy forces (yin and yang) 	<p><i>Dietary: Practices/ Preferences:</i></p> <ul style="list-style-type: none"> Soy sauce Raw fish Rice 	<ul style="list-style-type: none"> Expect that a traditional healer will probably be consulted first. Clarify responses to questions. Avoid excessive touch.

(continues)

TABLE 16-1 (continued)
Application of Cultural Phenomena to Nursing Care

Cultural Group	Communication	Space	Time Orientation	Social Organization	Environmental Control	Biological Variations	Nursing Implications
Asian-Americans (continued)	<p><i>Silence:</i></p> <ul style="list-style-type: none"> Is valued <p><i>Eye Contact:</i></p> <ul style="list-style-type: none"> Considered to be rude <p><i>Other:</i></p> <ul style="list-style-type: none"> Criticism or disagreement is not expressed verbally. The word No is avoided to show respect for others. An up-turned palm is offensive. 	<ul style="list-style-type: none"> Is unacceptable with members of opposite sex Touching someone on the head is disrespectful because the head is considered to be sacred. 		<ul style="list-style-type: none"> Family loyalty and honor are valued. <p><i>Gender Roles:</i></p> <ul style="list-style-type: none"> Men have the power and authority. Women are expected to be obedient. <p><i>Religion:</i></p> <ul style="list-style-type: none"> Taoism Buddhism Islam Christianity <p><i>Other:</i></p> <ul style="list-style-type: none"> Education is viewed as important. 	<ul style="list-style-type: none"> A healthy body is viewed as a gift from ancestors. <p><i>Causative Factors of Illness:</i></p> <ul style="list-style-type: none"> Yin and yang imbalance Contributing factors include: <ul style="list-style-type: none"> — prolonged sitting or lying — overexertion 	<p><i>Increased Susceptibility:</i></p> <ul style="list-style-type: none"> Lactose intolerance Hypertension Cancer (stomach and liver) 	<ul style="list-style-type: none"> Limit eye contact. Avoid gesturing with your hands. Only touch the client's head when necessary and explain before doing so. Avoid rigidly scheduling care procedures; be flexible with time use.
European Americans	<p><i>Language(s):</i></p> <ul style="list-style-type: none"> National languages English <p><i>Silence:</i></p> <ul style="list-style-type: none"> Can be used to show respect or disdain for another, depending on the situation <p><i>Eye Contact:</i></p> <ul style="list-style-type: none"> Indicates trustworthiness 	<p><i>Social Distance:</i></p> <ul style="list-style-type: none"> Tend to avoid close physical contact <p><i>Touch:</i></p> <ul style="list-style-type: none"> Aloof Handshakes for formal greetings 	<ul style="list-style-type: none"> Future over present 	<p><i>Family:</i></p> <ul style="list-style-type: none"> Nuclear family is basic unit. Extended family is important. <p><i>Gender Roles:</i></p> <ul style="list-style-type: none"> Man is dominant figure. <p><i>Religion:</i></p> <ul style="list-style-type: none"> Judeo-Christian <p><i>Other:</i></p> <ul style="list-style-type: none"> Community social organizations are important. 	<p><i>Definition of Health:</i></p> <ul style="list-style-type: none"> Usually viewed as absence of disease or illness <p><i>Causative Factors of Illness:</i></p> <ul style="list-style-type: none"> Often viewed as punishment for sins Tendency to be stoical when expressing complaints 	<p><i>Dietary Practices/ Preferences:</i></p> <ul style="list-style-type: none"> Carbohydrates (potatoes) Red meat <p><i>Increased Susceptibility:</i></p> <ul style="list-style-type: none"> Heart disease Thalassemia Breast cancer Diabetes 	<ul style="list-style-type: none"> Focus on client's body language. Respect client's personal space. Help client decrease fatalistic viewpoint of illness. Know that home remedies may be the first method of treatment used.

(continues)

TABLE 16-1 (continued)
Application of Cultural Phenomena to Nursing Care

Cultural Group	Communication	Space	Time Orientation	Social Organization	Environmental Control	Biological Variations	Nursing Implications
<i>Hispanic Americans</i>	<p><i>Language(s):</i></p> <ul style="list-style-type: none"> Spanish or Portuguese with many dialects <p><i>Silence:</i></p> <ul style="list-style-type: none"> Tend to be verbally expressive <p><i>Eye Contact:</i></p> <ul style="list-style-type: none"> Eye behavior is significant. The “evil eye” can be given to a child if a person looks at and admires a child without touching the child. Avoidance of eye contact indicates respect and attentiveness. <p><i>Other:</i></p> <ul style="list-style-type: none"> Direct confrontation is disrespectful. Dramatic body language (gestures, facial expressions) is used to express emotions or pain. Confidentiality is important. Expression of negative feelings is impolite. 	<p><i>Social Distance:</i></p> <ul style="list-style-type: none"> Comfortable with close proximity to others <p><i>Touch:</i></p> <ul style="list-style-type: none"> Very tactile (use of embraces, handshakes) Values physical presence of others <p><i>Other:</i></p> <ul style="list-style-type: none"> Politeness is essential. Modesty is necessary. 	<ul style="list-style-type: none"> Present oriented Concept of time is flexible. 	<p><i>Family:</i></p> <ul style="list-style-type: none"> Nuclear family is basic unit. Extended family is highly regarded. Needs of family take precedence over needs of individual members. <p><i>Gender Roles:</i></p> <ul style="list-style-type: none"> Man is the decision maker and breadwinner. Woman is caretaker and homemaker. <p><i>Religion:</i></p> <ul style="list-style-type: none"> Catholicism 	<p><i>Definition of Health:</i></p> <ul style="list-style-type: none"> May be a reward from God or the result of good luck Results from a state of balance between “hot” and “cold” forces and “wet” and “dry” forces <p><i>Causative Factors of Illness:</i></p> <ul style="list-style-type: none"> God’s punishment for sins <i>Susto</i> (fright) <i>Mal ojo</i> (evil eye) <i>Envidia</i> (envy) 	<p><i>Dietary Practices/ Preferences:</i></p> <ul style="list-style-type: none"> Beans Fried foods Spicy foods <p><i>Increased Susceptibility:</i></p> <ul style="list-style-type: none"> Lactose intolerance Diabetes Parasites 	<ul style="list-style-type: none"> Offer to call priest or other clergy because of the significance of religious practices related to illness (such as sacrament of anointing the sick person). Protect privacy. Maintain confidentiality. Communicate with male head of family. Always touch a child you are admiring or examining. Avoid rigidly scheduling care procedures; be flexible with use of time. Pay particular attention to dietary preferences.

(continues)

TABLE 16-1 (continued)
Application of Cultural Phenomena to Nursing Care

Cultural Group	Communication	Space	Time Orientation	Social Organization	Environmental Control	Biological Variations	Nursing Implications
Native Americans (Referred to as Native Americans in the United States and as Aborigines in Canada)	<p><i>Language(s):</i></p> <ul style="list-style-type: none"> English Tribal languages <p><i>Silence:</i></p> <ul style="list-style-type: none"> Indicates respect for the speaker <p><i>Eye Contact:</i></p> <ul style="list-style-type: none"> Is avoided because it is a sign of disrespect <p><i>Other:</i></p> <ul style="list-style-type: none"> Body language is important mode of communication. Speak in low tone of voice. Expects others to be attentive. 	<p><i>Social Distance:</i></p> <ul style="list-style-type: none"> Personal space is very important. Space has no boundaries. <p><i>Touch:</i></p> <ul style="list-style-type: none"> Will lightly touch another person's hand during greetings Massage is given to newborns to promote bonding between infant and mother. Touching a dead body is prohibited. 	Usually present oriented	<p><i>Family:</i></p> <ul style="list-style-type: none"> Basic unit is extended family, often including people from several households. Very family-oriented In some tribes, grandparents are viewed as family leaders. Elders are honored. <p><i>Gender Roles:</i></p> <ul style="list-style-type: none"> The father does all the work outside the home. The mother assumes responsibility for domestic duties. <p><i>Religion:</i></p> <ul style="list-style-type: none"> Sacred myths and legends provide spiritual guidance. Religion and healing practices are blended with each other. <p><i>Other:</i></p> <ul style="list-style-type: none"> Community social organizations are important. Children are taught to respect traditions. 	<p><i>Definition of Health:</i></p> <ul style="list-style-type: none"> Health is a state of harmony between the person, the family, and the environment. <p><i>Causative Factors of Illness:</i></p> <ul style="list-style-type: none"> Supernatural forces Disequilibrium between person and environment Everything that happens is the result of something else (past or future events). 	<p><i>Dietary Practices/ Preferences:</i></p> <ul style="list-style-type: none"> Vary greatly according to tribal customs and geographical location. Navajos prefer meat and blue cornmeal and tend to avoid consumption of milk. <p><i>Increased Susceptibility:</i></p> <ul style="list-style-type: none"> Tuberculosis Diabetes Heart disease Arthritis American Eskimos are susceptible to glaucoma. Because there are over 400 tribes in North America (including Eskimos and Aleuts), expect diversity according to specific tribe. 	<ul style="list-style-type: none"> Elicit input from extended family members. Actively accommodate extended family visitors in hospital and clinic settings. In the home, modify infection control and hygiene practices according to availability of resources. Closely monitor own use of body language. Encourage client to personalize space in which health care is delivered (e.g., bring personal items, objects to hospital room). Clarify messages. Understand that the client may be attentive even when eye contact is absent.

(Data from Andrews, M. M., & Boyle, J. S. [1998]. *Transcultural concepts in nursing care* (3rd ed.). Philadelphia: Lippincott; Giger, J. N., & Davidhizar, R. E. [1999]. *Transcultural nursing: Assessment and intervention* (3rd ed.). St. Louis: Mosby-Yearbook; Degazon, C. [2000]. Cultural diversity and community health nursing practice. In M. Stanhope, & J. Lancaster, (Eds.), *Community health nursing: Promoting health of aggregates, families, and individuals* (5th ed.). St. Louis: Mosby-Yearbook; Grossman, D. [1996]. *Cultural dimensions in home health nursing. American Journal of Nursing*, 96 (7), 33-36.)

Nurses provide information to clients by using two types of communication: verbal and nonverbal. Verbal communication consists of words, both spoken and written. When cultural variances exist, communication problems may occur. The nurse must validate the meaning of and interpret words to ensure that clients receive the intended message. For example, a communication barrier exists when different languages are spoken by the client and nurse. In such cases, the use of an interpreter facilitates communication. The interpreter can either be a bilingual family member or staff member. Even when both client and nurse speak the same language, communication problems may occur because of varying cultural contexts in which words have different meanings to different people.

NURSING ALERT

Assumptions and Communication

When the nurse assumes that the client understands the intended message and fails to confirm client understanding, cultural blindness can hamper the communication process

Nonverbal communication consists of body language (such as facial expressions, posture, and gestures); the use of silence; and paralinguistic cues (voice tone, pitch, and rate). An example of how nonverbal communication can be culturally misunderstood is the presence or absence of eye contact. For example, in Native American and Asian-American cultures, eye contact is considered intrusive and disrespectful. However, in the dominant U.S. cultural group, eye contact between individuals indicates trustworthiness.

Space

An individual's personal space includes one's body, the surrounding environment, and objects and people within that environment. Culture determines the amount of social distance tolerated by a person. Members of British, German, and American cultures usually require more personal space than do people of Hispanic and French backgrounds (Giger & Davidhizar, 1999).

Nurses must be aware of the client's degree of comfort with closeness since diverse groups have varying norms for the use of touch. Touch may be perceived as invasive by clients from some cultures. Who can touch a person, when a person can be touched, and what forms of touch are appropriate are culturally determined. For example, members of the dominant U.S. culture often greet each other with handshakes while it is commonly accepted in European cultures to greet others with a kiss on the cheek.

Orientation to Time

Time orientation (being focused on the past, the present, or the future) varies according to cultural group. European Americans are future oriented as evidenced by

their development of plans, such as retirement savings. Many Native Americans have a different concept of time in that they tend to live in the present moment (Giger & Davidhizar, 1999). For many Native Americans, watching the clock and timeliness/tardiness have little importance. Time is considered a circular, rather than a linear, process. Most health care providers value quickness and efficiency, which is interpreted by members of the Lakota tribe as insincerity and a lack of interest (Kavanagh et al., 1999). The nurse's nonverbal behavior can be changed to build interpersonal rapport by spending time, sitting down with clients, and demonstrating presence.



NURSING TIP

Time Orientation

In the mainstream American culture, time is a valuable commodity (i.e., "Time is money!"). When caring for clients of diverse cultures, be sensitive to the fact that they may view time differently. Avoid jumping to conclusions that the client who is late for an appointment is lazy or inconsiderate.

Social Organization

Social organization refers to the ways in which groups determine rules of acceptable behavior and roles of individual members. Examples of social organizations include family and other kinship ties, religious groups, and ethnic groups.

Family

General Systems Theory (GST) considers the family to be a system that seeks to maintain balance. From the GST perspective, the family functions as a unit. Thus, if an event affects one family member, all the other members will be affected in one way or another. The various types of family structures are described in the accompanying display. It is vital for the nurse to know who will be involved in making decisions related to health care. Including the family according to their cultural expectations is a hallmark of quality nursing care. Family patterns usually are of one of three types: linear, collateral, or individualist. See Table 16-2 for an explanation of these types of family patterns.

In many cultures, the family assumes greater importance than the individual (Figure 16-2). For example, in most Native American tribes, the extended family is the basic family structure. The extended family is also extremely important in Hispanic American cultural

TYPES OF FAMILY STRUCTURES

- *Nuclear* Parents and children
- *Extended* Parents, children, and other relatives (such as grandparents, cousins)
- *Attenuated* Single parent with children
- *Incipient* Married couple with no children
- *Blended* Married couple and their children from previous unions; may indicate step-parents, step-siblings, half siblings.

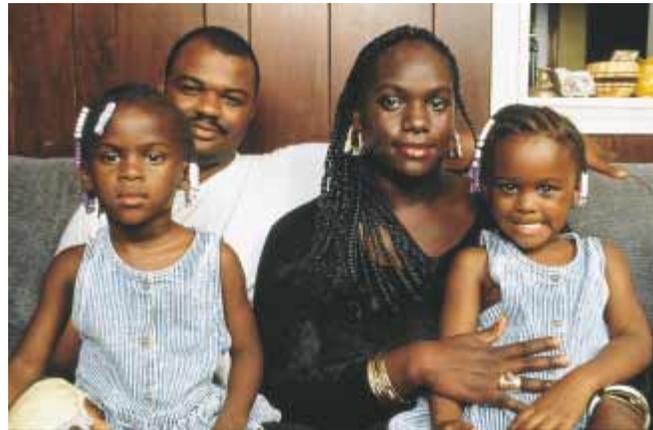


Figure 16-2 Within this family, decisions about health care are made on a very personal level among the parents and children.

groups. In some Hispanic groups, the family may include third and fourth cousins as well as close friends who are not related by ties of kinship.

Pickens (1998) identified the following attributes as necessary for nurses in order to collaborate with families:

- Nonjudgmental attitude (i.e., do not expect all families to be alike and behave similar to one’s own)
- Self-awareness of own preconceptions about family members
- Respect for others’ beliefs and values
- Recognition of families as significant providers of support
- Value the participation of families in caregiving

Gender

Gender roles vary according to cultural context. For example, in families with a patriarchal structure (the man is the head of the household and chief authority fig-

ure), the husband/father is the dominant person. Such expectations are the cultural norm for Latino, Hispanic, and traditional Muslim families. The husband/father is the one who makes decisions regarding health care for all family members. Also, in such cultures, the wife is responsible for child care and household maintenance, whereas the father’s role is to protect and support the family members (Luckmann, 2000).

Lifestyle

In addition to an increased heterogeneity of population groups in the United States, lifestyles are also becoming more diverse. Some examples of alternative lifestyles are homosexual couples, single parent families, and communal groups. Figure 16-3 illustrates a variety of types of families. Nurses must demonstrate respect for clients’

TABLE 16-2
Family Patterns

Kinship Pattern	Explanation	Most Common Cultural Context
Linear	<ul style="list-style-type: none"> • Goals focus on needs of extended and hereditary family. • Patriarchal structure is present. • Enculturation of children is an important function. • Elders are respected. 	<ul style="list-style-type: none"> • Asian • Middle Eastern • Upper-class Euro-American
Collateral	<ul style="list-style-type: none"> • Individual member’s goals are less important than those of the family. • Nuclear family is present. • Men are “head of household,” yet women contribute to decision making (especially about childcare). • Children are highly valued. • Socialization revolves around family groups 	<ul style="list-style-type: none"> • Hispanic • Native American
Individualist	<ul style="list-style-type: none"> • Individual’s goals take precedence over that of family. • Emphasis is on individual accountability and self-responsibility. • There is less respect for authority figures. • Elders are not as honored. • Family responsibilities are shared between men and women. 	<ul style="list-style-type: none"> • Middle-class Euro-American • Single-parent family • Gay family

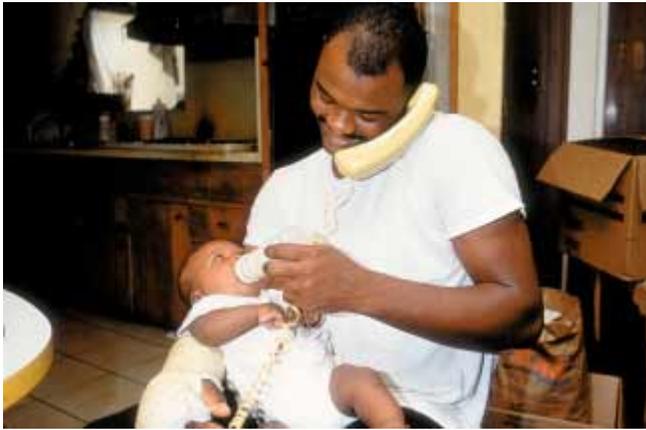


Figure 16-3 There are diverse family structures and types, as shown in these photographs.

lifestyles even when they differ from those of the nurse. Some specific ways in which nurses can respect clients with differing lifestyles are:

- Be aware of own tendency to be ethnocentric.
- Be sensitive to client's needs, especially those expressed nonverbally.
- Use self-awareness to determine the impact of own beliefs and values.

Often the nurse and client are of different cultural backgrounds; see Figure 16-4. The nurse must be culturally



Figure 16-4 Providing culturally sensitive care depends on establishment of a therapeutic nurse–client relationship.

sensitive in order to promote the development of a therapeutic nurse–client relationship.

Religion

Religious beliefs influence a person's response to major life events such as birth, illness, and death. Religious practices are often a source of comfort during stressful life events and provide support during the healing process. Table 15-5 presents an overview of the practices of selected major world religions that relate to issues such as diet, birth, death, and health care. Crises such as illness and treatment modalities are often the catalyst for increased spiritual needs; see Figure 16-5.

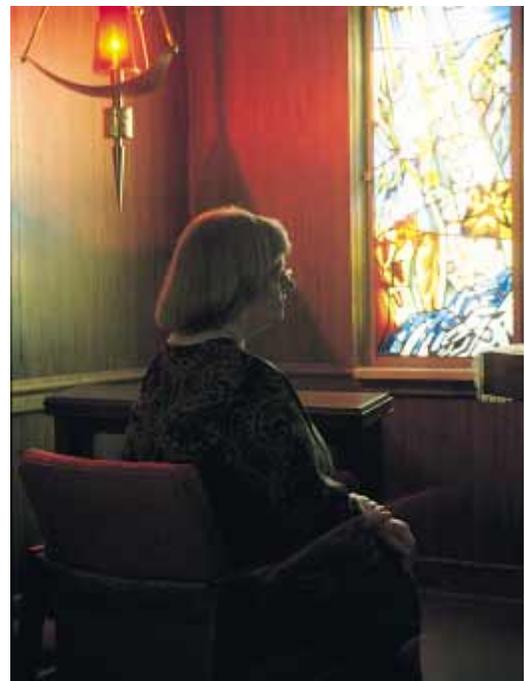


Figure 16-5 Spiritual needs often become more important during times of stress such as illness.

CULTURAL DISPARITIES IN HEALTH AND HEALTH CARE DELIVERY

“Researchers suggest that cultural insensitivity can create more than mere discomfort. It can create real barriers to accessing health care” (Lester, 1998, p. 28). Language and other cultural differences often present barriers to necessary health care including:

- Appointment procedures
- Transportation
- Directions written in an unfamiliar language.

There are disparities in the health of Americans. According to the ANA (1998), minorities experience some diseases at a much higher rate than white Americans. The following examples are listed in the ANA’s *Position Statement on Discrimination and Racism in Health Care* (1998):

- Cancer is the leading cause of death for Chinese and Vietnamese individuals.
- Vietnamese women suffer from cervical cancer at nearly five times the rate of white American women.
- Compared with the general population, Hispanics have a higher incidence of cancer of the stomach, esophagus, pancreas, and cervix.
- African-Americans have a life expectancy that is six years shorter than the life expectancy for white Americans.
- The Native American population has significant rates of diabetes, sudden infant death syndrome, and congenital malformations.

“Overall Native American and Alaskan Native rates of diabetes, tuberculosis, fetal alcohol syndrome, alcohol-related morbidity and mortality, and suicide significantly exceed those of other racial and ethnic groups in the United States” (Kavanagh et al., 1999, p. 10). One of the major objectives established by the U.S. Office of Public Health in its *Healthy People 2010 Objectives* is the elimination of disparities in health status by providing equitable services for people of all groups (Chrvala & Bulger, 1999).

Vulnerable Populations

As a result of societal changes, more people are at risk for health problems. Groups that are especially susceptible for health-related problems include the poor, the homeless, migrant workers, abused individuals, the elderly, pregnant adolescents, and people with sexually transmitted diseases such as acquired immunodeficiency syndrome (AIDS).

The United States is currently facing many economic, social, and political challenges related to the delivery of health care services to vulnerable population groups

(Edelman & Mandle, 1997). As a result, many vulnerable populations are underserved because of the high demand for services, lack of services, and limited availability and access to services.

The Poor

Poverty affects health status and accessibility to health care services. According to the Centers for Disease Control and Prevention (CDC) (1998), “increase in either income or education increases the likelihood of good health status. This relationship between socioeconomic status and health was observed for persons in every race and ethnic group examined” (p. 52). Living in poverty means being unable to meet the financial demands of basic living expenses, such as food, shelter, and clothing. Socioeconomic status is determined by family income, educational level, and occupation. “Childhood poverty has long-lasting negative effects on one’s health. Children in low-income families fare less well than children in more affluent families. In 1999, 17% of American children lived in poverty” (U.S. Bureau of the Census, 2000). In 1999, a family of four with an annual income below \$17,029 was below the Federal poverty threshold. The poor population has more complex health problems including a higher incidence of chronic illness (U.S. Bureau of the Census, 2000).

The CDC (1998) has identified the following as health risk factors that are related to lower income:

- Higher prevalence of cigarette smoking
- Greater incidence of obesity
- Elevated blood pressure
- Sedentary lifestyle
- Less likely to be covered by health insurance
- Less likely to receive preventive health care services

Increasing numbers of federally mandated health care initiatives are being implemented to address the historic racial and class disparities in health care. Entitlement programs imply that the government is legally mandated to provide services to the programs’ eligible populations. Entitlement programs such as Medicare, Medicaid, and Women, Infants, and Children (WIC) were developed, in part, because of social and political pressures. WIC, a special supplemental food program for women, infants, and children, is a U.S. Public Health sponsored program that targets low-income pregnant and breastfeeding mothers and their children age 5 years or younger. WIC links health care services, food supplements, and health education into a combined service package for eligible members. Medicaid is a program designed to provide access to health care for medically needy infants, children, and adults. Medicare is an entitlement program that finances health care services for individuals over the age of 65.

Poverty interferes with a child’s ability to be housed, clothed, and fed adequately and can deprive the child

of a safe (physical and psychological) environment. Children with access to health care have the possibility of getting necessary health care services. Children with health insurance (public or private) are much more likely than children without insurance to have a regular and accessible source of health care (U.S. Bureau of the Census, 2000). “There are many reasons why a child’s parent(s) are uninsured . . . related to employment, limited health care benefits, and recent immigration” (Scott, 2000, p. 26).

THINK ABOUT IT

Socioeconomic Status and Health Care

Think about the following questions regarding poverty and health:

1. When you see a child who is hungry, what do you feel?
2. When an adult approaches you on the street asking for money, what do you do?
3. What do you think causes a person to be economically impoverished? Is poverty a result of socioeconomic political conditions, the individual’s lack of initiative, or other factors?
4. How do you feel about a person who cannot afford adequate health care services?

The Homeless

Even though it is difficult to determine the exact number of homeless people, it is estimated that 350,000 to 6 million people are homeless in the United States (Walker, 1998, p. 27). Societal factors that contribute to homelessness are:

- Lack of affordable housing
- Increasingly stringent criteria for public assistance
- Decreased availability of social services
- Inadequate or lack of employment
- A history of psychosocial trauma
- Deinstitutionalization of clients from mental health facilities *without* adequate community support (such as half-way houses and group homes)

THINK ABOUT IT

Is Basic Shelter a Guarantee?

Every person in this country has a basic right to shelter. Do you agree or disagree with this statement? Consider the ethical ramifications of this statement. In light of the current political and social climate, what do you think the homeless population can expect from government and society?

Approximately 85% of homeless people are on the streets because they have some form of mental illness or are addicted to alcohol or other drugs (Walker, 1998). “We must confront the mistaken notion that hopelessness is a choice . . . It’s important to understand the connection between hopelessness and chronic mental illness, for with understanding can come the sensitivity and compassion necessary to serve this population” (Walker, 1998, p. 27).

Those who are homeless are at greater risk for illness and injuries (Edelman & Mandle, 1997). Hatton (1997) identified the following as major health care needs of homeless women: mental health, sexually transmitted diseases, and substance abuse. Access to basic health care services is limited because the homeless lack health insurance coverage. Those few facilities that do provide services to the homeless are not always accessible due to lack of transportation.

COMMON HEALTH PROBLEMS EXPERIENCED BY THE HOMELESS

Problem	Impact of Homelessness
Diabetes	<ul style="list-style-type: none"> • Lack of regularly scheduled nutritious meals • Inadequate rest • Insufficient exercise
AIDS	<ul style="list-style-type: none"> • Higher rate of sexual assault • Intravenous drug use • Lack of treatment or inadequate follow-up
Respiratory diseases (e.g., tuberculosis, pneumonia)	<ul style="list-style-type: none"> • Crowded living conditions • Inadequate nutrition • Limited or no access to treatment facilities
Cardiovascular diseases	<ul style="list-style-type: none"> • Impaired peripheral circulation as a result of extended time of walking on the streets and/or sleeping in upright, seated position • Food served in many shelters has a high sodium content • Consumption of alcohol and tobacco products
Parasitic infestations	<ul style="list-style-type: none"> • Shared personal items (clothing, bedding, hairbrushes) • Close physical contact (as in shelters) • Lack of facilities for bath, showers • Inability to treat all those in contact with the affected person

Data from Acquaviva, T., & Lancaster, J. (2000). Poverty and homelessness. In M. Stanhope, & J. Lancaster, (Eds.), *Community health nursing: Promoting health of aggregates, families, and individuals* (5th ed.). St. Louis: Mosby-Yearbook.

Children are especially vulnerable to the perils of homelessness. Presently, the federal government does not regularly collect data on the number of homeless children in the United States. However, 1998 statistics (U.S. Bureau of the Census, 2000) show that 36% of U.S. households with children had housing problems, including physically inadequate housing and crowded housing. Adolescents who are homeless are at high risk for physical and mental health problems, including malnutrition, substance abuse, accidental pregnancy, and sexually transmitted disease.

The social and political reforms that are needed to create solutions to homelessness have just begun. There is great *urgency* to meet the immediate needs of the homeless and to provide health care that emphasizes both disease prevention and health promotion.

“Nonprofit nursing centers and clinics try to halt the epidemic of uninsured children” (Scott, 2000, p. 26). Listed below are a few examples of nursing’s efforts in responding to the needs of vulnerable clients:

- Community Volunteers in Medicine is a nonprofit organization in which nurses, doctors, and dentists volunteer their time and services to treat uninsured people of all ages living in Chester County, Pennsylvania.
- Philadelphia-based Regional Nursing Centers Consortium (RNCC) sees approximately 250,000 clients annually. Up to 50% of these clients are uninsured.
- In 1999, LaSalle Neighborhood Nursing Center in Philadelphia identified 300 uninsured children and enrolled them in the Children’s Health Insurance Program (CHIPs) or for medical assistance (Scott, 2000).

Environmental Control

Environmental control refers to the relationships between people and nature and to a person’s perceived ability to control activities of nature, such as factors causing illness.

A person’s belief about the causation of disease will determine the type of treatment (if any) sought. According to Andrews and Boyle (1998), there are three types of health belief systems: magicoreligious, biomedical, and holistic. The magicoreligious belief system is based on the concept that health and illness are determined by supernatural forces (such as a Higher Power or the gods). The biomedical belief system states that illness is a result of an impairment in physical or biochemical processes. The holistic belief system views health as a result of harmony among the elements of nature; conversely, disease is caused by disharmony.

Folk Medicine

Most cultures have preferences about health care, including:

- The type of care that is necessary and appropriate
- When care/treatment should be sought
- The appropriate caregiver

Because the presence of a folk medicine system (also referred to as alternative medicine) can present challenges to nurses caring for clients from diverse cultures, knowledge of basic beliefs about illness, factors contributing to illness, and home remedies is necessary. See Chapter 14 for a complete discussion of complementary/alternative treatment methods.

Folk healers are knowledgeable about cultural norms and are usually familiar to the one seeking care (Edelman & Mandle, 1997). Table 16-3 presents the various healers within different cultures and describes common folk healing practices within these cultures. Nurses must be able to relate care and treatment to the client’s cultural context to incorporate informal caregivers, healers, and other members of the clients’ support system as allies in treatment. “The patient-centered orientation of nursing makes it imperative that nurses be able to respond to the unique cultural needs of different people. Nurses are challenged to provide effective caring and curing in varied cultural contexts” (Lester, 1998, p. 26).

Biologic Variations

Biologic variations that distinguish one cultural group from another include enzymatic differences and susceptibility to disease (Andrews & Boyle, 1998; Giger & Davidhizar, 1999). Enzymatic differences account for diverse responses of some groups to dietary therapy and drugs (Table 16-4). Nutritional variations include food preferences that may contribute to health problems (Table 16-5).

TRANSCULTURAL NURSING

The American Nurses Association (1994) states that culture is a central concept of nursing. Acknowledgment and acceptance of cultural differences and understanding of culturally specific responses to illness are prerequisites for providing safe and effective care.

The conceptual framework for understanding cultural diversity and providing culturally competent care is based on Leininger’s transcultural nursing theory. **Transcultural nursing**, according to Leininger (1978), focuses on the study and analysis of different cultures and subcultures with respect to cultural care, health beliefs and health practices, with the goal of providing health care within the context of the client’s culture.

A basic assumption of transcultural nursing is that when health care providers see problems from the client’s cultural viewpoint, they are more open to understanding, appreciating, and working effectively with

TABLE 16-3
Folk Medicine: Healers and Practices

Cultural Group	Traditional Healers	Healing Practices
<i>African-American</i>	<ul style="list-style-type: none"> • Elderly women healers • “Community Mother” or “Granny” • “Root doctor” • Voodoo healer (“Mambo” or “oungan”) • Spiritualist 	<ul style="list-style-type: none"> • Herbs, roots • Poultices • Oils • Religious healing through rituals, (e.g., laying on of hands) • Talismans are worn around the wrist or neck, or carried in a pouch to ward off disease
<i>Asian-American</i>	<ul style="list-style-type: none"> • Herbalist • Physician 	<ul style="list-style-type: none"> • Use of hot and cold foods • Herbs (e.g., ginseng root which is used as a restorative potion) • Soups • Cupping, pinching, and rubbing • Meditation • Acupuncture (puncturing the skin at specified areas with metal needles) • Acupressure (applying pressure with the fingertips to specified areas of the body) • Application of tiger balm (a salve) to relieve muscular pains • Energy to restore balance between yin and yang
<i>European American</i>	<ul style="list-style-type: none"> • Nurse • Physician 	<ul style="list-style-type: none"> • Exercise • Medication (prescribed and over-the-counter) • Modified diets • Amulets • Religious healing rituals
<i>Hispanic American</i>	<ul style="list-style-type: none"> • <i>Curandero</i> • <i>Espiritualista</i> • <i>Yerbero</i> (herbalist) • <i>Brujo</i> (healer who uses witchcraft) • <i>Sobadora</i> • <i>Santiguadora</i> 	<ul style="list-style-type: none"> • Hot and cold foods to treat some conditions • Herbal teas, such as <i>Manzanilla</i>, used to treat gastrointestinal problems, insomnia, and menstrual cramps • Prayers and religious medals • Massage • <i>Azabache</i>, a black stone worn as a necklace or bracelet to ward off the “evil eye” • Some Haitian mothers practice the “three baths” ritual: they bathe for the first 3 postpartum days in water boiled with special leaves
<i>Native American</i>	<ul style="list-style-type: none"> • Shaman • Medicine man/woman 	<ul style="list-style-type: none"> • Use of plants and herbs • Medicine bundle or bag filled with herbs that have been blessed by a medicine man/ woman during a healing ceremony • Sweet grass (herbs) burned to purify the ill person • <i>Estafiate</i> (dried leaves) boiled to produce a tea for treating stomach disorders • The <i>Blessingway</i> ceremony (a healing ritual conducted by the medicine man/woman) • In some Navajo tribes, the medicine man/ woman uses sand painting as a diagnostic method

(Data from Degazon, C. [2000]. Cultural diversity and community health nursing practice. In M. Stanhope, & J. Lancaster (Eds.), *Community health nursing: Promoting health of aggregates, families, and individuals* (5th ed.). St. Louis: Mosby-Yearbook; Giger, J. N., & Davidhizar, R. E. [1999]. *Transcultural nursing: Assessment and intervention* (3rd ed.). St. Louis: Mosby-Yearbook; Grossman, D. [1996]. Cultural dimensions in home health nursing. *American Journal of Nursing*, 96 (7), 33-36.

TABLE 16-4
Effects of Biologic Variations on Selected Drugs

Cultural Group	Effect of Biological Variance on Drugs
African-American	<ul style="list-style-type: none"> Isoniazid (drug used to treat tuberculosis) is rapidly metabolized, thus becoming inactive quickly; occurs in approximately 60% of population. An enzyme deficiency interferes with metabolism of primaquine (used to treat malaria); occurs in approximately 35% of population. Antihypertensive drugs (e.g., propranolol) need to be administered in higher doses to produce same effects as in European Americans.
Asian-American	<ul style="list-style-type: none"> Isoniazid (drug used to treat tuberculosis) is rapidly metabolized, thus becoming inactive quickly; occurs in approximately 85%–90% of population. Rapid metabolism of alcohol results in excessive facial flushing and other vasomotor symptoms. Chinese men need only about half as much propranolol (antihypertensive drug) as European American men. Asian people need smaller doses of alprazolam (antianxiety drug) to achieve same blood levels as their European American counterparts; the drug is also metabolized more slowly (remains in the bloodstream longer) in Asian men.
European American	<ul style="list-style-type: none"> Due to liver enzyme differences, caffeine is metabolized and excreted faster than by people of other cultural groups.
Native American	<ul style="list-style-type: none"> Isoniazid (drug used to treat tuberculosis) is rapidly metabolized, thus becoming inactive quickly; occurs in approximately 60%–90% of population. Rapid metabolism of alcohol results in excessive facial flushing and other vasomotor symptoms.

Data from Andrews, M. M. & Boyle, J. S. (1998). *Transcultural concepts in nursing care* (3rd ed.). Philadelphia: Lippincott; Giger, J. N., & Davidhizar, R. E. (1999). *Transcultural nursing: Assessment and intervention* (3rd ed.). St. Louis: Mosby-Yearbook.

TABLE 16-5
Food Preferences and Related Effects on Health

Cultural Group	Food Preferences	Nutritional Excess	Related Health Problem
African-American	<ul style="list-style-type: none"> Pork Greens Rice Fried foods 	<ul style="list-style-type: none"> Calories Cholesterol Carbohydrates Sodium 	<ul style="list-style-type: none"> Obesity Cardiovascular illnesses (hypertension, coronary heart disease)
Asian-American	<ul style="list-style-type: none"> Raw fish Rice Soy sauce 	<ul style="list-style-type: none"> Calories Cholesterol Carbohydrates Sodium 	<ul style="list-style-type: none"> Coronary heart disease Liver disease Stomach cancer Ulcers
Hispanic American	<ul style="list-style-type: none"> Beans Fried foods Chili Carbonated beverages 	<ul style="list-style-type: none"> Calories Cholesterol Carbohydrates Sodium 	<ul style="list-style-type: none"> Obesity Coronary heart disease
Native American	<ul style="list-style-type: none"> Blue cornmeal Fish Game Fruits and berries 	<ul style="list-style-type: none"> Calories Carbohydrates 	<ul style="list-style-type: none"> Malnutrition Diabetes

Data from Andrews, M. M., & Boyle, J. S. (1998). *Transcultural concepts in nursing care* (3rd ed.). Philadelphia: Lippincott; Giger, J. N., & Davidhizar, R. E. (1999). *Transcultural nursing: Assessment and intervention* (3rd ed.). St. Louis: Mosby-Yearbook.

these clients (Figure 16-6). Other assumptions of transcultural nursing theory are:

- Every culture has some kind of system for health care that is based on values and behaviors.
- Cultures have certain methods for providing health care. These methods of care are often unknown to nurses from other cultures (Leininger, 1978).

THINK ABOUT IT

Transcultural Nursing

In 1978, Dr. Madeleine Leininger, the originator of the concept of transcultural nursing, stated that nursing is caring, and the core of transcultural nursing is caring for people from diverse cultural contexts. What is your immediate response when reading this statement? Do you think this statement is as applicable today as when Leininger first made it?

Due to rapid globalization, every nurse must have an understanding of human conditions in diverse societies. Nurses do not need to travel to foreign countries to engage in international nursing. Nurses encounter cultural diversity everywhere—from inner city hospitals to suburban clinics, from technologically sophisticated institutions to homes in rural, inner city, and suburban areas.

Cultural Competence

Community, social and kinship ties, religion, language, food, and cultural perceptions of illness are all areas that need to be considered by the nurse when working with culturally diverse clients. Cultural diversity chal-



Figure 16-6 The relationship between this nurse and client is based on a mutual acceptance of each other's cultural viewpoints. In your interactions with clients, what factors or cultural phenomena would you explore to ensure acknowledgment of the client's cultural beliefs and values?

lenges nurses to bridge cultural gaps with clients by providing culturally relevant care. An understanding of the client's cultural context permits nurses to become familiar with the client as a person instead of focusing only on the illness or problem.

Cultural competence is the process through which the nurse provides care that is appropriate to the client's cultural context. Culturally competent nurses are those who demonstrate knowledge and understanding of the client's culture; accept and respect cultural differences; and adapt care to be congruent with the client's culture (Purnell & Paulanka, 1998). Culturally competent nurses have knowledge about cultural values related to health and illness. Also, nurses who provide care in a culturally sensitive manner are flexible in their approaches and thinking. Campinha-Bacote (1999) defines five elements of cultural competence; see Table 16-6 for an explanation of each element.

CULTURAL COMPETENCE AND NURSING PROCESS

Cultural sensitivity is requisite in every phase of the nursing process. The nurse's role in providing culturally competent care includes performing a cultural assessment, formulating nursing diagnoses, identifying expected client outcomes, planning care to assist clients in achieving the expected outcomes, intervening to address the client's nursing diagnoses, and evaluating the plan of care. In its *Guide to Nurses for Providing Culturally Sensitive Care*, the College of Nurses of Ontario (1991) identifies four elements of providing culturally sensitive care:

TABLE 16-6
Elements of Cultural Competence

Element	Definition
Cultural Awareness	A cognitive process in which the nurse becomes aware of and sensitive to the client's cultural values, beliefs, and practices
Cultural Knowledge	The nurse seeks a sound educational base about different cultures.
Cultural Skill	The nurse's ability to perform a culturally specific assessment (i.e., physical and psychosocial)
Cultural Encounters	The nurse interacts with clients from diverse cultural backgrounds.
Cultural Desire	The nurse's motivation ("want to") to become culturally competent

(Data from Campinha-Bacote, J. [1999]. A model and instrument for addressing cultural competence in health care. *Journal of Nursing Education*, 38[5], 204–205.)

RESEARCH FOCUS

Title of Study

“Preparing Culturally Competent Practitioners”

Authors

St. Clair, A., & McKenry, L.

Purpose

To evaluate whether international student nursing clinical experiences could change student’s ethnocentricism, cultural sensitivity, and cultural self-efficacy.

Methods

This exploratory study examined the relationship among cultural immersion, cultural self-efficacy, and cultural competence by using a triangulated research design. The study involved 10 different groups of students who volunteered to participate in international nursing experiences. The study was conducted during a 2-year time frame.

Findings

Quantitative analysis found statistically significant differences in the achievement of cultural self-efficacy for the students who completed international nursing clinical experiences as compared to the students who remained in the United States.

Implications

Short-term clinical cultural immersion experiences help move nursing students toward a greater understanding and achievement of cultural competence.

St. Clair, A., & McKenry, L. (1999). Preparing culturally competent practitioners. *Journal of Nursing Education*, 39(5), 228–234.

THINK ABOUT IT

Cultural Assessment

With every client, take time, listen carefully, and convey warmth, openness, and honesty when collecting information.

self-reflection, facilitating client choice, gaining cultural knowledge, and effective communication. These four elements permeate the nursing process.

Assessment

Caring for a client from a different culture can be challenging to the nurse. Using the client’s strengths and

respecting the client’s values are essential components of effective nursing care. To begin providing culturally competent care, the nurse should use questions to gather information about the client’s cultural background. The factors pertinent to cultural assessment are listed in the accompanying display.

CULTURAL ASSESSMENT FACTORS

- Client’s ethnic heritage
- Family role and function
- Religious practices
- Food preferences
- Native language
- Social networks
- Educational experiences (formal and informal)
- Health care beliefs
- Family patterns of health care

The questions in the Cultural Assessment Interview Guide, shown in Figure 16-7, can either be incorporated into a general nursing assessment tool or used separately as a cultural assessment tool.

Nursing Diagnosis

Diagnoses approved by the North American Nursing Diagnosis Association (NANDA, 2001) are used extensively by nurses. However, one stated disadvantage to NANDA diagnostic statements is that sometimes the diagnoses are worded in ways that result in cultural bias (Luckmann, 2000). The accompanying display lists some diagnoses that may be culturally biased.

NURSING DIAGNOSES THAT MAY BE CULTURALLY BIASED

- Noncompliance
- Impaired verbal communication
- Impaired social interaction
- Deficient knowledge
- Disturbed thought processes
- Powerlessness

Consider the following examples of ways in which these diagnoses may be used in a culturally inappropriate manner:

- Applying the diagnosis *impaired verbal communication* to clients who speak a language different from the nurse
- Using the diagnosis *noncompliance* with a client who rejects a prescribed treatment method in order to adhere to their culturally sanctioned folk healing methods

Cultural Assessment Interview Guide

Name: _____

Nickname or other names or special meaning attributed to your name: _____

Primary language:

When speaking _____

When writing _____

Date of birth: _____

Place of birth: _____

Educational level or specialized training: _____

To which ethnic group do you belong? _____

To what extent do you identify with your cultural group? _____

Who is the spokesperson for your family? _____

Describe some of the customs or beliefs that you have about the following:

Health _____

Life _____

Illness _____

Death _____

How do you learn information best?

Reading

Having someone explain verbally

Having someone demonstrate

Describe some of your family's dietary habits and your personal food preferences. _____

Are there any foods forbidden from your diet for religious or cultural reasons? _____

Describe your religious affiliation. _____

What role do your religious beliefs and practices play in your life during times of good health and bad health? _____

Whom do you rely on for health care services or healing and what type of cultural health practices have you been exposed to? _____

Are there any sanctions or restrictions in your culture that the person taking care of you should know? _____

Describe your current living arrangements. _____

How do members of your family communicate with each other? _____

Describe your strengths. _____

Who /what is your primary source of information about your health? _____

Is there anything else that is important about your cultural beliefs that you want to tell me? _____

Figure 16-7 Cultural Assessment Interview Guide

It may be more appropriate to use another term instead of *noncompliant*. Ward-Collins (1998) suggests “nonadherent” by stating that this term may present less of a stigma to clients than “noncompliant.”

Planning and Outcome Identification

Cultural groups are not homogeneous; there are individual variations in personality, behavior, and expectations. It is important not to consider one member of a particular group to be like all the others of that same group.



In order to develop effective plans of care, nurses need to understand the following (American Nurses Association, 1994):

- Cultural groups’ perspectives on life processes (e.g., birth, death)
- Cultural definitions of health and illness
- How cultural groups maintain wellness
- Culture’s perspectives on the causes of illness
- Use of healers in the cure and care of illness
- The influence of the nurse’s cultural background on the delivery of care

It is also necessary to consider how the client’s beliefs may impact the plan of care. Cultural beliefs greatly influence perceptions about health and, therefore, may create barriers to adhering to prescribed treatment plans. Culture influences the following:

- Perceptions of illness versus health
- Responses to illness
- Perceptions about the significance of symptoms
- The types of treatment approaches (i.e., alternative and/or conventional) (Muscari, 1998, p. 27).

Implementation

Caring for culturally diverse clients requires three major nursing interventions: self-awareness, use of a nonjudgmental approach, and client education. Each of these aspects are discussed in the following section. The accompanying display provides guidelines for providing culturally sensitive care for clients at home.

PROVIDING CULTURALLY SENSITIVE NURSING CARE IN THE HOME

- Remember that the setting for care is controlled by the client and family, not by the health care provider.
- The nurse is often viewed as a guest by the client and family. Social chatter may be necessary to facilitate rapport.
- The nurse must be nonjudgmental about the condition of the home (e.g., presence of clutter and disarray).
- Show respect and consideration for the client. For example:
 - Ask permission to use sink or bathroom to wash your hands.
 - Wipe your feet before entering the home.
 - Ask permission before moving client’s belongings and replace items after you have finished the task.
- Take advantage of the home environment to assess cultural values and norms. Cultural clues may include:
 - Orderliness and decor of the home
 - Assignment of family roles and tasks
 - Types of interactions among family members
 - Value placed on privacy
 - Value placed on possessions

Self-Awareness

In an increasingly diverse society, the nurse must be aware of the potential for bias or misunderstanding. Self-awareness can be used to help nurses recognize their own stereotypes, biases, and prejudgments about clients who are culturally different. Further experience, introspection, and study empower nurses to appreciate their own cultures and the strengths of other cultures.

Nonjudgmental Approach

A nonjudgmental attitude is essential in the provision of culturally sensitive care. When caring in a manner sensitive to the client’s cultural background, the nurse enables the client to offer open, honest feedback, to disagree, or to discuss real or perceived problems. A health care partnership is the outcome of this approach. “A key component of successful interactions with culturally diverse patients is to avoid using stereotypical, judgmental words” (Ward-Collins, 1998, p. 30).

Client Education

Educating clients is an integral part of nursing practice. Education must be relevant not only to the client’s needs but also must be provided in a culturally sensitive manner. Lester (1998) states “you need to present the

**CLIENT TEACHING CHECKLIST***Culturally Sensitive Teaching Guidelines*

When caring for clients from diverse cultures, the nurse should consider the following guidelines for client teaching.

1. Assess and incorporate family history of health care:
 - Fluency in English
 - Extent of family support or disintegration of family
 - Community resources
 - Level of education
 - Change of social status as a result of coming to this country
2. Affirm client strengths and potential for growth.
3. Recognize informal caregivers (family members and significant others) as an integral part of treatment.
4. Evaluate the client's current knowledge base by asking the client to state what he or she knows about the specific topic.
5. To ascertain the client's perception of need, ask the client/family what they need/want to learn.
6. Observe the interaction between the client and family to determine family roles and authority figures. Include the dominant family member in your teaching.
7. Use language easily understood by the client.
8. Clarify your verbal and nonverbal messages with the client.
9. Have the client repeat the information taught. If feasible, have the client do a return demonstration of material taught.

information in a way that the patient grabs onto what is important to her. We need to learn how to present teaching so that people can hear it. If people can't hear it, then we will not succeed in what we are trying to teach" (p. 29). See the Client Teaching Checklist for culturally sensitive teaching guidelines.

Evaluation

The final phase of the nursing process, evaluation, is extremely important in determining the client's achievement of expected outcomes and the efficacy of nursing interventions in delivery of culturally sensitive care.

Provision of culturally competent care requires that the nurse view the client as a partner of the health care

team. It is important to demonstrate caring behaviors rather than just tolerating cultural variations in client's behavior. Awareness of cultural similarities and variations allow nurses to accept and appreciate the impact of culture on health care.

KEY CONCEPTS

- Every aspect of a person's life is influenced by one's culture.
- Behavior affecting health is culturally determined.
- Culture is a dynamic structure of behaviors, ideas, attitudes, values, habits, beliefs, customs, languages, rituals, ceremonies, and practices that are unique to a particular group of people. This structure of knowledge, behaviors, and values provides a group with a "blueprint" for behavior.
- Cultural norms are transmitted from one generation to another.
- Ethnicity is described as a sense of belongingness that is shared by other members of that same group. Ethnic groups are usually composed of people with the same racial composition.
- Race refers to a grouping of people based on biologic similarities. Members of a racial group have similar physical characteristics, such as blood type, facial features, and color of skin, hair, and eyes.
- Members of some racial and ethnic groups have experienced oppression in the forms of racism, sexism, and classism.
- The dominant values of the United States include achievement and success; individualism, independence, and self-reliance; activity, work, and ownership; efficiency, practicality, and reliance on technology; material comfort; competition and achievement; and youth and beauty.
- There is great value in cultural diversity, including a broader perspective of others, enhanced problem-solving ability and creativity, and improved productivity in the workplace.
- The six organizing phenomena of culture are communication, space, orientation to time, social organization, environmental control, and biologic variations.
- Transcultural nursing is based on the belief that when nurses view problems from the client's cultural viewpoint, they are more open to understanding and working more effectively with clients from other cultures.
- Understanding and accepting cultural differences and responses to illness are prerequisites for providing quality nursing care.
- The provision of culturally sensitive care is achieved through the use of approaches such as non-judgmental attitudes and self-awareness and tools such as cultural assessment guides and client education strategies.

CRITICAL THINKING ACTIVITIES

1. Spend some time with a person from a culture different from your own. Talk with that person about health care beliefs. What did you learn?
2. Identify some positive and negative stereotypes used to describe groups in your community. What are the nursing implications of such assumptions?
3. What health care services are available to the homeless population in your geographic area? Are any services provided by nurses to people in this vulnerable group?
4. To increase your cultural awareness, ask yourself:
 - To what ethnic group, socioeconomic class, and community do I belong? To what extent do I recognize and understand my own racial/ethnic backgrounds?
 - What are the values of my ethnic group(s)?*
 - What do I know about people from ethnic groups different from my own?
 - What are my assumptions and attitudes about people from other racial/ethnic cultures?
5. To determine your values, answer the following:
 - What is the most important book you have read?
 - Why is it significant to you?
 - Which is more important, your health or your appearance? State the approximate amount of time you spend each day attending to your appearance. Approximately how much time do you spend daily on personal health promotion activities?
 - State three qualities of a “good” nurse.

* Sometimes, an individual may be a descendent of a variety of racial/ethnic cultures.

WEB RESOURCES

- American Nurses Association
www.ana.org
- American Psychiatric Nurses Association
www.apna.org
- National Black Nurses' Association
www.nbna.org
- Owl Star, Native American News & Culture
www.owlstar.com
- Transcultural Nursing Society
www.tcns.org

The Life Cycle



The strongest principle of growth lies in human choice.

—George Eliot (in Herrmann, 1990)

COMPETENCIES

1. Discuss the basic principles of growth and development.
2. Identify the factors that influence growth and development.
3. Compare the major developmental theories.
4. Discuss the importance of development as a holistic framework for assessing and promoting health.
5. Identify the critical milestones for each developmental stage.
6. Describe the specific nursing interventions that are relevant to each developmental stage.

KEY
TERMS

accommodation	fixation	phenylketonuria
adaptation	germinal stage	preadolescence
adolescence	growth	prenatal period
anorexia nervosa	infancy	preschool stage
assimilation	intrapsychic theory	puberty
bonding	learning	school-age period
bulimia	maturation	self-concept
critical period	menarche	spirituality
development	middle adulthood	teratogenic substance
developmental tasks	moral maturity	toddler
embryonic stage	neonatal period	young adulthood
fetal alcohol syndrome	obesity	
fetal stage	older adulthood	

From conception to death, individuals are constantly changing. Physical growth, psychological development, emotional maturation, cognitive development, moral development, and spiritual growth occur throughout life. Progression through each developmental stage influences health status. A thorough understanding of developmental concepts is essential for professional quality nursing practice. This chapter discusses the changes occurring in each stage of the life cycle.

FUNDAMENTAL CONCEPTS OF GROWTH AND DEVELOPMENT

Development occurs continuously through the life span. Adults continue to have transition periods during which growth and development occur.

Growth is the quantitative (measurable) changes in physical size of the body and its parts, such as increases in cells, tissues, structures, and systems. Examples of growth are physical changes in height, weight, bone density, and dental structure. Even though growth is not a steady process through the life cycle, growth patterns can be predicted. Variations in growth, such as rapid increases contrasted with slower rates of physical change, occur with each individual. Rapid growth is most common in the prenatal, infant, and adolescent stages. **Development** refers to behavioral changes in functional abilities and skills. Thus, developmental changes are qualitative, that is, not easily measured. **Maturation** is the process of becoming fully grown and developed and involves physiological and behavioral aspects of an individual. Maturation depends on biological growth, functional changes, and **learning** (assimilation of information with a resultant change in behavior). During each developmental stage of the life cycle, certain goals (**developmental tasks**) must be achieved. These developmental tasks set the stage for future learning and adaptation.

The **critical period** is the time of the most rapid growth or development in a particular stage of the life cycle. During these critical periods, an individual is most vulnerable to stressors of any type.

Growth, development, maturation, and learning are interdependent processes. For learning to occur, the individual must be mature enough to grasp the concepts and make required behavioral changes. Cognitive maturation precedes learning. Physical growth is also a prerequisite for many types of learning; for example, a child must have the physical ability to control the anal sphincter before toilet training skills are learned.

Principles of Growth and Development

All persons have individual talents and abilities that contribute to their development as unique entities. *There are no absolute rules in predicting the exact rate of development for an individual.* However, some general principles relate to the growth and development of all humans (Table 17-1).

The sequence of development is predictable even though the emergence of specific skills varies with each person. For example, not all infants roll over at the same age, but most roll over before they crawl.

Factors Influencing Growth and Development

Multiple factors such as heredity, life experiences, health status, and cultural expectations influence a person's growth and development. The interaction of these factors greatly influences how an individual responds to everyday situations; the choices a person makes regarding health behaviors are also greatly determined by these factors.

Heredity

A complex series of processes transmits genetic information from parents to children. The genetic composition of an individual determines physical characteristics

TABLE 17-1
Principles of Growth and Development

Principle	Example/Description
Development occurs in cephalocaudal (head-to-toe) direction.	An infant raises his head before sitting up.
Development occurs in a proximodistal manner.	The infant is able to move his arms before picking up objects with hands and fingers. Functions closer to the midline (proximal) of the body develop before functions farther away from the body's midline (distal).
Development occurs in an orderly manner from simple to complex and from the general to the specific.	An infant crawls before walking. A child holds a crayon with the entire hand before being able to grasp it between thumb and finger. Gross motor control is achieved before fine motor coordination.
The pattern of growth and development is continuous, orderly, and predictable. However, growth and development do not proceed at a consistent rate.	Periods of rapid growth (similar to growth spurts of adolescence) alternate with periods of slower growth (as seen in middle adulthood).
All individuals go through the same developmental processes.	Individual differences occur but the process is consistent.
Every person proceeds through stages of growth and development at an individual rate.	A child who grows more slowly may be shorter than other children of the same age.
Every stage of development has specific characteristics.	An infant is dependent on others for physical and emotional survival. Adolescence is characterized by a search for identity.
Each stage of development has certain tasks to be achieved or acquired during that specific time. Tasks of one developmental stage become the foundation for tasks in subsequent stages.	An infant must master the psychological task of developing trust in order to mature as an adolescent who can establish a separate identity.
Some stages of growth and development are more critical than others.	The first trimester of pregnancy is a critical time for fetal development. During this critical phase, the developing human is most vulnerable to damage from toxins (e.g., drugs, chemicals, viruses).

THINK ABOUT IT

Nature or Nurture?

What determines a person's behavior—heredity or environment? This “nature versus nurture” issue remains a controversy today. What do you think is most important in determining a person's behavior: an individual's genetic predisposition or the response of other people and socialization? This question has no simple answers. As you continue to develop in your professional role, keep an open mind regarding the factors influencing behavior.

such as skin color, hair texture, facial features, body structure, as well as a predisposition to certain diseases (i.e., Tay-Sachs, sickle cell anemia). Heredity is a genetic blueprint from which an individual grows and develops; it determines to a great extent the rate of physical and mental development.

Life Experiences

A person's experiences can also influence the rate of growth and development. For example, contrast the differences in physical growth rates between a child whose family can afford food, shelter, and health care and a child whose family has little, if any, resources. The child who is poor has a higher risk of experiencing physical and mental lags in growth and development.

Another example of the influence of life experiences, is an elderly person who is enjoying retirement, has an adequate income, and an active support system. If this individual had an impairment in any of these variables, psychological development would likely be affected in a negative way.

Health Status

Individuals experiencing wellness are progressing normally along the life cycle. However, illness or disability

can interfere with the achievement of developmental milestones. Individuals with chronic conditions will often meet developmental milestones but with a time delay.

Cultural Expectations

Society expects people to master certain skills in each developmental period. The age at which an individual masters a particular task is determined in part by culture. For example, the time for mastery of toilet training is greatly influenced by cultural norms.

The following are examples of how societal expectations can either promote or hinder one's growth and development:

- A child who grows up in an economically deprived home may receive inadequate food, shelter, emotional nurturing, or intellectual stimulation with resultant impairments in physical, psychosocial, and cognitive development.
- A woman may not be expected to fully use her intellectual abilities, thus she has altered cognitive development.
- A man may be discouraged from showing tenderness and nurturing behaviors; such discouragement results in dysfunctional psychosocial development.

THINK ABOUT IT

Stereotyping

Consider how people are stereotyped today. Our society labels certain characteristics as “masculine” or “feminine.” How do you think these stereotypes influence the development of young boys and girls in our society?

THEORETICAL PERSPECTIVES OF HUMAN DEVELOPMENT

Nurses must have a thorough understanding of human growth and development in order to provide individualized care. Remember that chronological age and developmental age are not synonymous. An overview of the major developmental theories is presented below. These theories are discussed more fully in the specific sections about each developmental period.

Physiological Dimension

Physiological growth (physical size and functioning) of an individual is influenced primarily by interaction of genetic predisposition, the central nervous system (CNS), the endocrine system, and maturation. The role of heredity in human development is complex and not

yet fully understood. Genetics is the foundation for achievement of specific tasks. Factors such as the psychosocial environment and health status help individuals live up to their genetic potential.

Psychosocial Dimension

The psychosocial dimension of growth and development consists of subjective feelings and interpersonal relationships. A favorable **self-concept** (view of one's self, including body image, self-esteem, and ideal self) is likely the most important key to a person's success and happiness. Following are characteristics of an individual with a positive self-concept:

- Self-confidence
- Willingness to take risks
- Ability to receive criticism without defensiveness
- Ability to adapt effectively to stressors
- Innovative problem-solving skills

People with a healthy self-concept believe in themselves; as a result, they set goals that can be achieved. The goal achievement reinforces the positive belief about one's self. Figure 17-1 illustrates this positive cycle of self-fulfilling beliefs and actions. See Chapter 19 for a complete discussion about self-concept.

A person with a positive self-concept is likely to engage in health-promoting activities. For example, a person who values self is more likely to change unhealthy habits (such as smoking and sedentary lifestyle) to promote health. There are many different psychosocial theories that explain the development of self-concept. This chapter presents the intrapsychic and interpersonal models of personality development.

Intrapsychic Theory

Intrapsychic theory (also called psychodynamic) focuses on an individual's unconscious processes. Feelings, needs, conflicts, and drives are considered to be motivators of behavior, learning, and development. Sigmund Freud and Erik Erikson are two major intrapsychic theorists.

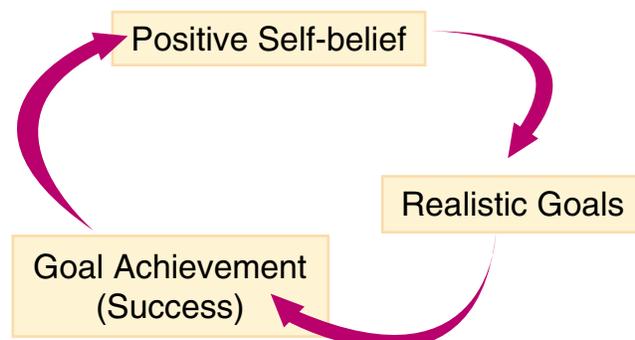


Figure 17-1 Self-Fulfilling Cycle in Positive Self-Concept

Freud's theories, developed in the early 1930s, continue to influence current concepts related to human development. A basic belief of the Freudian model is that *all behavior has some meaning*.

According to Freud (1961), to mature, a person must successfully travel through five stages of development (Table 17-2). In each stage, there is a task to be mastered; if the task is not achieved, the individual is halted (develops a fixation) at this stage. A **fixation** is characterized as either inadequate mastery or failure to achieve a developmental task. A fixation in earlier stages inhibits healthy progression through subsequent stages.

Erikson (1968) expanded Freud's concept of developmental stages by theorizing that psychosocial development is a lifelong process that does not end with the cessation of adolescence. Just as physical growth patterns can be predicted, certain psychosocial tasks must be mastered in each developmental stage. Erikson's model proposes that psychosocial development is a series of conflicts that can have favorable or unfavorable outcomes. These conflicts occur in eight developmental stages of life that are described in Table 17-3.

Havighurst (1972) theorized that there are six developmental stages of life, each with essential tasks to be achieved. Mastery of a task in one developmental stage is essential for mastery of tasks in subsequent stages. When a task in one stage is mastered, it is learned for life, independent of subsequent neurological change (which may occur with disease or injury). Table 17-4 presents Havighurst's developmental stages with the associated tasks.

Levinson (1978) studied men to determine developmental phases of young and middle adulthood. As a result of Levinson's research, five "seasons" or "eras" (phases) were identified (see the accompanying display). The midlife transition, which begins at approximately age 40, includes examining and structuring one's life to one's own satisfaction (Edelman & Mandle, 1997).

Interpersonal Theory

Harry Stack Sullivan theorized that relationships with others influence how one's personality develops. Approval and disapproval from significant others shape the formation of one's personality. To form satisfying relationships with others, an individual must complete six stages of development, which are shown in Table 17-5.

Cognitive Dimension

The cognitive dimension is characterized by the intellectual process of knowing, which includes perception, memory, and judgment, and develops as an individual

LEVINSON'S SEASONS OF ADULTHOOD

Age	Season (Phase)	Characteristics
18–20 years	Early adult transition	Seeks independence by separating from family
21–27 years	Entrance into the adult world	Experiments with different careers and lifestyles
28–32 years	Transition	Makes lifestyle adjustments
33–39 years	Settling down	Experiences greater stability
45–65 years	Pay-off years	Is self-directed and engages in self-evaluation

(Data from Levinson, D. [1978]. *The seasons of a man's life*. New York: Knopf.)

TABLE 17-2
Freud's Stages of Psychosexual Development

Stage	Age	Description
Oral	Birth to 18 months	Management of anxiety by using mouth and tongue
Anal	18 months to 3 years	Control of muscles, especially those controlling urination and defecation
Phallic ("Oedipal")	3–6 years	Awareness of sex and genitalia
Latency	6–12 years	Exhibition of latent sexual development and energy
Genital	12 years to adulthood	Emergence of sexual interests and development of relationships with potential sexual partners

(Data from Freud, S. [1961]. *Civilization and its discontents*. New York: Norton.)

TABLE 17-3
Erikson's Stages of Psychosocial Development

Stage	Age	Task to be Achieved	Implications
Trust vs. Mistrust	Birth to 18 months	Develop a sense of trust in others	Consistent, affectionate care promotes successful mastery. Inadequate, inconsistent care produces an unfavorable outcome at this stage.
Autonomy vs. Shame and doubt	18 months to 3 years	Learn self-control	The child needs support, praise, and encouragement to use newly acquired skills of independence. Shaming or insulting the child will lead to unnecessary dependence.
Initiative vs. Guilt	3–6 years	Initiate spontaneous activities	Give clear explanations for events and encourage creative activities. Threatening punishment or labeling behavior as “bad” leads to development of guilt and fears of doing wrong.
Industry vs. Inferiority	6–12 years	Develop necessary social skills	To build confidence, recognize the child's accomplishments. Unrealistic expectation or excessively harsh criticism leads to a sense of inadequacy.
Identity vs. Role diffusion	12–20 years	Integrate childhood experiences into a personal identity	Help the adolescent make decisions. Encourage active participation in home events. Assist with planning for the future.
Intimacy vs. Isolation	18–25 years	Develop commitments to others and to a life work (career)	Teach the young adult to establish realistic goals. Avoid ridiculing romances or job choices.
Generativity vs. Stagnation	21–45 years	Establish a family and become productive	Provide emotional support. Recognize individual accomplishments and provide appropriate praise.
Integrity vs. Despair	45+ years	View one's life as meaningful and fulfilling	Explore positive aspects of one's life. Review contributions made by the individual.

(Data from Erikson, E. [1968]. *Childhood and society*. New York: Norton; Varcacolis, E. & Rader, I. (1998). *Foundations of mental health psychiatric nursing* (3rd ed.). Philadelphia: Saunders.)

progresses through the life span. Intelligence is an adaptive process. Individuals use intelligence to adapt by changing the environment to meet their needs and by altering their responses to environmental stressors. The ability to change behavior in response to the demands of an ever-changing environment is characteristic of intelligent beings.

Jean Piaget (1963) studied the differences between children's thinking patterns at different ages and how intelligence is used to solve problems and answer questions. He theorized that children learn to think by playing. Four factors are catalysts to intellectual development:

1. Maturation of the endocrine and nervous systems
2. Action-centered experience that leads to discovery (“learning by doing”)

3. Social interaction with opportunities for receiving feedback
4. A self-regulating mechanism that responds to environmental stimuli (Murray & Zentner, 1997)

Piaget and Inhelder (1969) categorized intellectual development into four phases: sensorimotor, preoperational, concrete operations, and formal operations. Table 17-6 provides a description of each phase. Each phase is characterized by the ways in which the child interprets and uses the environment. Approximate ages are indicated for each phase, but there is great variation among individuals.

The individual learns by interacting with the environment through three processes: assimilation, accommoda-

TABLE 17-4
Havighurst's Developmental Stages and Tasks

Developmental Stage	Developmental Task
Infancy and Early Childhood	<ul style="list-style-type: none"> Eat solid foods Walk Talk Control elimination of wastes Relate emotionally to others Distinguish right from wrong through development of a conscience Learn sex differences and sexual modesty Achieve psychological stability Form simple concepts of social and physical reality
Middle Childhood	<ul style="list-style-type: none"> Learn physical skills required for games Build healthy attitudes toward oneself Learn to socialize with peers Learn appropriate masculine or feminine role Gain basic reading, writing, and mathematical skills Develop concepts necessary for everyday living Formulate a conscience based on a value system Achieve personal independence Develop attitudes toward social groups and institutions
Adolescence	<ul style="list-style-type: none"> Establish more mature relationships with same-age individuals of both sexes Achieve a masculine or feminine social role Accept own body Establish emotional independence from parents Achieve assurance of economic independence Prepare for an occupation Prepare for marriage and establishment of a family Acquire skills necessary to fulfill civic responsibilities Develop a set of values that guides behavior
Early Adulthood	<ul style="list-style-type: none"> Select a partner Learn to live with a partner Start a family Manage a home Establish self in a career/occupation Assume civic responsibility Become a part of a social group
Middle Adulthood	<ul style="list-style-type: none"> Fulfill civic and social responsibilities Maintain an economic standard of living Assist adolescent children to become responsible, happy adults Relate to one's partner Adjust to physiological changes Adjust to aging parents
Later Maturity	<ul style="list-style-type: none"> Adjust to physiological changes and alterations in health status Adjust to retirement and altered income Adjust to death of spouse Develop affiliation with one's age group Meet civic and social responsibilities Establish satisfactory living arrangements

(Data from Havighurst, R. J. [1972]. *Developmental tasks and education*. New York: Longman.)

TABLE 17-5
Sullivan's Interpersonal Model of Personality Development

Stage	Age	Description
Infancy	Birth to 18 months	Infant learns to rely on caregivers to meet needs and desires.
Childhood	18 months to 6 years	Child begins learning to delay immediate need for gratification of needs and desires.
Juvenile	6–9 years	Child forms fulfilling peer relationships.
Preadolescence	9–12 years	Child relates successfully to same-sex peers.
Early adolescence	12–14 years	Adolescent learns to be independent and forms relationships with members of opposite sex.
Late adolescence	14–21 years	Person establishes an intimate, long-lasting relationship with someone of the opposite sex.

(Data from Sullivan, H. S. [1953]. *Interpersonal theory of psychiatry*. New York: Norton.)

TABLE 17-6
Piaget's Phases of Cognitive Development

Phase	Age	Description
Sensorimotor	Birth to 2 years	Sensory organs and muscles become more functional.
Stage 1: Use of reflexes	Birth to 1 month	Movements are primarily reflexive.
Stage 2: Primary circular reaction	1–4 months	Perceptions center around one's body. Objects are perceived as extensions of the self.
Stage 3: Secondary circular reaction	4–8 months	Becomes aware of external environment. Initiates acts to change the environment.
Stage 4: Coordination of secondary schemata	8–12 months	Differentiates goals and goal-directed activities.
Stage 5: Tertiary circular reaction	12–18 months	Experiments with methods to reach goals. Develops rituals that become significant.
Stage 6: Invention of new means	18–24 months	Uses mental imagery to understand the environment. Uses fantasy ("make-believe").
Preoperational	2–7 years	Emerging ability to think.
Preconceptual stage	2–4 years	Thinking tends to be egocentric. Exhibits use of symbolism.
Intuitive stage	4–7 years	Unable to break down a whole into separate parts. Able to classify objects according to one trait.
Concrete Operations	7–11 years	Learns to reason about events in the here-and-now.
Formal Operations	11+ years	Able to see relationships and to reason in the abstract.

(Data from Piaget, J. [1963]. *The origins of intelligence in children*. New York: Norton.)

tion, and adaptation. **Assimilation** is the process of taking in new experiences or information. **Accommodation** allows for readjustment of the cognitive structure (mind-set) to take in the new information; thus, understanding is increased. **Adaptation** refers to the changes that occur as a result of assimilation and accommodation (Murray & Zentner, 1997).

Moral Dimension

The moral dimension consists of a person's value system that helps in differentiating right and wrong. **Moral maturity** (the ability to independently decide for oneself what is "right") is closely related to emotional and cognitive development. Lawrence Kohlberg (1977) estab-

lished a framework for understanding how individuals determine a moral code to guide their behavior. Kohlberg's model states that a person's ability to make moral judgments and behave in a morally correct manner develops over a period of time.

There are six stages of moral development. Each stage is built on the previous stage and becomes the foundation for successive stages. Moral development progresses in relationship to cognitive development. Individuals who are able to think at higher levels have the necessary reasoning skills on which to base moral decisions. Table 17-7 provides an overview of Kohlberg's stages of moral development. Kohlberg stated that individuals move through the six stages in a sequential fashion; however, not every-

one reaches stages 5 and 6 in their development of personal morality (Kohlberg, 1977).

Gilligan's theory of moral development is based on research that studied women. Women tend to describe moral issues in the context of human relationships and seek to avoid hurting others (Gilligan, 1982). Women's moral judgment revolves around three basic issues: a concern with survival, a focus on goodness, and an understanding of others' need for care (Gilligan & Attanucci, 1988). Table 17-8 provides an overview of Gilligan's theory.

Spiritual Dimension

The spiritual dimension is characterized by a sense of personal meaning. **Spirituality** refers to relationships with one's self, with others, and with a higher power or divine source. Spirituality does not refer to a specific religious affiliation; rather, it can be defined as the core of a person. Development of spirituality is an ongoing, lifelong process.

Fowler's theory of spiritual development was influenced by the works of Erikson, Piaget, and Kohlberg. Fowler's theory is composed of a pre-stage and six distinct stages of faith development (Fowler, 1981). Even though individuals will vary in the age at which they experience each stage, the sequence of stages remains the same. Table 17-9 describes Fowler's theory.

THINK ABOUT IT

Spiritual Awareness

The term *spirit* is derived from the Latin word meaning breath, air, and wind. Thus, *spirit* refers to whatever gives life to a person. What animates you? What is the core of your spirituality (life force)? The answers to these questions are truly individual. Remember that each client has a personalized definition of spiritual self, even though some clients seem to be unaware of their spiritual nature.

TABLE 17-7
Kohlberg's Stages of Moral Development

Level and Stage	Description
Level I: Preconventional (Birth to 9 years) <i>Stage 1: Punishment and obedience orientation</i> <i>Stage 2: Instrumental-relativist orientation</i>	Authority figures are obeyed. Misbehavior is viewed in terms of damage done. A deed is perceived as "wrong" if one is punished; the activity is "right" if one is not punished. "Right" is defined as that which is acceptable to and approved by the self. When actions satisfy one's needs, they are "right."
Level II: Conventional (9–13 years) <i>Stage 3: Interpersonal concordance</i> <i>Stage 4: Law and order orientation</i>	Cordial interpersonal relationships are maintained. Approval of others is sought through one's actions. Authority is respected. Individual feels "duty bound" to maintain social order. Behavior is "right" when it conforms to the rules.
Level III: Postconventional (13+ years) <i>Stage 5: Social contract orientation</i> <i>Stage 6: Universal ethics orientation</i>	Individual understands the morality of having democratically established laws. It is "wrong" to violate others' rights. The person understands the principles of human rights and personal conscience. Person believes that trust is basis for relationships.

(Data from Kohlberg, L. [1977]. *Recent research in moral development*. New York: Holt, Rinehart, & Winston.)

TABLE 17-8
Gilligan's Theory of Moral Development

Level	Characteristics
I. Orientation of Individual Survival Transition	Concentrates on what is best for self Selfish Dependent on others
Transition 1: From Selfishness to Responsibility	Recognizes connections to others Makes responsible choices in terms of self and others
II. Goodness as Self-Sacrifice	Puts needs of others ahead of own Feels responsible for others Is dependent May use guilt to manipulate others when attempting to “help”
Transition 2: From Goodness to Truth	Decisions based on intentions and consequences, not on others' responses Considers needs of self and others Wants to help others while being responsible to self Increased social participation
III. Morality of Nonviolence	Sees self and others as morally equal Assumes responsibilities for own decisions Basic tenet to hurt no one including self Conflict between selfishness and selflessness Self-judgment is not dependent on others' perceptions but rather on consequences and intentions of actions

(Data from Gilligan, C., & Attanucci, D. [1988]. Two moral orientations: Gender differences and similarities. *Merrill-Palmer Quarterly*, 34 [3], 332–333; Gilligan, C. [1982]. *In a different voice: Psychologic theory and women's development*. Cambridge, MA: Harvard University Press.)

TABLE 17-9
Fowler's Stages of Faith

Stage	Age	Characteristics
Pre-Stage: <i>Undifferentiated faith</i>	Infant	Trust, hope, and love compete with environmental inconsistencies or threats of abandonment
Stage 1: <i>Intuitive-projective faith</i>	Toddler-preschooler	Imitates parental behaviors and attitudes about religion and spirituality Has no real understanding of spiritual concepts
Stage 2: <i>Mythical-literal faith</i>	School-aged child	Accepts existence of a deity Religious and moral beliefs are symbolized by stories Appreciates others' viewpoints Accepts concept of reciprocal fairness
Stage 3: <i>Synthetic-conventional faith</i>	Adolescent	Questions values and religious beliefs in an attempt to form own identity
Stage 4: <i>Individuative-reflective faith</i>	Late adolescent and young adult	Assumes responsibility for own attitudes and beliefs
Stage 5: <i>Conjunctive faith</i>	Adult	Integrates other perspectives about faith into own definition of truth
Stage 6: <i>Universalizing faith</i>	Adult	Makes concepts of love and justice tangible

(Data from Fowler, J. W. [1981]. *Stages of faith: The psychology of human development and the quest for meaning*. New York: Harper & Row; Johnson, B. S. [1996]. *Psychiatric-mental health nursing: Adaptation and growth* [4th ed.]. Philadelphia: Lippincott.)

HOLISTIC FRAMEWORK FOR NURSING

Providing care to the whole person is a basic concept of professional nurses. Knowledge of growth and development concepts are essential for nurses because nursing interventions must be appropriate to each client's developmental stage. Nursing's holistic perspective recognizes the progression of individual development across the life span. Developmental progress, or lack of progress, in one aspect affects all other dimensions of life. Figure 17-2 shows the holistic nature of individuals.

Growth and development theories are useful to nurses as assessment parameters. Alterations in expected patterns are indicators for early intervention. Listed below are situations in which knowledge of developmental milestones is essential for prompt identification of problems and comprehensive intervention:

- The infant who does not sit, crawl, or walk at expected times
- The adolescent girl who has not experienced menarche at the expected time
- The adult who has failed to develop adequate problem-solving skills

STAGES OF THE LIFE CYCLE

For purposes of this discussion, eleven developmental stages are presented: prenatal period, neonate, infant, toddler, preschooler, school-age child, preadolescent, adolescent, young adult, middle adult, and older adult. For each stage, the manifestations of growth and devel-

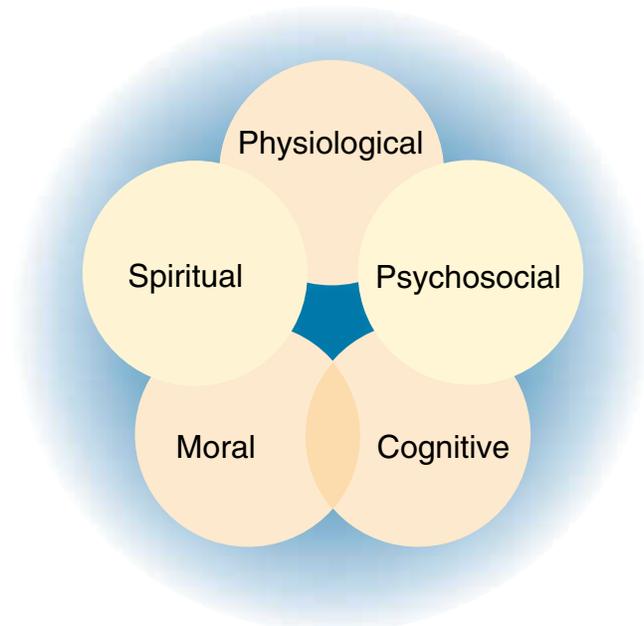


Figure 17-2 Holistic Nature of Human Beings

opment in the physiological, psychosocial, cognitive, moral, and spiritual dimensions are discussed with the relevant nursing implications.

Prenatal Period

The **prenatal period** (the developmental stage beginning with conception and ending with birth) is a critical time in a human being's development and consists of three developmental phases: the germinal, embryonic, and fetal stages. The **germinal stage** begins with conception and lasts approximately 10 to 14 days. This stage is characterized by rapid cell division and implantation of the fertilized egg in the uterine wall. In this very early stage, the CNS is already beginning to form.

The **embryonic stage** (the first 2 to 8 weeks after fertilization of an egg by a sperm) is characterized by rapid cellular differentiation, growth, and development of the body systems. This critical period is when the embryo is most vulnerable to noxious stimuli, which may lead to a spontaneous abortion (miscarriage) (Murray & Zentner, 1997).

The **fetal stage** (the intrauterine developmental period from 8 weeks to birth) is characterized by rapid growth and differentiation of body systems and parts. Table 17-10 provides an overview of fetal development.

Nursing Implications

The pregnant woman needs to have physical examinations and screenings during the entire pregnancy. Early prenatal care is essential for a positive pregnancy outcome.

Learning that one is pregnant is accompanied by several emotions: happiness, fear, sadness, excitement, and anxiety. Emotions lead to alterations in biochemicals; therefore, the mother's emotional state can bring about biochemical changes in the fetus. By teaching pregnant women how to relax, the nurse can promote a supportive environment for the developing embryo and fetus.

Wellness Promotion

The uterus is the primary environment affecting prenatal growth and development. Ideally, this environment nurtures positive growth of the embryo and fetus.

An ample supply of nutrients must be provided by the gestating woman. Women who consume insufficient

THINK ABOUT IT

Nutrition and Pregnancy

Do you think it is the responsibility of the federal government to ensure that pregnant women have adequate diets? What would happen if nutritional programs for pregnant women were abolished?

TABLE 17-10
Embryo and Fetus: Growth and Development

Age	Characteristics
Weeks 1–3	Rapid cell differentiation Heart starts to pulsate CNS formation Presence of all organs
Week 4	Beginnings of respiratory system Basic structures for eyes and ears Limb buds distinguishable
Week 5	Embryo has a C-shaped body with a tail and large head Each body system present in at least a rudimentary form Umbilical cord developed Brain vesicles developed Nerve tissues more fully developed
Week 6	Establishment of circulatory pathway (including heart with septa) Limbs distinguishable as arms and legs Intestine elongating Lungs formed, with bronchi beginning to branch out Liver begins production of blood cells
Week 9	Fingers, toes, eyelids, nose, and jaw evident
Week 12	Body growth speeds up while growth of head slows
Week 16	Ossification of skeleton begins Fingers and toes separated
Week 20	Fetal movement felt by mother Wake and sleep cycles evident Formation of small amounts of body fat
Week 24	Circulation of blood in vessels is visible Accelerated weight gain Ovaries/testes developed Kidney tubules branch out Brain grows rapidly
Week 28	Eyes open and close Thick hair on head Lanugo (thick coating of body hair) is present Rhythmic breathing patterns begin to be established
Week 32	Maturation of respiratory system and temperature-regulating mechanism Fat deposited in arms and legs Fingernails and toenails present
Week 36	Protrusion of mammary glands in both sexes Lack of melanin leads to white skin in all fetuses at this stage
Week 40	Completion of fetal development Fetus is ready for extrauterine environment Optimal time for birth

(Data from Guyton, A. C., & Hall, J. [1995]. *Textbook of medical physiology* [9th ed.]. Philadelphia: Saunders; Wong, D. L. [1999]. *Whaley & Wong's nursing care of infants and children* [6th ed.]. St. Louis: Mosby-Yearbook.)

amounts of protein during pregnancy have a high rate of giving birth to premature and low birth weight infants. Such infants are at risk for developmental alterations.

When teaching the pregnant woman about nutrition, the nurse must emphasize that vitamin supplements are *not* to be substituted for adequate intake of food. Other nursing interventions that promote prenatal health include:

- Screening (blood pressure measurement, urine sugar analysis)
- Teaching (nutritional guidelines)
- Counseling (e.g., guidance about bonding with the child and incorporating a child into a family unit)
- Promoting the use of complementary/alternative modalities to reduce stress
- Working with economically disadvantaged clients to obtain prenatal care

Safety Considerations

The fetus is especially vulnerable to substances consumed by the mother. In addition to providing the fetus with wholesome nutrients, maternal blood can also transport toxins.

Cigarettes contain several toxic substances, such as nicotine, that cross the placental barrier and interfere with the transport of oxygen to the fetus. Such toxins often result in increased risk of premature birth, retarded growth, learning difficulties, and fetal death.

Use of alcohol during pregnancy can result in **fetal alcohol syndrome** (FAS), a condition in which fetal development is impaired and is manifested in the infant by characteristic physical attributes and intellectual problems. Typically, FAS infants are small, have facial abnormalities (such as thin upper lips and short, upturned noses), and may have some degree of brain damage. Alcohol consumption is most dangerous during the first 3 months of pregnancy when the embryo's brain and other vital organs are developing. The effects of alcohol on the fetus are permanent. FAS is considered to be the leading cause of mental retardation among infants, and the incidence continues to increase (Wong, 1998).

In addition to nicotine and alcohol, there are many other teratogenic substances. A **teratogenic substance** is any substance that can cross the placental barrier and impair normal growth and development.

NURSING ALERT

Tocacco and Alcohol Use During Pregnancy

Total abstinence from cigarette smoking is advised during pregnancy. Because there has been no determination of "safe" amounts of alcohol consumption, caution all pregnant women to avoid drinking alcohol.

Client education consists of teaching pregnant women to check labels of *all* medicines for information about potential effects on the fetus. The Food and Drug Administration requires that all manufactured drugs list their potential for causing birth defects. The use of illegal drugs by pregnant women presents a very serious threat to the unborn. Substance abuse prevention programs can be effective in preventing or reducing this risk.

Neonate

The **neonatal** period (the first 28 days of life following birth) is a time of major adjustment to extrauterine life. The energies of the neonate (newborn) are focused on achieving equilibrium through stabilization of major body systems. Table 17-11 describes neonatal development.

The neonate's activities, which are reflexive in nature, consist primarily of sucking, crying, eliminating, and sleeping (Figure 17-3). The neonate blinks in response to bright lights and demonstrates the startle reflex in response to loud noises. Neonatal reflexes play a major role in the ability to survive. Table 17-12 lists the reflexive activities of the neonate.

During the first month of life, the neonate progresses developmentally from a mass of reflexes to behavior that is more goal directed (purposeful). In addition to the major physiological adjustments necessitated by extrauterine life, the neonate also undergoes psychological adaptation.

The major psychological task of neonates is to adjust to the parental figures. **Bonding**, the formation of attachment between parent and child, begins at birth when the neonate and parent make initial eye contact. The quality of parent-neonate bonding lays the foundation for trust that is necessary for the development of future interpersonal relationships. Figure 17-4 shows bonding between neonate and parent.

Nursing Implications

A complete and thorough assessment of the neonate, which is performed immediately after delivery, includes evaluation of the neonate's reflexes. In addition to focusing on the reflexes, the assessment also evaluates respiratory and cardiac functioning. Table 17-13 shows the Apgar assessment tool that is performed by the nurse at 1 minute and again at 5 minutes after birth.

In the first few hours after birth, encourage the parents to cuddle the newborn. Explain the neonate's interactive abilities. Encourage mutual eye contact between neonate and parents by showing parents how to hold the child facing them.

Wellness Promotion

Teaching is one of the most important nursing activities that promote neonatal wellness. First-time parents need information about basic newborn needs (to be held,

NURSING ALERT

Neonatal Reflexes

A complete assessment of neonatal reflexes should be performed immediately after birth or as soon as the neonate is physiologically stable.

rocked, and talked to), nutrition, infection control (especially handwashing and hygienic diaper changing practices), care of the umbilicus, and incorporating the newborn into the family unit. Knowledge of growth and development milestones is necessary for parents to provide appropriate neonatal stimulation and have realistic expectations.

TABLE 17-11
Neonate: Growth and Development

Dimension	Characteristics	Nursing Implications
<i>Physiological</i>	<p>Circulatory function shifts from the umbilical cord to heart.</p> <p>Gas exchange (oxygen and carbon dioxide) is transferred from placenta to lungs. Seconds after birth, respiratory reflexes are activated.</p> <p>Weak neck and shoulder muscles.</p> <p>Immature temperature-regulating mechanism.</p> <p>Incomplete ossification (process of cartilage changing to bone).</p> <p>Poor visual acuity; visual focus is generally rigid.</p>	<p>Accurately assess neonate's cardiovascular status.</p> <p>Immediately after birth, hold the neonate with head lower than body to allow for drainage of fluids that may block respiratory passages.</p> <p>If spontaneous respirations do not occur, resuscitate immediately.</p> <p>Carefully support the neonate's head.</p> <p>To conserve heat:</p> <ul style="list-style-type: none"> • Dry neonate immediately after birth and place in a warmed bassinet. • Place a stockinette cap on neonate's head. <p>Protect the anterior fontanelle on neonate's skull.</p> <p>Instruct parents to be directly in front of the neonate (about 9–12 inches away from child's face) when communicating.</p>
<i>Motor</i>	<p>Reflexes direct the majority of movement.</p> <p>The full-term neonate has some limited ability to hold the head erect.</p> <p>Able to lift head slightly when lying prone.</p>	<p>Support neck and head when lifting.</p>
<i>Psychosocial</i>	<p>Crying is the neonate's method of communication. There is a reason for the cry.</p> <p>The bonding process begins shortly after birth.</p>	<p>Teach parents about the dynamics of crying to avoid having the neonate labeled as "fussy" or the parents developing the misconception that they are inadequate caregivers.</p> <p>Encourage parents to learn to discriminate crying patterns.</p> <p>Teach parents the importance of interacting with the neonate during every contact (feeding, bathing, changing, cuddling).</p>
<i>Cognitive</i>	<p>Neonates learn through sensory experiences.</p> <p>Learning is enhanced by an environment that provides stimuli without bombarding the neonate.</p> <p>Learning occurs by repeated exposure to stimuli.</p>	<p>To promote learning, encourage parents to provide frequent sensory stimuli (touching, talking, looking the neonate in the eyes).</p>

(Data from Fuller, J., & Schaller-Ayers, J. [1999]. *Health assessment: A nursing approach* [3rd ed.]. Philadelphia: Lippincott; Murray, R. B., & Zentner, J. P. [1997]. *Nursing assessment and health promotion through the lifespan* [6th ed.]. East Norwalk, CT: Appleton & Lange; Wong, D. L. [1999]. *Whaley & Wong's nursing care of infants and children* [6th ed.]. St. Louis: Mosby-Yearbook.)



Figure 17-3 Selected Neonatal Reflexes: A, rooting; B, sucking; C, grasp; D, Moro; E, tonic neck.

Other nursing interventions that promote neonatal wellness are listed below:

- Continually assessing the neonate's physiological status
- Providing a warm environment (neonates breathe more easily when they are warm)
- Monitoring nutritional status. It is normal for neonates to lose weight (up to 10% of birth weight) during the first week of life.
- Providing a clean environment to protect neonates from infection and teaching parents that neonates need a clean environment, not a sterile one
- Conducting screening tests; for example, the blood test for **phenylketonuria (PKU)**, a genetic disorder that, if untreated, can lead to impaired intellectual functioning
- Promoting *early* parent-neonate interaction

Selection of a feeding method for the neonate is a major decision for parents. Breastfeeding is the most nat-

ural option. However, commercially prepared formula is sometimes used due to the neonate's special needs or parental choice. For a comparison of feeding methods, see the discussion about nutrition for the infant.

Safety Considerations

Safety is of primary concern when caring for neonates because neonates are totally dependent on others to meet their needs. Accidents are the primary cause of neonatal mortality (Fuller & Schaller-Ayers, 1999).

One of the most important neonatal accident prevention methods is to teach parents about the use of infant car seats. Under current federal law, neonates and infants must be secured in an approved infant car seat *every* time the child travels in a car.

In addition to accidents, infections pose a serious health risk to the neonate. Newborns should not be in contact with anyone experiencing an infectious disease. The skin is the body's major defense against invasion by disease-producing microorganisms; therefore, it is essential that the neonate's

TABLE 17-12
Major Neonatal Reflexes

Reflex	Description
Rooting	Turning the mouth and nose in the direction of any facial touch
Sucking	Using the tongue and mouth to take in liquid or food
Swallowing	Movement of throat muscles to push food from mouth to esophagus
Grasp	Firm contraction of hand muscles around an object
Babinski	When foot stroked, toes fan upward and outward
Moro	When startled, arms and legs swing quickly out, then immediately back and neonate curls up into a ball
Smiling	Turning lips upward; neonate looks “happy”
Blinking	Rapid closing and opening of eyelids
Sneezing	A violent, spasmodic, sudden expiration of breath
Coughing	Explosively expelling air from the lungs
Crying	Making a loud, wailing sound
Tonic neck	When head is turned to side, arm and leg on same side are extended in a fencing posture
Extrusion	Tongue pushes outward when touched by an object at the tip
Head turning	Moving face to one side or the other when airway is blocked by a surface, such as a bed or pillow



Figure 17-4 Bonding between a parent and neonate. Consider the factors that may have an impact on the early attachment between this father and daughter.

skin integrity be maintained. Parents must be taught the importance of skin cleanliness. Diaper rash is a common skin problem for newborns and infants because of the ammonia from urine in wet diapers. The ammonia burns and irritates the skin, resulting in localized irritation, blisters, or fissures. In addition to prompt changing of wet diapers, bathing and use of protective creams are useful in preventing skin breakdown. See chapter 31 for a complete discussion of safety considerations and infections control practices.

Infant

Infancy (the developmental stage from the first month to the first year of life) is a time of continued adaptation. During this stage, the infant experiences rapid

TABLE 17-13
Apgar Assessment Tool

Sign	Value		
	0	1	2
Heart rate	Absent	Less than 100 beats per minute	Over 100 beats per minute
Respiratory effort	Absent	Slow and irregular	Crying
Muscle tone	Flaccid	Some flexion of extremities	Active movement
Reflex irritability	No response	Weak cry or grimace	Vigorous cry
Color	Blue or pale	Pink body, cyanotic extremities	Entire body is pink

The neonate is rated in each of the above categories. The rating for each category is totaled. A score of 7–10 indicates normal function; a score of 4–6 indicates that neonate needs special assistance; and a score of less than 4 indicates the neonate’s need for *immediate* life-sustaining measures.

physiologic growth and psychosocial development (Figure 17-5). Table 17-14 provides an overview of infant development in the physical, motor, psychosocial, cognitive, moral, and spiritual dimensions.

Nursing Implications

The nurse caring for an infant must focus on safety, prevention of infection, and teaching parents about incorporating the child into the family. Teaching parents and other caregivers about developmental milestones is essential. Nursing care involves the provision of support, reassurance, and information to the parents.

Wellness Promotion

Nurses promote infant wellness by teaching growth and development concepts to parents and other caregivers. Knowledge of the type of behavior to expect at certain times during infancy serves as both guidance and reassurance for parents. Three specific areas in which parents need guidance from the nurse in caring for their infants are nutrition, protection from infection, and promotion of sleep.

A major factor influencing health maintenance of the infant is the provision of adequate nutrients delivered in a loving, consistent manner. Caregivers should be taught that the nutrients must be germ free and provide the recommended amounts of carbohydrates, protein, calcium, iron, and vitamins. It is recommended that infants be breastfed for the first 6 to 12 months (Murray & Zentner, 1997).

Breastmilk has several benefits over commercially prepared formulas, including:

- Offers immunologic benefits (e.g., contains immunoglobulins, lymphocytes, and other bacteria growth retardants)
- Is more easily digested because of smaller curds than those in cow's milk and formula



Figure 17-5 These children are exploring their world and are demonstrating mastery of both the physiological and cognitive dimensions of their development.

- Enhances absorption of fat and calcium
- Is readily available and economical.

The act of breastfeeding promotes maternal-infant bonding (Wong, 1998). There are some cultural sanctions against breastfeeding and some cultures view bottle-feeding as a status symbol.

Normal growth and development can occur without breastfeeding. Special formulas are available for infants who are hypersensitive to protein, who have PKU, and who experience fat malabsorption. Soy-based formulas have been developed for the infant with lactose deficiency or who is allergic to regular formula. Infants who are formula fed generally have greater deposits of subcutaneous fat (Murray & Zentner, 1997). The Nursing Checklist provides teaching strategies for parents of bottle-fed infants.

It is important that the nurse provide accurate information about the types of feeding available and support the parents' decision about the method chosen.

NURSING ALERT

Cow's Milk

Whole cow's milk is not recommended for infants under age 1 year. Human milk and commercially prepared formula are more easily digested.

Solid foods are usually introduced at 3 to 4 months of age. Rice cereal is the first solid food of choice because it has the fewest allergic responses (Murray & Zentner, 1997).

Infants are especially vulnerable to developing infections. Because the immune system is not fully matured, infections pose a great threat. Immunizations are of utmost importance in preventing infections. Nurses should confirm that infants receive all necessary immunizations. Figure 17-6 provides a recommended schedule for childhood immunization.



NURSING CHECKLIST

Bottle Feeding

- The baby should be in a semi-reclining position cradled close to the mother's body with the mother in a comfortable position. Never prop a bottle in the baby's mouth because choking may result.
- Use care if heating bottles. Do not warm bottles in the microwave because the hot liquid can cause esophageal and oropharyngeal burns.
- Avoid using the bottle as a pacifier because this action may result in tooth decay and set the stage for future obesity.

TABLE 17-14
Infant: Growth and Development

Dimension	Characteristics	Nursing Implications
<i>Physiological</i>	<p>Physical growth is rapid. Birth weight usually triples by end of first year. Height increases by approximately 50%. Progressive maturation of all body systems.</p> <p>Body temperature stabilizes. Heart rate slows (approximately 80–130 beats per minute). Blood pressure rises. At approximately 4–6 months, eruption of teeth begins. Rapid growth of brain (reaches about half the adult size) Posterior fontanel closes at approximately 2 months. Eyes begin to focus.</p>	<p>Inform parents of the developmental norms.</p> <p>Encourage parents to have “well-baby checkups” as recommended.</p> <p>Protect infant’s skull.</p>
<i>Motor</i>	<p>Physical maturation allows for development of motor skills.</p> <p>Primitive reflexes are replaced by movement that is more voluntary and goal directed.</p> <p>Motor skills develop rapidly: 6 months: rolls over voluntarily 6-7 months: crawls 8 months: sits alone</p> <p>Grasping objects is reflexive for first 2–3 months and gradually becomes voluntary.</p>	<p>Teach parents anticipated ages for motor skill development.</p>
<i>Psychosocial</i>	<p><i>Freud</i>: Oral stage</p> <p><i>Erikson</i>: Trust vs. mistrust</p> <p>A sense of self begins to develop. Responds to caregiver’s voice.</p> <p>Anxiety separation occurs at approximately 6 months. <i>Havighurst</i>: Learns to eat solid food, crawl, walk, and talk.</p>	<p>Seeks immediate gratification of needs. Receives pleasure and comfort through mouth, lips, and tongue.</p> <p>Encourage parents to feed in a prompt, consistent manner (feed on demand rather than a fixed schedule).</p> <p>Other activities that promote trust are providing warmth, diapering, and comforting.</p> <p>Teach parents approximate ages that developmental milestones are expected to occur.</p>
<i>Cognitive</i>	<p><i>Piaget</i>: Sensorimotor stage</p> <p>Infant learns by interacting with the environment.</p> <p>Language development includes babbling, repetition, and imitation.</p>	<p>Encourage parents to provide a variety of sensory stimuli: visual, sensory, auditory, and tactile (e.g., colorful mobiles; musical toys; soft plush animals; rubbing, patting, stroking the infant’s skin)</p> <p>Caregivers need to talk to infant often.</p> <p>Encourage caregivers to name objects that are the focus of infant’s attention.</p>
<i>Moral</i>	<p><i>Kohlberg</i>: Preconventional stage</p>	<p>Teach parents that now is the time to start teaching (by role modeling) the difference between “right” and “wrong.”</p>
<i>Spiritual</i>	<p><i>Fowler</i>: Stage of undifferentiated faith</p>	<p>Encourage caregivers to model the values they want the infant to learn.</p>

(Data from Murray, R. B., & Zentner, J. P. [1997]. *Nursing assessment and health promotion through the lifespan* [6th ed.]. East Norwalk, CT: Appleton & Lange; Wong, D. L. [1999]. *Whaley & Wong’s nursing care of infants and children* [6th ed.]. St. Louis: Mosby-Yearbook.)

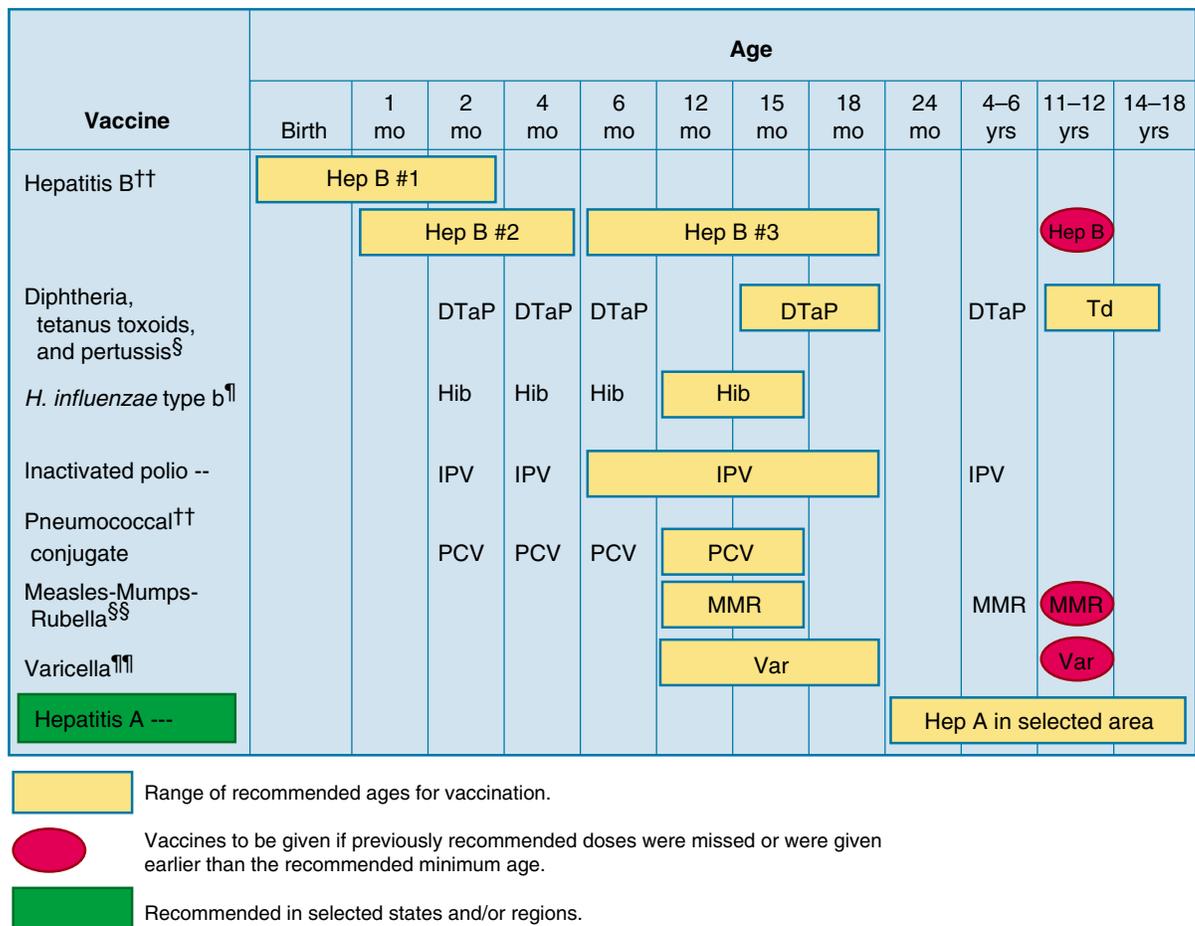


Figure 17-6 Recommended Childhood Immunization Schedule (From Centers for Disease Control and Prevention. Recommended childhood immunization schedule—United States, January-December 2001.)



NURSING TIP

Handwashing and Infant Care

Handwashing is the most useful action to prevent the transmission of microorganisms.

Parents often need information about normal sleep patterns of infants and how the patterns change with maturation. Activities that promote sleep include:

- Providing a quiet room for the infant
- Scheduling feedings and other care activities during periods of wakefulness instead of drowsy times
- Developing sensitivity to the unique sleep and rest periods established by the infant
- Providing comfort and security measures (e.g., rocking, singing)
- Establishing routine times for sleep

Safety Considerations

The majority of infant injuries and deaths are related to motor vehicle accidents. Therefore, the consistent and proper use of infant car seats is one of the most effective measures parents can take to ensure their infant’s safety.

See the Nursing Checklist for guidelines that the nurse can share with parents to prevent infant accidents.

Toddler

The **toddler** period begins at 12 to 18 months of age, when a child begins to walk alone, and ends at approximately age 3. The family is very important to the toddler in that the family promotes language development and teaches toileting skills. During this stage, the child becomes more independent. Frequently, when attempts to demonstrate autonomy are prevented, the child will have a temper tantrum; thus, this stage is often referred to as “the terrible twos.” Parents must understand that the toddler’s frequent use of the word “no” is an expression of developing autonomy.

Nurses can greatly influence the quality of parent-child interaction by teaching parents about developmental concepts. This information helps parents form *realistic* expectations of the toddler’s behavior. The use



NURSING CHECKLIST

Preventing Infant Accidents

- To avoid vehicular accidents: use infant seats and keep the infant out of the paths of automobiles and other vehicles. Many infants can crawl very quickly!
- To prevent burns: keep infant away from open heaters, furnaces, fireplaces, hot stoves, and matches.
- To protect from falls: keep crib rails up at all times, never leave the infant lying unattended on furniture, and use protective gates and barriers to block stairways.
- To prevent drowning: never leave the infant unattended near water (bathtubs, buckets, swimming pools).
- To prevent electrocution: as the infant begins to crawl, use plastic safety plugs to cover all electrical outlets and keep electrical cords out of infant's reach.
- To prevent choking: closely monitor the infant who is exploring the environment. During this oral phase of development, infants tend to test out their environment and seek pleasure through the mouth. Aspiration accidents are common with infants who choke on objects such as buttons, coins, and food. The Heimlich maneuver is *not* used with infants because it may force the foreign object further down the trachea. Figure 17-7 illustrates the proper technique to use with an infant who is choking.

NURSING ALERT

Aiding the Choking Infant

Never use the Heimlich maneuver on an infant who is choking. Instead, use alternating back blows and chest compressions to dislodge the object.

of firm limits set in a consistent manner helps the toddler learn while providing parameters for safe and socially acceptable behavior. Table 17-15 describes the toddler's growth and development in the physiological, motor, psychosocial, cognitive, moral, and spiritual dimensions.

Nursing Implications

Nurses who work with toddlers must be sensitive to the fact that children of this age are likely to be anxious and fearful in the presence of strangers. The establishment of rapport with the child will help alleviate this stranger anxiety. Play is an effective tool for building rapport with toddlers.

When toddlers are hospitalized (for an extended time or only a day), fear and anxiety can make the experience a negative one. The major stressor resulting from hospitalization is the toddler's separation from parents. An unfamiliar environment also results in stress for the toddler. Nurses can help reduce stress in the hospitalized toddler by teaching both the child and parents about procedures.

Toddlers need to have regular health examinations, and immunizations remain an essential part of health care. Encourage parents to be involved during the examination and immunizations. Parents can alleviate the toddler's stress by holding the child and talking in a calm manner when in the presence of the health care provider (Figure 17-8).



Figure 17-7 Intervention for a choking infant. Emergency care for an infant who is choking consists of a series of four blows to the back between the shoulder blades, followed by four thrusts midline on the chest approximately 1 inch below the nipple line.



Figure 17-8 By participating in this health examination, this mother is helping her son overcome his anxiety.

TABLE 17-15
Toddler: Growth and Development

Dimension	Characteristics	Nursing Implications
<i>Physiological</i>	<p>Overall rate of growth slows. By 24 months, the toddler usually weighs four times more than at birth.</p> <p>Rapid growth of brain.</p> <p>Bones in extremities grow in length.</p> <p>Physiological readiness for bowel and bladder training develops.</p>	<p>Instruct parents on need for vitamin D, calcium, and phosphorus.</p> <p>Recognize that “growing pains” are normal.</p> <p>Instruct parents of timing for toilet training and need for consistency and patience.</p>
<i>Motor</i>	<p>Walks and runs.</p> <p>Becomes more coordinated.</p>	<p>Assess home environment for safety as toddler becomes more mobile.</p>
<i>Psychosocial</i>	<p><i>Freud</i>: Anal stage (receives pleasure from contraction and relaxation of sphincter muscles)</p> <p><i>Erikson</i>: Autonomy vs. Shame and Doubt</p> <p><i>Havighurst</i>: Developmental tasks include:</p> <ul style="list-style-type: none"> • Beginning to learn sex differences • Learning to talk <p>Engages in parallel play (playing near other children but not necessarily interacting with them).</p> <p>A reemergence of separation anxiety often occurs.</p> <p>By age 3, most toddlers are able to tolerate being left with strangers.</p>	<p>Instruct parents to avoid overemphasis on toilet training.</p> <p>Teach parents to encourage toddler’s attempts at independence (e.g., trying to feed and dress self).</p> <p>Explain that sexual curiosity is normal.</p> <p>Encourage parents to talk to child frequently.</p> <p>Provide opportunities for child to socialize with peers.</p> <p>Reassure child that parents will return.</p>
<i>Cognitive</i>	<p><i>Piaget</i>: Preoperational stage</p> <p>Can follow simple directions.</p> <p>Concrete thought processes.</p> <p>Is able to anticipate future events.</p> <p>Short attention span.</p> <p>Comprehends self as a separate entity.</p> <p><i>Language</i>: At approximately 1 year, can make two-syllable sounds (e.g., ma-ma, da-da)</p> <p>At approximately 2 years, can form short sentences.</p> <p>Has a vocabulary of approximately 900 words.</p>	<p>Instruct parents to give only one direction at a time.</p> <p>Use a calendar to show today’s date and the number of days until a significant event.</p> <p>Teach caregivers importance of calling child by name.</p> <p>Talk to child frequently, avoiding use of “baby talk.”</p>
<i>Moral</i>	<p><i>Kohlberg</i>: Preconventional stage</p> <p>Learns to distinguish right from wrong.</p>	<p>Parents need to be consistent in setting limits.</p> <p>Understand the significance of role modeling desired behavior to child.</p>
<i>Spiritual</i>	<p><i>Fowler</i>: Intuitive-projective stage of faith</p>	<p>Instruct parents to provide simple answers to questions related to religion.</p> <p>Instruct on importance of incorporating religious rituals and ceremonies into daily life.</p>

(Data from Murray, R. B., & Zentner, J. P. [1997]. *Nursing assessment and health promotion through the lifespan* [6th ed.]. East Norwalk, CT: Appleton & Lange; Wong, D. L. [1999]. *Whaley & Wong’s nursing care of infants and children* [6th ed.]. St. Louis: Mosby-Yearbook.)

Some specific nursing approaches to use with toddlers are listed below:

- Explain what is being done in a calm tone of voice.
- Use play to alleviate anxiety (e.g., have the child examine a teddy bear or doll).
- Give short, simple directions.
- After a painful procedure, comfort the child (cuddling, rocking).
- Encourage parents' active participation in the care.

Wellness Promotion

Teaching is done with both toddlers and their parents. Play can be used to establish an effective relationship with the child. Play is a valuable process for toddlers in that it is the primary mechanism for learning and socialization. To facilitate teaching, approach toddlers at eye level and use terminology that they can understand.

Respiratory infections are common health threats to the toddler. Parasitic diseases are also fairly common. Teaching parents preventive measures becomes the focus of wellness promotion.

Nutritional needs change during the toddler period as the rate of growth slows. The need for calories decreases from the requirements for infants. The required amount of protein is also lower than that of the infant; however, toddlers still need more protein than do older children. The toddler needs fewer fluids than the infant (Wong, 1998). Because most toddlers become selective (“picky”) with the foods they enjoy, it is sometimes difficult to provide increased intake of calcium and iron due to the toddler’s food habits. The toddler should consume an average of 2 to 3 cups of milk a day to ensure adequate calcium intake. The toddler who drinks more than a quart of milk per day is at increased risk of developing anemia because the high milk consumption limits the amount of other nutrients taken in (Wong, 1998).

Nurses can play a key role in the toddler’s nutritional counseling. The following points should be shared with parents about dietary practices:

- Avoid using food as a reward because this may encourage overeating.
- Do not serve large helpings because the child may be overwhelmed and refuse to eat.
- Expect sporadic eating patterns (e.g., toddler eats a lot one day and very little the next; enjoys one food for several days then suddenly will not eat it).
- Avoid power struggles related to meals. Trying to force a child to eat is counterproductive to establishing healthy eating habits.
- Establish a mealtime routine and follow it (rituals are comforting to toddlers).
- Provide nutritional snacks to meet dietary requirements.

Safety Considerations

Accidents (especially those involving automobiles) are the most frequent cause of disability and death in tod-

dlers (Edelman & Mandle, 1997; Murray & Zentner, 1997). The information on the use of car seats for neonates and infants is applicable to toddlers.

Another common type of accident occurring with toddlers involves toys. Parents need to be taught to inspect toys for:

- Age appropriateness
- Sharp objects
- Small parts that can be swallowed
- Flammable or toxic materials (e.g., lead-based paint)

As children gain new skills, parents should be taught to reassess the safety of toys and of the home environment.

Toddlers, with their increased mobility and curiosity, are especially prone to accidental poisonings. Parents should be informed of the need for careful observation of the toddler and child-proofing the home. See Chapter 31 for a complete discussion of preventing poisoning in children.

Preschooler

The developmental stage from the ages of 3 to 6 is called the **preschool stage**. During this stage, physical growth slows and psychosocial and cognitive development are accelerated. Table 17-16 describes preschool development in detail.

During this period of childhood, curiosity becomes pronounced and the child is better able to communicate. When teaching the parents, let them know that the child’s frequent use of the word “why” is necessary for normal cognitive and psychosocial development.

The child’s world begins to expand outside the immediate home environment. Play is the mechanism used by the preschooler to learn about and develop relationships.

Nursing Implications

Play is a tool that can be used by nurses with preschoolers to help reduce fear and anxiety. Through the use of play, preschoolers learn about the environment, incorporate socially defined expectations for behavior, and reduce tension (Figure 17-9).

Wellness Promotion

When working with a preschooler, it is important for the nurse to communicate at the child’s level of comprehension without talking down to the child. Include the child in activities and decisions as much as possible. The preschool years are the optimum time for the child to begin showing interest in health. The astute nurse capitalizes on this by making health education fun to promote the development of lifelong health-promoting lifestyles.

A major wellness intervention for preschoolers is immunization. Teach parents about and encourage them to adhere to the recommended schedules. Each state in the United States has immunization requirements as

TABLE 17-16
Preschooler: Growth and Development

Dimension	Characteristics	Nursing Implications
<i>Physiological</i>	<p>Physical growth slows; average weight at age 5 is 45 pounds.</p> <p>Size of head is approximate adult size.</p> <p>Has a full set of deciduous teeth; these “baby teeth” start to fall out and be replaced by permanent teeth.</p>	<p>Can eat larger meals and a variety of foods.</p>
<i>Motor</i>	<p>Development of fine motor skills, (e.g., ability to skip, throw a ball overhand, use scissors, tie shoelaces).</p>	<p>Provide a safe environment for play and exploration.</p> <p>Praise attempted independent activities.</p>
<i>Psychosocial</i>	<p><i>Freud</i>: Phallic stage</p> <p>Oedipal conflict leads to development of superego (conscience)</p> <p><i>Erikson</i>: Initiative vs. Guilt</p> <p><i>Havighurst</i>: Developmental tasks include:</p> <ul style="list-style-type: none"> • Learning sex differences and modesty • Language development and basic ability to formulate concepts • Developing reading readiness • Distinguishing right from wrong 	<p>Inform parents that preschoolers learn self-control through interacting with others.</p> <p>Inform parents to provide sex education information at the child’s comprehension level.</p> <p>Encourage parents to read to child.</p>
<i>Cognitive</i>	<p><i>Piaget</i>: Preoperational stage</p> <p>Improved ability to use reason and logic and increased curiosity result in frequent use of questioning.</p> <p>Play becomes more reality based.</p> <p>As a result of increased ability to communicate, there is greater socialization with peers.</p>	<p>Parents need to know that children of this age learn through frequent use of the word “why.”</p>
<i>Moral</i>	<p><i>Kohlberg</i>: Preconventional stage</p> <p>A conscience begins to develop.</p> <p>Child fears wrongdoing.</p> <p>Child seeks parental approval.</p>	<p>Teach child basic values, ideally by role modeling.</p> <p>Provide consistent praise and acceptance of child.</p>
<i>Spiritual</i>	<p><i>Fowler</i>: Intuitive-projective stage of faith</p> <p>Not yet able to understand spiritual concepts.</p> <p>Imitates parental behaviors.</p>	<p>Remind parents that teaching by example is the best approach for a child this age.</p>

(Data from Murray, R. B., & Zentner, J. P. [1997]. *Nursing assessment and health promotion through the lifespan* [6th ed.]. East Norwalk, CT: Appleton & Lange; Wong, D. L. [1998]. *Whaley & Wong’s nursing care of infants and children* [6th ed.]. St. Louis: Mosby-Yearbook.)



Figure 17-9 Play is an important tool for socializing among preschoolers. Describe a few health care activities that nurses can incorporate through play that would correspond to a preschooler's level of development.

prerequisites for school admission. The nurse should encourage parents to have children immunized and to keep the immunization records current. All states offer exemptions for children who have medical problems such as severe illness, immunocompromised status, or allergies to vaccine constituents (Douma, 1997).

Safety Considerations

Accidents are the leading cause of death in young children. Eagerness to explore the environment and cognitive immaturity lead to the preschooler's risk for accidents. Children in this stage often act impulsively and cannot be expected to remember and follow all safety rules. Parents must understand the importance of teaching young children the meaning of "no" to prevent accidents.

Common accidents that involve preschoolers are automobile accidents, burns, falls, drowning, animal bites, and ingestion of poisonous substances.

It is important for the nurse to emphasize education about protection from potential hazards. The safety practices that are developed by the preschooler will tend to be lifelong. Adults can best teach preschoolers about accident prevention through role modeling. For example, parents who buckle their seatbelts every time they get into a car are not only protecting themselves but are also teaching their children an important accident preventive measure.

School-Age Child

During the **school-age period** (developmental stage from the ages of 6 to 12 years), physical changes occur in a slow, even, continuous pace. Table 17-17 gives an overview of growth and development of the school-age child.

The school-age child's world expands greatly. Participation in school activities, team sports, and play contributes to an enlarging social network. As children

continue to mature, their play time becomes more structured and less spontaneous. Communication increases and vocabulary expands greatly to accommodate the expression of needs, thoughts, and feelings.

As the school-age child's cognitive abilities expand, creativity is expressed in a variety of unique ways. Involvement in academic, sports, and social activities stimulates the development of creativity and provides outlets for its expression.

Nursing Implications

The most common health problems of school-age children are accidents and minor illnesses such as upper respiratory infections. Health promotion teaching is a major role of the nurse caring for school-age children.

Wellness Promotion

Lifestyles begin to be established during childhood; nurses can intervene to promote the development of healthy lifestyles with children in schools. Schools are an area in which health promotion behaviors can be taught in a cost-effective manner. Nurses can promote wellness in the school-age child by teaching parents to:

- Encourage healthy lifestyles (nonsedentary activities, nutritious meals)
- Have children immunized
- Provide nutritious meals
- Teach children appropriate hygienic measures
- Schedule regular checkups with the primary health care provider
- Schedule dental checkups and encourage daily brushing and flossing
- Establish sleep patterns alternating with periods of activity
- Report any symptoms of illness immediately to the health care provider
- Teach safety precautions

Safety Considerations

Many accidents experienced by school-age children occur during play. Injuries related to the use of skates, skateboards, in-line skates, and bicycles are common. Children should be taught safety rules for use of such toys (e.g., use of protective equipment; Figure 17-10). Parents must frequently remind children of the danger of playing near traffic. Children in this developmental stage must also be taught to use caution with strangers because of the possibility of abductions.

Preadolescent

Preadolescence (developmental stage from the ages of 10 to 12 years) is marked by rapid physiological changes with accompanying psychological and social implications. The child is beginning to experience hormonal changes that will result in the onset of **puberty** (appear-

TABLE 17-17
School-Age Child: Growth and Development

Dimension	Characteristics	Nursing Implications
<i>Physiological</i>	<p>Physical growth is steady (approximately 3–6 pounds and 2–3 inches per year).</p> <p>Due to changes in amount and distribution of fat, body has an overall slimmer shape.</p> <p>Maturation of CNS is nearly completed.</p> <p>By age 12, all permanent teeth are present (except second and third molars).</p>	<p>Emphasize with parents the need for a balanced diet to sustain growth requirements.</p> <p>Teach parents need for dental hygiene (daily brushing and flossing) and regularly scheduled visits to dentist.</p> <p>Instruct to change toothbrushes every 3 months.</p>
<i>Motor</i>	<p>Continued development of motor control.</p> <p>Becomes less dependent on parents for activities of daily living.</p>	<p>Encourage participation in physical activities.</p> <p>Provide praise for independent activities.</p>
<i>Psychosocial</i>	<p><i>Freud</i>: Latency stage</p> <p>Same-gender companions preferred.</p> <p><i>Erikson</i>: Industry vs. Inferiority</p> <p>Develops initiative and high self-esteem as shown in school and sports.</p> <p>Exhibits less dependency on family.</p> <p><i>Havighurst</i>: Developmental tasks include:</p> <ul style="list-style-type: none"> • Ability to perform more-complex motor functions (e.g., ride a bicycle, catch a ball) 	<p>To develop a sense of confidence, encourage child to:</p> <ul style="list-style-type: none"> • Participate in both group and individual activities • Become involved in a variety of activities <p>Encourage parents to praise child's efforts.</p>
<i>Cognitive</i>	<p><i>Piaget</i>: Concrete operations stage</p> <p>Ability to cooperate with others and begins to be able to see the other's point of view which leads to more meaningful communication.</p> <p>Reasoning ability moves from intuitive to logical and rational.</p> <p>Ability to think in the abstract is not fully developed.</p> <p>Develops the concept of time:</p> <ul style="list-style-type: none"> • Knows difference between past and present • Begins to learn to tell time • Better able to understand the process of aging <p>Able to order, categorize, and classify groups of objects as evidenced in increased interest in collections (coins, stamps, rocks).</p> <p>Sees relationships between objects.</p>	<p>Encourage child to engage in group activities.</p> <p>Communicate at child's level of comprehension.</p>
<i>Moral</i>	<p><i>Kohlberg</i>: Conventional stage</p> <p>Can understand what society deems as unacceptable behavior but cannot always choose between right and wrong without assistance.</p>	<p>Provide consistent limits.</p> <p>Role model appropriate behavior.</p> <p>Provide praise for appropriate behavior.</p>
<i>Spiritual</i>	<p><i>Fowler</i>: Mythical-literal stage of faith</p> <p>Accepts existence of a deity.</p> <p>Beliefs are symbolized through stories.</p>	<p>Encourage parents to discuss their beliefs.</p> <p>Story telling and use of parables can reinforce understanding of spiritual concepts.</p>

(Data from Edelman, C. L., & Mandle, C. L. [1997]. *Health promotion throughout the lifespan* [4th ed.]. St. Louis: Mosby-Yearbook; Murray, R. B., & Zentner, J. P. [1997]. *Nursing assesment and health promotion through the lifespan* [6th ed.]. East Norwalk, CT: Appleton & Lange.)



Figure 17-10 The use of equipment, such as safety helmets, helps to protect school-aged children from injury.

ance of secondary sex characteristics). Girls generally experience preadolescence at a younger age than boys—approximately age 9 to 10 for girls and age 10 to 11 for boys (Edelman & Mandle, 1997). Table 17-18 provides an overview of preadolescent development.

In girls, breast development begins between the ages of 10 and 11. Further breast development is stimulated by the release of estrogen that occurs during puberty. The pattern of female breast development is described in Table 17-19. Other aspects of female sexual development are described in Table 17-20.

Approximately 2 years after the appearance of breast buds, **menarche** (onset of the first menstrual period) occurs. The first menstrual periods are usually irregular, scant, and may or may not be accompanied by ovulation. The average age of menarche in the United States is 12.8 years, which has gradually declined over the past century. This is probably due to improved general health status, particularly nutrition and sanitation (Wong, 1998).

The menstrual cycle is a complex blend of physiological and psychological changes that occur approximately every month. After approximately the first 6 to 12 months, a girl's cycle will become established in a regular pattern. Some girls may have received inadequate or incorrect information regarding the onset of

menstruation. Client teaching should include information about the physiological changes, emotional changes, and hygienic practices. Teaching should emphasize that the cyclical hormone-induced changes are normal.

One menstrual problem experienced by many American females is premenstrual syndrome (PMS). PMS is a complex condition characterized by a variety of symptoms including headache, backache, fatigue, irritability, weight gain, and crying spells. Females need information about PMS to receive early intervention if needed.

NURSING TIP

Late Onset of Menarche

Late onset of menarche can be the result of several factors. If you encounter a client who has not experienced the onset of menstruation by age 16 to 18, evaluate her for the following:

1. Inadequate nutrition
2. Presence of eating disorders
3. Chronic diseases (e.g., Crohn's disease, hypothyroidism)
4. Environmental stressors
5. Use of steroids or opiates

In preadolescent boys, the first signs of puberty are:

- Testicular enlargement
- Penile enlargement
- The scrotum becomes thinner and redder
- Pubic hair growth

Table 17-21 illustrates the physiological changes in boys during sexual development of male genitalia.

Nursing Implications

Sensitivity is essential for the nurse working with the preadolescent child. To increase one's sensitivity, the nurse uses a nonjudgmental approach and attends to the child's body language. It is imperative that the nurse establish a trusting relationship with the preadolescent in order to encourage the child to ask questions about any health-related concerns.

Wellness Promotion

The preadolescent needs information about nutrition, rest and activity, and the physiological changes that are occurring. The child must learn about the growth spurt,

TABLE 17-18
Preadolescent and Adolescent: Growth and Development

Dimension	Characteristics	Nursing Implications
<i>Physiological</i>	<p><i>Physiological Changes:</i> Accelerated physical growth with changes in body proportion. Extremities grow first, then trunk and hips. Growth in skull and facial bones results in changes in physical appearance.</p> <p><i>Reproductive/Sexual Changes:</i> Hypothalamus stimulates secretion of pituitary gonadotropins, leading to reproductive maturity. Development of both primary and secondary sex characteristics.</p> <p>Beginning of puberty is evidenced in girls by:</p> <ul style="list-style-type: none"> • Breast development • Pubic and axillary hair growth • Menarche (onset of menses) • Increases in height <p>Beginning of puberty is evidenced in boys by:</p> <ul style="list-style-type: none"> • Genital development • Growth of facial, pubic, and axillary hair • Nocturnal ejaculations • Height increases • Voice changes <p><i>Musculoskeletal Changes:</i></p> <ul style="list-style-type: none"> • Ossification of bones • Increased muscle mass and strength <p><i>Cardiovascular Changes:</i></p> <ul style="list-style-type: none"> • Heart increases in size and strength • Heart rate decreases to adult norms • Increased blood volume and blood pressure <p><i>Respiratory Changes:</i></p> <ul style="list-style-type: none"> • Rate decreases to an average of 15–20 respirations per minute • Increased respiratory volume and vital capacity • Growth of larynx, laryngeal cartilage, and vocal cords and voice pitch deepens <p><i>Gastrointestinal and Genitourinary Changes:</i></p> <ul style="list-style-type: none"> • Spleen, liver, kidneys, and digestive tract enlarge but experience no functional changes <p><i>Dental Changes:</i></p> <ul style="list-style-type: none"> • Eruption of last four molars <p><i>Integumentary Changes:</i></p> <ul style="list-style-type: none"> • Skin becomes thicker and tougher • Activation of sebaceous glands leads to possibility of acne • Appearance of pubic hair 	<p>Teach the child and parents about expected growth spurts.</p> <p>Provide reassurance that it is not uncommon for facial appearance to change in only a few months.</p> <p>Provide support and information about emerging sexual changes.</p> <p>Remember that the physiological changes are accompanied by psychological and social alterations.</p> <p>Encourage physical activities and intake of adequate amounts of calcium.</p> <p>Instruct about anticipated changes.</p> <p>Emphasize importance of continued dental hygiene.</p> <p>Teach proper skin care:</p> <ul style="list-style-type: none"> • Wash two to three times daily with soap and water. • Avoid vigorous scrubbing. • Females should avoid cosmetics with a fat or grease base. • Use sunscreen and avoid prolonged exposure to sunlight. • Provide support to children experiencing acne.

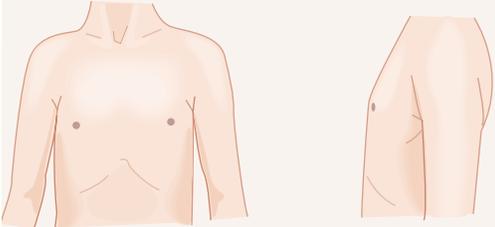
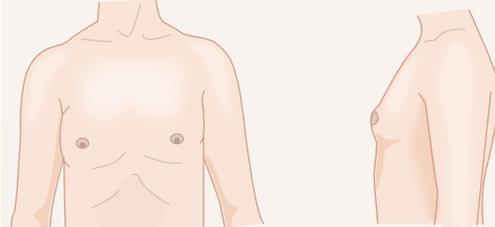
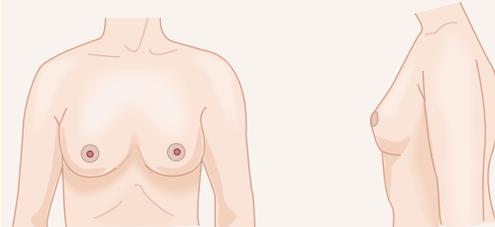
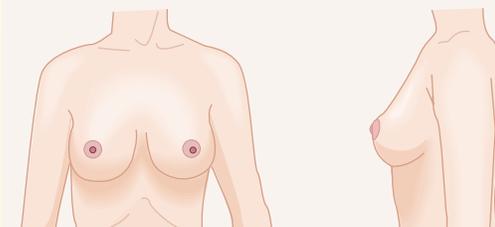
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TABLE 17-18 (continued)
Preadolescent and Adolescent: Growth and Development

Dimension	Characteristics	Nursing Implications
<i>Motor</i>	<ul style="list-style-type: none"> • Able to be completely independent with self-care activities 	
<i>Psychosocial</i>	<p><i>Freud:</i> Genital stage</p> <p><i>Erikson:</i> Identity vs. Role diffusion</p> <p>Major task: develop a sense of identity</p> <p>Develops a new body image.</p> <p>Establishes intimacy with members of opposite gender.</p> <p>Peer group is the primary mechanism of support.</p> <p>Rebels against adult authority.</p> <p><i>Havighurst:</i></p> <p>Achieves personal independence.</p> <p>Establishes more mature relationships with others.</p>	<p>Offer support.</p> <p>Provide sex education.</p> <p>Inform parents that rebellion is a normal developmental experience.</p> <p>Encourage attempts to achieve independence while providing assistance and support as needed.</p>
<i>Cognitive</i>	<p><i>Piaget:</i> Formal operations stage</p> <p>Logical, organized, consistent approach to thinking.</p> <p>Thinks in terms of cause and effect.</p> <p>Note: Not all adolescents achieve this level of cognitive development. Some are capable of flights from reality.</p> <p>Tends to be extremely idealistic.</p> <p>Egocentric (self-centered) thinking is common with views of themselves as omnipotent.</p> <p>Sees self as exceptional, special, and unique, and possesses a belief that one is immune to problems.</p>	<p>Teach parents expected developmental changes in thinking patterns.</p> <p>A false sense of immunity (“It can’t happen to me” attitude) has an impact on health behaviors.</p> <p>Teach safety issues to children:</p> <ul style="list-style-type: none"> • Safe sex practices • Avoid driving and use of alcohol
<i>Moral</i>	<p><i>Kohlberg:</i> Postconventional stage</p> <p>Tends to support the morality of law and order to determine right from wrong.</p> <p>Begins to question status quo and discards and chooses different values.</p> <p>Moral maturity varies in context of the situation and the relationship.</p> <p>Peer pressure may override the adolescent’s own moral reasoning.</p>	<p>Teach parents that questioning of values is normal.</p> <p>Teach child assertiveness skills to use in communicating with peers.</p>
<i>Spiritual</i>	<p><i>Fowler:</i> Synthetic-conventional stage of faith</p> <p>Questions values and beliefs.</p>	<p>Inform parents that curiosity about other religious beliefs is normal.</p>

(Data from Edelman, C. L., & Mandle, C. L. [1997]. *Health promotion throughout the lifespan* [4th ed.]. St. Louis: Mosby-Yearbook; Varcarolis, E. & Rader, I. [1998]. *Foundations of mental health psychiatric nursing* [3rd ed.]. Philadelphia: Saunders.)

TABLE 17-19
Sexual Maturity Rating for Female Breast Development

Developmental Stage	
	<p>1. Preadolescent stage (before age 10). Nipple is small, slightly raised.</p>
	<p>2. Breast bud stage (after age 10). Nipple and breast form a small mound. Areola enlarges. Height spurt begins.</p>
	<p>3. Adolescent stage (10–14 years). Nipple is flush with breast shape. Breast and areola enlarge. Menses begin. Height spurt peaks.</p>
	<p>4. Late adolescent stage (10–14 years). Nipple and areola form a secondary mound over the breast. Height spurt ends.</p>
	<p>5. Adult stage. Nipple protrudes; areola is flush with the breast shape.</p>

(Data from Estes, M.E. [2001]. *Health assessment and physical examination*. Albany, NY: Delmar Publishers.)

sexual changes, and psychosocial changes. By preparing the preadolescent for upcoming changes, the nurse is promoting physical and emotional health.

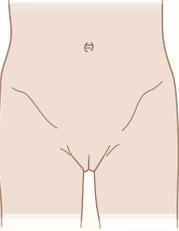
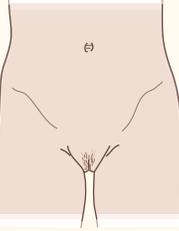
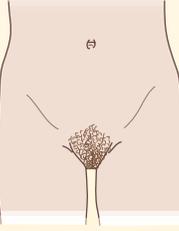
Safety Considerations

The preadolescent is at risk for injury from sports and play activities. Another major health risk posed to many

preadolescents is violence both in and away from the home. Education is a major preventive approach to violence; it is the tool for helping break the intergenerational cycle of child abuse.

Other topics for promoting preadolescent safety are: substance abuse prevention, sex education, and development of healthy lifestyles.

TABLE 17-20
Sexual Maturity Rating for Female Genitalia

Developmental stage	Description
Stage 1 	No pubic hair, only body hair (vellus hair)
Stage 2 	Sparse growth of long, slightly dark, fine pubic hair, slightly curly and located along the labia (ages 11 to 12)
Stage 3 	Pubic hair becomes darker, curlier, and spreads over the symphysis (ages 12 to 13)
Stage 4 	Texture and curl of pubic hair are similar to those of an adult but not spread to thighs (ages 13 to 15)
Stage 5 	Adult appearance in quality and quantity of pubic hair; growth is spread to inner aspect of thighs and abdomen

(Data from Estes, M.E. [2001]. *Health assessment and physical examination*. Albany, NY: Delmar Publishers.)

Adolescent

Adolescence (the developmental stage from the ages of 13 to 20 years) begins with the onset of puberty. During adolescence, the individual undergoes the major transi-

tion from child to adult. Numerous physiological changes and rapid physical growth occur during this stage. The rapid changes that occur during adolescence are not only physical. Many psychosocial adjustments must be made by the adolescent. Establishing a sense of personal identity uses a great amount of the adolescent's psychic energy. Questions such as "Who am I?" and "What is *really* important?" are common for adolescents to consider. See Table 17-18 for an overview of adolescent development.

Most adolescents are greatly concerned about their appearance. This emphasis on physical attractiveness sometimes results in eating disorders, such as **anorexia nervosa** (a self-imposed starvation that results in a 15% loss of body weight). Approximately 1% to 2% of female adolescents are affected by anorexia; the rate in males is much lower—about 5% to 10% of the anorectic population is male (Stuart & Laraia, 1998). Other types of eating disorders common in adolescents are **bulimia** (episodic binge eating followed by purging) and **obesity** (weight that is 20% or more above the ideal body weight).

The teaching checklist provides essential information about eating disorders to share with clients and families.



CLIENT TEACHING CHECKLIST Preventing Eating Disorders

- Encourage a balance between exercise and food consumption.
- Promote an increased sense of self-esteem.
- Emphasize the importance of a healthy lifestyle rather than physical appearance.
- Avoid pressuring children to seek perfection or to strive for unrealistic goals.
- Recognize the indicators of eating disorders.

Nursing Implications

The nurse can support adolescents by providing information about the numerous bodily changes. Adolescents should be encouraged to share their health concerns with parents. However, the nurse must honor the adolescent's choice to withhold sensitive information from parents. The use of a nonjudgmental attitude is essential to the establishment of rapport when working with adolescents. Adolescents should be treated in a respectful, dignified manner. Avoid using a condescending attitude when communicating with them. The Nursing Checklist discusses approaches that can be used when working with adolescents.

Wellness Promotion

The nurse promotes the adolescent's wellness primarily through teaching. Areas to be emphasized in health education of adolescents include hygiene, nutrition, sex

TABLE 17-21
Sexual Maturity Rating for Male Genitalia

DEVELOPMENTAL STAGE	PUBIC HAIR	PENIS	SCROTUM
1. 	No pubic hair, only fine body hair (vellus hair)	Preadolescent; childhood size and proportion	Preadolescent; childhood size and proportion
2. 	Sparse growth of long, slightly dark, straight hair	Slight or no growth	Growth in testes and scrotum; scrotum reddens and changes texture
3. 	Becomes darker and coarser; slightly curled and spreads over symphysis	Growth, especially in length	Further growth
4. 	Texture and curl of pubic hair are similar to an adult's but hair not spread to thighs	Further growth in length; diameter increases; development of glans	Further growth; scrotum darkens
5. 	Adult appearance in quality and quantity of pubic hair; growth is spread to medial surface of thighs	Adult size and shape	Adult size and shape

(Data from Estes, M.E. [2001]. *Health assessment and physical examination*. Albany, NY: Delmar Publishers.)

education, developmental changes, and substance abuse prevention.

Adolescents need education about the physical changes they are undergoing. Health teaching is often done by school nurses, and the establishment of nurse-managed

clinics in schools is one avenue for promoting wellness among adolescents. School-based clinics are rapidly increasing. *Nursing's Agenda for Health Care Reform* (American Nurses Association, 1990) calls for the delivery of primary health care services to individuals in convenient, familiar



NURSING CHECKLIST

Therapeutic Approaches with the Adolescent Client

- Treat the adolescent as an active participant in health care to form a collaborative partnership.
- Answer all questions honestly.
- Be especially sensitive to nonverbal clues. Adolescents are often too embarrassed to initiate discussion of their health-related concerns.
- Remember that the peer group is of major importance to adolescents, and use group settings whenever possible to provide health education.
- Demonstrate acceptance of the adolescent even when limits need to be established to intervene with unhealthy or inappropriate behaviors.
- Questioning adult authority is a normal part of adolescent rebelliousness. Do not personalize testing behaviors. Nurses who personalize the behavior become defensive and lose their interpersonal effectiveness and credibility with adolescents.

places. What better place to teach adolescents about health care than in the schools?

Safety Considerations

Unhealthy behaviors contribute to the three major causes of adolescent death: accidents, homicide, and suicide. The following developmental factors increase the adolescent's risk for accidents:

- Impulsive behavior
- Sense of being invulnerable to accidents (a feeling that "It can never happen to me!")
- Testing limits
- Rebelling against adult advice

As a result, many adolescents engage in unhealthy behaviors such as smoking, consuming alcohol and other drugs, reckless driving, violence, and unprotected sexual activity.

THINK ABOUT IT

Adolescent Behaviors

Think of the type of behaviors adolescents often demonstrate to prove that they are "grown up." Which of these behaviors have a negative impact on health? A positive impact?

Many health problems in adolescents are related to sexual behaviors including acquired immunodeficiency syndrome, sexually transmitted diseases (STDs), and unplanned pregnancy.

The effect of teen pregnancy on families and communities is great. Social programs that provide resources for meeting the special needs of pregnant adolescents are decreasing. Many pregnant teens become trapped in a cycle of school failure (or dropout), limited employment opportunities, and poverty. Adolescents who become pregnant experience developmental difficulties in that they must make adult decisions. Infants born to adolescent mothers are likely to experience health-related problems such as prematurity and low birth weight.

The pregnant adolescent needs expert prenatal care, a supportive environment, and information. Client teaching must emphasize the prevention of STDs because the pregnancy itself is evidence of high-risk (unprotected) sexual activity.

Sexually transmitted diseases present a serious health threat for adolescents. Diseases such as genital herpes virus, human papillomavirus (which causes genital warts), chlamydia, syphilis, and gonorrhea are spread through sexual contact. The human immunodeficiency virus (HIV), which causes AIDS, is also transmitted through unprotected sexual activity. Table 17-22 describes the most common STDs.

NURSING ALERT

Legal Mandate to Report STDs

Laws concerning the dissemination of information about STDs vary among states and provinces. However, most have legislation that requires nurses to report the names of clients with certain STDs to the state/provincial health department. You must know the requirements for your state or province.

Nurses must educate adolescents about methods for preventing the spread of STDs. Preventive education should include the following topics:

- Methods of transmission
- Incubation period
- Clinical manifestations
- Treatment methods
- Consequences of lack of or inadequate treatment
- Notification of sexual partner(s)

Nurses who teach adolescent clients about safe sex practices need to be especially sensitive to cultural influences on sexual activity.

Another major health problem during adolescence is the high risk of suicide. Often, suicide is perceived by the adolescent as the only alternative to an overwhelming situation. Low self-esteem, lack of maturity, and

TABLE 17-22
Sexually Transmitted Diseases: An Overview

Disease	Characteristics	Nursing Implications
<i>AIDS</i>	<p>Incurable and, often, fatal disease In addition to sexual activity, other modes of transmission are:</p> <ul style="list-style-type: none"> • Direct exposure to infected blood or blood products • Intrauterine transmission from infected woman to fetus 	<p>Know that the incubation period can range up to 15 years from time of initial exposure. The only “cure” is prevention. Teach safe sex methods (use of latex condoms). Provide information about the disease. Treatment is primarily supportive. Provide physical care and psychological support. Always follow standard precautions guidelines.</p>
<i>Chlamydia</i>	<p><i>Males:</i> Painful urination Urethral discharge <i>Females:</i> Usually none May experience purulent discharge Note: If untreated, pelvic inflammatory disease (PID) can develop.</p>	<p>Instruct client to notify sexual partner(s) of past 2 months of their need for treatment. Instruct clients to avoid sexual activity or to use condoms until both client and partner(s) are symptom free. Medication education.</p>
<i>Chancroid</i>	<p>A small, irregular shaped papule (on the penis, labia, or vaginal opening) that develops into a painful ulcer that drains pus or blood. Dysuria (painful urination) Painful regional lymph nodes (inguinal tenderness)</p>	<p>Partner(s) having sex within 10 days before onset of client’s symptoms need to be assessed. Client should be reassessed within 7 days after treatment begins. Instruct in proper use of condoms. Medication education.</p>
<i>Genital herpes: herpes simplex virus 2 (HSV-2)</i>	<p>Vesicles on penis, vagina, labia, perineum, or anus Can progress to painful ulceration Lesions may last up to 6 weeks Recurrence is common Note: May be asymptomatic</p>	<p>Refer sexual partner(s) for examination. Teach that virus can be transmitted even when the person experiences no symptoms. Instruct in use of condoms. Teach females of need for annual Pap smear. Medication education.</p>
<i>Gonorrhea</i>	<p><i>Male:</i> Urethritis (inflammation of the urethra) Purulent discharge Urinary frequency Epididymitis (inflammation of the epididymis) <i>Female:</i> Is often asymptomatic May lead to PID or salpingitis (inflammation of the fallopian tube) Can occlude the fallopian tubes with resultant sterility</p>	<p>Instruct client to return for further treatment if symptoms persist. Sexual partner(s) within past 60 days need to be assessed. Avoid sexual activity until symptoms subside in both client and partner(s). Medication education.</p>
<i>Hepatitis B virus (HBV)</i>	<p>Varies greatly from asymptomatic state to severe hepatitis to cancer</p>	<p>Partner(s) should receive medical prophylaxis within 14 days after exposure. For client and partner(s): recommend three-dose immunization series when this episode has abated.</p>
<i>Human papillomavirus (genital warts)</i>	<p>Fleshy, cauliflower-like growth on genitalia</p>	<p>Inform and treat sexual partner(s). Medication education.</p>

(continues)

TABLE 17-22 (continued)
Sexually Transmitted Diseases: An Overview

Disease	Characteristics	Nursing Implications
<i>Syphilis</i>	<p>Disease consists of four stages with distinct manifestations:</p> <p><i>Primary:</i> A painless papule on penis, vagina, or cervix Serologic blood test usually negative Highly infectious during this stage</p> <p><i>Secondary:</i> Rash, especially prevalent on palms and soles Low-grade fever Sore throat Headache</p> <p><i>Early Latency:</i> Infectious lesions may occur, otherwise asymptomatic. Reactive serologic tests</p> <p><i>Late Latency:</i> Lesions may be present in central nervous and cardiovascular systems. Noninfectious except to fetus of pregnant woman</p>	<p>Interview client to identify sexual contacts. Protect confidentiality of all involved. All those exposed to the disease should be given penicillin.</p> <p>Educate client and sexual contacts about the disease. Medication education.</p> <p>Counsel and educate client.</p> <p>Counsel and educate client.</p>
<i>Trichomoniasis</i>	<p>Petechial lesions Profuse urethral or vaginal discharge that is foul smelling, yellow, and foamy</p>	<p>Treat sexual partners simultaneously with metronidazole (Flagyl). Medication education.</p>

(Data from Hale, P. J. [1996]. HIV, hepatitis, and sexually transmitted diseases. In M. Stanhope & J. Lancaster [Eds.]. *Community health nursing: Promoting health of aggregates, families, and individuals* [4th ed.]. St. Louis: Mosby-Yearbook; Harkness, G. A., & Dincher, J. R. [1999]. *Medical-surgical nursing: Total patient care* [10th ed.]. St. Louis: Mosby-Yearbook.)

THINK ABOUT IT

Values Clarification

As a nurse, you will often encounter clients whose value systems conflict with your own beliefs. How will you provide care to sexually active adolescents if you think their behavior is immoral or “wrong”? Is it ethical for you to try to change the adolescent’s values to be congruent with yours? Should you change your values to be congruent with those of the client?

impulsive behaviors may increase the risk of suicidal behavior. The rate of suicide is higher among adolescent males than females.

When assessing for suicidal potential, the nurse should always directly question the adolescent about any plans for harming or killing self. The accompanying display lists signs indicative of suicide risk in adolescents.

When teaching suicide prevention, inform people to *immediately* contact a health care professional if someone is exhibiting any of the indicators of suicide risk. Many communities have a special telephone suicide-cope line available.

NURSING ALERT

Suicide Prevention

Never leave the suicidal adolescent alone. Close observation is the best deterrent to suicide.

SIGNS OF SUICIDAL RISK IN ADOLESCENTS

- Anorexia
- Writing suicide notes
- Talking about suicide
- Aggressive behavior
- Substance abuse
- Running away from home
- Preoccupation with death
- Neglecting personal hygiene
- Giving away treasured objects
- Sudden changes in behavior
- Verbal cues (e.g., “You won’t have to worry about me much longer”)
- Fatigue
- Social withdrawal

Another significant health problem for many adolescents is substance abuse. Using alcohol or other drugs is a common maladaptive attempt to cope with the stressors of adolescence. The accompanying display lists indicators of substance abuse in adolescents.

INDICATORS OF ADOLESCENT SUBSTANCE ABUSE

- Decline in academic performance
- Mood swings
- Changes in personality (such as confusion, euphoria, belligerence, withdrawal)
- Fatigue
- Drowsiness
- Behaviors indicative of depression (such as appetite changes, insomnia, weight loss, apathy)

Nurses can play a key role in substance abuse prevention with adolescents. A comprehensive substance abuse prevention educational program includes:

- Hazards of drug use
- Misuse of legal substances, such as tobacco and alcohol
- Self-esteem boosting methods
- Assertive communication skills (how to say “no” to peers)
- Adaptive coping mechanisms for dealing with stress

By providing such information, nurses can help adolescents make responsible, informed decisions before experimentation with drugs begins.

Young Adult

Physical growth stabilizes during **young adulthood** (the developmental stage from the ages of 21 to approximately 40 years). The young adult continues to experience physical and emotional changes at a slower rate than adolescents. Table 17-23 describes the development of young adults. Young adulthood is a time of transition from an adolescent to a person capable of assuming adult responsibilities and making adult decisions.

Pregnancy, a time of transition and lifestyle adjustment, is experienced by many young women. Table 17-24 lists a few of the changes commonly experienced by women during pregnancy. Throughout pregnancy, women experience changes in self-concept and may need reassurance that such changes are normal.

Nursing Implications

Usually, young adulthood is the healthiest time in a person’s life. Consequently, concern for health is low among people in this age group and wellness is taken

for granted by many young adults. Preventive measures for young adults focus on two primary areas:

1. Avoidance of accident, injury, and violence
2. Development of health-promoting behaviors (e.g., lifestyle modification; Figure 17-11).

The nurse plays an important role in each of these areas of health promotion by teaching and counseling.

Other topics that are developmentally appropriate for the nurse to address are vocational counseling and establishing relationships.



Title of Study

“Feeling Old: Being in a Phase of Transition in Later Life”

Authors

Nilsson, M., Sarvimaki, A., & Ekman, S. L.

Purpose

To get a better understanding of the aging process in later life (among the old-old).

Methods

In-depth interviews were conducted on 15 people aged 85-96 years. The subjects lived in their own homes. Data were analyzed through a phenomenological-hermeneutic approach.

Findings

8 subjects stated that they felt old. The experience of being old included the following four factors:

1. Being able to date the beginning of feeling old
2. Fear of helplessness and of being dependent on others
3. Feeling different from others
4. Not recognizing one’s former self.

Each of these factors correspond to the characteristics of a transition phase.

Implications

Sensitivity to those who are very old is essential in delivery adequate health care. Knowledge about transition processes can assist the nurse in preventing unhealthy transitions.

Nilsson, M., Sarvimaki, A., & Ekman, S. L. (2000). Feeling old: Being in a phase of transition in later life. *Nursing Inquiry*, 7, 41-49.

TABLE 17-23
Young Adult: Growth and Development

Dimension	Characteristics	Nursing Implications
<i>Physiological</i>	<p><i>Physiological Changes:</i> Physical growth stabilizes.</p> <p>Time of optimum physical functioning.</p> <p>Maturation of body systems complete.</p> <p><i>Cardiovascular Changes:</i> Men are more likely to have increased cholesterol levels than women.</p> <p><i>Gastrointestinal Changes:</i> After age 30, decreased digestive juices.</p> <p><i>Dental Changes:</i> By mid-20s, dental maturity is achieved with emergence of last four molars (“wisdom teeth”).</p> <p><i>Musculoskeletal Changes:</i> At approximately age 25, skeletal growth is complete.</p> <p><i>Reproductive/ Sexual Changes:</i> System is completely matured.</p> <p><i>Women:</i> Ages 20–30 are optimal years for reproduction.</p> <p><i>Men:</i> Beginning at about age 24, male hormones slowly decrease; does not affect ability to reproduce.</p>	<p>The person is at physical peak and therefore less likely to be concerned with own health. Teach importance of health promotion behaviors.</p> <p>Encourage development of healthy lifestyles.</p>
<i>Psychosocial</i>	<p><i>Erikson:</i> Intimacy vs. Isolation Engages in productive work. Develops intimate relationships.</p> <p><i>Havighurst:</i> Becomes part of a social group. Selects a partner. Assumes civic responsibility.</p>	<p>Emphasize need for social support as the person assumes new roles. Teach time management skills.</p> <p>Provide sex education information, including prevention of STDs.</p>
<i>Cognitive</i>	<p><i>Piaget:</i> Formal operations stage Problem-solving abilities are realistic.</p> <p>Demonstrates less egocentricism.</p> <p>Many young adults are engaged in formal educational activities.</p>	<p>Encourage the development and use of appropriate judgment.</p>
<i>Moral</i>	<p><i>Kohlberg:</i> Postconventional stage Defines right and wrong in terms of personal beliefs and principles.</p> <p><i>Gilligan:</i> Women consider morality to be based on caring for others and avoiding hurt.</p>	<p>Assess the person’s value system and respect beliefs.</p>
<i>Spiritual</i>	<p><i>Fowler:</i> Individuative-reflective faith Assumes responsibility for own beliefs.</p>	<p>Encourage client to use spiritual support system.</p>

(Data from Beare, P. G., & Myers, J. L. [1994]. *Adult health nursing*. [2nd ed.]. St. Louis: Mosby-Yearbook; Edelman, C. L., & Mandle, C. L. [1997]. *Health promotion throughout the lifespan* [4th ed.]. St. Louis: Mosby-Yearbook.)

TABLE 17-24
Changes Experienced During Pregnancy

Physiological	Psychological
<p><i>First Trimester</i></p> Fatigue Nausea and vomiting Urinary frequency Constipation Breast tenderness and enlargement	<p><i>First Trimester</i></p> Emotional detachment as thoughts begin to focus on developing child Labile (rapidly changing) mood Ambivalence about the pregnancy Increased dependency on others Interest in learning about physical changes
<p><i>Second Trimester</i></p> Perception of fetal movement Fetal heart tone can be detected with fetoscope Increased libido	<p><i>Second Trimester</i></p> Doubts and fears about ability to care for an infant Bond with mate either strengthened or threatened Excited by fetal movement Initial attachment with fetus strengthened
<p><i>Third Trimester</i></p> Backache Stretch marks on abdomen or breasts Urinary frequency Heartburn Shortness of breath Varicose veins on legs	<p><i>Third Trimester</i></p> Feels less attractive Increased irritability Insomnia Anticipation of birth Plans for incorporating child into family unit

(Data from Edelman, C. L. & Mandle, C. L. [1997]. *Health promotion throughout the lifespan* [4th ed.]. St. Louis: Mosby-Yearbook; Fuller, J. & Schaller-Ayers, J. [1999]. *Health Assessment: A nursing approach* [3rd ed.]. Philadelphia: Lippincott.)



Figure 17-11 The assessment of this young adult's blood pressure is one part of a health promotion program that helps to enhance this client's wellness.

Wellness Promotion

Decision making by young adults affects their health status. Since young adults tend to take excessive risks, they are at greater risk for death from accident, suicide, or homicide (Edelman & Mandle, 1997). For example, driving recklessly, driving while intoxicated, engaging in unprotected sex, and participating in gang activities are examples of the lack of a sense of fear demonstrated by many young adults.

Sexually transmitted disease is a leading cause of infection with resultant reproductive dysfunction in young adults. The information presented about STDs in the discussion of safety considerations for adolescents is also applicable to young adults. Nurses should teach women how to perform a monthly breast self-examination (BSE). Men need to learn how to perform a testicular self-examination (TSE). See Chapter 27 for a complete discussion of the methods involved in performing BSE and TSE.

Safety Considerations

Because vehicular accidents are a major cause of health problems for young adults, providing information about driving safety is a must. Another activity that poses a health risk for many young adults is sunbathing. Exposure to direct sunlight with the resultant radiation or use of tanning salons is directly linked to skin cancer. Nurses can be influential in decreasing the occurrence of skin cancer through teaching and by role modeling safe behaviors.

Middle Adult

Middle adulthood (the developmental stage from the ages of 40 to 65 years) is characterized by productivity and responsibility. For most middle-aged adults, the majority of activity revolves around work and parenting, and success and achievement are measured in terms of career accomplishments and family life.

Physiological changes that affect many of the body systems occur during middle adulthood. Table 17-25 lists the major changes experienced by the middle-aged person.

The primary developmental task of the middle-aged adult revolves around the conflict of generativity (a sense that one is making a contribution to society) versus stagnation (a sense of nonmeaning in one's life). When an individual successfully resolves this developmental conflict, acceptance of age-related changes occurs. Achievement of the developmental task is indicated by the following:

- Demonstrating creativity
- Guiding the next generation
- Establishing lasting relationships
- Evaluating goals in terms of achievement

The evaluation of goals often leads to a midlife crisis, especially if individuals feel they have accomplished little or not lived up to earlier self-expectations.

Nursing Implications

A large proportion of the United States population consists of middle-aged adults (Edelman & Mandel, 1997). Individuals of the baby-boom generation have entered their midlife stage and will require more nursing care to maintain wellness and cope with illness.

Nurses have the opportunity to help middle-aged clients improve their health status (and thus quality of life) by identification of risk factors and early intervention. The major risk factors for adults in the middle years can be changed because they are primarily environmental and behavioral. Assisting the middle-aged client to change unhealthy behaviors can be done through one-to-one intervention or in group settings.

Wellness Promotion

As health educators, nurses can encourage middle-aged adults to assume more responsibility for their own health (Figure 17-12). Self-care education topics appropriate for the middle-aged adult include:

- Acceptance of aging
- Nutrition
- Exercise and weight control
- Substance abuse prevention
- Stress management
- Recommendations for health screening (cholesterol screening, prostate examination, mammogram, Papanicolaou [Pap] test).

Safety Considerations

Automobile accidents, especially those involving the use of alcohol, are a serious health problem for middle-aged adults. Another significant problem is occupational health hazards such as exposure to environmental tox-



Figure 17-12 Through activities such as running, these middle-aged adults have taken responsibility for their health and are learning to cope with the physiological changes that occur during this stage.

ins. Middle adulthood is also the time when a lifelong accumulation of unhealthy lifestyle practices, such as smoking, sedentary habits, inadequate nutrition, and overuse of alcohol, begins to exert adverse effects.

Most middle-aged individuals have increased leisure time. Consequently, there is an increased risk for recreational accidents, such as, boating accidents, sports-related injuries, and jogging mishaps.

Older Adult

Older adulthood is the developmental stage occurring from age 65 and beyond. Chapter 18 provides an in-depth discussion of the elderly adult. Therefore, this section only highlights the concepts of growth and development as they relate to the older adult. Table 17-26 provides an overview of growth and development in the older adult.

Older adults have several psychosocial tasks to accomplish, such as:

- Developing a sense of satisfaction with the life that one has lived (to find meaning in one's life)
- Establishing meaningful roles
- Adjusting to infirmities (if any exist)
- Coping with losses and changes
- Preparing for death

Nursing Implications

Professional nursing care is important in assisting aging people to develop a sense of well-being (Eliopoulos, 1996). Nurses who work with the elderly must be especially sensitive to their own feelings, attitudes, and beliefs about aging and be aware of the effect of these responses on their care of older clients.

When assessing the older adult for health-related needs, the nurse needs to learn about the client's background, family history, work history, hobbies, and

TABLE 17-25
Middle Adult: Growth and Development

Dimension	Characteristics	Nursing Implications
Physiological	<p><i>Cardiovascular Changes:</i> Decreased functional aerobic capacity results in decreased cardiac output. Blood vessels become thicker and lose elasticity.</p>	<p>Decreased capacity for physical activity. Instruct client about necessity of remaining physically active. Predisposition for hypertension (high blood pressure), coronary artery disease, cerebral vascular accidents (“strokes”). Teach client about lifestyle modifications related to cardiovascular health:</p> <ul style="list-style-type: none"> • Smoking cessation • Avoid secondary tobacco smoke • Nutrition (low fat, low cholesterol) • Engage in physical activity
	<p><i>Neurological Changes:</i> Cellular changes (regulation, repair, and atrophy) occur gradually. A gradual loss in efficiency of nerve conduction leads to impaired sensation of heat and cold.</p>	<p>Explain age-related changes. Provide support and reassurance. Teach safety precautions regarding:</p> <ul style="list-style-type: none"> • Exposure to sunlight • Sensitivity to heat stroke • Sensitivity to frostbite
	<p><i>Gastrointestinal Changes:</i> Slower gastrointestinal motility results in constipation.</p>	<p>Teach client about:</p> <ul style="list-style-type: none"> • Nutrition (high-fiber food intake; adequate amounts of fluid) • Maintaining physical activity
	<p><i>Genitourinary Changes:</i> Nephron units diminish in number and size; diminished blood supply to kidneys.</p>	<p>Teach normal age-related changes.</p>
	<p>Decreased glomerular filtration rate leads to decrease in urinary output with resultant dehydration.</p>	<p>Teach signs indicative of dehydration. Inform client of need to maintain adequate fluid intake.</p>
	<p><i>Integumentary Changes:</i> Decreased moisture and turgor of skin and loss of subcutaneous fat leads to development of wrinkles. Hair thins and turns gray.</p>	<p>Instruct client about effects of sun and cigarette smoking on the skin. Assess client for body image alterations. Use nonjudgmental listening. Provide support.</p>
	<p><i>Musculoskeletal Changes:</i> Decreased bone mass and density. Slight (from 1–4 inches) loss of height may occur.</p>	<p>Instruct client about:</p> <ul style="list-style-type: none"> • Need for calcium intake • Importance of decreasing caffeine and alcohol consumption • Effects of sedentary versus active lifestyle on osteoporosis
	<p>Thinning of intervertebral disks.</p>	<p>Increased risk of injury. Instruct client of need for proper posture (especially sitting), exercise, and adequate fluid intake.</p>
	<p>Generalized decrease in muscle tone; “flabby” appearance and less agility.</p>	<p>Instruct client on need for adequate physical activity.</p>
	<p><i>Endocrine Changes:</i> Decreased metabolism results in reduced production of enzymes and increased hydrochloric acid. Lead to acid indigestion and belching.</p>	<p>Instruct client to:</p> <ul style="list-style-type: none"> • Eat foods that are not spicy or fried • Avoid eating within 2 hours before bedtime

(continues)

TABLE 17-25 (continued)
Middle Adult: Growth and Development

Dimension	Characteristics	Nursing Implications
	<p><i>Reproductive/Sexual Changes: Women:</i> Cessation of estrogen and progesterone production during menopause. Regression of secondary sex characteristics (decreased breast size, loss of pubic hair). Decreased vaginal secretions. Note: With no pregnancy risk, some postmenopausal women enjoy sexual activity more.</p> <p><i>Reproductive/Sexual Changes: Men:</i> Decreased levels of testosterone. Reduced amount of viable sperm. Decline in sexual energy; takes longer to achieve an erection; erection is sustained longer. Adaptation to developing chronic diseases and sexual problems may diminish self-esteem.</p>	<p>Teach clients about age-related sexual/reproductive changes. Encourage responsible sexual behavior. Teach about prevention of sexually transmitted diseases.</p>
<i>Psychosocial</i>	<p><i>Erikson:</i> Generativity vs. Stagnation Adults who have achieved generativity feel good about their lives and are comfortable with themselves. Become more involved in altruistic acts (e.g., community activities, volunteer work). Usually experience changing family roles (e.g., caregiver to aging parents, grandparent).</p> <p><i>Havighurst:</i> Fulfill social and civic responsibilities. Assist children to become independent. Adult children leaving home may lead to happiness or depression (“empty nest syndrome”). Maintain relationship with one’s partner.</p>	<p>Provide support as the client deals with aging.</p> <p>Encourage to become involved in community activities. Teach leisure skills. Instruct in the need to care for self while caring for others.</p>
<i>Cognitive</i>	<p><i>Piaget:</i> Will use all stages, depending on the task (e.g., can move between formal operations, concrete operations, and problem-solving as needed). Able to reflect on the past and anticipate the future. Reaction time diminishes during late middle age. Memory is unimpaired. Learning ability remains intact if person is motivated and material is meaningful.</p>	<p>Encourage middle-age clients who are anticipating returning to school or engaging in other intellectually stimulating activities.</p>
<i>Moral</i>	<p><i>Kohlberg:</i> Postconventional stage</p> <p><i>Gilligan:</i> Women tend to judge morality of issues according to a sense of fairness and avoiding hurt to others. Establishes moral beliefs that are independent of what others think.</p>	<p>Use nonjudgmental approach when client discusses values.</p> <p>Respect personal differences by individualizing care.</p>
<i>Spiritual</i>	<p><i>Fowler:</i> Conjunctive faith Is able to appreciate others’ belief systems. Becomes less dogmatic with own beliefs. Religion is usually a source of comfort.</p>	<p>Encourage use of spiritual support. Refer to clergy if desired by client.</p>

(Data from Beare, P. B., & Myers, J. L. [1998]. *Adult health nursing* [2nd ed.]. St. Louis: Mosby-Yearbook; Edelman, C. L., & Mandle, C. L. [1997]. *Health promotion throughout the lifespan* [4th ed.]. St. Louis: Mosby-Yearbook; Fuller, J. & Schaller-Ayers, J. [1999]. *Health assessment: A nursing approach* [3rd ed.]. Philadelphia: Lippincott.)

TABLE 17-26
Older Adult: Growth and Development

Dimension	Characteristics	Nursing Implications
<i>Physiological</i>	<p><i>Cardiovascular Changes:</i> Reduced elasticity of heart muscle and arteries. Less efficient functioning of cardiovascular system; increased systolic blood pressure. Increased fat deposits on heart lead to reduced oxygen supply. Thickening of aortic and mitral valves leads to incomplete closure; murmurs may occur. Arterial diameter decreases as a result of arteriosclerosis Orthostatic hypotension may occur as the stiffened vessels are unable to constrict rapidly in response to postural changes. Thickening of venous walls leads to decreased elasticity. Development of varicose veins is common.</p> <p><i>Neurological Changes:</i> Decreased number of neurons. Fewer neurotransmitters. Slower transmission of nerve impulses. Decreased sensory threshold. The vestibulocochlear nerve (associated with balance and equilibrium) has decreased number of fibers.</p> <p><i>Vision</i> Pupils decrease in size and are less responsive to light. Cataracts and/or glaucoma often occur. Fewer tears are produced by the lacrimal glands so the cornea is likely to become irritated. Decreased ability to see colors; pastels fade; monotonous, blacks, and whites are difficult to see.</p> <p><i>Hearing</i> Ear canal may become blocked with cerumen (wax) which diminishes transmission of sound. Tympanic membrane is thinner and may become sclerotic. Diminished ability to hear high-frequency sounds.</p> <p><i>Taste and Smell</i> General decline in taste perception. Diminished salivation often occurs with aging. Olfactory nerve cells decrease in number.</p> <p><i>Respiratory Changes:</i> Decreased elasticity and muscle tone. Fewer functioning alveoli. Decreased number of cilia results in ineffective clearing of respiratory system. Calcification of chest wall and rib cage. Lungs tend to remain hyperinflated on exhalation which causes decreased vital capacity.</p>	<p>Decreased capacity for physical activity. Instruct client about the importance of remaining physically active and to balance activity with adequate rest/sleep. Teach client lifestyle modifications that promote cardiovascular health:</p> <ul style="list-style-type: none"> • Avoid smoking and other use of tobacco. • Avoid secondary tobacco smoke. • Proper diet (low fat, low cholesterol). • Avoid sedentary lifestyle. <p>A generalized slower response to environmental changes leads to increased risk for:</p> <ul style="list-style-type: none"> • Falls • Burns • Other injuries <p>Teach safety measures. Teach fall preventive measures.</p> <p>Be aware of client's increased sensitivity to glare; allow time for eyes to accommodate changes in lighting. The use of eye drops or artificial tears is helpful.</p> <p>Brighter colors compensate for decline in color discrimination.</p> <p>Teach proper hygiene for cleaning ears. Caution client to avoid inserting objects into ear during cleaning. Lower tone of voice and rate of speech; instruct family members to do likewise.</p> <p>Many elders prefer more highly seasoned foods, salt, and sugar; teach healthy diet plans. Increased loss of appetite often occurs; make food visually appealing and know the client's food preferences. Be alert for safety hazards associated with decreased sense of smell (inability to detect smoke, leaking gas, or spoiled food).</p> <p>Instruct client how to deep breathe and cough effectively. Encourage a balance between exercise/activity and rest/sleep.</p>

(continues)

TABLE 17-26 (continued)
Older Adult: Growth and Development

Dimension	Characteristics	Nursing Implications
	<p><i>Musculoskeletal Changes:</i> Loss of calcium from bones. Bone loss is a greater problem in women since it is accelerated by menopause. A gradual decrease in height results from bone loss. Less flexibility; muscle stiffness due to decreased number of elastic fibers in muscle tissues. General posture is flexion. Stands with feet apart. Center of gravity shifts with resultant changes in movement and balance.</p>	<p>Instruct women of all ages about importance of calcium consumption. Encourage the elderly to engage in physical activity, especially walking.</p> <p>Teach safety measures, including fall preventive measures. Encourage exercise to promote flexibility. Perform passive range of motion exercises for those who need it.</p>
	<p><i>Gastrointestinal Changes:</i> <i>Mouth</i> Atrophy of oral mucosa. Connective tissue loses elasticity. Decreased number of nerve cells. Saliva production is decreased and becomes more alkaline. Ability to chew food is impaired by loss of teeth, gum recession and degeneration of jaw bone.</p> <p><i>Gastrointestinal Tract</i> Peristalsis slows; decreased emptying of esophagus and stomach; slowed intestinal motility. Shrinkage of gastric mucosa leads to decreased amounts of hydrochloric acid. Reduction of pancreatic enzymes. Delayed time for emptying gallbladder; bile is thicker. Elimination is often impaired.</p>	<p>Decreased absorption of nutrients as a result of changes. Instruct on importance of adequate nutrition, especially fluids and bulky foods.</p> <p>Keep client well hydrated; instruct client to drink at least 8 glasses of fluid daily. Provide foods that are easily chewed.</p> <p>Encourage client to remain physically active. Teach importance of having a regular time for toileting.</p>
	<p><i>Endocrine Changes:</i> Metabolism slows. Alteration in pancreatic activity.</p>	<p>Inform client of need for fewer calories.</p>
	<p><i>Reproductive/ Sexual Changes:</i> Decreased amounts of growth hormone, estrogen, and testosterone blood levels.</p>	<p>Provide information about the normal changes associated with aging. Use nonjudgmental approach when client discusses sexual issues. Teach about effects of aging on reproduction and sexuality.</p>
	<p><i>Men:</i> Enlargement of prostate gland. Decreased reserves of testosterone. Testes softer and smaller. Sperm production decreased or inhibited. Ejaculations less forceful.</p>	
	<p><i>Women:</i> Breast tissue loses elasticity (starts to sag). Decreased size of uterus and fallopian tubes. Vaginal walls thin. Vaginal secretions decrease. Vulva and external genitalia shrink (due to loss of subcutaneous body fat).</p>	

(continues)

TABLE 17-26 (continued)
Older Adult: Growth and Development

Dimension	Characteristics	Nursing Implications
	<p><i>Integumentary Changes:</i> Decreased activity of sebaceous glands leads to drying. Decreased turgor. Thinning of epidermal layer. Decreased number of sweat glands (can result in heat exhaustion). Loss of subcutaneous fat increases susceptibility to cold. Wrinkles become more pronounced. Hair turns gray and thins.</p>	<p>When bathing:</p> <ul style="list-style-type: none"> • Avoid excessive use of soap, hot water, and brisk rubbing. • Pat, do not rub, skin dry. • Use tepid water. <p>Use lotion for itching and dryness. Avoid prolonged pressure on bony prominences. Protect from temperature extremes. Assess for body image alterations. For those with body image alterations:</p> <ul style="list-style-type: none"> • Assist with grooming as necessary. • Use photographs to help adjust to changing appearance. • Use touch to help clarify body boundaries.
<i>Psychosocial</i>	<p><i>Erikson:</i> Integrity vs. Despair Accepts one's life as it is. Feels a sense of worth when helping others.</p> <p><i>Havighurst:</i> Adjusts to retirement and changed financial status. Adjusts to decline in physical strength. Fulfills civic responsibilities. Meets social obligations. Adjusts to death of significant others. Develops affiliation with peers and age group (sees self as "old"). Retirement from employment affects finances, social activities, leisure time, and role identity (may be positive or negative impact). Potential for social isolation as significant others and peers die.</p>	<p>Ask the older person for advice. Identify and use their strengths. Encourage the use of reminiscence (life review).</p> <p>Encourage to express feelings concerning aging. Promote socialization with peers.</p>
<i>Cognitive</i>	<p><i>Piaget:</i> Formal operations stage; There is no decline in IQ associated with aging. Reaction time is usually slowed.</p> <p><i>Memory:</i> Short-term: decreased capacity for recall. Long-term: remains unchanged.</p>	<p>Allow client time to respond to questions or instructions. Be alert for the possibility of medication-induced confusion with resultant impact on memory.</p>
<i>Moral</i>	<p><i>Kohlberg:</i> Postconventional stage Makes moral decisions according to own principles and beliefs.</p>	<p>Support decision making. Respect values even when different from own.</p>
<i>Spiritual</i>	<p><i>Fowler:</i> Universalizing stage of faith. Is generally satisfied with one's spiritual beliefs. Tends to act on beliefs.</p>	<p>Listen carefully to determine spiritual needs. Acknowledge losses and encourage appropriate grieving.</p>

(Data from Firth, P. A., & Watanabe, S. J. [1996]. *Women's health: Instant nursing assessment*. Albany, NY: Delmar Publishers; Edelman, C. L., & Mandle, C. L. [1997]. *Health promotion throughout the lifespan* [4th ed.]. St. Louis: Mosby-Yearbook; Murray, R. B., & Zentner, J. P. [1997]. *Nursing assessment and health promotion through the lifespan* [6th ed.]. East Norwalk, CT: Appleton & Lange.)

THINK ABOUT IT

Nurses' Attitudes about Aging

Consider the “typical” older adult portrayed in our current society. What messages about the value of older people are communicated through the media? It is imperative that nurses become aware of their own attitudes toward aging. How do you feel about getting older? How do you feel about caring for aging people? Do you see aging as a progressive decline that ends in death? If so, you probably view aging as a depressing experience and, as a result, may project a hopeless attitude toward elderly clients. Or, do you view aging as time for continued development and change? If so, you are more likely to promote positive behaviors in elderly clients.

achievements (Figure 17-13). Clients should be encouraged to talk about their life experiences. When planning care, it is important to build on the client’s lifelong interests. By recognizing each client’s unique experiences and assets, the nurse is more likely to individualize care.

When clients express dissatisfaction and regrets about the past, the nurse should listen in a nonjudgmental manner and avoid trying to convince them that things are really better than they remember or perceive. It is important, however, to help clients put disappoint-



Figure 17-13 This older adult is able to maintain her independence and self-esteem through volunteer work. Describe the importance of incorporating information such as the ability and desire to make a contribution to society into an older adult’s nursing care.

ments into perspective by balancing them with accomplishments and achievements. Nurses should encourage families to engage in a positive life review with elderly clients. Most nursing interventions for the elderly center around introspection and reflection on their lives. Life review (or reminiscence therapy) promotes a positive self-concept in older people (Stuart & Laraia, 1998).

Wellness Promotion

Health promotion activities should be implemented with the elderly to maintain functional independence. Health promotion activities are aimed at maximizing the elder’s abilities and strengths. Specific topics that are developmentally appropriate for older clients are: use of leisure time, increased socialization, engaging in regular physical activity, maintaining a positive mental attitude, and developing and maintaining healthy lifestyles.

THINK ABOUT IT

Maintaining Autonomy

What type of behaviors can nurses promote to encourage an older client’s independence? In other words, how do nurses empower elderly clients to remain independent?

Safety Considerations

Falls pose a major health threat to the elderly. See Chapter 31 for information related to fall prevention and other specific safety promotion practices for elderly individuals. See Chapter 18 for information on other safety measures for the elderly.

KEY CONCEPTS

- Growth is the quantitative changes in physical size of the body and its parts.
- Development refers to behavioral changes in functional abilities and skills.
- Maturation is the process of becoming fully grown and developed and involves both physiological and behavioral aspects of an individual.
- During each developmental stage, certain developmental tasks must be achieved for normal development to occur.
- Growth and development of an individual are influenced by a combination of factors, including heredity, life experiences, health status, and cultural expectations.
- According to Freud, certain developmental tasks must be achieved at each developmental stage; failure to achieve or a delay in achieving the developmental task results in a fixation at a previous stage.
- Erikson stated that psychosocial development is a series of conflicts that occur during eight stages of life.

- Sullivan stated that personality development is strongly influenced by interpersonal relationships.
- Piaget's theory states there are four stages of cognitive development: sensorimotor, preoperational, concrete operations, and formal operations. Each stage is characterized by the ways in which the child interprets and uses the environment.
- Kohlberg's theory describes six stages of moral development through which individuals determine a moral code to guide their behavior.
- Gilligan states that women's moral judgment revolves around three issues: a concern with survival, a focus on goodness, and an understanding of others' need for care.
- Fowler's theory states that there are six distinct stages of faith development and, even though individuals will vary in the age at which they experience each stage, the sequence of stages remains the same.
- Providing care to the whole person is a basic concept of professional nurses, and knowledge of growth and development concepts guides holistic care of clients.
- The stages of the life cycle are the prenatal, neonate, infant, toddler, preschooler, school-age child, preadolescent, adolescent, young adult, middle adult, and older adult.
- Nurses have important roles in promoting the health and safety of individuals at each stage of the life cycle.

CRITICAL THINKING ACTIVITIES

1. State some ways in which Erikson's developmental theory relates to nursing.
2. Shaw stated, "Faith is the soul riding at anchor." What does this mean to you? In what ways do you demonstrate your faith? Observe several nurses. Note their demonstrations of faith.
3. You are assigned to care for a 4-year-old girl. What games and toys would be appropriate for her? Consider her developmental needs when answering.
4. You are a nurse in a clinic setting providing teaching to an adolescent male who has tested positive for chlamydia. What information will you discuss with him?
5. Name five beliefs you have about the elderly. Can you identify the source of these beliefs? How will these beliefs influence your care of elderly clients?

WEB RESOURCES

Centers for Disease Control and Prevention
<http://www.cdc.gov>
 National Health Information Center
<http://nhic-nt.health.org>

The Older Client



The setting sun is as beautiful as the rising sun.

—Japanese proverb

COMPETENCIES

1. Explain the meaning of “old age” in terms of theories and myths about aging.
2. Evaluate the multiple physical changes associated with aging and the impact these may have on an older adult’s ability to function and to perform activities of daily living.
3. Outline the physiological changes that occur with aging and ways that the older client can adapt to these changes.
4. Discuss the psychosocial impact that retirement, changes in social relationships, changes in living arrangements, and loss may have on the older client.
5. Define polypharmacy and its significance for nurses caring for older clients.
6. Identify physical and psychological signs of elder abuse.
7. Outline safety considerations for the elderly living at home.
8. Discuss the use of the nursing process with elderly clients.

KEY
TERMS

ageism
 chronological age
 lentigo senilis
 polypharmacy
 presbycusis
 restorative nursing care

When Ponce de Leon, the Spanish explorer, set out in search of the fountain of youth, he did not realize that the secret to longevity would be found—beginning in the late 20th century. Medical science has discovered what explorers could not: long life.

For most of the history of humankind, aging has been the problem of a fortunate few. Before 1900, when the average life expectancy was 47, relatively few people lived to be 50 years old. In the 20th century, great strides have been made in medicine, sanitation, hygiene, and control of infectious diseases. We have learned how to live longer, with life expectancy now over 75 years, but we are still trying to learn how to live well. The present challenge is not adding years to one's life, but rather to improve the quality of an extended life span. "The urgency, now, has begun to shift from that of medically prolonging life to ensuring that a prolonged life is worth living" (Volz, 2000, p. 24).

DEFINING OLD AGE

It is difficult to define *old age* in an era when factors such as medical breakthroughs and advanced health care techniques have extended the average lifetime by at least 20 years. The most obvious measure of age is a person's **chronological age**, or the exact age of a person from birth. But a person's chronological age does not dictate the state of health, attitude toward daily life, or beliefs about living. There are enormous differences among individuals. People in their seventies may look and act more as if they were 50, whereas some people in their thirties possess ideas and outlooks that resemble our worst stereotypes of the older generation. For these reasons, age is difficult to define chronologically.

So when does old age begin? For many centuries, people in their fifties were considered old. Today, Americans in their fifties generally consider themselves still young, and if asked at what age old age begins, are likely to respond "80." Nurses must respond to the needs of the *young old* (65 to 75 years of age), the *middle old* (ages 75 to 85), and the *old* (85 years and older). The U.S. population is rapidly aging; for example, between 1960 and 1996, the number of centenarians rose from 3,000 to 55,000 (Sadler, 2000).

There are approximately 34.4 million people in the America who are age 65 and older (American Association

of Retired Persons, 1999). As the fastest growing segment of the population, adults over the age 65 are projected to make up 16% of the total population by the year 2020 (U.S. Bureau of the Census, 1999); see Figure 18-1.

The graying of America's baby boomers will increase the demand for nurses with an increased sensitivity to and understanding of the needs, requirements, and capabilities of the older adult.

Theories of Aging

Aging is a complex process of biologic, psychosocial, cultural, and experiential changes. No one theory on aging completely embraces and explains all the many facets of change. Following is a discussion of several biologic and psychosocial theories on aging that provide a frame of reference for providing nursing care to elderly clients.

Biological Theories

There are several biological theories which address the physical changes of aging. The *stress theory* suggests that irreversible structural and chemical changes occur in the body as a result of stress throughout the life span and that individuals must learn to adapt to these changes. The *cross-linkage theory* describes the deterioration of tissues and organs as the cause of loss of flexibility and functional mobility that occurs with aging. The *somatic mutation theory* takes a similar cellular level approach in stating that changes in DNA that are not repaired lead to replication of mutated cells, which brings about decreased cellular functioning and loss of organ efficiency. The *programmed aging theory* states that life span is determined by heredity and that an internal genetic clock is responsible for the rate at which an individual develops, ages, and eventually dies.

Psychosocial Theories

Psychosocial theories on aging present the position that many factors in addition to genetics contribute to the aging process. The *disengagement theory* posits that as



Figure 18-1 People age 65 and over are the fastest growing segment of the U.S. population. (From U.S. Bureau of the Census. (2000). *Population estimates and projections*. [On-line]. Available: <http://www.childstats.gov/ac1999/poptxt.asp>)

individuals age, they inevitably withdraw from society and society withdraws from them in a mutually agreed-on dance of separation. The *continuity theory* suggests that an individual's values and personality develop over a lifetime and that goals and individual characteristics will remain constant throughout life; an individual thus learns to adapt to changes and will tend to repeat those reactions and behaviors that brought success in the past. The *activity theory* proposes that an individual's satisfaction with life depends on involvement in new interests, hobbies, roles, and relationships. Volunteering is one way that many retirees stay connected to the community. In addition to providing social connection, volunteer activities provide a daily routine, a way to make a contribution, and a sense of being needed.

THINK ABOUT IT

Personal Views on Aging

Consider your own beliefs about aging. Do you feel that one of these theories best represents the older adult population? Would you classify your opinion of older adults as basically positive or basically negative? On what information have you based your views?

Myths and Stereotypes of Aging

In our youth-driven society, old age has a negative connotation. In many cultures, elderly people are accorded a position of respect, and young people feel a moral and familial responsibility to care for parents and older relatives. In American culture, misconceptions about the elderly abound. Older adults are often stereotyped as being ill, bald, hard of hearing, forgetful, rigid, grumpy, or boring, simply on the basis of their age and regardless of their competencies and individual characteristics. Many younger Americans also believe that all older people live in nursing homes and fail to consider the independence of the older generation and their contributions to society. These types of attitudes are known as **ageism** (the process of stereotyping of and discriminating against people because they are old).

To many, aging is synonymous with death; these individuals have a negative view of the aging process, which usually results from fear, lack of exposure to older individuals, and a lack of understanding of how varied experiences can enhance the overall quality of life. Surprisingly, many older adults have negative attitudes toward other older adults; these often result from fear of stereotypes and social stigmas, or a sense of anxiety over “guilt by association.” Nurses need to be aware of these myths and stereotypes and to separate them from the realities of the aging process in order to provide sensitive and appropriate care to older clients.



NURSING TIP

Working with the Older Client

As you work with older clients, keep these concepts in mind:

- “Old” is a relative, subjective, and changing concept.
- Old age is experienced by individuals who were once young.
- Older persons are individuals; many of their attributes have nothing to do with their age.
- Ageism is unacceptable in the care and treatment of older persons.
- Older persons are entitled to the same high quality of health care as younger persons.

Quality of Life among the Elderly

Quality of life is gaining more emphasis in today's aging society. Sadler (2000) states that the United States is experiencing a *longevity revolution*, in that “many people are living twice as long as humans were previously expected to live. In 18th century America, the average life span was barely 40. With the approach of the 21st century, the average American life span is nearly 80” (p. 80). The increasing life span has both positive and negative outcomes. For example, Medicare beneficiaries (people aged 65 and over) spent an average of \$2,430.00 each (19% of their income) for health care services in 1999 (American Association of Retired Persons, 1999).

One of the greatest fears associated with advancing age is poor health. Everyone wants to live a long life, as long as it is a long *healthy* life. The elderly do have more health problems than the general population.

Fortunately, the trend is in fact for people to live longer *and healthier* lives. Many Americans over 65 live in relative financial comfort, able to continue working or start enjoying their retirement years. Good nutrition, proper exercise, continued work, travel, recreation, hobbies, and companionship are just a few of the healthy lifestyle choices many older people now have the means to afford.

Outlook and adaptation contribute to the high quality of life enjoyed by many older adults today. Although many people over 65 have some kind of chronic health problem, most have found ways to keep these ailments from lowering their enjoyment of life. Most older people accept a certain amount of declining health as a normal, expected part of aging, but do not allow health issues to interfere with the vigorous pursuit of enjoyment; see Figure 18-2.



Figure 18-2 Older adults often assume new roles, such as grandparent, as they mature, and can gain immense pleasure in spending time with family and sharing wisdom and ideas with the younger generation.

CHANGES ASSOCIATED WITH AGING

Change is an ongoing part of life. Anyone who has a difficult time accepting change, and therefore adapts poorly to it, will experience problems and pain, even if he or she lives to be 100. Changes of aging can be viewed as developmental, physiological, or psychosocial in nature.

Developmental Changes

At every stage of life, including old age, new developmental challenges constantly arise. Like developmental challenges faced earlier in life, these occasions are opportunities for success or failure. Older people may experience feelings of satisfaction or success over completing certain developmental tasks associated with aging, such as:

- Gaining insight or wisdom, even if physical powers are in decline
- Developing better social skills, with more same-sex friendships
- Becoming more open-minded and tolerant
- Finding an unexpectedly active and pleasurable sexual dimension
- Seeing children transform into responsible, successful adults
- Becoming a grandparent
- Holding civic and community positions of responsibility
- Achieving mastery of one's occupation or skills
- Developing new skills, hobbies, and avocations
- Renewing and deepening one's relationship with one's spouse
- Gaining new knowledge and experiences

- Accepting and adjusting to physical changes associated with aging
- Coping with aging parents, spouses, and friends

On the other hand, any older person would be challenged to find successful ways to cope with other developmental tasks of aging, such as:

- Adjusting to the death of a spouse
- Adapting to major declines in health or physical ability
- Adjusting to the loss of social role, prestige, occupation, income, or sense of usefulness
- Getting accustomed to loss of independent living
- Adjusting to any kind of loneliness or loss without boredom or depression

Research (Tanner & Lethbridge, 1998) shows that loneliness is the greatest problem among homebound elders.

It is important for the nurse to assess the nature of any developmental challenges a client may be experiencing because a client's adaptation to changes can have a profound effect on health status.

Physiological Changes

From the moment of birth, the human body begins the aging process. As a unique individual, each person ages differently; the rate of age-related changes varies from one individual to the next. However, some generalized physiological changes occur with the aging process, including:

- A decrease in the rate of cell mitosis
- A deterioration of specialized nondividing cells (such as neurons)
- Decreased elasticity and increased rigidity of connective tissue
- Decreased functional capacity

Some of the physical changes of aging, such as graying of the hair and decreased visual acuity, are readily apparent. Other changes are more subtle and may go undetected until a problem occurs.

The rate of aging is influenced by:

- genetic composition
- lifestyle (dietary and exercise patterns)
- previous experience (e.g., adaptive responses to stressors)
- presence of chronic illnesses

Neurological Changes

Aging brings about several changes in the nervous system that alter sensory and perceptual responses, as shown on the accompanying display. As a result of these changes, reaction time is usually slowed. The generalized slower response to environmental changes leads to increased risk for falls, burns, and other injuries.

AGE-RELATED NEUROLOGICAL CHANGES

- Fewer neurons
- Transmission of nerve impulses slowed
- The number of neurotransmitters (chemical messengers of the central nervous system) decreased
- Sensory threshold decreased (affects pain and tactile sensations)

(From Murray, R. B., & Zentner, J. P. [1997]. *Nursing assessment and health promotion: Strategies through the life span* [6th ed., p. 557]. Norwalk, CT: Appleton & Lange)

It is important that the nurse allow older clients time to respond to questions and instructions. Teaching safety measures is a preventive aspect of nursing that must not be overlooked when dealing with older clients.

Sensory and Perceptual Changes

Sensory changes are progressive and usually cause some limitations in later years. The resultant changes may impair the individual's ability to enjoy life to the fullest, as well as present related health problems.

Vision

The aging process causes some visual changes. For example, pupils decrease in size and are less responsive to light. Usually a loss of visual acuity occurs because of degenerative changes related to aging. By the age of approximately 42, the lens cortex becomes thicker, impairing its ability to change shape and focus. This condition, presbyopia, causes farsightedness and is corrected by the use of bifocals.

Cataracts, glaucoma, and age-related macular degeneration are the most common pathological visual problems experienced by the elderly. Cataracts (or opacity of the lens) can be surgically corrected. If untreated, glaucoma can result in blindness; thus, annual screening is recommended for all individuals over age 40. Age-related macular degeneration is the loss of central vision; magnification must be used to compensate for the changes. Diabetes, hypertension, and other systemic diseases will exacerbate macular degeneration. Fewer tears are produced by the lacrimal glands so the cornea is likely to become irritated. Most elderly people experience a decreased ability to see colors; pastels fade, and monotonous blacks, and whites are difficult to see. These changes normally occur with aging.

The nurse caring for older clients must be aware of the client's increased sensitivity to glare and allow time for the eyes to accommodate changes in lighting. The use of eyedrops or artificial tears may also be beneficial. Brighter colors compensate for the decline in color discrimination.

Hearing

Generally, hearing is diminished with age. There is a drying and wrinkling of the auricle with a noticeable increase of hair in the auditory canal. Cerumen becomes drier and can cause impaction, which blocks transmission of sounds. The hearing loss associated with old age is called **presbycusis**. In the middle ear, bony joints show some degeneration. However, the major changes occur in the inner ear, where degeneration of the vestibular system and simultaneous atrophy of the cochlea and the organ of Corti produce deficits in equilibrium and hearing.

Nurses need to be very patient in their approach to the older client. With anticipated changes in sensory perception, it is important that nurses face their clients, speak slowly and clearly, and protect them from injury. It is important when teaching clients that nurses ask for feedback and evaluate comprehension.

Taste and Smell

With aging, taste perception declines and salivation is diminished. Many older clients prefer more highly seasoned foods, with more salt and sugar to compensate for a decreased sensation of taste. Increased loss of appetite often occurs and may be medication-related in some individuals. It may be helpful for older adults to eat small portions frequently throughout the day. The nurse seeks to make food visually appealing and know the client's food preferences. It is important to teach clients about healthy eating patterns.

Olfactory nerve cells decrease in number. The nurse should instruct family members and other caregivers to be alert for safety hazards associated with decreased sense of smell, such as the inability to detect smoke, leaking gas, or spoiled food.

THINK ABOUT IT

Food Preferences

When you think about eating and preparing food for others, what are some of the things you consider? Think of a favorite meal and what you like most about it. Do you have preferences involving color, aroma, texture? Older people may experience gradual loss of taste and smell. What do you do to your food to enhance its taste appeal?

Cardiovascular Changes

As a result of aging, functioning of the cardiovascular system becomes less efficient. Reduced elasticity of the heart muscle and arteries causes a subsequent increase in systolic blood pressure. Increased fat deposits in the blood vessels lead to a reduced supply of oxygen. The arterial diameter decreases as a result of arteriosclerosis. Thickening of venous walls leads to decreased elasticity.



RESEARCH FOCUS

Title of Study

“Comprehensive Discharge Planning and Home Follow-Up of Hospitalized Elders: A Randomized Clinical Trial”

Authors

Naylor, M.D., Brooten, D., Campbell, R., Jacobsen, B.S., Mezey, M.D., Pauly, M.V., & Schwartz, J.S.

Purpose

Examine the effectiveness of an advanced practice nurse-centered discharge planning and home care follow-up intervention for elders at risk for hospital readmissions.

Methods

This was a randomized clinical trial with follow-up at 2, 6, 12, and 24 weeks after hospital discharge. Participants were 65 years or older and had been hospitalized between August 1992 and March 1996. The clients in the experimental group received a comprehensive discharge planning and follow-up protocol designed for elders at high risk for poor outcomes following discharge; the interventions were performed by advanced practice registered nurses (APRNs).

Findings

By week 24 after hospital discharge, control group clients were more likely than experimental group clients to be readmitted at least once. Fewer experimental group members had multiple readmissions. Time to first readmission was increased in the intervention group.

Implications

APRN-centered discharge planning and home care intervention for at-risk hospitalized elders reduced readmissions, lengthened the time between discharge and readmission, while reducing the cost of delivery of care to elders.

Naylor, M. D., Brooten, D., Campbell, R., Jacobsen, B. S., Mezey, M. D., Pauly, M. V., & Schwartz, J. S. (1999). Comprehensive discharge planning and home follow-up of hospitalized elders: A randomized clinical trial. *Journal of the American Medical Association*, 281(7), 613–620.

ished cardiac output is problematic when the older person becomes physically, mentally, or emotionally impaired (Ebersole & Hess, 1998).

The nurse should instruct the client about the importance of remaining physically active and the need to balance activity with adequate rest and sleep. Older clients also need information on lifestyle modifications that promote cardiovascular health. Such instruction would include the following:

- Avoid smoking and use of other forms of tobacco.
- Avoid secondary tobacco smoke.
- Eat a proper diet (low fat, low cholesterol).
- Avoid a sedentary lifestyle, which can result in impaired cardiac output and fatigue.

Respiratory Changes

Most older adults experience a decreased functional respiratory reserve capacity, with a generalized decreased elasticity and tone of muscles, including the muscles necessary for respiration. Physical changes in the lungs include fewer functioning alveoli and a decreased number of cilia. Therefore, ineffective clearing of the respiratory system occurs. Calcification of the chest wall and rib cage causes the lungs to remain hyperinflated on exhalation, thereby decreasing vital capacity. Factors contributing to respiratory problems are shown in the accompanying display.

FACTORS CONTRIBUTING TO RESPIRATORY DISEASES

- *Smoking*—the major contributing factor to respiratory problems; workload of the lungs is increased due to decreased oxygenation level.
- *Impaired functioning of immune system*—increases the risk of respiratory infections.
- *Impaired mobility*—lung expansion is decreased; secretions pool in lungs and provide a medium for growth of microorganisms; increased risk of pneumonia.
- *Obesity*—leads to decreased lung expansion and volume.
- *Surgery*—most anesthetic agents cause decreased respiratory rate and decreased tidal volume and lead to hypoventilation.

(From Johnson, A. P. [1999]. The pulmonary system and its problems in the elderly. In M. Stanley & P. G. Beare [Eds.], *Gerontological nursing* (2nd ed.). Philadelphia: Davis)

Thickening of aortic and mitral valves leads to incomplete closure; murmurs may occur in some older people. The development of varicose veins is common. As a result of decreased cardiac output, many elderly experience a decreased capacity for physical activity. A dimin-

To deal with respiratory changes, the nurse teaches the client how to breathe deeply and cough effectively. The client needs to establish a balance between exercise and activity to conserve respiratory effort while at the same time improving vital capacity. Because physical

exercise increases lung capacity, nurses encourage clients to walk.

Gastrointestinal Changes

Aging brings about several alterations in gastrointestinal functioning. The major changes are described in the following section.

Mouth

Many elderly people lose their teeth for a variety of reasons, including years of inadequate dental hygiene and extended use of medication (e.g., anticonvulsant drugs). Other physiological changes include atrophy of oral mucosa, loss of elasticity in connective tissue, and a decreased number of nerve cells that control chewing, swallowing, and taste. Saliva production is decreased, and saliva becomes more alkaline. The elderly person's ability to chew food is often impaired by loss of teeth, gum recession, and degeneration of the mandible. The nurse should instruct the client and caregivers to have foods that are easily chewed and swallowed available.

Gastrointestinal Tract

There is a decrease in peristaltic action with a relaxation of the lower esophageal sphincter. This causes a decreased emptying of the esophagus and stomach. Intestinal motility is slowed. Shrinkage of gastric mucosa leads to changes in the levels of hydrochloric acid, the reason for many older person's complaint of heartburn. Older adults have an inability to tolerate large amounts of foods containing fat.

Elimination is often impaired in elderly clients. As a result, there is decreased absorption of nutrients. Some loss of sphincter control may be noted. Nurses should instruct older clients about the importance of adequate nutrition, especially fluids and bulky foods. Keep clients well hydrated by instructing them to drink at least 8 glasses of fluid daily. Other methods to prevent constipation are physical activity and a regular time for toileting.

Genitourinary Changes

Major changes in the structure and function of the urinary system are associated with aging. The kidneys, bladder, and ureters are all affected by the aging process.

The loss of some muscle tone in the bladder and urethra can result in incomplete emptying of the bladder. Residual urine can lead to bladder infection. Decreased bladder capacity may cause subsequent nocturia and polyuria.

Renal function is the major determinant of an individual's fluid and electrolyte balance. In the elderly, renal function is often affected by diminished blood flow to the kidneys as a result of arteriosclerosis, hypertension, and other cardiovascular disorders. The glomerular filtration rate slows and there are fewer functioning nephrons.

The risk of renal failure increases with age, as does fluid retention. Dehydration is a very real threat for many older adults. The aging body loses some of its functional ability to adapt to changes in total body water, which is essential for metabolism. The composition of body water declines to about 40% of an older adult's total body weight.

Nursing measures address the underlying problems that result in a fluid and electrolyte imbalance. For example, if clients are dehydrated, they should be instructed to drink 2000 ml (10 glasses) of liquid a day. Note that the fluid intake should be limited 2 hours before bedtime to decrease the likelihood of nocturia.

Endocrine Changes

During the aging process, the following changes occur in the endocrine system:

- Slowing of metabolism
- Alteration in pancreatic activity
- Decreased blood levels of growth hormone, estrogen, and testosterone

As a person ages, the number of hormonal receptors in the adrenal and thyroid glands decreases. Thus, the person's ability to respond effectively to stress is diminished. Aging is associated with altered functioning of the pancreas; there is an increased level of insulin and circulating glucose.

The major changes affecting men are enlargement of prostate gland (benign hypertrophy) and decreased reserves of testosterone. The age-related changes for women include a loss of elasticity in breast tissue with resultant sagging of the breasts, decreased size of uterus and fallopian tubes, and decreased motility of fallopian tubes.

The nurse must provide information about the normal changes associated with aging and listen in a non-judgmental manner when clients discuss their concerns about the physical changes.

Reproductive/Sexual Changes

To promote discussion of sexuality, it is important for the nurse to adopt an understanding and accepting attitude. Sensitivity to verbal and nonverbal cues will also promote the client's expression of concerns. The nurse must not assume that the elderly client is heterosexual, sexually inactive, or uninterested in sex (Figure 18-3). "Sexual function is not normally lost with age, yet attitudes and expectations seem to imply that older adults are not interested in or capable of sex" (Eliopoulos, 1999, p. 405). It is important to recognize the elderly as sexual beings and to provide privacy to promote intimacy. See the accompanying display for a listing of sexual responses in older adults.



Figure 18-3 Elders need companionship as intimacy and sexuality remain important throughout the entire life span.

Older adults who are sexually active may need education about sexually transmitted diseases (STDs), including AIDS. This is one health education topic that is frequently overlooked in health promotion for the elderly.

When caring for clients of either gender, the nurse should teach about the effects of aging on reproduction and sexuality and should use a nonjudgmental approach when clients discuss sexual issues.

Changes in Men

As men age, the testes become softer and smaller as a result of decreased concentration of testosterone in the bloodstream. The production of sperm is inhibited or decreased, and ejaculations are less forceful. Sexual dysfunction increases in prevalence with aging; however, it is not an inevitable result of the aging process. According to Sheehy (1999), “40% of normal healthy males remain completely potent at age 70” (p. 188).

RISK FACTORS FOR ERECTILE DYSFUNCTION (ED)

- Anemia
- Anxiety
- Cigarette smoking
- Concern about sexual performance
- Depression
- Diabetes
- Hormonal imbalances
- Hyperlipidemia
- Hypertension
- Medications
- Multiple sclerosis
- Previous traumatic sexual experience
- Prostate surgery
- Renal failure
- Spinal cord injury
- Substance abuse
- Thyroid abnormalities
- Vascular bypass surgery

(From Sadovsky, R. Management of erectile dysfunction. *CNS Special Edition*, 1[1],79–83.)

Several factors contribute to the possible development of erectile dysfunction (ED), also referred to as impotence; see the accompanying display.

Changes in Women

The older woman experiences a decline in the serum levels of estrogen. As a result, the vaginal walls thin and vaginal secretions decrease. The vulva and external genitalia shrink because of loss of subcutaneous body fat. Postmenopausal changes, such as vaginal dryness, may cause the woman to experience pain during intercourse. The nurse needs to inform the older woman about using water-soluble lubricants to relieve the pain and discomfort that may occur during intercourse.

AGE-RELATED CHANGES IN SEXUAL RESPONSES

Women

- Nipple erections during sexual excitement may last several hours postorgasm.
- Orgasms are usually unchanged, except that vaginal contractions may be of shorter duration.
- Vaginal lubrication is decreased.
- Urinary frequency and urgency occur after intercourse.
- Clitoral response to stimulation is the same as in youth.
- Skin is less flushed due to superficial vasocongestive skin response.

Men

- It takes longer to achieve an erection.
- More direct physical stimulation is required for erection.
- Erection is more readily lost after interruption.
- There is an increased ability to prolong time before ejaculation.
- Ejaculation may be less forceful or may not occur.
- Orgasm is similar to that experienced in youth.
- Less flushing of skin occurs.

(From Eliopoulos, C. [1999]. *Manual of gerontologic nursing* [2nd ed.]. St. Louis: Mosby.)

Musculoskeletal Changes

Many people experience a decrease in height as they age. Long bones take on a disproportionate size, and many aged people assume a stooped posture. These postural changes occur primarily as a result of calcium loss from bone, creating osteoporosis and kyphosis. These conditions are more common in women than in men and are implicated in estrogen loss that occurs with aging.

Ligaments, tendons, and joints are also affected by age. They show results of collagen loss and become hardened, more rigid, less flexible, and predisposed to tears. Cartilage wears down around the joints, making flexion painful. Walking and a consistent exercise pattern can promote function and prevent the disabling effects of many of these changes (Ebersole & Hess, 1998).

The nurse should instruct women about the importance of calcium consumption. Foods with a high calcium content include dairy products and green leafy vegetables. Encourage exercise, especially walking, to promote flexibility and perform passive range of motion exercises for those who need it. It is essential that the nurse teach safety measures, including fall prevention measures, to clients and caregivers.

Integumentary Changes

Older adults frequently experience dry, wrinkled, flaccid skin. This is an expected condition that occurs with aging because the skin loses many of the properties that help make it appear youthful. It takes approximately 20 days for epidermal cells to be replaced in a young person, whereas in the older adult, this process takes about 30 days. Therefore, it takes longer for an elderly client's wounds to heal. Because of collagen loss, the skin of an older person loses its ability to stretch, and thus tears more easily. Loss of subcutaneous fat, moisture content of the skin, and elastic fibers causes the older person's skin to wrinkle, dry, and sag, leading to the development of elongated ears, jowls, and double chin. If the client has had years of sun exposure, skin drying is accelerated. For the aging smoker, dehydration of the skin is exacerbated even more.

The development of **lentigo senilis** (brown pigmented areas on the face, hands, and arms of older people) can cause the person concern over his appearance. Sometimes called liver spots or age spots, these colorations are benign. Some cosmetic agents may lighten or almost eliminate these spots.

Skin appendages (hair and nails) also undergo changes associated with aging. Hair loses its original color as the production of melanin decreases, turning it gray, and eventually, white. Hair also tends to thin, both on the head and elsewhere on the body. Nails thicken and become more brittle. Care of the toenails often becomes a problem for many older people because they may not have the flexibility to reach their feet easily. The nurse must take special care to assess the skin and its appendages. Referrals to a podiatrist may be necessary for an older person to receive adequate care of the toenails.

As a person ages, the number of sweat glands decreases; this decrease can result in heat exhaustion. The decreased amount of subcutaneous fat may also lead to increased susceptibility to cold.

The accompanying Client Teaching Checklist provides guidelines for dealing with integumentary changes. Some elderly clients will have body image changes as a result of these visible signs of aging. The nurse must assess for body image alterations. If the client has an altered body image, it may be appropriate to:

- Assist with grooming as necessary.
- Use photographs of client to help adjust to changing appearance.
- Use touch to help clarify body boundaries.



CLIENT TEACHING CHECKLIST

Responding to the Elderly Person's Integumentary Alterations

1. Instruct client to avoid excessive use of soap, hot water, and brisk rubbing when bathing.
2. Teach client to pat skin dry instead of briskly rubbing.
3. Inform client of the need to use tepid bathwater.
4. Use lotion for itching and dryness.
5. Use a humidifier to help reduce dryness.
6. Avoid prolonged pressure on bony prominences.
7. Protect the skin from temperature extremes.
8. Protect skin from sun exposure (wear protective clothing, hats, sunglasses, and use sunblock with a high SPF factor).
9. Soak nails in water before trimming.
10. Dress appropriately for weather and climate.

Alterations in Mental Status

Alterations in mental status that occur with aging can be mild and have little impact on a client's functioning, or they can be severe and require the older adult to have assistance in managing psychosocial and physical needs. The nurse must understand the types of cognitive deficits experienced by the elderly and what each one means to the client's health status.

Acute confusion is a state of diminished awareness and attention of typically short duration (hours to weeks). The level of confusion often varies according to the time of day, worsening at night; this may cause sleep pattern disturbances. The individual is usually unaware of the setting, time of day, or day of the week and needs frequent reorientation to reality.

An individual with *dementia* experiences chronic confusion, usually of a long duration (months to years), that impedes functioning. Individuals with dementia will exhibit personality changes, difficulty with sequential speech and thoughts, and possibly a lack of orientation to reality. *Alzheimer's disease* is a type of dementia that causes numerous deficits, including diminished intellectual abilities, confusion, and impaired judgment.

Depression is an altered state of mood that lasts at least 6 weeks. Individuals suffering from depression typically are alert and oriented to their environment but are characterized by exaggerated sadness, apathy, and preoccupation with negative thoughts. Table 18-1 offers guidelines for distinguishing among acute confusion, dementia, delirium, and depression in the elderly. Many people believe that it is normal for older adults to

TABLE 18-1
Distinguishing Acute Confusion, Delirium, Dementia, and Depression

Parameter	Acute Confusion	Delirium	Dementia	Depression
Definition	Inability to think with usual clarity, speed, and coherence	Perceptual disorder characterized by heightened awareness, hallucinations, vivid dreams, and intense emotional outbursts	Deterioration of all cognitive functions with little or no disturbance of consciousness or perception	Altered emotional state characterized by feelings of intense sadness, helplessness, and hopelessness
Onset	Variable	Sudden	Gradual	Variable
Duration	Reversible	Reversible	Irreversible	Reversible
Pathophysiology	Metabolic disorders Toxic substances Cerebrovascular accident (CVA) Trauma Febrile states	Drug intoxications Withdrawal from alcohol and other drugs Encephalitis Trauma Febrile states Hypoxia Fluid and electrolyte imbalance	Alzheimer's disease Metabolic disorders CVA Head injury	Neurochemical abnormalities Significant loss Parkinson's disease Alzheimer's disease CVA Medications
Attention	Impaired: dulled	Impaired: heightened or dull	Impaired	Intact
Memory	Short term: impaired Long term: may be impaired	Short term: impaired Long term: intact	Short term: impaired first Long term: intact until disease progresses to later stages	Variable because of concentration ability
Judgment	Impaired	Grossly impaired Impulsive Volatile	Impaired	Impaired
Insight	Impaired	Impaired	Impaired	Impaired if in bipolar (manic) phase
Spatial perception	May be impaired	Intact	Impaired	Intact
Thought process and content	Impaired, incoherent	Impaired, hallucinations	Impaired	Intact but may demonstrate flight of ideas (jumping rapidly from one unrelated topic to another)

(From Estes, M. E. Z. [2002]. *Health assessment and physical examination (2nd ed.)*. Albany, NY: Delmar Publishers.)

become sad and withdrawn; this is a false assumption, which leads to lack of diagnosis and treatment of a serious health problem. Late life depression can be successfully treated if it is not dismissed as an inevitable part of the aging process.

Psychosocial Changes

The multitude of physical changes that occur with aging are accompanied by numerous psychosocial changes. As adults age, the nature of their daily lives changes along with their bodies. Major life events such as retirement, changes in social relationships and roles, changes in living arrangements, and dealing with loss are usually experienced during the later years of life and can affect an individual's health status and outlook on life.

Retirement

An individual's view of retirement is a product of many factors, including overall life attitude, support of significant others, and personal expectations. For individuals who, during their adult years, defined themselves and their success according to their work contributions, retirement is likely to produce feelings of uneasiness and anxiety. An individual who views retirement as the end of the productive years will dread the change in life pattern and social status and may fear being a burden to others, both socially and financially.

Many adults, though, look forward to retirement as their reward for years of hard work and contributions and fill their newly freed days with activities, travel, new skills or hobbies, and interests that time constraints had prohibited them from pursuing during their earlier years (Figure 18-4). These individuals typically led more balanced lives during their working years, viewing their



Figure 18-4 Retirement often means time to develop new hobbies or interests.

value as a combination of many factors including work, family, and community involvement; they adjust more easily to the loss of employment status by balancing this change with other positive aspects of their lives. Also, individuals who have planned for retirement and made arrangements (financial, housing, social) ahead of time tend to adjust more readily to this change in work status.

Social Relationships and Roles

Relationships and roles change over time as an individual grows and develops. For the older adult, these changes may take on even more meaning because activities and involvement in other areas of life may change or diminish. Changes in relationships and roles typically occur in conjunction with major life events, such as marriage, divorce, birth, death, relocation, and change in employment status. For instance, the older adult who has been a husband for 40 years will find his life and his roles greatly changed when he becomes a widower. The birth of his children's children will bring him new status as a grandparent, and his retirement will remove him from the full-time work force and present opportunities for the development of relationships with new friends.

A key to successful aging is staying connected to others. Volz (2000) cites a definite link between social support and health: older people "do better if they continue to engage with life and maintain close relationships" (p. 27).

One type of relationship that many older adults experience is grandparenthood. This relationship may be the source of pride and happiness, or it can become a negative stressor. For many older Americans, grandparenting has become a full-time responsibility, as they are the sole caretakers of grandchildren. Over 2.4 million families in the United States were maintained by grandparents in 1998. This is a 19% increase since 1990 (Davidhizar, Bechtel, & Woodring, 2000). The changing role of grandparenthood "causes caregiver stress, adversely affects child health, and ultimately diminishes family functioning" (Davidhizar, Bechtel, & Woodring, 2000, p. 24). However, not all grandparents are overwhelmed by the role of childrearing for a second generation; many find it rewarding (Davidhizar, Bechtel, & Woodring, 2000).

Listed below are some of the factors that have contributed to the increasing numbers of grandparents who are raising their grandchildren on a full-time basis:

- Divorce
- Unemployment
- Teen pregnancy
- Death of a grandchild's parent
- Abuse and/or neglect of the child
- Substance abuse

Nurses should be knowledgeable about potential areas of stress imposed by the additional responsibilities of the new grandparenthood role. Also, knowledge of community resources is essential for appropriate referral. Some

grandparents may also need information about current childhood problems that were not as prevalent during their years of parenting their own offspring (e.g., cyberporn, school violence).

Living Arrangements

Advancing age often brings with it changes in living arrangements. The older client has many living options depending on income, health status, activity level, level of independence, and family or other support systems; see Figure 18-5. A change in living arrangements is a significant event for any individual, but for older adults, this change may mean leaving family, friends, neighbors, and routines that have been a part of life for decades. Most older adults prefer to remain in their homes or dwellings, in a familiar environment and with familiar routines. In some cases, older adults may move in with their grown children and their families or have the grown children move in with them. The degree of physical, psychological, and financial independence of the older adult, and the status of the relationship with the children, will likely determine the success of this arrangement. Larsen (1998) reports:

One of the most pressing community challenges we face is the care of elderly persons with a chronic illness. Home care for this population is provided primarily by family members who report chronic fatigue, anger, depression, stress, family conflicts, and excessive financial costs. (p. 8)

Older adults needing assistance to remain in their homes may take advantage of home care services, which provide assistance in the tasks of daily living, or day care services, which provide limited health and rehabilitation intervention. Assisted Living Facilities (ALFs) are quickly becoming the transition between living independently at home and residing in a nursing home (Kaas & Lewis, 1999). Nursing homes and ALFs are the most common types of residential treatment services used by the older adult. Other options include foster care, group living arrangements, and hospice (Fleming, 2000). “Although only 5% of the older population reside in nursing homes at any one time, about 43% of all people eventually spend some time in such a facility”

(National Institute of Aging, 2000). When health needs necessitate extensive or full-time supervision and care, a long-term care facility such as a nursing home may be the best living option. Nursing homes offer a variety of services to support the medical, personal, and psychosocial needs of the aging client. Older adults who are able to participate in the decision regarding their living arrangements generally adapt better to the change than those who are unable to participate or who are not involved in their care decisions.



NURSING TIP

Monitoring Drug Use by the Older Adult

Watch for nonspecific side effects, such as appetite disturbance, altered behavior, and falls. Many side effects of medication use are subtle and, therefore, not detected.

Coping with Loss

Loss is an inevitable part of life, and the longer a client lives, the more losses will be experienced. Losing a lifetime partner is one of the most stressful loss experiences an individual can face, and many older clients will face loss through death of a spouse at some point in their lives. As the years pass, deaths of children and friends may leave older adults grieving and feeling as if everyone they have known and loved has died before them. Feelings of isolation and hopelessness may arise; these can be compounded if the individual suffers multiple losses at once or within a short period of time. Losses are magnified in older adults who are socially isolated. Fleming (2000) states:

THINK ABOUT IT

Understanding the Meaning of Loss

Consider the perspective of an older client who has experienced the loss of loved ones, such as a spouse of 50 years, or a child. How many losses of this magnitude have you experienced? Do you feel you will be able to relate to and show empathy to an older adult whose life experiences may differ dramatically from your own? What steps can you take to ensure that you treat these clients with dignity, respect, and compassion?

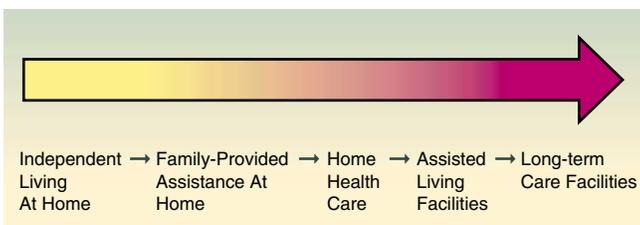


Figure 18-5 Continuum of Living Arrangements for the Elderly

We need to move away from making old people invisible. We need to care for them. We're the longest-living people planet Earth has ever seen. It's no wonder we never planned for it. We don't know how to live this long. (p. 2)

Helping older adults stay connected with others in the community is an effective intervention for those who are experiencing loss and resultant depression. Some avenues for helping elders develop a social support system are churches, senior citizen centers, neighborhood/apartment associations, and community support groups. Often, loss will lead older clients to reflect on their lives and their relationships and to review their successes and shortcomings.

Individuals who feel isolated and abandoned often feel angry and hopeless. Nursing actions that promote a sense of hope in the elderly include making time to be sure that the client is included in the discussion and asking about daily plans. It is imperative that nurses avoid expressing pity toward lonely older clients, as pity decreases hope and exacerbates the sense of loss.

MEDICATIONS AND THE OLDER ADULT

Adverse Drug Reaction

The physiological changes of aging can complicate drug therapy in the older adult. The normal effects of aging alter how the body metabolizes and excretes drugs. Therefore, older adults are more sensitive to both the toxic and therapeutic effects of medications. Another factor affecting the elderly's drug use is **polypharmacy** (the concurrent use of several medications). Older adults take more medicine than those who are young and as a result, they are at greater risk for adverse drug reactions (ADR). In addition to increased risk of an ADR, other problems associated with polypharmacy are:

- Medication errors
- Inappropriate prescribing
- Excessive drug costs
- Noncompliance

The presence of multiple diseases and the use of several medications place the elderly person at risk. The effectiveness of drug therapy in the older individual depends on the properties of the particular drug and the impact of age-related changes (Table 18-2). As reported by Aparasu (1999), one in 20 prescriptions written for older outpatients may be for medications that should not be used by older clients. "Inappropriate prescribing is the primary cause of adverse drug effects in the geriatric population" (Aparasu, 1999, p. 438).

The symptoms of many ADRs are subtle and often are confused with the changes of aging or chronic illnesses.

TABLE 18-2
Impact of Age-Related Changes on Drug Therapy

Change	Impact on Drug Therapy
Less total body fluid; body water declines by about 18%	Higher blood level of water-soluble drugs
Increased adipose tissue; decrease in lean body mass	Greater accumulation of fat-soluble drugs (e.g., diazepam, barbituates)
Decreased secretions in gastrointestinal tract, lower gastric pH	Slight reduction in absorption
Reduced liver size; functional liver tissue diminishes; decreased hepatic metabolism	Slower metabolism and longer half-life of some drugs (e.g., acetaminophen)
Reductions in number of nephrons, glomerular filtration rate, renal blood flow	Slower elimination of drugs that are predominantly eliminated in unchanged form (e.g., digitalis, kanamycin, penicillin); increased competition of protein-bound drugs
Drier oral mucosa	Difficulty swallowing tablets and capsules
Muscle mass and soft tissue decrease by 25% to 30%	Difficulty absorbing usual adult intramuscular dose at single injection site
Reduced circulation to lower bowel and vagina	Prolonged melting time for suppositories

(From Pasero, C., Reed, B., & McCaffery, M. (1998). Pain in the elderly. In M. McCaffery & C. Pasero (Eds.), *Pain: Clinical manual*. (pp. 674–710). St. Louis: Mosby.)

For example, confusion, constipation, fatigue, and dizziness are nonspecific symptoms of many conditions, including ADRs.

The older client's response to drugs is highly individualized. Therefore, the nurse must accurately monitor the client for therapeutic effectiveness and signs of adverse drug reactions.

NURSING ALERT

Use of NSAIDs by the Elderly

Older adults should take nonsteroidal anti-inflammatory drugs (NSAIDs) with caution. NSAIDs can contribute to renal disease. The elderly have renal changes that may exacerbate renal problems.

Compliance

In addition to assessing the client's responses to medications, the nurse also must assess the client's knowledge of medications being used. Knowledge about the medication, its intended effects, possible side effects, and how to reduce the side effects can increase the client's compliance with the medication regimen. Factors that may negatively affect medication compliance are as follows:

- Complicated dosing schedules and regimens
- Multiple dosing throughout the day
- Use of several medications concurrently (polypharmacy)
- Cost of drugs
- Limited mobility and range of motion (e.g., the client with arthritis who is unable to open child-proof containers)
- Impaired memory (e.g., omission—i.e., the client forgets to take the medication; overdosing as a result of not remembering whether the medicine was taken)
- Clients who need assistance and live alone

Educating elderly clients and caregivers about medication, self-administration, and ways to increase compliance is a major nursing intervention. See the accompanying Nursing Checklist.



NURSING CHECKLIST

Improving Medication Compliance

1. Provide easily understood information about the medications.
2. Schedule administration of the medication around certain activities of daily living as a reminder to the client.
3. Provide the client with a name and telephone number of a person to contact when questions arise.
4. Assess how the medications are stored and arranged in the client's home. Make sure they are accessible.
5. Perform a complete drug history to determine *all* medications being taken. Instruct the client or caregiver to provide this information to the prescribing practitioner.
6. Encourage client and caregiver to discuss any concerns regarding the medication.

MISTREATMENT OF THE OLDER ADULT

Mistreatment of the elderly (also referred to as elder abuse) is a serious and ever-increasing problem and disturbing trend. It is estimated that annually 1 million or more older Americans are victims of some form of abuse (National Institute on Aging, 1996). There are many forms of elder abuse, including:

SIGNS OF PHYSICAL MISTREATMENT IN THE ELDERLY

- Contusions
- Abrasions
- Sprains
- Burns
- Bruising
- Human bite marks
- Sexual molestation
- Untreated but previously treated conditions
- Misuse of medications
- Freezing
- Depression
- Erratic hair loss from hair pulling
- Lacerations
- Fractures
- Dislocations
- Oversedation
- Over- or undermedication
- Welts
- Scratches
- Decubiti
- Dehydration
- Malnutrition
- Poor hygiene
- Head and face injuries (especially orbital fracture, black eyes, broken teeth)

(From Pierce, A. G., Fulmer, T. T., & Edelman, C. L. [1997]. Older adult. In C. L. Edelman & C. L. Mandle [Eds.], *Health promotion throughout the lifespan* [4th ed., p. 655]. St. Louis, MO: Mosby; Stuart, G. W., & Laraia, M. T. [1998]. *Stuart & Sundeen's principles and practice of psychiatric nursing* [6th ed.]. St. Louis: Mosby. p. 834)

- *Physical abuse*—willful infliction of injury
- *Neglect*—withholding goods or services (such as food, attention) to the detriment of the elder's physical or mental health
- *Psychological abuse*—withholding affection or imposing social isolation
- *Exploitation*—dishonest or inappropriate use of the older person's property, money, or other resources

Nurses in the home, clinic, hospital emergency department, and long-term care setting are often the first to identify signs of mistreatment in elderly people; see the accompanying display on signs of physical abuse. Abused older adults may either cling to or act in a very guarded manner toward the abuser. Another indicator of possible abuse is vague explanations offered for the cause of the injuries. Psychosocial indicators of abuse may be anger and rage, depression, anxiety, and conflictual interactions between the older adult and the abuser.

When assessing for mistreatment, the nurse must be nonjudgmental and avoid any signs of disapproval that may evoke further feelings of anger and shame in the older client. A private setting should be used for interviewing to promote sharing; also, if the older victim thinks the perpetrator is able to hear the interview, the victim may withhold information or refuse to talk. It is essential that the interview findings be documented in an accurate and unbiased manner.

Nursing interventions for the abused elder are primary, secondary, and tertiary. Primary intervention strategies emphasize prevention. Secondary nursing interventions consist of early identification and prompt treatment to minimize the long-term effects of the abuse. Tertiary interventions occur after the abuse and

promote recovery and rehabilitation. Tertiary interventions are restorative in nature.

If the nurse suspects abuse or neglect, this concern should first be addressed with the client. Many abused older adults may not admit to abuse because of embarrassment and/or fear of reprisal. Most states and many local governments have Adult Protective Services program. Nurses are responsible for knowing the local statutes on mandatory reporting of elder abuse, as these laws may vary.

NURSING PROCESS AND THE OLDER ADULT

Due to the changing demographics in the United States, the elderly are currently the most frequent consumer of health care services (Sheffler, 1998). Thus, an ever-increasing number of nurses will provide care to the older client. “With advancing age, health-promoting interventions along with the management of chronic health problems become essential elements for maintaining independent living and minimizing use of costly health care services” (Tanner & Lethbridge, 1998, p. 354). Nurses are the ideal health care providers to help people change their behavior in order to take advantage of increased longevity.

According to Kamimoto, Easton, Maurice, Husten, & Macera (1999), older Americans could do more to improve their health and quality of life. Listed below are areas in which older adults need to develop health-promoting behaviors:

- Nutrition: More than 60% of older adults are not eating at least five fruits and vegetables daily.
- Exercise: Approximately 33% of those aged 55 to 74 are physically inactive; 46% of those over age 74 are not physically active.
- Use of preventive health services: Fewer than 60% of those over age 65 have received the pneumococcal vaccine.
- Use of health screenings: (1) Breast cancer screening decreases with age. (2) Fewer than 33% of people aged 55 years and older had received a screening test for colorectal cancer (Kamimoto et al., 1999).

Increasing numbers of gerontological nurses are needed to provide quality of care. As stated by the American Nurses Association (1995):

Gerontological nursing is one of the profession's most challenging practice areas. Gerontological nurses will continue to work with populations at risk for health care problems as they recognize the needs of specific groups, including frail elders over age 85, minorities, the socially and financially impoverished, the homeless, and the institutionalized. (p. 6)

Professional standards for gerontological nurses were developed by the ANA in 1995; these standards are addressed in the next section.

Assessment

The data-gathering phase of assessment begins with the first encounter with the elderly client. Overall appearance, dress, gait, presentation, and general behavior can be noted when a client first enters the room. Assessment of the older client can be a time-consuming yet rewarding process when the nurse works thoughtfully and sensitively with the client to discover strengths, resources, and limitations.

When interviewing the older client in the home, it is important to also include the client's caregivers in the assessment. The home care nurse assesses:

- Family interactions
- Caregiver motivation to participate in the rehabilitation process
- The motivational impact of the caregivers on the older person to accept some control over own care
- Feelings of caregivers toward their role (i.e., level of satisfaction or burnout)

A complete assessment includes a health history and a physical examination. The ANA Standard I of Clinical Gerontological Nursing Care (American Nurses Association, 1995) states “The gerontological nurse collects client health data” (p. 11).

Health History

Older adults are individuals not only of age and vintage, but also individuals with a long history that deserves telling. The nurse's role in conducting a health history with the older client is to draw facts and interpretations from the client that will shed light on current health status and health concerns. Eliciting these data requires time and patience on the part of both nurse and client, but it can be a rewarding and interesting process. To gather pertinent health data, the nurse may interview the client and the client's support members to determine the client's past coping strategies, strengths, and health habits. A holistic approach will include discussion of physical, emotional, psychological, spiritual, and sociocultural aspects that contribute to the client's overall health.

Older clients often feel a loss of control over their lives when decisions, including health care decisions, are made by others. The nurse respects the client's dignity and independence during the interview process by facing the client, speaking directly to the client in a clear manner, and reacting appropriately to client concerns and needs.

Physical Examination

The nurse must be knowledgeable about the normal physical changes of aging in order to conduct an efficient and informative physical examination of the older client. The physical changes must be noted: the impact these changes have on the client's quality of life and activities of daily living must also be determined. The

assessment tools will need to be adjusted to the older person's abilities and limitations. For instance, the physical examination may need to be performed in more than one session to prevent client fatigue. Client positioning may need to be adjusted according to client comfort. The client may need assistance with disrobing or position changes, and the nurse must always be alert to protect the client from potential injury, such as falls. For an explanation of special considerations necessary in assessment of elderly clients, see Table 18-3.

Nursing Diagnosis

Nursing diagnoses developed from the assessment of the older client will be as varied as the clients themselves. According to the ANA (1995), gerontological nurses are expected to “analyze the assessment data in determining diagnosis” (p. 12).

Nurses must keep in mind that older clients may present with many needs, both physical and psychosocial, and that the nursing diagnoses will need to be prioritized. Client status may change frequently, so reevaluation of nursing diagnoses on a regular basis is warranted. Selected nursing diagnoses (North American Nursing Diagnosis Association [NANDA], 2001) that are frequently seen in older clients include:

- Physical
 - Impaired Physical Mobility* related to intolerance to activity/decreased strength and endurance; pain/discomfort; perceptual/cognitive impairment; neuromuscular impairment; musculoskeletal impairment; depression/severe anxiety
 - Activity Intolerance* related to bed rest/immobility; generalized weakness; sedentary lifestyle
 - Deficient Self-Care* related to intolerance to activity; decreased strength and endurance; physical, perceptual, or cognitive impairment

TABLE 18-3
Special Considerations for Assessing Elderly Clients

Assessment Area	Essential Points
Fluid balance	Elderly are more sensitive to fluid and electrolyte imbalances. Elderly can become dehydrated quickly due to deficient volumes. Monitor closely the amount of fluid administered (including oral ingestion, IV fluids, blood products). Maintain accurate fluid intake and output record.
Body temperature	Decreased body tissue, diminished thermoregulation, and peripheral vascular changes place elderly at risk for hypothermia. Watch closely for signs of chilling (e.g., shivering). Assess environmental temperature.
Neurologic	Assess mental status. Assess for underlying causes of confusion and memory loss, if necessary.
Sensory	Assess vision. Assess hearing. Determine level of orientation.
Cardiovascular	Assessment of peripheral pulses may be difficult because of atherosclerosis. Monitor for baseline values (i.e., signs of hypoxia, hypovolemia, acidosis). Reassess frequently.
Pulmonary	Monitor respiratory rate and characteristics. Assess ability to cough productively. Reassess frequently to detect early indicators of deterioration.
Musculoskeletal	Evaluate ability to ambulate (immobility contributes to risk of pulmonary embolism and deep vein thrombosis). Determine amount of assistance needed for performing activities of daily living.
Integumentary	Less elastic, thin skin abrades easily and is vulnerable to pressure. Assess for any reddened areas or fissures. Check skin turgor.

(From Walhout, M. F., Tubergen, C. R., & Cook, K. J. [1998]. Multiple accident victims: All elderly. *Nursing98*, [November] p. 59.)

- Psychosocial
 - Social Isolation* related to absence of supportive significant others; alterations in physical appearance; alterations in mental status; inadequate personal resources
 - Risk for Loneliness*: risk factors include affectional deprivation; physical isolation; social isolation
 - Ineffective Role Performance* related to change in self-perception of role; change in physical capacity to resume role; change in usual patterns of responsibility
 - Impaired Home Maintenance* related to disease or injury; insufficient finances; impaired cognitive or emotional functioning; inadequate support systems
 - Acute Confusion* related to age; dementia; alcohol abuse; drug abuse; delirium

Outcome Identification and Planning

Outcomes identified in the plan of care must be developed in partnership with the older client and the client's support system. See the accompanying display for the ANA gerontological standards related to outcome identification and planning.

STANDARDS OF CLINICAL GERONTOLOGICAL NURSING CARE: OUTCOME IDENTIFICATION AND PLANNING

The gerontological nurse:

- Identifies expected outcomes individualized to each client
- Develops a plan of care that prescribes interventions to attain expected outcomes

(From American Nurses Association. [1995]. *Scope and standards of gerontological nursing practice*. Washington, DC: Author.)

Outcomes should be realistic for the client's current status and desired goals and should be targeted to maintaining a certain level of health or restoring the client to a former state of health. Support systems, friends, and colleagues should be involved as agreeable with the client to assist in meeting health care needs. See the accompanying Nursing Process Highlight for a discussion of a teaching plan for an older client.

Implementation

Nursing interventions for the elderly client will typically focus on the areas of maintaining physical health, supporting psychosocial well-being, promoting safety, and providing restorative care. The ANA (1995) directs

Nursing Process Highlight

OUTCOME IDENTIFICATION AND PLANNING

When developing client outcomes and a teaching plan, consider:

1. Plan for a quiet, private environment that is conducive to learning.
2. Assess the client's readiness to learn as well as previous knowledge.
3. Treat the client as a partner whose input is valuable in the planning and outcome identification process.
4. Assess sensory status, especially sight and hearing, and adjust actions according to client needs.
5. Use language that is clear and easy to understand.
6. Encourage clients to ask questions and verbalize their understanding of what is being taught. For instance, state, "I want you to feel free to ask questions; all your questions are important."
7. Plan to include the family and significant others in the teaching session, not as a substitute for the client, but for support and reinforcement.
8. Plan for active learning experiences (e.g., use examples, simulations, games, and audiovisuals when appropriate).
9. Pace the learning. Do not give too much information at one time, and progress at the individual's learning pace. Stop if you see that the client is distracted or fatigued.
10. Plan to summarize and reinforce what has been taught.

gerontological nurses to "implement the interventions identified in the care plan" (p. 16).

Three major interventions used effectively with the elderly are education, communication, and life review. See Chapter 13 for specific guidelines for teaching elderly clients. The Nursing Checklist provides information on communication effectively with older adults.

Life review (also referred to as reminiscence therapy) is a structured intervention in which the nurse guides the client through remembrance of life, stage by stage. This intervention is especially therapeutic for clients who feel alienated and depressed as it helps people develop a sense of meaning and promotes achievement of the sense of integrity identified by Erikson (1968). Brady (1999) discusses the "power and efficacy of reminiscence and life review for the elderly" (p. 178). See the accompanying display for some of the therapeutic outcomes of reminiscence.

**NURSING CHECKLIST****Communicating with Elderly Clients**

1. Get the client's attention before you speak.
2. Minimize extraneous stimuli (e.g., background noises).
3. Sit directly facing the client, keep your mouth visible, and maintain eye contact.
4. Speak slowly and clearly. Use short simple sentences. Give the client time to respond.
5. Speak loudly enough for the client to hear you, but avoid yelling.
6. Use repetition often.
7. Summarize frequently the most important elements of your message.

(From: Tips on overcoming communication breakdown with elderly patients. (1999). *Home Healthcare Nurse*, February, 1999, 17[2], 78.)

BENEFITS OF REMINISCENCE

- Enhances problem-solving
- Provides an outlet for catharsis (“getting things off one’s chest”)
- Assists in resolving conflicts
- Maximizes long-term memory when short-term memory is impaired
- Maintains identity and self-esteem
- Promotes ability to attain perspective and find meaning

(From Brady, E. M. [1999]. Stories at the hour of our death. *Home Healthcare Nurse*, 17[3], 176–180; Eliopoulos, C. [1999]. *Manual of gerontologic nursing* [2nd ed.]. St. Louis: Mosby.)

Maintain Physical Health

During the assessment phase, the nurse will identify which physical changes are the result of normal aging and which have underlying pathology. Clients will need to be educated as to what these changes mean, what impact they may have on their daily activities, and what strategies they can use to meet their needs given their new or changing abilities. It is critical to emphasize clients' assets and abilities, instead of focusing on limitations, to maintain a healthy self-concept and to show clients how much independence they still maintain.

Specific interventions related to the physical changes of aging will depend on the nature of the alterations. For instance, skin changes such as dryness, wrinkling, or flaccidity can be partially overcome through the use of oils, moisturizers, and a humidifier. If deteriorating eyesight is a prominent complaint, nurses should instruct the client to avoid reading when fatigued, to use large-print materials, and to ensure that the reading environment is well lit with an overhead and desk lamp that does not create glare. If cardiovas-

cular changes result in fatigue and shortness of breath on exertion, nurses should help the client learn the signs indicating his activity tolerance level and to adjust activity accordingly (for example: plan for frequent rest periods, sit or lie down when fatigued, avoid carrying heavy parcels when ambulating).

Support Psychosocial Well-Being

An older client's psychosocial health is as equally important as physical well-being. The use of touch and therapeutic communication helps the client overcome feelings of isolation and enhances a positive self-concept. Encouraging the older adult to be active in social groups, leisure activities, and hobbies supports a higher level of self-esteem and pleasure with life and helps the client to focus on positive traits and abilities.

The client's family or significant others can have a significant impact on maintaining the client's psychosocial functioning. They can assist the client in maintaining a relatively independent lifestyle and may even be able to help the client sustain activities of daily living outside of an institutional environment. For clients without support systems, teaching how to cope with alterations in mental status (e.g., using calendars to orient to reality, reading the daily paper to keep aware of current events) and how to work within those parameters can help clients maintain a sense of independence and dignity.

Promote a Safe Environment

Ongoing assessment includes observing the client's immediate environment for safety. This is especially critical for clients who will be remaining in their own homes or in a home situation where they, not the health care staff, are responsible for maintaining a safe environment. Family members and significant others should be included in the efforts to create a safe environment for the elderly client (see Figure 18-6). See Chapter 31 for additional information on safety and preventing falls.

Falls are a major safety issue with many older adults. The accompanying display lists some age-related factors that contribute to falls.

In order to promote a safe home environment for the elderly client, the nurse may suggest the following environmental safety actions:

- Provide adequate nonglare lighting.
- Place nightlights in bedroom, bathroom, and hall.
- Install slip-proof mats in tub/shower.
- Place a chair in tub/shower.
- Install grab bars in tub/shower and next to toilet.
- Have handrails next to stairs and in long hallways.
- Use sturdy chairs with armrests.

Each year, approximately 2 million elder Americans are victims of crime (National Institute on Aging, 1996).



Figure 18-6 Educating the older client about safety, particularly in the home, is an essential nursing function that is facilitated by the use of clear step-by-step instructions.

Older people are often easy targets for car theft, robbery, and burglary. For suggestions on preventing victimization, see Table 18-4.

Restorative Care

Restorative nursing care (also referred to as rehabilitative care) seeks to assist the client in regaining maximal functional ability. Restorative care that is provided to clients who have residual impairment as a result of disease or injury seeks to increase the client's independence and ability to perform self-care. Nurses providing restorative care understand that sometimes the impairment in functional ability will remain. In such cases, the goal is to help the client function at the maximal level

AGE-RELATED FACTORS CONTRIBUTING TO FALLS

- Decreased visual acuity
- Poor vision in dimly lit areas
- Less foot and toe lift when walking
- Altered center of gravity
- Slower reflexes
- Impaired muscle control
- Orthostatic hypotension (blood pressure related to posture)
- Urinary frequency

(From Ebersole, P., & Hess P. [1999]. *Toward healthy aging: Human needs and nursing response* [5th ed.]. St. Louis: Mosby; Eliopoulos, C. [1999]. *Manual of gerontologic nursing* [2nd ed.]. St. Louis: Mosby.)

possible. Nurses constantly balance the client's need for dependence with the need for independence. In other words, nurses provide care as needed while encouraging the client to do for self as much as possible. Restorative care is provided in home health, assisted-living facilities, and long-term care facilities (e.g., nursing homes).

Clients who might benefit from restorative care are those who:

- Are incontinent
- Have an indwelling catheter
- Are nonambulatory
- Have pressure sores (decubitus ulcers)
- Require partial or complete assistance with activities of daily living

See the Nursing Checklist for interventions most useful in providing restorative care.

TABLE 18-4
Suggestions for Decreasing the Risk of Elder Victimization

In the home	Lock doors and windows. Be sure locks cannot be easily broken. Install an alarm system. Identify the caller before opening the door. Take photographs of valuable items; mark items with an identification number.
On the street	Always be vigilant. Avoid dark alleys and dark parking areas. Walk with others instead of alone. Have monthly income checks sent to the bank via direct deposit. Vary the time you go to the bank. Avoid using isolated ATM machines. Avoid keeping a lot of cash on hand, but if threatened by an assailant, hand over all cash.
Consumer fraud	Don't take money if a stranger tells you to do so. Avoid giving credit card or bank account numbers over the phone. Beware of deals that sound "too good to be true"; check with the local Better Business Bureau. Be alert to "miracle cures" for health problems.

(From National Institute on Aging. [1996]. *Age page: Crime and older people*. Gaithersburg, MD: Author.)

NURSING CARE PLAN

An Older Adult Who Is Confused

Case Presentation

Winston Evans, an 82-year-old man, is a retired grocer who was widowed 6 years ago. Until last year, Mr. Evans lived alone in a small home, was involved with his family, went to church regularly, and enjoyed socializing with peers at the community senior center. He now lives in his daughter's home. His daughter brings him to the clinic today stating, "We can't go on like this! Last night he walked out of the house and was missing for hours. The policeman brought him home while we were looking for him." This was Mr. Evans' fourth episode of wandering within the past 3 months. The daughter also stated that Mr. Evans was unable to take care of himself. "I have to feed and bathe him every day." Mr. Evans was unable to state the date, day of week, month or year. He also did not know where he was, even though he had been treated by the nurse practitioner (NP) for several years at the clinic. He could not remember the names of his family except for his daughter. He was observed by the NP to be restless, and his speech was rambling and confused. Mr. Evans tells the NP, "Get away from me. No one's gonna hurt me." His medical diagnosis is severe arthritis, glaucoma, and congestive heart failure. He weighs 115 pounds (a weight loss of 24 pounds over the past 4 months), he "picks at his food," is constipated, sleeps most of the day, and is usually loud and restless at night. During the assessment, Mr. Evans is agitated and cries out several times, "Help me, help me!"

Assessment

- Disoriented
- Forgetful
- Restless
- Paranoid
- Wandering behavior
- Insomnia
- Decreased appetite
- Constipation

Nursing Diagnosis #1

Risk for Injury related to confused mental status.

Expected Outcome

Mr. Evans will be free from injury to self or others.

Interventions/Rationales

1. Approach in a calm, nonthreatening manner.
Decreases anxiety level, which further impairs mental status.
2. Determine the presence of personal or environmental risk factors.
Identification of safety hazards is the first step in minimizing such hazards.
3. Orient Mr. Evans regularly to his environment.
To decrease client's frustration level and better understand client needs.
4. Closely supervise Mr. Evans at night to assess safety.
To determine which risk factors are present and what safety measures should be implemented.
5. Set limits on self-destructive behavior.
To promote safety of client and others.
6. Monitor judgment, decision-making ability, and impulse control.
Impaired judgment and impulsivity increase the likelihood of unsafe behaviors.
7. Minimize specific hazards in the home (e.g., remove stove knobs, store cleaning products and medications in a locked area, clear floor and hallway of obstacles).
To make the home environment safer.
8. Provide an ID bracelet for Mr. Evans to wear at home, and participate in local police registry if available.
To increase possibility of client's quick return to home if he wanders away. *(continues)*

NURSING CARE PLAN**An Older Adult Who Is Confused (continued)**

9. Keep nightlights on at night.
Decreases the potential for falls.
10. Instruct family to install an alarm system on all exit doors.
To minimize the possibility of wandering.

Evaluation

Goal met. Mr. Evans remains free from physical injury and does not injure any one else. He has not wandered off alone in the past week.

Nursing Diagnosis #2

Disturbed Sleep Pattern related to altered mental status.

Expected Outcome

Mr. Evans will experience at least 4 hours of uninterrupted sleep at night.

Interventions/Rationales

1. Monitor and keep a record of sleep patterns.
To determine a baseline for future evaluation of progress or lack of progress.
2. Minimize daytime napping.
Older adults need less sleep, so daytime napping only subtracts from amount of sleep required at night.
3. Schedule exercise 2 hours prior to scheduled bedtime.
To provide relaxation.
4. Teach client and family simple relaxation techniques.
Keeping instructions simple helps the client who is confused to better absorb the information. Relaxation techniques can be used to promote sleep.
5. Limit caffeine intake.
Caffeine can interfere with sleep.
6. Ensure quiet environment with a soft nightlight.
Promotes relaxation and a sense of comfort.
7. Provide comfort measures and teach such measures to family.
The use of back rubs and rearranging linens can promote comfort and relaxation.

Evaluation

Goal partially met. Family reports that Mr. Evans is sleeping every night in approximately 3-hour intervals.

Nursing Diagnosis #3

Bathing/Hygiene Self-Care Deficit related to cognitive impairment.

Expected Outcome

Mr. Evans will perform activities of daily living (ADL) with optimal independence.

Interventions/Rationales

1. Monitor ability to perform ADLs.
To determine the client's level of functional ability and the amount of assistance that is needed.
2. Encourage client to perform the skills that are present.
To prevent functional disuse and to promote self-esteem.

(continues)

NURSING CARE PLAN

An Older Adult Who Is Confused (continued)

3. If necessary, give step-by-step directions in clear simple terms with only one step at a time.
Breaking a task down into small segments increases the likelihood of successful completion.
4. Instruct family to purchase clothing (or modify existing wardrobe) with Velcro fasteners instead of buttons and zippers.
Decreases amount of effort client must expend to dress self appropriately without assistance.

Evaluation

Goal partially met. Mr. Evans is able to dress himself if the clothes are laid out by someone else. He follows step-by-step directions but is unable to initiate or complete the task alone.

(From Carpenito, J. L. [1999]. *Handbook of nursing diagnosis* [8th ed.]. Philadelphia: Lippincott; Krupnick, S. L., & Wade, A. [1998]. *Psychiatric care planning*. Springhouse, PA: Springhouse; North American Nursing Diagnosis Association. [2001]. *Nursing diagnoses: Definitions & classifications, 2001–2002*. Philadelphia: Author.)



NURSING CHECKLIST

Guidelines for Providing Restorative Care

1. Encourage independence.
2. Use a positive, reassuring approach.
3. Be alert to limitations and client-expressed need for help.
4. Encourage client decision-making.
5. Communicate with words easily understood by the client. Ask client to repeat directions in order to assess their comprehension.
6. Provide positive reinforcement often.
7. Use repetition through words and actions (i.e., demonstration).
8. Provide rest periods as needed.
9. Ensure client safety by safeguarding against injury at all times.

KEY CONCEPTS

- Persons in the late adulthood years are often classified as “young old” (those between 65 and 75); “middle old” (those between 75 and 85); and the “old” (those 85 and older).
- Biological theories of aging state that the physical changes of aging are universal and inevitable.
- Psychosocial theories of aging consider factors other than genetics when describing the aging process.
- Numerous myths about aging can be viewed as ageism, which is stereotyping and discrimination based on age.
- Advances in medicine and technology have greatly improved life expectancy as well as the quality of life for the elderly.
- Developmental tasks of the elderly include enhancing skills, gaining and sharing wisdom, renewing relationships, expanding knowledge, and adjusting to losses and change.
- The multiple physical changes associated with aging can have a profound impact on an older adult’s ability to function and to perform activities of daily living.
- Retirement, changes in social relationships, changes in living arrangements, and loss may affect an older client’s self-esteem, self-concept, impression of self-worth, and feelings of isolation.
- Individuals who have had a positive outlook on the aging process over the years tend to adapt better to retirement and the many other life changes that occur in late adulthood than do individuals who fear or do not understand the aging process.
- Physical assessment of the older client will need to be tailored to the client’s functional level and activity tolerance.
- Including family and significant others in planning and implementing care for older clients enhances the chance for successful outcomes.
- Restorative nursing care (also referred to as rehabilitative care) seeks to assist the client in regaining max-

Evaluation

Evaluation is an important function of all nurses working with the elderly. The ANA standard for gerontological requires nurses to evaluate the “aging person’s progress toward attainment of expected outcomes” (ANA, 1995, p. 17). Evaluation is a major determinant of the need for continuing care of the older client. The nurse must decide whether the original assessment is still pertinent and if its accompanying diagnoses have been resolved. New diagnoses need to be established on the basis of client progress and changing needs, and new goals must be developed with the client and significant others that will foster maximum health status based on the client’s abilities and capabilities. In terms of providing for continuity of care, the nurse should consider the ongoing needs of the client and offer resources or make referrals to ensure that the health and well-being of the client will continue to be monitored and enhanced.

imal functional ability. Restorative care is provided to clients who have residual impairment as a result of disease or injury and aims to increase the client's independence and ability to perform self-care.

- Safety is a primary concern when caring for older clients; this can be addressed through thorough assessment and client and family teaching.

CRITICAL THINKING ACTIVITIES

1. Explain “old age” in terms of theories and misconceptions about aging.
2. What are the multiple physiological changes associated with aging and the impact these may have on an older adult's ability to function and to perform activities of daily living?
3. Discuss the psychosocial impact that retirement, changes in social relationships, changes in living arrangements, and loss may have on the older adult.
4. Define polypharmacy and its significance for nurses caring for older clients.
5. What are the physical and psychological signs of elder abuse?
6. What safety considerations for the elderly living at home should the nurse and caregivers evaluate?
7. Develop guidelines for teaching the older client.
8. As the nurse manager of a nursing home, you want to establish a program to encourage clients to engage in life review. You decide to conduct a weekly class for interested residents who want to share their life experiences. How would you prepare for the class? What agenda would you establish? How would you evaluate the effectiveness of the class?

WEB RESOURCES

- Agency on Aging
www.aoa.dhhs.gov
- American Association of of Retired People
www.aarp.org
- American Society on Aging
www.asaging.org
- National Conference of Gerontological
 Nurse Practitioners
www.ncgnp.org
- National Council on Aging
www.ncoa.org
- National Institute on Aging
www.nih.gov/nia
- United States Administration
 on Aging: Elder Abuse Sites
www.aoa.dhhs.gov/aoa/webres/abuse.htm

Self-Concept



So much is a man worth as he esteems himself.

—Milton, 1532 (in McWilliams & McWilliams, 1991)

COMPETENCIES

1. Describe the four components of self-concept.
2. Explain the development of self-concept throughout the life span.
3. Discuss factors affecting self-concept.
4. Describe behaviors indicative of altered self-concept.
5. Discuss application of the nursing process with clients experiencing self-concept alterations.

KEY
TERMSbody image
identity
rolerole conflict
self-concept
self-esteem

Self-concept (an individual's perception of self) affects every aspect of life, including relationships, functional abilities, and health status. No two people have an identical self-concept; self-concept is what helps make each individual unique. Everyone has both positive and negative self-assessments in the physical, emotional, intellectual, and functional dimensions, which change over time and according to the context of the situation. Because self-concept is an individual's frame of reference for perceiving and interacting with the world, it exerts a powerful influence on one's life. Though neither visible nor tangible, a positive self-concept is one of the greatest strengths a person can possess.

One's view of self affects the ability to function. A person who sees self as a competent individual will behave competently and vice versa. Individuals with a positive self-concept approach new experiences and tasks with confidence; they expect to be accepted by others and to succeed. Conversely, the person with a negative self-concept tends to shy away from others and to avoid challenges. Self-concept greatly influences health status. For example, a person with a positive self-concept is more likely to care for one's self—physically, emotionally, and spiritually. The relationship of the components of self-concept and mental health are discussed in Table 19-1.

TABLE 19-1
Self-Concept and Mental Health

Component of Self-Concept	Relationship to Mental Health
Strong sense of identity	Experiences self as a unique individual.
Accurate and positive body image	A healthy awareness of one's body is based on reality testing.
Positive self-esteem	A person with a high degree of self-esteem respects self and treats self with dignity.
Satisfying role performance	The person with healthy role performance relates well with others and receives gratification from fulfilling role expectations.

COMPONENTS OF SELF-CONCEPT

Self-concept is composed of four components: **identity**, **body image**, **self-esteem**, and **role performance** (see Figure 19-1). By considering these four elements of self-concept, nurses can more effectively respond to a client.

Identity

A sense of personal **identity** is what sets one person apart as a unique individual. A well-formulated identity provides the answer to the question “Who am I?” Identity may include a person's name, gender, ethnic identity, family status, occupation, and various roles.

A person begins to develop identity during childhood and constantly reinforces and modifies it throughout life. First, parents or caretakers provide a child with elements of an emerging identity. Children may be told they are good or naughty, shy or outgoing, creative or dull, powerless or empowered. Children believe what they are told by others, and these beliefs influence the developing identity. During adolescence, conflict often arises as the teenager struggles to become independent and to establish a unique identity. Eventually, people learn to observe themselves critically, as their social environment expands. Feedback from others may support and strengthen an aspect of identity already implanted, or it may contradict an aspect and help change it.

Body Image

Body image is an attitude about one's physical attributes and characteristics, appearance, and performance.

Body image is dynamic because any change in body structure or function, including the normal changes of growth and development, can affect body image. The ado-

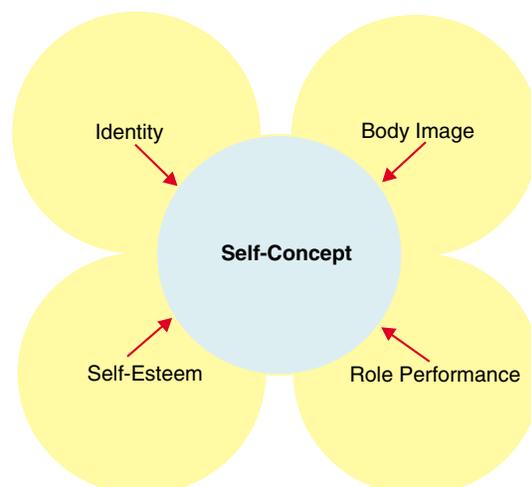


Figure 19-1 The Interrelationship of the Components of Self-Concept

lescent years are a good example of the interplay between an individual's physical changes and a developing sense of body image. Many teenagers will have harmless body image distortions. It is not at all uncommon for adolescents to feel self-conscious because they think their noses are too big, or their hips too wide, or their blemishes too prominent. Usually, these are normal concerns. Adolescents generally find that their perceptions continue to evolve as their physical development continues to mature.

Self-Esteem

Self-esteem is an individual's generalized sense of worth and value, or how a person regards self. Self-esteem refers to an individual's self-evaluation, whereas self-concept is a broader term encompassing an individual's overall self-description.

The level of self-esteem at any given moment can be influenced by many factors. Individuals will make decisions on what life factors (for example, physical attributes, skills, social accomplishments) they deem important and will calculate their self-esteem on the basis of their achievement of the factors they value most highly. These values will be based on the individual's familial and cultural background and influenced by societal standards. Self-esteem will vary over time depending on the situation (e.g., new job), the environment (e.g., cocktail party with strangers), and an individual's level of development and overall self-confidence.

THINK ABOUT IT

Self-Esteem

How do you value yourself? As a human being or as a human doing? Do you praise yourself for who you are—or for what you do?

Role Performance

Role refers to a set of expected behaviors that are determined by familial, cultural, and social norms. Individuals fulfill several roles simultaneously—parent, sibling, friend, spouse, student nurse. Each role has a set of expected behaviors, that is, a belief about how a person in that role should behave.

The nurse theorist Peplau examined roles in the context of the nurse-client relationship. The nurse may assume several different roles, such as counselor, teacher, leader, or surrogate parent. As the relationship progresses, the client feels free to express deep feelings to the nurse because the nurse has assumed the roles of listener, counselor, and expert. As teacher, the nurse may provide information to the client or correct misconceptions. As counselor, the nurse responds to the client's feelings or behavior, helping the client to gain insight or self-care or a health-affirming outlook.

Stressors Affecting Role

Roles have accompanying responsibilities. Whenever a person is unable to fulfill role responsibilities, self-concept is impaired. When an individual has too many roles to fulfill simultaneously, overload can occur. The person becomes overwhelmed by the many demands of several roles. The individual may complain of being stressed out and feeling unable to cope. In fact, the individual's coping skills are greatly taxed.

In addition to overload, another common problematic role experience is **role conflict**, which occurs when the expectations of one role compete with the expectations of other roles. The person may feel unable to establish priorities among competing role expectations. Table 19-2 describes the various types of role conflict.

THINK ABOUT IT

Personal Roles

Consider the various roles you currently fulfill. What are some of the potential conflicts inherent in your multiple roles? For example, your role of student may at times conflict with your role of friend or parent (e.g., you need to be in class at the same time you need to attend a parent-teacher conference or be available to your friend who is undergoing a crisis). Or your need to study for an examination (student role) is superseded by your need to work (role of wage earner).

TABLE 19-2
Types of Role Conflict

Type	Description	Example
Interrole conflict	Expectations of one role oppose expectations of another role.	A woman's job requires travel at the same time her child's dance recital is scheduled.
Interpersonal role conflict	Incompatible role expectations are held by one or more people.	A husband and wife disagree on parental expectations (e.g., disciplinary methods).
Role overload	Excessive demands of numerous roles have conflicting priorities.	A nurse must decide which urgent task to do first.
Person-role conflict	The individual's values are violated by demands of a role.	A nurse who believes in always telling the truth is directed by the supervisor to withhold a diagnosis from a client.

THINK ABOUT IT

Sick Role

It is difficult enough for a healthy person to manage multiple roles, conflicts, and stresses. But what happens when illness forces an individual to assume the “sick role”? What are the social expectations of a sick person, and what effect does this new and often unexpected role have on all the other roles the individual performs?

DEVELOPMENT OF SELF-CONCEPT

Self-concept evolves throughout life and depends to an extent on an individual’s developmental level. Self-concept changes during each developmental stage. According to Stuart and Laraia (1998), the ongoing process of self-concept development is facilitated by the following:

- Interpersonal and cultural experiences
- Self-perceived competence
- Self-actualization (living up to one’s potential)

Self-concept is developed primarily in response to social interactions and experiences. Sullivan (1953) stated that self-concept is developed according to perceptions mirrored by others to the individual. A person’s concept of self depends, to an extent, on what one thinks that others think about oneself.

As individuals mature, they can accept or reject the appraisals of others and change their behavior, in a way that leads to a more positive self-concept.

Childhood

Self-concept is not innate; rather, it develops throughout the life cycle as a result of social interactions. An infant whose basic needs are met in a warm, consistent manner develops positive feelings about self. Formation of self-concept occurs in the following manner: (1) during infancy, the child develops a self-perception of being separate from the environment (including parents); (2) as the child ages, perspectives (especially of the parents) are internalized; and (3) society’s norms (e.g., expectations of appropriate behavior) are then internalized by the child.

A child’s sense of self is shaped by family experiences and interactions with parents and siblings. Children learn about their individual worth and their ability to be competent in the family unit and their sense of self changes as they move through each developmental stage. Infants learn to trust based on the degree to which

their needs are met, and begin to develop a sense of self as distinct from the primary caretaker and their surroundings. As new skills are mastered, toddlers begin to develop a sense of autonomy and self-image, yet they still remain very self-centered. Preschoolers have increasing initiative and self-awareness as their expanding language and motor skills broaden their horizons, and they begin to have an awareness of emotions and the values that their families embrace. When children reach school age, they will incorporate experiences and values of their new contacts and environments into their image of self and may start to have an understanding of their strengths as well as their shortcomings (see Figure 19-2).

Positive experiences, role models, and family environment are all crucial to the healthy self-concept of the growing child. The impact of early parent-child experiences on the shaping of a child’s self-concept was emphasized by Sullivan (1953), whose interpersonal theory of psychiatry has greatly influenced nursing. The child develops a sense of self according to the type of feedback received from significant others (parental figures). Positive feedback reinforces the development of a “Good-Me” sense of self. A negative self-concept (“Bad-Me”) is reinforced by feedback that is consistently negative and anxiety-provoking.

Adolescence

The numerous changes in physical, emotional, and psychosocial status that characterize the adolescent years bring about rapid and often continuous changes in self-concept. Impressions about self from childhood may be internalized or challenged. The primary benchmark for arriving at an overall perception of self can change from family or parental values to those held by peers and friends or embodied in desired role models. Teens typically invest tremendous energies in appearances and social status and often fail to see their positive traits if they feel deficient in these areas. Adolescents often can-



Figure 19-2 For a school-aged child, praise from teachers and a feeling of accomplishment in school can boost self-esteem.

not separate their opinion of their own body image, for instance, from their overall self-concept; the teen who views herself as fat, when in fact she is emaciated, is likely to have a disturbed self-concept based on her distorted body image, regardless of what other positive qualities she may possess.

NURSING ALERT

Teens and Self-Concept

Because of their emphasis on body image, teens are at particular risk for feelings of disturbed body image, which may lead to serious health concerns, such as anorexia nervosa and bulimia nervosa. The nurse needs to learn to distinguish between what might be a normal body image distortion (“I wish I were 3 inches taller.”) and one that can have serious, even fatal, consequences (“Weighing 100 pounds is the most important thing in the world for me.”). Determining a teen’s self-concept and the importance he or she places on different aspects of self will help the nurse know which perceptions are normal reactions to the changes of adolescence and which are potentially harmful.

Adulthood

Self-concept continues to develop and change as an individual progresses through the adult years. Periods of relative stability in self-image may be interspersed with realizations of physical changes in body size, proportion, characteristics, and energy levels, all of which will influence perception of self. Involvement in family, work, and community obligations and activities often contributes significantly to an individual’s self-concept, as roles and responsibilities change and new roles are introduced. Healthy adjustment to these changes usually leads to a positive self-concept (see Figure 19-3).



Figure 19-3 The mature adult’s self-concept can be enhanced by learning new skills and enjoying new activities.



Figure 19-4 Elders need to adjust their self-concept, especially body image, in accordance with physical changes that affect appearance.

As the years pass, the older adult’s perception of self continues to develop. Learning to adapt to the numerous physical changes that normally occur with aging, such as diminished eyesight and hearing, lower stamina levels, loss and change in color of hair, can be a true challenge for many individuals; see Figure 19-4. Accompanying these changes is often the desire to look back on one’s life and evaluate its overall success. Such reminiscence is usually a critical factor in an older adult’s self-concept.

FACTORS AFFECTING SELF-CONCEPT

There is a universal need for positive self-concept, which includes a high degree of self-esteem and self-acceptance. This need develops in childhood as a result of the approval the child receives from parents and other adults. Any type of threat (real or imagined, actual or anticipated) may challenge one’s self-concept.

Altered Health Status

Illness evokes anxiety in most people; in turn, anxiety can result in illness. Every client will have some element of anxiety that influences behavioral and emotional responses. Most ill people are somewhat uneasy, especially if they are being treated in an unfamiliar environment. When anxiety level is heightened, recovery is compromised. Nurses, as professionals who focus on the human response to illness, must be aware of the anxiety level of clients to promote more effective adaptation. Table 19-3 shows common stressors experienced during illness.

By their very nature, some illnesses may impair self-concept. For example, there is a social stigma against mental illness; the reactions of other people to the mentally ill person affect the client’s self-perceptions. Many people fear cancer and isolate those affected with the disease. A diagnosis of acquired immunodeficiency syndrome (AIDS) may also carry a stigma leading to low self-esteem. Society often shuns those with AIDS, which

TABLE 19-3
Stressors Associated with Illness

Threat	Example
Threats to physical safety	Undergoing painful procedures (the thought of receiving an injection evokes anxiety in many) Fear of pain Fear of death
Threat to psychological integrity	One's image of self is threatened or challenged by new situations (such as moving to a nursing home)
Inability to exert control	Having little or no input into important decisions. Clients often feel as if they have no input into decision making regarding their treatment plan Loss of control may have a negative impact on self-concept and self-esteem which in turn evokes anxiety
Unmet biological needs	Hunger Thirst Urge to eliminate and lack of bathroom or privacy for toileting Physical pain, discomfort

may make them feel embarrassed or ashamed about their illness. To improve the client's quality of life, the nurse caring for individuals with any of these disorders must intervene to promote positive self-concept.

Compromised health status that requires surgery can also lead to several psychological alterations, including an impaired body image. Altered body image may result from loss of a body part or function; surgical procedures often threaten body image. Some procedures (e.g., mastectomy, amputation, colostomy) may leave the individual feeling mutilated or flawed. Other common sequelae of surgery—decreased independence, loss of



Title of Study

“Developmental Task Achievement and Learned Resourcefulness in Healthy Older Adults”

Authors

Zauszniewski, J. A., & Martin, M. H.

Purpose

To examine Erikson's eight developmental tasks as predictors of learned resourcefulness in healthy elders. Learned resourcefulness enables an individual to cope with adversity.

Methods

A convenience sample of 60 older adults aged 65 to 90. Two self-reported instruments were used for the analysis.

Findings

This study examined the predictive relationships between indicators of the successful resolution of Erikson's eight developmental tasks and learned resourcefulness. The study revealed the following:

- Learned resourcefulness is a collection of skills developed throughout the life span.
- The achievement of identity (which occurs during adolescence) plays an important role in the development of resourcefulness skills.
- Each of the first five developmental tasks (trust, autonomy, initiative, industry, and identity) was a significant predictor of the development of resourcefulness.

Implications

The mastery of the developmental tasks for infancy through adolescence plays an important role in determining how resourceful healthy elders are in coping with daily activities.

Zauszniewski, J. A., & Martin, M. H. (1999). Developmental task achievement and learned resourcefulness in healthy older adults. *Archives of Psychiatric Nursing*, 13(1), 41–47.

control, and disruption of routine—can also negatively affect self-concept. Self-esteem deficits related to surgery often include interference with role performance and interference with sexuality.

Bodily changes as a result of surgery have different meanings to different individuals. For example, consider a mastectomy. The woman whose feminine identity is symbolized by a voluptuous shape will likely be adversely affected by the surgery.

THINK ABOUT IT

Stigmatization of Illness

Do you believe that there is a stigma against the mentally ill? What is your rationale for your answer? How do you feel about caring for someone infected with human immunodeficiency virus? Are there thoughts of blame directed toward the person with AIDS? What about the stigma against individuals with cancer?

Developmental Transitions

Developmental processes may also affect self-concept by introducing changes or challenges to an individual's identity, body image, self-esteem, and role expectations. For example, pregnancy is a process with resultant changes in all these factors of self-concept; see Figure 19-5. In the early part of pregnancy, the woman incorporates the baby into her self-image. As the pregnancy progresses, the woman's body image adjusts to accommodate the idea that the baby is a separate individual (Edelman & Mandle, 1997). After delivery, the woman who has positive self-esteem will accept and love the baby. One who feels unlovable or unattractive may make disparaging remarks about the infant (Edelman & Mandle, 1997), and have difficulty bonding appropriately and adjusting to the life changes a new baby introduces. New roles of mother and parent need to be incorporated into a revised self-concept, and identity and self-esteem must be adjusted on the basis of new expectations.

Another example of a developmental issue that can affect the self-concept of an individual is menopause. The nurse must understand the meaning of this transitional period to the client and know that it varies with



Figure 19-5 Body-image changes with developmental events such as pregnancy. What does this client's nonverbal cues indicate about her self-concept?

each individual. This normal developmental transition in a woman's life may have a negative psychological impact on some women. Some people view the female climacteric (menopausal phase) as an indication of loss of femininity with resultant decrease in value as a person. Other women view menopause as a sign of freedom from the risk of childbearing. See the accompanying display, which lists some common misconceptions about menopause.

COMMON MISCONCEPTIONS ABOUT MENOPAUSE

- Menopause is a disease.
- The menopausal woman has decreased sex drive.
- Menopause means the end of femininity.
- A woman who has experienced menopause is "old."
- The physical symptoms of menopause are unbearable.

Experience

Self-concept is also influenced by an individual's experiences. Individuals who have experienced several failures begin to view themselves as failures; their behavior often becomes self-fulfilling, in that they perform at an unsuccessful level because they feel that is all they are capable of achieving. A negative self-concept is the result of repeated failures. On the other hand, people who achieve a task begin to see themselves in a positive manner, thus setting the foundation for a positive self-concept.

ASSESSMENT

When assessing a client's self-concept, the nurse must consider both the client's developmental level and chronological age. Clients need to be addressed at a level that reflects their current condition as well as their cognitive competence. For example, very young clients and those with low literacy skills may not be able to read; thus, the use of pictures would be helpful.

It is necessary to determine the client's perception of self-concept and the factors affecting it. For example, an adjustment to and recovery from an appendectomy may be uneventful for one person and difficult for another. The person who sees the surgery as a means to recovery will be healthier than the one who feels mutilated by a scarred abdomen.

Behavior, thoughts, and emotions are affected by self-concept. It is important to attend to the client's verbal and nonverbal clues. Self-concept is reflected in a person's behavior and conversation. Individuals who feel they are unable to accomplish goals will experience changes in eating, sleeping, and activity patterns (Edleman & Mandle, 1997).

Nursing Process Highlight

ASSESSMENT

Body Image and Self-Esteem

Body Image

- What do you like best about your body?
- What do you like least about your body?
- If you could change how you look, what would you change?

Self-Esteem

- What do you like best about yourself?
- What do you like least about yourself?
- How do you describe yourself to others?
- How would others describe you?
- What are your strengths and weaknesses?

The Nursing Process Highlight offers some questions useful in assessing body image and self-esteem. Table 19-4 lists some indicators of high and low levels of self-esteem.

To provide quality care, the nurse must determine the client's strengths. Doing so enables assessment of characteristics that can be used for coping and problem solving. The client's strengths are a foundation on which to build therapeutic interventions. Some areas to assess include the client's ability to:

- Develop and maintain appropriate relationships
- Care for self in order to meet basic needs
- Adapt to stressors in a positive manner

The nurse should encourage clients to make a list of all the positive things they have done and then review the list. Also, the nurse can help clients identify how they have handled problems in the past: "When you were in a similar situation, what did you do? Was it helpful? Are you willing to try that now? If not, what else can you do?"

The nurse should ask clients to describe their appearance and abilities. This information is an indicator of awareness of strengths as well as limitations; it is also important to assess the personal meaning of these assets and liabilities to clients.

DIAGNOSIS

Individuals experiencing self-concept disturbances usually have feelings of anxiety, hostility, guilt, and shame. Self-concept alterations affect every aspect of a person's life: emotions, relationships, and functional ability.

TABLE 19-4
Indicators of High and Low Self-Esteem

High Self-Esteem	Low Self-Esteem
Communication	
Assertive Direct and honest	Passive or aggressive Indirect, dishonest
Posture	
Erect Moves briskly	Stooped Slow movement and activity
General Appearance	
Well-groomed	Unkempt and dirty
Eye Contact	
Frequent and appropriate to context of situation	Avoidance or intrusive staring
Speech	
Well modulated Speech flows smoothly	Monotone Mumbling Hesitant
Self-Care	
Attends to own needs	Neglects own needs by always caring for others first Denies or minimizes own needs
Self-Talk	
Praises self	Puts self down Highly self-critical
Behavior	
Appropriate to situation and context of interpersonal relationship	Socially inappropriate Violates social norms Counterproductive
Measure of Worth	
Values self	Has feelings of worthlessness
Decision Making	
Makes decisions appropriately for context of situation	Indecisive Hesitant
Locus of Control	
Internal	External
Autonomy	
Self-directed	Overly dependent on others
Emotions	
Able to experience a wide range of emotions Varies appropriately according to situation	Wide range of emotions inappropriately expressed Hostile

The nurse must conduct a thorough assessment to determine the nature and extent of problems to formulate accurate nursing diagnoses. Because of the extensive impact of self-concept problems, several diagnoses may be established by the nurse. The accompanying Nursing Process Highlight shows some primary nursing diagnoses associated with self-concept disturbances as defined by the North American Nursing Diagnosis Association (NANDA, 2001).

Nursing Process Highlight

NURSING DIAGNOSIS

- Disturbed Body Image
- Parental Role Conflict
- Disturbed Personal Identity
- Ineffective Role Performance
- Chronic Low Self-Esteem
- Situational Low Self-Esteem
- Disturbed Personal Identity
- Anxiety
- Social Isolation
- Hopelessness
- Powerlessness

(From North American Nursing Diagnosis Association. [2001]. *Nursing diagnoses: Definitions & classification 2001–2002*. Philadelphia: Author.)

OUTCOME IDENTIFICATION AND PLANNING

For clients with an altered self-concept, a major nursing goal is to promote the client's sense of well-being and to facilitate growth. This involves teaching coping skills and the effective use of personal resources.

Together the nurse and client develop specific goals; mutually established goals encourage the client to assume an active role in recovery. Realistic planning involves examination of options. What is available to use in helping a client regain responsibility for self-care? Realistic goals should be stated in terms of specific behavior that is measurable and should have an appropriate time frame for evaluation of outcome achievement. See the accompanying Nursing Process Highlight on outcome identification and planning.

IMPLEMENTATION

Regardless of the setting in which they practice, nurses will inevitably encounter clients who are experiencing alterations in self-concept. Whether a client is experiencing optimal level of health or an alter-

Nursing Process Highlight

OUTCOME IDENTIFICATION AND PLANNING

For a client to have a distorted body image, the belief must be very powerful to persist in the face of obvious evidence to the contrary. How should a nurse respond to and plan care for clients who reveal that their body image is distorted? What outcomes need to be identified? Do the expected outcomes depend on the pathology behind the distortion? Should the nurse always try to comfort and support the client whose beliefs about body image are distorted?

ation in health, a high degree of self-esteem is important to a positive outcome. The nurse needs to find ways to support positive self-esteem. High self-esteem can be associated with several different dimensions of the whole person, such as success in relationships, intelligence, or in being a member who is held in high regard of an ethnic or cultural group. In attempting to support the client's high self-esteem, the nurse should try to learn sources of self-esteem for the client and reinforce them.

Initiate Therapeutic Interaction

Self-concept, or lack of it, affects the nurse-client relationship. The nurse is a role model of an individual who has self-respect and also respects others. By using a non-judgmental approach, the nurse encourages clients to feel more positive about themselves.

The use of open-ended statements facilitates open, honest communication. Active listening is essential in working with clients experiencing self-concept alterations. By thoughtfully applying therapeutic communication skills, the nurse facilitates the development of trust and rapport.

Support Healthy Defense Mechanisms

Use of defense mechanisms is a common reaction to anxiety or a perceived threat. See Chapter 20 for a discussion of defense mechanisms. When caring for a client with altered or threatened self-concept, it is wise to first identify the client's strengths and successful coping mechanisms before formulating and implementing a plan of care. It is important to not take away a client's defensive processes until another method of coping with anxiety has been developed. For example, breaking through a client's denial too

soon can result in overwhelming anxiety. On the other hand, encouraging the use of denial beyond its helpful period will result in reality distortion.

Ensure Satisfaction of Needs

The relationship between satisfaction of basic needs and psychological comfort is undeniable. When needs are unmet, anxiety increases.

Physical Needs

Self-concept stems in part from the client's perception of personal appearance, competencies, and limitations. It includes the client's self-perception as well as others' perceptions. By assisting the client to maintain personal appearance, the nurse is also assisting the client to improve self-esteem. Being unable to meet one's basic needs usually results in self-concept impairment. Self-esteem is generally decreased as a person becomes more dependent on others.

Providing for the client's well-being and comfort is the foundation of quality nursing care. When clients are treated in a caring competent manner and their physical needs are met, self-concept is positively influenced.

Psychosocial Needs

Uncertainty escalates anxiety. Explain procedures, telling the client what is expected and what is going to occur. All clients in every health care setting need clear statements of expected behavior. The following nursing actions promote the client's psychological safety:

- Respect a client's privacy. Loss of privacy triggers anxiety in most individuals. During treatment in any setting, personal probing questions must be asked; procedures often violate physical space and can be offensive; elimination activities often occur in the presence of others. Be sure to protect privacy as much as possible.
- Treat each client as an individual worthy of dignity. This means being sensitive to the feelings of others and recognizing that their feelings may differ from yours and those of other clients.
- Encourage the client to be as independent as possible while providing assistance as needed.

Promote Positive Self-Esteem Across the Life Span

Childhood

The child's self-concept continues to develop over time and is greatly influenced by interactions and experiences with others. The nurse must consider that the child needs to feel successful and competent with tasks.

Some of the changes occurring with physical growth and maturation may be anxiety-provoking for the child;

for instance, anxiety may result when the child loses baby teeth or experiences menstruation for the first time. The onset of physical changes of puberty can be frightening or unsettling to the child. The nurse is most effective by providing education and support and serving as a role model. The following Client Teaching Checklist provides information essential in helping parents promote positive self-concept development in children.



CLIENT TEACHING CHECKLIST

Actions of Parents to Promote Positive Self-Concept in Children

- Encourage expression of feelings.
- Promote mutual respect and trust by establishing and maintaining open lines of communication; demonstrate a willingness to talk about any subject.
- Listen carefully to children, and use words they understand.
- Use examples and anecdotes to promote learning.
- Teach by example. Role model problem-solving and coping skills.
- Encourage children's talents and accept their limitations. Be realistic in your expectations, and avoid comparing one child to another.
- Celebrate the child's accomplishments.
- Demonstrate confidence in their abilities.
- Provide the child with unconditional love.

Adolescence

Adolescents' sense of self is greatly influenced by how others, especially peers, view them. Acceptance and a sense of belonging to a peer group influence the adolescent's sense of worth and well-being; see Figure 19-6. Feelings about one's self intensify during puberty. Adolescents may become very self-conscious because they often "feel that others are as concerned about them as they are themselves. Thus, they're overpowered by self-consciousness and the feeling that 'everyone is looking at them.'" To blend in with peers, teenagers focus on complexion, hair, and clothing" (Muscarì, 1998, p. 28).

As adolescents' bodies change, they must keep revising their body images. A severe or deep-rooted distortion of body image may be a manifestation of a mental illness, such as anorexia nervosa or bulimia nervosa, which occur primarily during adolescence. The nurse needs to help the adolescent redirect energies and focus on positive traits and to view self as a compilation of many factors, not just one (e.g., weight).



Figure 19-6 Peers exert much influence on the adolescent's changing self-concept.

Adulthood

As adults continue to mature, self-concept changes in response to new self-perceptions and roles; see Figure 19-7. Young adults make a transition to independent living without parental assistance. The degree of ease or discomfort in making such a transition affects the young adult's self-concept by demonstrating a sense of competency.

The self-concept of an older person is the culmination of a variety of factors, including life experiences and interactions with others. Some life experiences that shape the older person's self-concept are adjusting to role loss and dealing with the loss of significant others. "Many of the realities of aging make the elderly vulnerable to self-perception problems. Older adults suffer numerous losses, have a decreased ability to protect themselves, and are confronted with many subtle messages that they are misplaced in a youth-oriented society" (Eliopoulos, 1999, pp. 362–363). Spending time with significant others may increase the older client's self-esteem by making him or her feel valued; see Figure 19-8.



Figure 19-7 Young adulthood often means assuming new roles. What role changes are this newly married couple likely to experience?



Figure 19-8 Identify some factors that may contribute positively to this older client's self-esteem.

FACTORS CONTRIBUTING TO SELF-CONCEPT ALTERATIONS IN THE OLDER CLIENT

- Changes in environment
- Ageism (social stigma against the elderly)
- Loss of significant others (including pets)
- Social isolation
- Illness, acute or chronic
- Financial change

Throughout life, the individual has developed coping resources. Because self-concept is intertwined with competency, it is important for nurses to allow older clients the time to complete tasks that are meaningful to them. Some of the many factors that may negatively affect the older adult's self-esteem are shown in the accompanying display. When caring for older clients, it is important to plan activities that promote a healthy self-concept (see the following Nursing Checklist).

EVALUATION

A client's behavior and attitudes will reflect the degree of progress toward restoring an altered self-concept. The nurse must reconsider the alignment of the

NURSING CARE PLAN

The Client with Ineffective Role Performance

Case Presentation

Todd Lloyd is a 31-year-old civil engineer who has just left his job of 10 years to care full-time for his newborn daughter, Sarah. He and his wife decided that, after their child was born, she would return to work full-time outside the home, and he would be the primary caregiver for their daughter during the day. Mr. Lloyd presents to you at the clinic stating, “I am very eager and excited about being a full-time dad, but I’m also a little nervous because I really don’t know what to expect.”

Assessment

- Lack of knowledge about new parenting role
- Concern over changes in responsibilities

Nursing Diagnosis

Ineffective Role Performance related to change in roles and usual patterns of responsibility, as evidenced by verbalization of concern over lack of knowledge about new role.

Expected Outcomes

The client will:

1. Explain specific concerns about new roles.
2. Demonstrate role competence.
3. Verbalize satisfaction with role performance.

Interventions/Rationales

1. Encourage the client to express his feelings about his new role.
Opens the door to communication and problem solving.
2. Outline with client what aspects of his role(s) will be changing and what will be the same.
Helps client identify the ways in which his role is changing, so he can face the changes from a realistic frame of mind. Also highlights similarities, not just differences, between his past and present roles, thus helping client feel less overwhelmed.
3. Assist the client in identifying specific concerns he has regarding the change in roles.
Helps the client determine exactly what his concerns are, so they can be addressed.
4. Encourage client to discuss concerns with wife and to seek help together.
Support of spouse will be critical to client’s success in overcoming concerns about changing roles.
5. Help client gain confidence and competence with new role by demonstrating new role behaviors, offering literature and resources, and providing referral to parenting courses or counselors.
Assures client that resources are available to help him meet his needs and helps lessen his anxiety and his feeling of being overwhelmed.
6. Have client return demonstrate new behaviors and offer encouragement and additional teaching.
Allows client to try out new behaviors in a “safe” environment and provides a means for immediate feedback.
7. Ask client for feedback on the new behaviors and information acquired.
Provides chance for client to evaluate progress in new role, which will increase client’s confidence.

Evaluation

Mr. Lloyd is able to identify specific concerns about his new role as parent and has demonstrated a growing competence in some of the behaviors that will support this new role. He read the literature and has ordered a videotape designed for new parents. He is also planning to subscribe to a newsletter entitled “The Full-Time Father.” Mr. Lloyd agrees that his wife’s input would be very valuable to his gaining comfort and confidence in his new role, and he agrees to visit the clinic again with her in a week.



NURSING CHECKLIST

Promoting Self-Concept in the Older Client

1. Increase socialization.
2. Encourage involvement and participation in care.
3. For clients in the home setting, urge family members to allow client to be involved with household tasks and routines as much as possible.
4. Elicit client feedback.
5. Use touch to decrease feelings of isolation and to promote feelings of security and acceptance.
6. Modesty is often important to the older client; therefore, maintain and promote privacy. For example, perform physical examinations or procedures without completely exposing the client.
7. Do not remove all personal belongings because these are often invested with symbolic meaning (for example, let the elderly woman keep her purse at her bedside).
8. Demonstrate patience; allow clients time to complete sentences and to finish one task before moving on to the next.
9. Involve family or significant others as much as possible in the provision of care.
10. Encourage the client to reminisce, especially focusing on individual strengths and accomplishments.

client's targeted self-concept with the plan of care to assess if the two are still congruent. Input from family members or significant others can be useful in seeing the client in a larger context of differing roles and expectations and may also highlight some of the similarities and differences between the client's perceived self-image and the impression of those closest to him or her.

Another crucial factor in evaluating success of attaining goals outlined in the care plan is the consideration of time. Because self-concept is based on personal attitudes, feelings, and impressions, it often requires months or even years to change. Nurses, clients, and their families all need to learn to be patient and to work together to improve or restore a client's self concept.

KEY CONCEPTS

- Self-concept (an individual's perception of self) affects every aspect of a person's life.
- A person who sees oneself as a competent individual will behave competently and vice versa.
- Self-concept consists of four interrelated components: identity, body image, self-esteem, and role performance.

- A well-formulated identity provides the answer to the question "Who am I?" and may consist of a person's name, family status, occupation, and various roles.
- Body image refers to a person's mental picture of and attitudes about his or her body. It includes physical attributes and characteristics, appearance, and performance.
- Self-esteem is the individual's generalized sense of worth and value.
- Role refers to a set of expected behaviors that are determined by social norms.
- The development of self-concept begins at birth and depends, to a degree, on interactions with others as the child grows and matures.
- The person's developmental level affects self-concept; with maturity comes a stronger self-concept.
- Illness evokes anxiety in most people; anxiety can cause illness. Any threat to self-concept arouses anxiety. When anxiety level is heightened, recovery is compromised.
- Surgery can result in body image disturbances. Altered body image results from loss of a body part or function, invasion of body space, and distortion of body image.
- Assessment of self-concept must consider both developmental level and chronological age.
- Identification of client strengths enables the nurse to determine the presence of factors the client can use for coping and problem solving.

CRITICAL THINKING ACTIVITIES

1. Consider self-concept and the four factors that comprise it. Would you consider any one of these factors more important than another in contributing to overall self-concept?
2. Outline some of the specific factors that contribute to the development of self-concept throughout the life span.
3. What are some specific nursing strategies that you could use to promote the self-concept and comfort of a hospitalized client?
4. Refer to the chapter nursing care plan. What other assessments might you expect to find in this client? How could the plan of care be modified to reflect these additional findings?

WEB RESOURCES

- American Holistic Nurses Association
www.ahna.org
- American Nurses Association
www.ana.org
- American Psychiatric Nurses Association
www.apna.org
- American Psychological Association
www.apa.org

Chapter 20

Stress, Anxiety, and Adaptation



There is nothing either good or bad, but thinking makes it so.

—William Shakespeare

COMPETENCIES

1. Discuss stress, anxiety, and adaptation as they affect health.
2. Identify factors contributing to the stress response.
3. Describe the general adaptation syndrome.
4. Explain stressors inherent in the change process.
5. Discuss the role of the nurse as a change agent.
6. Explain nursing interventions that promote positive adaptation to stress.
7. Develop an individualized stress management plan for use as a nurse.

KEY
TERMS

adaptation	distress	paradigm
anxiety	endorphins	proactive
burnout	eustress	progressive muscle
catharsis	fight-or-flight response	relaxation
change	general adaptation	secondary gain
change agent	syndrome (GAS)	stress
cognitive reframing	guided imagery	stressor
crisis	homeostasis	suppression
crisis intervention	local adaptation syndrome	
defense mechanisms	(LAS)	
depersonalization	maladaptation	

Stress, a universal experience, can be the catalyst for positive change or it can be the source of discomfort and pain. How does stress affect nurses? Caring for clients who are experiencing high levels of anxiety can be stress-provoking for nurses. Nurses are involved with stress management from a teaching perspective, helping clients learn to cope with the stress imposed by illness, injury, disability, or treatment approaches. Nurses also encounter stress as a personal experience. Successful stress management is necessary for wellness of both clients and nurses. This chapter discusses the major concepts related to stress and anxiety and presents strategies for coping with stress and change.

STRESS, ANXIETY, AND ADAPTATION

Stress is the body's physiological reaction to any stimulus that evokes a change. Any situation, event, or agent that threatens a person's security is a **stressor**. A stressor is a stimulus that evokes the need to adapt and can be internal or external. For example, a headache is an internal stressor, whereas a difficult assignment is an external stressor. A stressor can be physical (such as a laceration), physiological (e.g., hypertension), or psychosocial (e.g., graduation from school). Even pleasant events can be stressful in that they evoke the need to adapt. Stressors in themselves are neutral; in other words, a stressor is neither good nor bad. The individual's *perception* of the stressor greatly determines whether the outcome is positive or negative. Any event can be stressful, depending on the person's interpretation of that event.

Anxiety is a subjective response that occurs when a person experiences a threat to well-being; it is a pervasive feeling of dread or apprehension. There is a close relationship between stress and anxiety. Stress is the person's physiological response to a stimulus, whereas anxiety is the psychological response to a threat. Anxiety can be both an activator of stress and a response to stress. It is usually activated by stress and may, in and of itself, lead to more stress.

Adaptation is an ongoing process by which individuals adjust to stressors in order to achieve **homeostasis** (equilibrium between physiological, psychological, sociocultural, intellectual, and spiritual needs). Adaptation is a holistic response that involves all dimensions of an individual. Individuals, as holistic beings, seek to maintain a *steady state* (another term for homeostasis) in all dimensions of life: physiological, psychological, cognitive, social, and spiritual. Wellness is an adaptive state; that is, the well person is one who is coping effectively with stressors to maintain a high level of well-being. The nurse's goal is to identify and support the client's positive adaptive responses.

Sources of Stress

Individuals experience stress from multiple sources, primarily their bodies, their thoughts, and the environment. A situation or event that evokes stress in one person may not affect another. Examples of factors contributing to stress are shown in Table 20-1.

RESPONSES TO STRESS

Every individual has unique responses to stress. A person's response to stress is influenced by several variables: mental attitude, lifestyle, perception, and heredity.

Physiological Response to Stress

The stress response, which can be adaptive or maladaptive, is the nonspecific response of the body to any demand (Selye, 1974). When the response is adaptive, the individual achieves and is able to maintain homeostasis. If the stress response is maladaptive, health status is altered.

General Adaptation Syndrome

Hans Selye (1976), a Canadian physiologist, introduced the concept of the **general adaptation syndrome (GAS)**, the physiological response to stress. The GAS is the same whether the stressor is actual or imagined, present or potential. In other words, the physiological reactions

TABLE 20-1
Common Stressors

Type of Stressor	Examples
Physiological	<ul style="list-style-type: none"> • Maturation (moving from one developmental stage to another) • Trauma • Illness • Poor nutrition • Sleep disturbances • Hunger • Discomfort • Pain
Psychological	<ul style="list-style-type: none"> • Worry • Fear • Anger • Happiness
Cognitive	<ul style="list-style-type: none"> • Thoughts • Perceptions • Interpretation of events
Environmental	<ul style="list-style-type: none"> • Temperature (weather) • Air pollution • Noise pollution • Crowding • Time pressures
Sociocultural	<ul style="list-style-type: none"> • Job loss or promotion • Changes in interpersonal relationships • Interpersonal conflict • Living conditions

of the body are essentially the same regardless of the source of the stress. For example, the mind can imagine a stressor, and the physiological response (GAS) will be the same as if the body had actually experienced the stressor. According to Selye (1976), all stress reactions involve similar physiological reactions. The three stages of the GAS are described in Figure 20-1.

THINK ABOUT IT

Anticipatory Stress

Consider what happens when you worry about a situation. Your thoughts are stressors that trigger the GAS. While you are reviewing these “movies of the mind,” your body responds as if you were *actually* experiencing the events in the present moment.

Fight-or-Flight Response

During the resistance stage of the GAS, an individual attempts to defend against the stressor through the **fight-or-flight response**. The body becomes physiologically

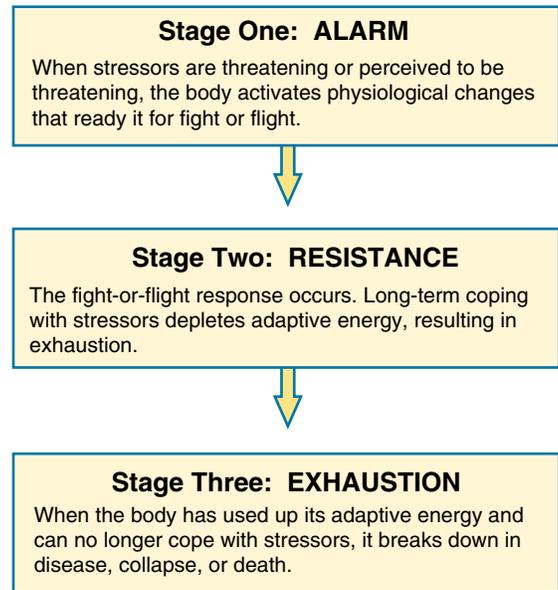


Figure 20-1 Stages of the General Adaptation Syndrome (GAS)

ready to defend itself by either fighting or running away from the danger (stressor). Hormones, such as adrenaline and norepinephrine, are secreted that cause various biological changes. Arousal of the autonomic nervous system (ANS) characterizes the fight-or-flight phenomenon (see Figure 20-2). The endocrine system is also involved in maintaining physiological homeostasis.

Local Adaptation Syndrome

The **local adaptation syndrome (LAS)** is the physiological response to a stressor (e.g., trauma, illness) affecting a specific part of the body. For example, if a person experiences a puncture wound on the foot, the LAS is initiated and leads to localized inflammation. The classic symptoms of inflammation (redness, warmth, and swelling) occur at the injured site. The LAS is usually a temporary process that is resolved when the traumatic area is restored to its steady state. However, if the inflammation is not resolved with the LAS, the individual will then experience the GAS as the entire body becomes affected.

Manifestations of Stress

The manifestations of stress are numerous and affect every dimension of a person. Common manifestations of stress are described in Table 20-2.

Outcomes of Stress

Stress is an experience that provides the individual with two possibilities: (1) an opportunity for personal growth or (2) the risk of disorganization and distress. When stressors are responded to appropriately, adaptation is successful and the body returns to its normal steady state.

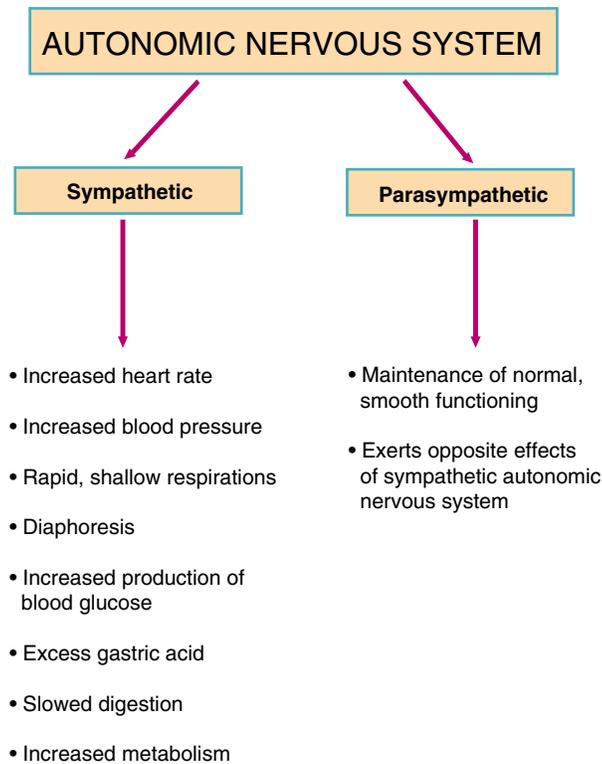


Figure 20-2 Physiology of Autonomic Nervous System: Arousal and Homeostasis (Adapted from DeLaune, S. C. [1996]. Applying the nursing process for clients with anxiety, somatoform, and dissociative disorders. In H. S. Wilson & C. R. Kneisl [Eds.], *Psychiatric nursing* [5th ed., p. 368]. Menlo Park, CA: Addison-Wesley.)

When stress is not handled within a short period of time, however, problems may occur. Individuals who experience chronic periods of stress are the ones who have the greatest risk of becoming ill. Selye (1976) refers to the effects of chronic stress as “dis-ease,” which occurs in the third stage of the GAS, exhaustion. The person becomes dis-eased when coping mechanisms are ineffective. This process of coping ineffectively with stressors is referred to as **maladaptation**. The inability to adapt to continued demands of stress can have harmful results, such as illness.

The term **eustress** is used to describe a type of stress that results in positive outcomes. Consider, for example,

THINK ABOUT IT

Maladaptation or Adaptation?

Do you remember the last time you were stuck trying to solve a problem? The process of “spinning your wheels but going nowhere” refers to maladaptation. In other words, you were using up a great deal of energy while accomplishing very little. What are some ways to use your adaptive energy in a more productive manner? How can you enhance your adaptation to stressful events?

TABLE 20-2
Manifestations of Stress

Physiological	<ul style="list-style-type: none"> • Cardiovascular/respiratory effects <ul style="list-style-type: none"> —Increased pulse —Increased blood pressure —Rapid, shallow breathing • Neurologic effects <ul style="list-style-type: none"> —Dizziness —Headaches —Dilated pupils • Gastrointestinal effects <ul style="list-style-type: none"> —Nausea —Altered appetite —Diarrhea or constipation • Genitourinary effects <ul style="list-style-type: none"> —Polyuria • Musculoskeletal effects <ul style="list-style-type: none"> —Tension —Twitching • Endocrine effects <ul style="list-style-type: none"> —Increased levels of blood glucose and cortisol
Psychological	<ul style="list-style-type: none"> • Irritability • Increased sensitivity (feelings are easily hurt) • Sadness, depression • Feeling “on edge”
Cognitive	<ul style="list-style-type: none"> • Impaired memory • Confusion • Impaired judgment • Poor decision making • Delayed response time • Altered perceptions • Inability to concentrate
Behavioral	<ul style="list-style-type: none"> • Pacing • Sweaty palms • Rapid speech • Insomnia • Withdrawal • Exaggerated startle reflex
Spiritual	<ul style="list-style-type: none"> • Alienation • Social isolation • Feeling of emptiness

students who have an examination scheduled the following week. The stress over the impending test motivates them to study early. As a result, they pass the examination.

When stressors evoke an ineffective response, **distress** is experienced. For example, consider students who have an examination scheduled for the next day. They had plenty of time to study, but because they put it off until the last minute, they take the examination unpre-

THINK ABOUT IT

Personal Stressors: Eustressful

Think about some of the stressors in your life. Identify those that are eustressful, that is, stimulating and positive.

Personal Stressors: Distressful

Think of the last time you felt “stressed-out” and anxious. How did your body respond? What did you feel? What were you thinking? How did you respond behaviorally?

pared. As a result of “cramming” all night, they are not alert, do not know the material, and fail the examination; they are experiencing distress. In general, when people say *stress* they are referring to distress, the negative outcomes of an ineffectual stress response.

Crisis

When stressors exceed the person’s ability to cope, a crisis develops. A **crisis** (an acute state of disorganization) occurs when the individual’s usual coping mechanisms are no longer effective. Crisis is characterized by extreme anxiety, inability to function, and disorganized behavior. A crisis is time-limited; that is, no one can remain in acute disequilibrium for a long period of time because of the degree of discomfort that is experienced. Owing to the time-limited nature of crisis, a client experiencing a crisis needs immediate intervention to reach a successful resolution. Crisis intervention is discussed later in this chapter.

A crisis can be a negative experience, but it also has the potential to be an opportunity for growth and learning. The outcome is unique according to each individual’s perception and coping abilities. Nurses are challenged to help clients discover the opportunity in their crises to adapt in a positive, healthy manner.

Not every person will experience a crisis as a result of stressful events. Each crisis is unique according to the individual and circumstances. However, there are some characteristics common to all crises, including the following:

- A crisis is experienced as a sudden event.
- A crisis has an identifiable precipitating event.
- The situation is perceived as overwhelming or life-threatening.
- The situation cannot be resolved with usual coping skills.
- Intervention is required for equilibrium to be achieved.

A crisis is *not* a mental illness even though it is not uncommon for a person experiencing the acute discomfort and anxiety to fear “I’m losing my mind.” There are three types of crises, which are shown in Table 20-3.

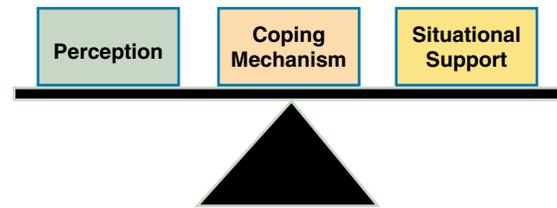


Figure 20-3 Balancing Factors of a Crisis (From Aguilera, D. C. [1997]. *Crisis intervention: Theory and methodology* [8th ed.]. St. Louis, MO: Mosby.)

Balancing Factors

Three factors that influence a person’s resolution of a crisis (Aguilera, 1997) are shown in Figure 20-3. During a crisis, one (or sometimes more) of these factors is out of balance. When the factors return to a balanced state, the individual is able to resolve the crisis effectively. Nursing interventions focus on reestablishing equilibrium among these factors.

Anxiety

Anxiety is the most common emotional (affective) response to stress. Individuals feel anxious whenever they are threatened, whether the threat is perceived or actual. Anxiety occurs on a continuum; some degree of anxiety is necessary as it serves as a motivator for adaptation. High levels of anxiety, however, can overwhelm the person and impair the ability to think and function. As the severity of anxiety increases, the person is less and less able to function. Table 20-4 describes the levels of anxiety.

Coping Behaviors

There are many ways to cope with stress. The following are frequently used coping strategies:

- Talking
- Crying
- Laughing
- Exercising

These strategies can result in successful adaptation. However, they become ineffective if they are the only coping methods used by the individual.

Defense Mechanisms

Just as the body has physiological mechanisms (e.g., the immune system, the inflammatory response) to defend against infection and disease, the mind has psychological protective mechanisms. **Defense mechanisms** are unconscious operations that protect the mind from anxiety (see Table 20-5). Defense mechanisms are employed to achieve and maintain psychological homeostasis. Zook (1998) describes defense mechanisms as “unconscious psychological processes that let us filter out intolerable realities and emotional pain during

TABLE 20-3
Types of Crises

Type	Definition	Examples
Developmental or maturational	<ul style="list-style-type: none"> • Occur as a person ages and moves from one developmental stage to another • Are universal 	<ul style="list-style-type: none"> • An adolescent attempting to gain independence from parents • A middle-aged woman experiencing menopause
Situational	<ul style="list-style-type: none"> • Can occur at any time and are not predictable • Are not experienced by everyone • Occur when there is change in role or function 	<ul style="list-style-type: none"> • Illness • Loss (death, divorce) • Graduation • Job promotion • Retirement
Adventitious	<ul style="list-style-type: none"> • Are unpredictable events that rarely occur 	<ul style="list-style-type: none"> • Being in an airplane crash • Losing one's home in a tornado • Being a victim of a school shooting • Winning a \$10 million lottery

times of crisis” (p. 16B). Illness and the resultant treatment evoke anxiety in everyone; thus, all clients use defense mechanisms (also called mental mechanisms).

Defense mechanisms are universal. Their use does not indicate psychosocial imbalance or mental illness; however, defense mechanisms are pathological when they become a stereotyped pattern, that is, the only way that an individual responds to a threat. Defense mechanisms are also considered to be pathological when they limit the individual's ability to function. People who use defensive mechanisms in a pathological way “may develop physiologic problems and psychological symptoms associated with emotional illness” (Zook, 1998, p. 26B).

Defense mechanisms operate at the unconscious level of awareness and are involuntary and automatic, that is, the individual does not consciously decide to use a defense mechanism. **Suppression** is a conscious mechanism whereby a person decides to avoid dealing with a stressor at the present time. The accompanying display gives an example of the use of suppression.

The nurse who is unfamiliar with defense mechanisms is likely to be judgmental about clients who do not respond according to the nurse's expectations. If, for example, the nurse tries to break through a client's denial too quickly by presenting reality, the client will likely be overwhelmed by anxiety and will panic.

TABLE 20-4
Levels of Anxiety

Anxiety Level	Characteristics of Anxious Person	Nursing Implications
Mild	<ul style="list-style-type: none"> • Increased degree of alertness • Increased vigilance 	<ul style="list-style-type: none"> • Optimal time for client teaching because of heightened awareness and increased perceptual field
Moderate	<ul style="list-style-type: none"> • Subjective distress • Decreased perception and attention 	<ul style="list-style-type: none"> • Help the client to determine a cause-and-effect relationship between stressor and anxiety
Severe	<ul style="list-style-type: none"> • Increased subjective distress • Selective attention • Distorted perception 	<ul style="list-style-type: none"> • Encourage verbalization • Engage in motor activity • Give specific directions
Panic	<ul style="list-style-type: none"> • Major perceptual distortion • Immobilization; inability to function • Impaired communication 	<ul style="list-style-type: none"> • Provide limits and structure • Maintain client safety (both physical and psychological)

(From Peplau, H. E. [1952]. *Interpersonal relations in nursing*. New York: Putnam; Sullivan, H. S. [1953]. *The interpersonal theory of psychiatry*. New York: Norton.)

TABLE 20-5
Common Defense Mechanisms

Mechanism	Description	Example
Denial	Negation of reality of threatening situations, despite factual evidence	The client refuses to admit to anger, even though the situation warrants it and the client's voice indicates anger.
Projection	Attribution of one's own thoughts, feelings, or impulses to others	"I'm not attracted to him. My best friend is."
Repression	Unconscious blocking from awareness material that is threatening or painful	"I never got angry at my father; our family lived in harmony and love" (when such descriptions of the family life would not fit with anyone else's interpretation of the events).
Rationalization	Intellectual explaining away of threatening circumstances	"The test had too many trick questions; I really know all the material; our instructor was out to get me."
Introjection	Incorporating, without examination or thought, the qualities or attitudes of others	The adolescent who takes on all the values and styles of an admired teacher.
Displacement	Transfer of feelings or reactions evoked by one topic or event to another that is less threatening	The husband who is angry at his wife and yells at the family dog rather than dealing directly with his anger.
Reaction formation	Expression of a feeling that is the opposite of one's authentic feeling or of feelings that would be appropriate in the situation	A client who brings gifts to the nurse at whom he is really angry.
Regression	Retreat to a previous developmental level	A child starts to suck his thumb (after 2 years of not thumb sucking) when admitted to the hospital.
Suppression	Conscious attempt to keep threatening material out of consciousness	A student nurse decides not to think about a family problem at the moment so he can study for an upcoming examination.
Sublimation	Channeling of socially unacceptable impulses into socially acceptable activities	A young man who is dealing with aggression by playing football.
Symbolization	Use of an object, idea, or act to express emotion that is not expressed directly	The client who leaves the nurse a flower rather than directly saying she cares about the nurse.

STRESS AND ILLNESS

Everyone experiences stress and accompanying anxiety; this anxiety is increased during illness and the recovery process. Illness and stress are interwoven to such a degree it is difficult to determine which precedes the other. When a person's adaptive attempts are unsuccessful, illness occurs. Also, a person who is ill has fewer adaptive resources available to cope with stressors. Even though some stressors may not directly cause illness, stress is a significant component in the onset and progression of many diseases. Table 20-6 lists some disorders commonly associated with stress.

One of the major outcomes of prolonged periods of stress is impairment of the immune system. As the body continues to fight off the threat (actual or perceived),

CLINICAL EXAMPLE: SUPPRESSION

Mrs. James, a 34-year-old mother of two small children, has just been informed by her physician that she has cervical cancer. She is also told that her prognosis is dire; she has about 3 months left to live. Mrs. James asks questions and appears to be very calm. Later, the nurse asks Mrs. James if she wants to talk. Mrs. James replies, "I can't deal with this right now. I'll wait until my family is here and then I'll want to talk to you." Mrs. James's use of suppression allows her to postpone attempting to deal with the threatening diagnosis until she has members of her support system available to help her cope.

steroid production is increased. Increased steroid production is helpful on a short-term basis because steroids speed up the healing process. However, increased

NURSING ALERT

To Prevent Panic

To prevent panic, never attempt to take away a defense mechanism until the client has learned another method of coping. Denying a client the use of a defense mechanism will cause more anxiety.

TABLE 20-6
Stress-Related Disorders

Respiratory disorders	<ul style="list-style-type: none"> • Emphysema • Chronic bronchitis • Asthma
Cardiovascular disorders	<ul style="list-style-type: none"> • Hypertension • Cardiac arrhythmias • Migraine headaches
Endocrine disorders	<ul style="list-style-type: none"> • Thyroid problems • Amenorrhea, anovulation • Diabetes • Excessive weight gain or weight loss
Musculoskeletal disorders	<ul style="list-style-type: none"> • Chronic back pain • Arthritis
Genitourinary disorders	<ul style="list-style-type: none"> • Enuresis • Urinary frequency
Sexual and reproductive disorders	<ul style="list-style-type: none"> • Low libido • Impotence (erectile dysfunction, or ED) • Menstrual irregularities
Gastrointestinal disorders	<ul style="list-style-type: none"> • Colitis • Chronic constipation • Ulcers • Gastritis
Integumentary disorders	<ul style="list-style-type: none"> • Eczema • Hives • Psoriasis

steroid production over a period of time will impair the immune system. Thus, the body is less able to protect itself from disease.

Impact of Illness and Treatment

Everyone entering the health care system experiences a change in their usual routine. For example, hospitalization, surgery, and admission to a long-term care facility are major disruptions in one's routine. Such changes evoke the stress response.

THINK ABOUT IT

Stressors Associated with Hospitalization

Think of some major changes that people experience when they are hospitalized. Can you identify at least three changes? What can you do to significantly reduce threats (real or perceived) in acute care settings? In long-term care settings?

Being in an unfamiliar environment, losing control over one's schedule, and being dependent on others for care are all issues with which hospitalized clients must cope. Each of these issues is a stressor that requires adaptation in order to maintain a steady state. Most clients do not have the energy to cope with the numerous changes simultaneously. Some cues that a person may be reacting adversely to hospitalization include:

- Increased stress response
- Higher levels of anxiety
- Increased or impaired use of coping mechanisms
- Inability to function
- Disorganized behavior

Individuals do not have to be hospitalized to experience stressors associated with the client role. Consider for example the person having "minor" surgery at an outpatient center, the employee being treated at the industrial clinic for a work-related injury, or the adolescent being treated by the school nurse. Even clients who are treated by home health agencies experience stressors associated with having a health care provider enter their personal environment.

The greater the threat (or perceived threat), the greater the level of the client's anxiety. The nurse must be sensitive to stress and anxiety stemming from the multiple changes imposed by illness on the client, family, and/or significant others. The nurse's sensitivity to clients' stress reduces the risk of depersonalizing the client.

Depersonalization describes the process in which an individual is treated as an object instead of a person. Literally, it involves taking away clients' unique aspects by treating them as nonhuman. Nurses who demonstrate caring and compassion avoid depersonalizing clients. In order to prevent depersonalization, nursing interventions focus on helping the client reduce feelings of unfamiliarity and loss of control. The following Nursing Checklist suggests some actions for promoting client control.

STRESS AND CHANGE

Change (a dynamic process in which an individual's behavior is altered in response to a stressor) is an inherent part of life. It is the process that causes individuals to adapt. Whether it is planned or unplanned, change is both inevitable and constant. Change can be construc-

**NURSING CHECKLIST****Actions to Promote Client Control**

- **Communicate clearly.** Use terms easily understood by clients and families. Avoid using medical jargon with clients.
- **Answer questions thoroughly.** Validate client's and family's level of understanding.
- **Teach the use of relaxation techniques,** such as **progressive muscle relaxation** (a stress management technique involving the tensing and relaxing of muscles) and **guided imagery** (a relaxation technique in which the individual uses the imagination to experience a pleasant, soothing image).
- **Instruct clients on the use of cognitive reframing** (a technique in which the individual changes her or his negative perception of a situation or event to a more positive, less-threatening perspective.)
- **Provide support and reassurance.** The nurse's presence ("being with" the client) can alleviate anxiety levels. The most therapeutic tool in alleviating client anxiety is the nurse's therapeutic use of self.
- **Break down the information shared with clients.** Too much information at once can make the client feel overwhelmed and less likely to listen. When clients have adequate information, they can make informed decisions and maintain some degree of control over their lives.

CHARACTERISTICS OF CHANGE

- Is an inevitable part of life.
- May be eustressful or distressful.
- Can be self-initiated or externally imposed.
- Can occur abruptly or have a gradual onset with insidious progression.
- Energy is required to effect change, as well as to resist change.

tive or destructive and is stressful to individuals because it activates the GAS. The accompanying display lists characteristics of change.

Nurses must be able to initiate and cope with change. Proficiency in critical-thinking and problem-solving skills is necessary to initiate positive change.

The pace of change is rapidly increasing in health care agencies, which have been changing and continue to change in response to consumer demands. "Change is inevitable and nurses have the qualities and a strategic position to participate actively" (Joel, 1998, p. 7). Some changes that have evolved from consumer demands and needs include:

- Sports medicine clinics
- Substance abuse treatment programs
- Day treatment programs for geriatric and psychiatric clients
- Weight control programs
- Exercise programs

Types of Change

Change is either planned or unplanned. Unplanned change is the change that "just happens"; it is unpredictable and may be imposed by others or by uncontrollable natural events (e.g., losing one's home in a flood). On the other hand, planned change results from a deliberate effort to improve a situation. In addition to planned and unplanned change, there are other types of change (see the accompanying display).

TYPES OF CHANGE

Type of Change	Description
Developmental	<ul style="list-style-type: none"> • Physical and emotional changes that occur at different stages of the life cycle • Generally predictable • Usually occur gradually
"Reactive"	<ul style="list-style-type: none"> • Adaptive responses to external stimuli • Efforts to cope with change imposed by others
Covert	<ul style="list-style-type: none"> • Occur without person's conscious awareness
Overt	<ul style="list-style-type: none"> • Person is aware of the change • Usually not under individual's direct control

Theories of Change

Nurses must have a thorough understanding of the change process in order to effectively implement change with clients and within the health care delivery system. Two major theories of change are discussed below.

Lewin's Theory of Change

A classic theory of change was developed by Lewin (1951), who stated that the change process occurs in three stages: unfreezing, moving, and refreezing (see Figure 20-4). In the unfreezing stage, the person recognizes a need for change and becomes motivated to move in a new direction. Stage two, changing, is the actual implementation of the change. In the third stage, refreezing, new changes are incorporated into behavior and these new behaviors stabilize. Because the change process is dynamic, these stages are not rigid. The

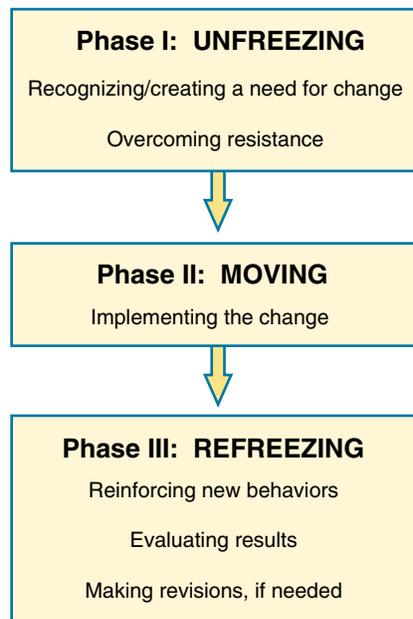


Figure 20-4 Lewin's Theory of Change (From Lewin, K. [1951]. *Field theory in social science*. New York: Harper.)

process of change may quickly move through all stages, or it may become “stuck” in one stage.

Lippitt's Theory of Change

Lippitt (Lippitt, Watson, & Westley, 1958) proposed a theory of change that consists of seven phases:

1. Diagnose the problem (need for change).
2. Assess the change target's motivation and capacity for change.
3. Assess the change agent's motivation and capacity for change.
4. Establish objectives for change.
5. Determine the role of the change agent.
6. After change has occurred, maintain it.
7. Terminate the role of the change agent.

Resistance to Change

Many people tend to resist change because of the energy required to adapt. Conversely, energy is also required to resist change, or to maintain the *status quo*. Individuals differ in their ability to tolerate (or even thrive on) change.

There are many reasons people tend to resist change (see Table 20-7). There are no absolute guarantees that the change activity will lead to positive outcomes; this uncertainty about outcomes is a major barrier to change.

Changing Paradigms

Changing involves questioning and frequently results in the development of a new **paradigm** (a pattern, model, or mindset that strongly influences one's decisions and

TABLE 20-7
Reasons People Resist Change

Conformity	Often referred to as “groupthink;” complying with the group's expectations; going along with others to avoid conflict.
Dissimilar beliefs and values	Differences in attitudes and expectations regarding health and illness behaviors; differences between client and nurse that can impede positive change.
Habits	Routine, “set” behaviors are often hard to change.
Satisfaction with <i>status quo</i>	Seeing only advantages to the present system can blind one to the possible need for change. Satisfaction with the way things are now reinforces resistance to change.
Secondary gains (outcomes other than alleviation of anxiety)	Benefits or pay-offs of the sick role (such as gaining attention and sympathy, avoiding responsibilities, and getting financial compensation or reward) often are so desirable that the client has little incentive to change.
Threats to satisfying basic needs	Change may be perceived as a threat to self-esteem, security, or survival.
Fear	Fear of failure and fear of the unknown especially block change.
Unrealistic goals	Set up the individual for failure in change efforts.

THINK ABOUT IT

Responses to Change

What is your typical response when first learning that a change is imminent? Do you feel threatened, afraid, anxious? Do you feel excited and optimistic? Perhaps you feel something in between resistance and excitement. It is important for you to be aware of your automatic thoughts that influence your response to change.

behaviors). One's paradigm greatly colors one's perceptions and behaviors. By changing paradigms, an individual can determine what is positive in the old system and use it to create a newer, better system (Alfaro-LeFevre, 1998).

It is risky to initiate change, to challenge one's own paradigms and those of others. One of the first signs of the need for change is questioning. The nurse who wonders Why? or Why not? or What if? is the nurse who will

likely take the risk to initiate change activity. The risk taker who is effective is neither reckless nor overly cautious. Successful risk takers consider possible outcomes before initiating action. “Accepting change as inevitable and taking personal control and responsibility for it needs to be acknowledged by all in the health service industry today” (Bonalumi & Fisher, 1999, p. 70).

THINK ABOUT IT

Nurses As Risk Takers

Do you think nurses are encouraged to be risk takers? What empowers you to take risks as a student? What barriers to risk taking can you identify in academic and health care settings?

Overcoming Barriers to Change

Because change is inevitable, learning how to deal with it is crucial for nurses. Resistance occurs when the individual rejects proposed new ideas without critically thinking about the proposal.

Overcoming this barrier doesn't mean embracing every new idea uncritically. It means being willing to suspend judgment long enough to make an informed decision on whether the change is worthwhile. (Alfaro-LeFevre, 1998, p. 25)

Coping with change of any type calls for flexibility, adaptability, and resilience.

Nurse As Change Agent

Initiating change is an expectation for professional nurses. The American Nurses Association (1991) calls for nurses to bring about changes in practice as well as changes in the system of delivering health care. Nurses experience stress daily as a result of changes within their immediate work environment as well as changes in the entire health care delivery system. The uncertainty over health care reform is very distressful to some nurses. Others see opportunity for positive change in the future. “Nursing staff members need to realize that change is not something that happens to them, but something that they can influence” (Bonalumi & Fisher, 1999, p. 72).

In bringing about change to promote positive adaptation, the nurse serves as a **change agent** (a person who intentionally initiates and creates change). True change agents constantly seek ways to make improvements. They use critical-thinking skills to develop creative, innovative solutions. Critical thinking is also required to determine the outcome of initiating change. Evaluating the effects of change is key to bringing about positive change.

To be most effective, change should be planned and directed by people who are **proactive** (individuals who initiate change rather than respond to change imposed by others). Proactive individuals assume responsibility for their own lives. On the other hand, a reactive person responds only to externally imposed change. Proactive nurses are change agents who affect the entire health care system as well as individual clients.

Change agents keep the change process moving toward a positive outcome. As an advocate for change, the nurse empowers the client to initiate change in order to adapt more successfully; client education is a powerful tool for initiating change. Teaching a client about a disease process, a treatment modality, or a lifestyle alteration provides the client with an opportunity to change. In fact, learning results in behavioral changes.

ASSESSMENT

When caring for an anxious client, the nurse must first determine the client's perception of the situation. This determination is done by directly asking for the client's input and carefully listening to the client's response. Because the nurse's nonverbal behavior can affect the client's anxiety level, nurses must be aware of their own body language. Anxiety is a subjective experience, thus, it cannot be directly observed. Therefore, the nurse must look for the signs indicative of anxiety (previously discussed in Table 20-2).

A thorough assessment of stress and anxiety levels includes eliciting client input to evaluate the following factors:

- Patterns of stressors
- Typical responses to stressful situations
- Cause-and-effect relationships between stressors and thoughts, feelings, and behaviors
- Past history of successful coping mechanisms

Assessing the client's coping abilities can be done in various ways. For example, use open-ended questions to determine previously used coping mechanisms. Some sample questions are:

- “What is the problem?”
- “What have you tried before?”
- “How well did it work?”
- “Who is available to help you?”

Identification of the client's coping abilities assists in establishing appropriate nursing diagnoses and developing an effective plan of care. Assessment, which relies heavily on the nurse's observation and listening skills, provides the data necessary for formulating nursing diagnoses.

NURSING DIAGNOSIS

There are several nursing diagnoses that may apply to clients experiencing anxiety. See Table 20-8 for selected diagnoses and their defining characteristics and related factors. In addition to the four diagnoses listed in Table 20-8, the following NANDA (2001) diagnoses may also be appropriate for anxious clients.

- *Impaired Adjustment*
- *Ineffective Role Performance*
- *Disturbed Thought Processes*
- *Defensive Coping*
- *Fear*
- *Post-Trauma Syndrome*
- *Impaired Social Interaction*
- *Spiritual Distress*

OUTCOME IDENTIFICATION AND PLANNING

Client involvement in planning care is essential because helping clients learn to cope successfully is part of the empowerment process. Planning means exploring with the client self-responsibility issues.

The Nursing Process Highlight shows expected outcomes appropriate for many anxious clients.

Nursing Process Highlight

OUTCOME IDENTIFICATION AND PLANNING

The client:

- Identifies situations that increase stress and anxiety levels.
- Verbalizes a plan to decrease effects of common stressors.
- Differentiates positive and negative stressors in his or her life.
- Classifies stressors into categories of those that can be eliminated, can be controlled, or cannot be controlled directly by self.
- Demonstrates the accurate use of selected stress management exercises (e.g., progressive muscle relaxation [PMR], guided imagery, thought stopping).
- Verbalizes a plan for stress management, including necessary lifestyle modifications.

IMPLEMENTATION

Teaching, a major nursing intervention for managing stress, is inherent in holistic nursing practice. Stress

management approaches can be taught to clients of every age and developmental stage in all health care settings: acute care (inpatient and outpatient), long-term care, and the home.

Teaching clients to reduce their own levels of stress is a major step in promoting self-care. Client education provides clients with options. Clients who have a thorough understanding of their options can make informed decisions about necessary lifestyle changes (see Figure 20-5). Following is a discussion of some of the many interventions that can be used with anxious clients.

Meeting Basic Needs

There is a close relationship between basic physiological needs and stress. Anything that interferes with the satisfaction of basic needs evokes the stress response and attendant anxiety. Clients who are cold, hungry, or in pain have higher anxiety levels than those who are comfortable. When anxiety levels increase, so does the perception of pain. Nurses who empower clients to meet basic needs are laying the foundation for a less stressful, more caring treatment process. By reducing anxiety, the nurse is improving the client's healing potential.

Environmental Strategies

Because an individual's immediate environment can influence stress levels, it is important for the nurse to decrease environmental stimuli that may contribute to anxiety. Some specific ways to limit environmental stimuli are listed in the accompanying display.

Verbalization

Encouraging clients to express their feelings is especially valuable in stress reduction. Freud (1959) used the term **catharsis** to describe the process of talking out



Figure 20-5 By discussing the options for care with this client, the nurse is providing him with the information he needs to plan effective lifestyle changes. What methods can the nurse use to assess whether the client fully understands the information?

TABLE 20-8
Nursing Diagnosis: Clients Experiencing Anxiety

Nursing Diagnosis: Definition	Defining Characteristics	Related Factors
<i>Anxiety</i> : Feelings of apprehension and arousal of the autonomic nervous system in response to a threat (which may be specific or vague)	<p>Note: Manifestations will vary according to the level of anxiety.</p> <ul style="list-style-type: none"> • Physiological <ul style="list-style-type: none"> –Changes in vital signs (increased pulse, respirations, blood pressure) –Diaphoresis (increased sweating) –Restlessness, tremors –Frequent urination • Emotional <ul style="list-style-type: none"> –Verbalization of feelings of helplessness, losing control, nervousness, fear –Inability to relax –Increased irritability –Withdrawal or angry outbursts • Cognitive <ul style="list-style-type: none"> –Forgetfulness –Impaired ability to concentrate –Inability to remember 	<ul style="list-style-type: none"> • Any threat, real or perceived • Unmet needs (biological, safety and security, belonging, self-esteem) • A loss (e.g., of a relationship as a result of death or divorce; a job; functional ability) • Loss of control (over one’s situation or events) • Conflict (interpersonal or intrapersonal) • Environmental changes
<i>Ineffective Coping</i> : The inability to manage stressors because problem-solving behaviors are no longer effective	<ul style="list-style-type: none"> • Inability to meet basic needs • Inability to solve problems • Altered patterns of communication • Inappropriate use of defense mechanisms • Verbalization of inability to ask for help • Destructive behavior toward self or others 	<ul style="list-style-type: none"> • Low self-esteem • Alterations in body integrity (e.g., disfigurement secondary to trauma or surgery; loss of body part) • Disruption of emotional ties • Unsatisfactory support system • Separation from home and family • Sensory overload
<i>Ineffective Denial</i> : Occurrence in which the person minimizes or negates symptoms to the point of being injurious to his or her health status	<ul style="list-style-type: none"> • Refusal of health care treatment • Delay in seeking treatment • Resistance to treatment program • Failure to perceive danger of presence of symptoms • Relinquishing of self-responsibility (frequent verbalizations of “I can’t”) • Blaming other people or circumstances (“It’s not my fault”) • Inability or unwillingness to admit impact of illness or trauma on self 	<ul style="list-style-type: none"> • Presence of chronic and/or terminal disease • Loss (e.g., of job, significant other, income) • Personal vulnerability • Fear • Difficulty handling new situations • Learned response • Cultural factors • Personal and/or family value system
<i>Powerlessness</i> : Situation in which the person perceives a lack of control over situations or events	<ul style="list-style-type: none"> • Verbalization of dissatisfaction over inability to control the situation • Passive, “giving-up” behavior or aggressive, hostile behavior • Difficulty in expressing self directly • Anxiety • Resignation • Depression 	<ul style="list-style-type: none"> • Illness (both acute and chronic) • Hospitalization or institutionalization • Expressed feelings of insecurity and/or resentment • Multiple life changes and/or losses

(From Carpenito, L. J. [1999]. *Handbook of nursing diagnosis* [8th ed.]. Philadelphia: Lippincott; Doenges, M. E., Townsend, M. C., & Moorhouse, M. F. [1998]. *Psychiatric care plans: Guidelines for planning and documenting client care* [3rd ed.]. Philadelphia: Davis. North American Nursing Diagnosis Association (2001). *Definitions and classifications 2001–2002*. Philadelphia: Author.)



Figure 20-6 Familiar objects help personalize this client's treatment environment. What else could be done to this client's living area to reduce anxiety?

REDUCING ENVIRONMENTAL STRESSORS

- Close the door to the client's room.
- Turn off the television.
- Lower the tone of the telephone ringer or take the phone off the hook if feasible.
- Turn off the lights or close the blinds.
- Limit the number of visitors (unless isolation increases the client's anxiety).
- Decrease environmental clutter
- Personalize the environment (Figure 20-6)

one's feelings. People instinctively know the value of "getting things off their chest" through verbalization. Verbalization promotes relaxation primarily in two ways. First, when a feeling is described it becomes *real*. Once the problem is identified, the person can begin to deal effectively with it. Also, the actual activity of talking uses energy and, therefore, reduces anxiety.

NURSING TIP

Reducing Anxiety

To reduce client anxiety levels, maintain an environment in which the client feels free to express emotions.

Involvement of Family and Significant Others

The client's developmental stage influences the type of intervention for stress management. Children and adolescents have varying coping skills; children of all ages rely on their parents to a varying degree for security and support. It is important to include the entire family in the care of the client whenever possible (see Figure 20-7). Such an approach is useful in decreasing the stress levels of everyone involved because families provide essential support for clients.

Family members who are extremely anxious often have a negative impact on the client's health status. Therefore, nurses often need to help family members relax; one way to accomplish this is by providing explanations and information. Thus, it is often necessary for nurses to teach stress management techniques to the client's family.

NURSING ALERT

The Client Experiencing Panic

Never leave a panic-stricken client alone. When anxiety has reached the panic level, the client may harm himself or herself. *Stay with the highly anxious client* or have someone else do so.

Stress Management Techniques

There are a variety of stress management techniques that can easily be taught to clients, families, and significant others. Many of these techniques are considered to be complementary modalities as they are used in conjunction with traditional medical treatment methods (i.e., medication, radiation therapy). Some of the most



Figure 20-7 Nurses can encourage the interaction of clients with family members and significant others in various health care settings. This involvement is helpful in easing the client's anxiety and can also serve as a method through which the family member is kept informed about the client's care.

common approaches for managing stress are discussed below.

Exercise

Physical exercise is a powerful way to reduce anxiety and can be used by clients of all ages and with varying physical abilities; see Figure 20-8. Client teaching should emphasize the need for incorporating exercise into one's lifestyle (see the accompanying display). In other words, if exercise is to reduce anxiety, it must be done on an ongoing and regular basis. The physiological benefits of regular exercise are shown in Table 20-9.

Lack of physical exercise contributes to obesity, which presents many health problems. "The increasing number of overweight Americans is accompanied by increased health risks and increased demands on the health-care system for advice and treatment" (Bray, 1998, p. 9). According to the Centers for Disease Control and Prevention (CDC), the percentage of children and adolescents who are overweight has more than doubled in the past 30 years, and most of the increase has occurred since the late 1970s. A total of 12.5% of children aged 6–17 years are overweight (CDC, 1999).

Participation in all types of physical activity declines as children get older. Adults who are less active are at greater risk of dying of heart disease and of developing diabetes, colon cancer, and high blood pressure (CDC, 1997).



Figure 20-8 Exercise provides physiological and psychological benefits to individuals of all ages with varying degrees of functional abilities. Notice that the individuals in this figure are also experiencing socialization during the physical activity.

TABLE 20-9
Physiological Benefits of Exercise

Effect of Exercise	Benefit
Promotes metabolism of adrenalin and thyroxine.	<ul style="list-style-type: none"> Decreased amounts of these substances in the bloodstream minimize autonomic arousal and hypervigilance.
Reduces musculoskeletal tension.	<ul style="list-style-type: none"> Reduction of the tension in muscles reduces feelings of being tense and "uptight."
Improves circulation, resulting in better oxygenation of bloodstream and brain.	<ul style="list-style-type: none"> Increased alertness and concentration enhance problem-solving ability.
Stimulates endorphin production.	<ul style="list-style-type: none"> Endorphins (a group of opiate-like substances produced naturally by the brain) raise the body's pain threshold, produce sedation and euphoria, and promote a sense of well-being.
Decreases cholesterol levels.	<ul style="list-style-type: none"> Reduces risk of atherosclerosis.
Decreases blood pressure.	<ul style="list-style-type: none"> Reduces risk of myocardial infarction (heart attack) and cerebral infarction (stroke).
Increases acidity of blood (lowered pH).	<ul style="list-style-type: none"> Improves digestion. Improves energy level. Improves utilization of food for energy (promotes metabolism).
Improves elimination (through lungs, skin, bowels).	<ul style="list-style-type: none"> Reduces buildup of toxins in the body.

(From Bray, G. A. (1998). *Contemporary diagnosis and management of obesity*. Newtown, PA: Handbooks in Health Care; Keegan, L. [1999]. Nutrition, exercise, and movement. In B. M. Dossey, L. Keegan, C. E. Guzzetta, & L. G. Kolkmeier [Eds.], *Holistic nursing: A handbook for practice* [3rd ed.]. Gaithersburg, MD: Aspen; Mandle, C. L., & Gruber-Wood, R. [1997]. Health promotion and the individual. In C. L. Edelman & C. L. Mandle [Eds.], *Health promotion throughout the lifespan* [4th ed.]. St. Louis, MO: Mosby.)

In addition to the physical benefits, individuals who exercise regularly also experience psychological benefits, such as the following:

- Enhanced feelings of well-being
- Improved concentration and memory
- Reduced depression
- Reduced insomnia

- Reduced dependence on external stimulants or relaxants
- Increased self-esteem
- Sense of self-control over anxiety

GUIDELINES FOR ESTABLISHING AN EXERCISE PROGRAM

- Explore the availability of different exercise programs.
- Consult with a health care provider about the safety of a specific exercise program.
- Set realistic goals.
- Plan a routine, allow for a warm-up and cool-down period using stretch exercises.
- Engage in activity that increases heart rate for a period of time and is followed by a cool-down period.

Relaxation Techniques

There are several approaches that help individuals relax. See Chapter 14 for a discussion of complementary/alternative modalities (such as aromatherapy, herbals, music, and humor) that promote relaxation. A discussion of some specific relaxation techniques that are easily learned and can be effective in a variety of stressors follows.

Progressive Muscle Relaxation

Progressive muscle relaxation (PMR) is a method of inducing relaxation by tensing and releasing various muscle groups. For example, the individual tightens her hands into a fist, holds the tension for a few seconds, then slowly relaxes her fingers and hands, paying particular attention to the different sensations of tension and relaxation (see Figure 20-9). This tense-release action



Figure 20-9 This nurse is demonstrating the technique of progressive muscle relaxation in a client education program. How does instruction in this method enhance the self-responsibility that clients need to develop in order to manage their stress?



CLIENT TEACHING CHECKLIST Progressive Muscle Relaxation

After explaining the purpose and process of progressive muscle relaxation, instruct the client to:

1. Assume a comfortable position in a quiet environment.
2. Close eyes and keep them closed until the exercise is completed.
3. Inhale deeply to a count of 4.
4. Hold breath for a count of 4.
5. Exhale to a count of 4.
6. Continue to breathe slowly and deeply.
7. Tense both feet until muscle tension is felt.

Caution the client to tighten the muscles only until the muscles are tensed, not to the point of pain. Hold a gentle state of tension in both feet for a count of 3.

NOTE: If muscle cramps occur, stop the procedure and gently massage the affected area. Then begin the cycle of slight muscle tension and relaxation again.

8. Slowly release the tension from the feet.
9. Fully experience the difference between tension and relaxation.
10. Repeat steps 3–6.

Repeat the above sequence with all the muscle groups to experience relaxation throughout your body. To be effective, this procedure requires approximately 20 to 30 minutes. Like all other relaxation exercises, progressive muscle relaxation is most effective with repetition.

is applied to all muscle groups of the body. PMR is especially helpful in promoting sleep. PMR is a technique that can successfully be taught to clients for use in any health care setting, including the home (see the Client Teaching Checklist).

Guided Imagery

Another technique for helping clients manage stress successfully is guided imagery, a process in which the person uses all the senses to experience the sensation of relaxation. During guided imagery, the client is directed to concentrate on a pleasant scene or image in order to become more relaxed. In many situations, music is a helpful adjunct to guided imagery (see Figure 20-10). The Client Teaching Checklist describes the steps involved in using this technique. See Chapter 14 for further discussion of guided imagery. Note that imagery is not recommended for individuals experiencing emotional instability.



Figure 20-10 To help relieve this client's stress, the nurse is giving him a tape recorder and a relaxation tape. In your opinion, are there any situations in which this type of intervention may be inappropriate?



CLIENT TEACHING CHECKLIST *Guided Imagery*

After explaining the purpose and process of guided imagery, instruct the client to:

- Assume a comfortable position in a quiet environment.
- Close your eyes and keep them closed until the exercise is completed.
- Inhale deeply to a count of 4.
- Hold breath for a count of 4.
- Exhale to a count of 4.
- Continue to breathe slowly and deeply.
- Think of a favorite place and prepare to take an imaginary journey there. Select a place in which you are relaxed and at peace.
- Picture in your mind's eye your favorite place. Look around you. See all the colors, the light and shadows. Look at all the pleasant sights.
- Listen to all the sounds. Pay attention to what you hear.
- Feel all the physical sensations . . . the temperature . . . the textures . . . the movement of the air.
- As you take in a deep breath, smell the aromas of your favorite place.
- Taste the foods and drinks you usually consume in your favorite place. Savor each taste fully.
- Focus all your attention totally on your favorite place.
- Inhale deeply to a count of 4.
- Hold breath for a count of 4.
- Exhale to a count of 4.
- Resume your usual breathing pattern.
- Slowly open your eyes and stretch, if desired.

This procedure works best when all five senses are used. Like all other relaxation exercises, guided imagery becomes more effective with repetition. This technique (as all imagery exercises) is not recommended for individuals with emotional instability.

Cognitive Reframing or Thought Stopping

Cognitive reframing is a technique based on a theory proposed by Aaron Beck (1976), who stated that a person's emotional response is determined by the meaning attached to an event. For example, if an event is perceived to be threatening, the client is likely to feel anxious. If the interpretation of the event can be modified, the client will be less anxious. Reframing is a technique used to alter one's perceptions and interpretations by changing one's thoughts. The accompanying display describes the thought-stopping process, a cognitive reframing technique.

THOUGHT STOPPING: A COGNITIVE REFRAMING TECHNIQUE

- Listen to self-talk (thoughts).
- Recognize when the self-talk is negative.
- When a negative thought is detected, do something physical to stop the train of thought. For example, clap your hands or snap a rubber band on your wrist. Tell yourself, "Stop!"
- Replace the negative thought with one that is both positive and realistic.

Like all other relaxation exercises, thought stopping becomes more effective with repetition

Crisis Intervention

Some clients will be in an acute crisis state and require **crisis intervention**, a specific technique that helps clients regain equilibrium. Clients are viewed as having the ability to control their own lives. The five steps of crisis intervention are illustrated in Figure 20-11.

The client is an active participant in the process of resolving the crisis in order to restore equilibrium. If the client is unable to participate in problem solving (for example, because of delayed developmental stage or altered mental status), then crisis intervention should not be attempted. However, the family can be approached with the crisis intervention method.

Sometimes clients need more assistance than the nurse is able to provide. Recognition of such situations calls for prompt consultation with and, sometimes, referral to other health care providers, such as:

- Psychiatric clinical nurse specialists
- Nurse psychotherapists
- Psychologists
- Social workers
- Psychiatrists
- Clergy and other counselors

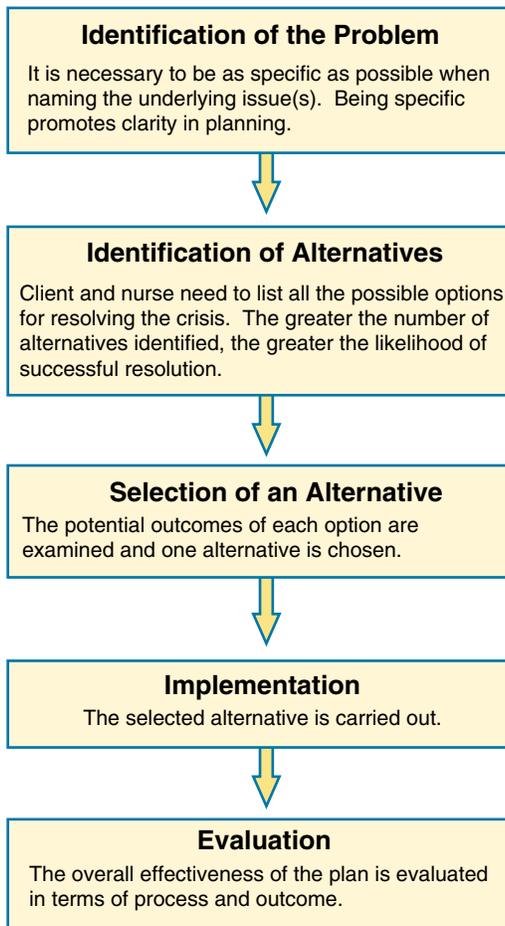


Figure 20-11 Steps of Crisis Intervention

EVALUATION

Evaluating the effectiveness of clients' coping abilities is an ongoing comprehensive process that must include client input. It is imperative that the nurse evaluate client outcomes as well as the process of delivering nursing care.

In addition to eliciting verbal input from the client and significant others, nurses also collect evaluation data by observation of client behavior. See the Nursing Process Highlight for some questions that the nurse may consider in evaluating the effectiveness of interventions to reduce anxiety.

PERSONAL STRESS MANAGEMENT APPROACHES FOR THE NURSE

"Before nurses can care for clients, they must first learn to value and care for themselves" (Fontaine, 2000, p. 18). There are many stressors inherent in nursing. Learning to cope successfully with stressors is essential for nurses.

Nursing Process Highlight

EVALUATION

Consider these questions when evaluating the effectiveness of your anxiety-reducing interventions:

- Does the client exhibit decreased fidgeting and pacing?
- Is the client's tone of voice calm?
- Is the client's problem-solving ability unimpaired?
- Is ability to concentrate intact?
- Are the vital signs within normal limits (client's baseline)?

Two major reasons nurses must cope successfully with stress are to maintain their own wellness and to model health-promoting behaviors to others. In order to help clients learn to manage stress, nurses must first be able to manage their own stress.

As Watson (1997) states, "If one is to work from a caring-healing paradigm, one must live it out in daily life" (p. 51). Caring for one's self includes the following:

- Taking time out for self
- Using effective communication skills with coworkers, family, significant others
- Managing conflict effectively

See the accompanying display for a listing of complementary/alternative methods that nurses can use to promote self-care.

Burnout and Nurses

High stress levels among nurses are associated with **burnout**, a state of physical and emotional exhaustion that occurs when caregivers deplete their adaptive

COMPLEMENTARY/ALTERNATIVE THERAPY

Modalities Useful for Promoting Nurse's Self-Care

- Imagery
- Progressive muscle relaxation
- Prayer
- Humor
- Music
- Communion with nature
- Journaling
- Meditation (Figure 20-12)



Figure 20-12 This individual is reducing her stress level by the use of meditation. What physiological effects will this woman likely experience as a result of meditation?

energy. Nurses who have experienced such an overwhelming degree of stress tend to treat clients in depersonalizing ways. Such nurses also lack feelings of personal accomplishment. Burnout exacts a high price not only on individual nurses themselves but also on the profession. Highly qualified professionals leave nursing and, as a result, the quality of care declines.

Several work-related factors can contribute to the development of nursing burnout:

- Job-related stress (for example, the stress evoked by caring for dying people)
- Workload
- Interpersonal conflict in the work environment
- Rapid restructuring of health care organizations (e.g., mergers, partnerships)

In order to avoid developing the classic symptoms of burnout—absenteeism, poor morale, and illness—nurses need to recognize “the importance of self-care in their personal and professional lives” (O’Brien, 1998, p. 16B).

Burnout prevention and recovery depend on stress management.

THINK ABOUT IT

Experiencing Burnout

A client is exhibiting panic-level anxiety and you do not want him left alone. You are experiencing severe burnout because of very long work hours and stressful situations that have occurred with clients and with other nurses recently. Your stress level is so high that you feel you cannot even be in the same room with this upset client. If you leave the room to find another nurse to stay with him, he may injure himself. If you stay, you risk your own emotional well-being. How do you deal with the situation?

THINK ABOUT IT

Self-Nurturers

Society often labels people who take care of themselves as selfish. Do you agree? Why or why not? Consider how taking care of yourself can help you be a better care provider to others. What are some *specific* things you can do now to take better care of yourself?



NURSING TIP

A stress management plan is a continuous process, not the occasional use of a technique or exercise.

There are many strategies that nurses can use to help manage professional and personal stress (see Table 20-10). In addition to the techniques listed in Table 20-10, the following Nursing Checklist provides strategies that are also helpful in managing professional stress. Guidelines that are helpful in changing from a negative to a positive outlook include:

- Expect to be successful.
- Remember the power of self-fulfilling prophecies and deliberately focus on the positive.
- Let go of the need to be perfect.
- Listen to your self-talk.
- Encourage the use of appropriate humor in the workplace.

Nurses who cultivate the hardiness factor will likely be resilient to stress. Kobasa (1979) originated the concept of hardiness in the late 1970s. Hardiness consists of a set of attitudes, beliefs, and behaviors that result in individuals being more resilient (or hardy) to the negative effects of stress. There are three components to stress hardiness:

TABLE 20-10
Strategies for Coping with Professional Stress

Strategy	Explanation
Use time management methods.	Encourages recognition of needs as priorities.
Focus on accomplishments instead of the uncompleted tasks.	Being focused on unfinished business increases anxiety; paying attention to successes boosts self-esteem.
Practice slow, focused breathing.	Alleviates muscle tension by increasing the amount of oxygenated blood. Consciously thinking about breathing serves as a diversionary tactic.
Don't assume personal responsibility for others' behaviors/problems.	Encourages avoidance of assuming rescuer role.
Know own limits.	Clarifying expectations, strengths, and limitations. Learning to differentiate what's really important. Knowing when a problem is beyond your control.
Whenever possible, distance self from stressors that have a negative impact.	Avoids exposure to needless stress and subsequent draining of adaptive resources.
Identify and change the stressors that you can directly influence.	Increases your sense of personal power. Avoids needless expenditure of energy.
Vary tasks between physical and mental activities.	Helps restore a sense of balance. Conserves energy by reducing fatigue.

- *Commitment.* Becoming involved in what one is doing
- *Challenge.* Perceiving change as an opportunity for growth rather than an obstacle or threat
- *Control.* Believing that one is influential in directing what happens to oneself rather than feeling helpless and victimized

According to studies (Kobasa, 1979; Kobasa, Maddi, & Kahn, 1982), individuals who have higher degrees of hardiness are healthier than are individuals with low degrees of hardiness. Such people develop fewer illnesses when they experience multiple stressors.

Many nurses need to relearn the value of play and to know when to stop working. Nursing students, who spend many hours a week working and studying, may need to schedule some time for play as it is a method to



NURSING CHECKLIST
Managing Professional Stress

- *Develop and maintain active support systems*, both at work and away from work. Having friends who are not health care providers helps maintain a sense of balance and separateness between personal and professional domains.
- *Develop decision-making skills.* For example, break large tasks down into small, realistic, achievable objectives. This strategy avoids your becoming overwhelmed by the seemingly “impossible” task before you.
- *Avoid consumption of noxious substances.* Practice a substance-free lifestyle to manage stress well. Do not depend on these unhealthy behaviors as avenues to relaxation: smoking, overeating, drinking alcohol and caffeine.
- *Nourish your body* with a healthy diet and adequate amounts of sleep and rest balanced with activity and exercise. Care for yourself as you would for clients.
- *Maintain a sense of humor while you work.* Humor helps a person maintain a positive outlook; therefore, it can be used to reframe situations to reduce distress (see Figure 20-13).



Figure 20-13 Humor helps nurses manage the stress created by the nature and intensity of their work. What can you do to help your fellow nursing students cope with the anxiety that is inherent in this stage of your academic experience?



NURSING TIP

Journaling

When you are feeling “stressed out,” write down your thoughts and feelings. Writing down emotions and thoughts may help clarify issues related to anxiety. Writing is also an effective method for venting pent-up feelings.

RESEARCH FOCUS

Title of Study

“Hardiness, Help-Seeking Behavior, and Social Support of Baccalaureate Nursing Students”

Authors

Hegge, M., Melcher, P., & Williams, S.

Purpose

To (1) examine the effects of hardiness, social support and help-seeking behavior on academic performance, and (2) determine the relationship among hardiness, social support, and help-seeking behavior.

Methods

This descriptive correlational study used a questionnaire with a self-selected sample. Surveys were administered to students who remained after class.

Findings

(1) Students indicated that they sometimes seek help, with more students seeking help for academic than personal situations. (2) General students were more likely to seek help than nursing students. (3) As hardiness increases, academic performance increases slightly.

Implications

The study results reinforce the importance of social support to success in any challenging life situation. Faculty should build on students’ perseverance, persistence, and hardiness.

Hegge, M., Melcher, P., & Williams, S. (1999). Hardiness, help-seeking behavior, and social support of baccalaureate nursing students. *Journal of Nursing Education, 38*(4), 178–182.

manage stress and, thereby, to become a more effective care provider.

KEY CONCEPTS

- Stress is an individual’s physiological response to stimuli.
- Individuals who experience prolonged periods of stress are at risk for developing stress-related diseases.
- Anxiety is the psychological response to a threat to the health and well-being of an individual and activates the stress response.
- An individual seeks equilibrium through the process of adaptation. When adaptation is effective, homeostasis (the body’s self-regulation of physiological processes) is maintained.
- Many factors, such as physiological, psychological, cognitive, or environmental changes, contribute to stress.
- The general adaptation syndrome (GAS), the physiological response to stress, consists of three stages: alarm, resistance, and exhaustion. The GAS is the same whether the stressor is actual or imagined, present or potential.
- Illness and hospitalization are major stressors for individuals and their families. To alleviate the stress of hospitalization, nursing interventions should reduce the client’s feelings of unfamiliarity and loss of control.
- Change can be perceived as stressful because of a fear of failure, a threat to security, a potential for loss of self-esteem, and the need to develop new paradigms.
- Nurses act as change agents by consciously empowering the client through education to initiate change in order to successfully adapt to perceived stressful situations.
- Nursing interventions that promote positive adaptation to stress are the empowerment of clients to meet basic needs; the minimization of environmental stimuli; the encouragement of verbalization of feelings; the inclusion of family members and significant others into client care; and the use of various relaxation techniques, such as progressive muscle relaxation (PMR) and guided imagery.
- Stress management techniques can be used by both clients and nurses to facilitate effective coping.
- The thought-stopping technique, a cognitive approach to stress management, involves removing or reducing anxiety by changing negative thoughts to positive and realistic thoughts.
- Burnout occurs when the nurse is overwhelmed by stress. As a result, the nurse experiences physical, emotional, and behavioral dysfunction, including decreased productivity.
- Elements of a stress management plan for professional nurses consist of maintaining support systems; developing time-management and decision-making skills; identifying and changing stressors that can be managed; and knowing personal limits.

NURSING CARE PLAN**The Client Experiencing Anxiety****Case Presentation**

Kathryn Markham is a 38-year-old female who is seeking treatment in the emergency department of a metropolitan hospital. She is tearful, pacing, and wringing her hands. She is complaining of severe chest pain, a pounding headache, and back pain. She is sweating profusely and exhibits fine hand tremors. Her blood pressure and pulse are elevated, and her respirations are rapid and shallow. She says that she hasn't slept well since her husband left her 3 months ago. She states that "I'm afraid I'm losing my mind! My heart is racing and I can't sit still. Help me! I feel like I'm going to die."

Assessment

- Autonomic hyperactivity (rapid pulse, elevated blood pressure)
- Verbalized feelings of apprehension and uneasiness
- Restlessness

Nursing Diagnosis

Anxiety related to feelings of powerlessness and lifestyle change.

Expected Outcomes

The client will:

1. Identify effective coping mechanisms.
2. Report that anxiety is reduced to a manageable level.
3. Demonstrate relaxation skills.

Interventions/Rationales

1. Establish a trusting relationship.
The client may perceive the nurse or emergency department as a threat and thus anxiety will increase.
2. Have the client identify and describe physical and emotional feelings.
The first step in coping with anxiety is to recognize the anxiety and become aware of feelings in order to link emotions with maladaptive coping responses.
3. Help the client to relate cause-and-effect relationships between stressors and anxiety.
Increases the client's sense of control and power over the situation.
4. Encourage the client to use coping mechanisms that have been successful previously.
Increases confidence in own abilities to cope.
5. Teach the client relaxation techniques (such as imagery and meditation).
The relaxation response is the opposite of the stress response and, therefore, counters the physiological effects of the stress response. The relaxation response leads to lowered blood pressure, decreased heart rate, deeper and slower respirations.
6. Administer anti-anxiety medication as indicated.
Anti-anxiety agents provide relief from the immobilizing effects of anxiety. NOTE: This is a collaborative dependent nursing action.

Evaluation

The client is visibly relaxed. Vital signs are within normal limits. The client verbalizes that she is calmer and no longer afraid.

CRITICAL THINKING ACTIVITIES

1. Identify positive and negative outcomes of an upcoming change in your life.
2. Reflect on the past 4 months. List some of the changes that you experienced during that time. What were the outcomes of the changes? Would you now respond differently in similar situations? If so, what would be altered?
3. Explain the fight-or-flight response.
4. Describe how you would explain to a client the relationship between stress and illness.
5. List some ways in which your life has changed since becoming a nursing student.
6. How can you act as a change agent in your school?
7. Identify some ways you can become a change agent for clients.
8. Select one stress management exercise described in this chapter and practice it three times a week for 4 weeks. Keep a journal reflecting your experience, including your emotions, physical responses, and behaviors.
9. What are some changes you can begin now to improve your ability to handle personal and professional stress in your life?
10. Answer the following as true or false to determine how well you care for yourself.

- | | TRUE | FALSE |
|---|-------|-------|
| 1. I exercise regularly. | _____ | _____ |
| 2. I limit my intake of salt, fat, refined sugar, and cholesterol. | _____ | _____ |
| 3. I get enough sleep and rest. | _____ | _____ |
| 4. I have specific techniques for managing stress. | _____ | _____ |
| 5. I'm healthier now than I was 5 years ago. | _____ | _____ |
| 11. Which of the following are physiological indicators of anxiety? | | |
| a. Decreased pulse rate | | |
| b. Constricted pupils | | |
| c. Increased blood pressure | | |
| d. Warm, dry skin | | |

WEB RESOURCES

- American Holistic Nurses Association
www.ahna.org
- American Psychiatric Nurses Association
www.apna.org
- National Institute of Mental Health
www.nimh.nih.gov

Chapter 21

Loss and Grief



Everyone can master grief but he that has it.

—Shakespeare

COMPETENCIES

1. Discuss theoretical perspectives of loss, grief, and dying.
2. Describe various losses that affect individuals at different stages of the life cycle.
3. Describe the characteristics of an individual experiencing grief.
4. Differentiate adaptive grief and pathological grief.
5. Explain the relationship between loss and grief.
6. Discuss the holistic needs of the dying person and family.
7. Discuss use of the nursing process with a grieving individual.
8. Define the purpose of hospice care.
9. Develop a plan for end-of-life (EOL) care.
10. Discuss nursing responsibilities when a client dies.
11. Describe ways in which nurses can cope with their own grief.

KEY
TERMS

algor mortis
anticipatory grief
autopsy
bereavement
complicated grief
dysfunctional grief

grief
grief work
hospice
liver mortis
loss
maturational loss

mourning
palliative care
rigor mortis
situational loss
uncomplicated grief

In contemporary society, individuals constantly experience loss. Frequent episodes of terrorism, natural disaster, and personal crises result in the universal experience of loss. Throughout the life cycle, people are faced with loss, without which growth would not continue. Many people consider loss only in terms of death and dying; however, loss of every type occurs daily. Nurses must be aware of the potential for loss in today's world, as well as the processes by which individuals adapt.

Every day nurses encounter clients who are responding to grief associated with losses. Thus, nurses must have an understanding of the major concepts related to loss and grieving. Grief is a response to losses of all types. However, this chapter focuses on grief as a response to death. Nurses also care for dying clients. This chapter provides information on meeting the special needs of terminally ill clients and their families.

LOSS

Loss is any situation (either actual, potential, or perceived) in which a valued object is changed or is no longer accessible to the individual. Because change is a major constant in life, everyone experiences losses. Loss can be actual (e.g., a spouse is lost through divorce) or anticipated (a person is diagnosed with a terminal illness and has only a short time to live). A loss can be tangible or intangible. For example, when a person is fired from a job, the tangible loss is income, whereas the loss of self-esteem is intangible.

Losses occur as a result of moving from one developmental stage to another. An example of such a **maturational loss** is the adolescent who loses the younger child's freedom from responsibility. Other examples of losses associated with growth and development are discussed later in this chapter. A **situational loss** occurs in response to external events, usually beyond the individual's control (such as the death of a significant other). As Bateman (1999) states:

Dealing with an actual or impending loss—whether the experience is of the magnitude of war, mass murder, and natural disasters or divorce, homelessness, or living with chronic illness—has long been part of the human experience. (p. 142)

Refer to Figure 21-1.



Figure 21-1 Loss occurs with the destruction of property. Think of the many losses that are experienced by the family whose home was destroyed in an earthquake.

Loss as Crisis

Loss precipitates anxiety and a feeling of vulnerability—which may lead to crisis. When a significant other dies, one's sense of safety and security is disrupted. Grieving is a mechanism for crisis resolution. When an individual feels overwhelmed by stress and the usual coping mechanisms are no longer effective, crisis occurs. Crisis intervention may be necessary to help the person grieve successfully. See Chapter 20 for a discussion of crisis and crisis intervention.

Types of Loss

Loss occurs when a valued object is changed or is no longer available. Not everyone responds to loss in the same way because the significance of the lost object or person is determined by individual perceptions. There are many types of loss, including:

- *Actual loss*: Death of a loved one, theft of one's property
- *Perceived loss*: Occurs when a sense of loss is felt by an individual but is not tangible to others
- *Physical loss*: Loss of an extremity in an accident, scarring from burns, permanent injury
- *Psychological loss*: Such as a woman feeling inadequate after menopause and resultant infertility

There are four major categories of loss: loss of external objects, loss of familiar environment, loss of aspects of self, and loss of significant other.

Loss of an External Object

When an object that a person highly values is damaged, changed, or disappears, loss occurs. The significance of the lost object to the individual determines the type and amount of grieving that occurs. The valued object may be a person, pet, prized possession, or one's home. The loss of a pet, especially for those who live alone, can be a devastating loss.

Loss of Familiar Environment

The loss of a familiar environment occurs when a person moves to another home or a different community, changes schools, or starts a new job. Also, a client who is hospitalized or institutionalized experiences loss when faced with new surroundings. This type of loss evokes anxiety caused by fear of the unknown.

Loss of Aspect of Self

Loss of an aspect of self can be physiological or psychological. A psychological aspect of self that may be lost is ambition, a sense of humor, or enjoyment of life. An example of physiological loss includes loss of physical function as a result of illness or injury. Loss also occurs when there is disfigurement or disappearance of a body part, such as having an amputation or mastectomy. Loss of an aspect of self can result from illness, trauma, or treatment methodologies (such as surgery).

Loss of Significant Other

The loss of a loved one is a significant loss. Such a loss can be the result of separation, divorce, running away, moving to a different area, or death. Responses to loss are highly individualized as each person perceives the meaning of loss differently. For example, the death of a spouse is different for men and women (Figure 21-2). "Men who are widowed react as if they have lost a part of themselves, whereas women react as if they have been deserted or abandoned" (Bateman, 1999, p. 140).

GRIEF

Grief is a series of intense physical and psychological responses that occur following a loss. It is a normal, natural, necessary, and adaptive response to a loss. "Grieving is a walk through unknown territory. Familiar internal and external stabilities disappear in a whirlwind of changing thoughts, feelings, and emotional flux" (Wong, 1995, p. 29). Loss leads to the adaptive process of **mourning**, the period of time during which the grief is expressed and resolution and integration of the loss occur. **Bereavement** is the period of grief following the death of a loved one.

Theories of the Grieving Process

There is no one comprehensive theory to explain the grief process, which may consist of a series of phases. Several theories have allowed us to delineate pre-



Figure 21-2 Losing a spouse or partner who has been a part of their lives for many years is common for older adults. How can nurses support elders during the grieving process?

dictable symptoms and states in response to loss. When reviewing the following theories, remember that everyone does not experience each phase in the order described. The theories of Erich Lindemann, George L. Engle, John Bowlby, and J. William Worden are discussed in the following sections.

Lindemann

In 1944, after the Coconut Grove fire in Boston, in which over 400 people died, Lindemann studied survivors of the disaster and their families. Lindemann coined the phrase **grief work**, which is still used today to describe the process experienced by the bereaved. During grief work, the person experiences freedom from attachment to the deceased, becomes reoriented to the environment in which the deceased is no longer present, and establishes new relationships (Lindemann, 1944). Lindemann's classic work is the foundation for current crisis and grief resolution theories. The accompanying display provides a description of Lindemann's concepts.

Engle

Grief is a typical reaction to loss of a valued object. There are three stages of mourning, and progression through each stage is necessary for healing. The grieving process, which may take several years for completion, cannot be accelerated. The goal of the grieving process is for the mourner to accept the loss and let go of the deceased. The accompanying display provides an overview of Engle's theory of grief.

LINDEMANN'S THEORY: REACTIONS TO NORMAL GRIEF

Somatic Distress

Episodic waves of discomfort in duration of 10–60 minutes; multiple somatic complaints, fatigue, and extreme physical or emotional pain.

Preoccupation with the Image of the Deceased

The bereaved experience a sense of unreality, emotional detachment from others, and an overwhelming preoccupation with visualizing the deceased.

Guilt

The bereaved consider the death to be a result of their own negligence or lack of attentiveness; they look for evidence of how they could have contributed to the death.

Hostile Reactions

Relationships with others become impaired owing to the bereaved's desire to be left alone, irritability, and anger.

Loss of Patterns of Conduct

The bereaved exhibit an inability to sit still, generalized restlessness and continually search for something to do.

(Data from Lindemann, E. [1944]. Symptomatology and management of acute grief. *American Journal of Psychiatry*, 101, 141–148; Roach, S. S., & Nieto, B. C. [1997]. *Healing and the grief process* [pp. 1–24]. Albany, NY: Delmar Publishers.)

Bowlby

Bowlby stated that grief results when an individual experiences a disruption in attachment to a love object. His theory proposes that grief occurs when attachment bonds are severed. There are four phases that occur during grieving:

- Numbing
- Yearning and searching
- Disorganization and despair
- Reorganization (Bowlby, 1982)

Worden

J. William Worden has identified four tasks that an individual must perform in order to successfully deal with a loss:

- Accept the fact that the loss is real.
- Experience the emotional pain of grief.
- Adjust to an environment without the deceased.
- Reinvest the emotional energy once directed at the deceased into another relationship (Worden, 1982).

Worden categorized the behavioral responses that grieving individuals experienced; these responses are listed in Table 21-1.

ENGLE'S THEORY OF GRIEF: THREE STAGES OF MOURNING

Stage I: Shock and Disbelief

- Disorientation
- Feeling of helplessness
- Denial gives protection until person is able to face reality

Stage I can last from minutes to days.

Stage II: Developing Awareness

- Emotional pain occurs with increased reality of loss
- Recognition that one is powerless to change the situation
- Feelings of helplessness
- Anger and hostility may be directed at others
- Guilt
- Sadness
- Isolation
- Loneliness

Stage II may last from 6 to 12 months.

Stage III: Restitution and Resolution

- Emergence of bodily symptoms
- May idealize the deceased
- Mourner starts to come to terms with the loss
- Establishment of new social patterns and relationships

Stage III marks the beginning of the healing process and may take up to several years.

(Data from Engle, G. L. [1961]. Is grief a disease? *Psychosomatic Medicine*, 23, 18–22; Engle, G. L. [1964]. Grief and grieving. *American Journal of Nursing*, 64(9), 93–98; Roach, S. S., & Nieto, B. C. [1997]. *Healing and the grief process* (pp. 1–24). Albany, NY: Delmar Publishers.)

Types of Grief

Grief is a universal, normal response to loss. Grief drains people, both emotionally and physically. Because grief consumes so much emotional energy, relationships may be impaired and health status may become altered. There are different types of grief including uncomplicated (“normal”), dysfunctional, and anticipatory.

Uncomplicated Grief

Many individuals use the term *normal grief*. Engle (1961) proposed use of the term **uncomplicated grief** to describe a grief reaction that normally follows a significant loss. Uncomplicated grief runs a fairly predictable course that ends with the relinquishing of the lost object and resumption of the previous life. Of course, the bereaved person's life is changed forever, but the person is able to regain the ability to function.

TABLE 21-1
Manifestations of Normal Grief (Worden)

Emotions	Physical Settings	Behaviors	Thought Processes
Sadness	Increased sensitivity to noise	Disrupted sleep patterns	Disbelief
Anxiety	Constricted feeling in throat and chest	Dreaming about the deceased	Preoccupation
Guilt	Shortness of breath	Forgetfulness	Confusion
Relief	Hollow feeling in stomach	Crying	Sense of presence of the deceased
Emancipation	Dry mouth	Avoiding reminders of the deceased	Hallucinations (such as seeing or hearing the deceased)
Self-blame	Muscular weakness	Treasuring objects belonging to the deceased	
Fatigue	Lethargy	Social withdrawal	
Numbness			
Shock			
Helplessness			
Yearning			
Loneliness			

“Expression of loss is often experienced by somatic symptoms that may range in severity from minor to incapacitating” (Bateman, 1999, p. 143). Some of the common responses experienced by grieving individuals are shown in Table 21-2. Not every mourner will experience all the reactions, but the reactions most often experienced in response to a recent loss are listed.

Many grieving people experience feelings of anger or blame; these feelings may be directed toward those perceived to have caused or contributed to the death. Often the anger associated with grief is directed at one’s self, that is, expressed as guilt or depression. Some survivors have a strong need to assign blame. If someone else can be blamed, then the survivors can rid themselves of any responsibility. Those who are experiencing grief must be provided an opportunity to express feelings—both positive and negative—in order to alleviate guilt.

Nurses play an important role in assisting mourners to develop and understand the normal grieving process

and the complex feelings exhibited when grief becomes more complicated. Nurses with a sound knowledge base of both normal grief and dysfunctional grief will be better prepared to assist the survivors than nurses who believe that all grief is the same.

Dysfunctional Grief

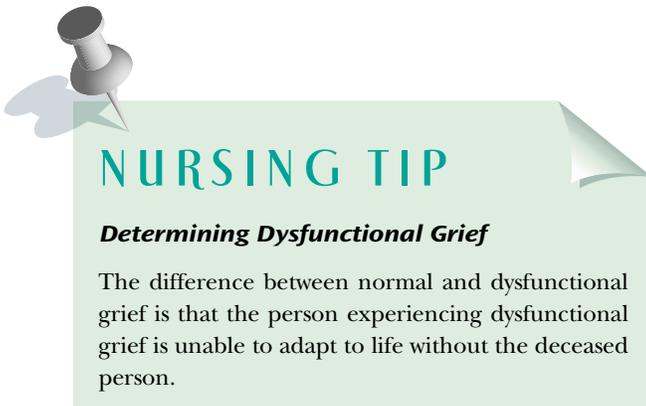
Persons experiencing **dysfunctional grief** do not progress through the stages of overwhelming emotions associated with grief, or they may fail to demonstrate any behaviors commonly associated with grief. The person experiencing pathologic grief continues to have strong emotional reactions, does not return to a normal sleep pattern or work routine, usually remains isolated, and has altered eating habits. The bereaved may have the need to endlessly tell and retell the story of loss but without subsequent healing. The pathologically grieving person is unable to reestablish a routine. Visits to the

TABLE 21-2
Reactions Commonly Experienced During Grief

Physical Reactions	Psychosocial Reactions	Cognitive Reactions	Behavioral Reactions
<ul style="list-style-type: none"> • Loss of appetite • Weight loss • Insomnia • Fatigue • Decreased libido • Decreased immune functioning (increased susceptibility to illness) • Multiple somatic complaints (e.g., headache, backache) • Restlessness 	<ul style="list-style-type: none"> • Profound sadness • Helplessness • Hopelessness • Denial • Anger • Hostility • Guilt • Nightmares • Ennui (overwhelming sense of emptiness) • Preoccupation with lost object • Loneliness 	<ul style="list-style-type: none"> • Inability to concentrate • Forgetfulness • Impaired judgment • Decreased problem-solving ability 	<ul style="list-style-type: none"> • Impulsivity • Indecisiveness • Social withdrawal • Distancing

gravesite or mausoleum may be made often or not at all. Schattner (2000) refers to a type of dysfunctional grief as unspoken grief that “can lead to a variety of unresolved grief symptoms . . . and isolation from support of friends, family, and activities” (p. 11).

Dysfunctional grief is a demonstration of a persistent pattern of intense grief that does not result in reconciliation of feelings. A person experiencing chronic grief continues to focus on the deceased, may overvalue objects that belonged to the deceased, and may engage in depressive brooding.



NURSING TIP

Determining Dysfunctional Grief

The difference between normal and dysfunctional grief is that the person experiencing dysfunctional grief is unable to adapt to life without the deceased person.

Several factors predispose a person to experience dysfunctional grieving, including:

- Uncertain, sudden, or overcomplicated circumstance surrounding the loss
- A loss that is socially unspeakable or socially negated (e.g., suicide)
- A relationship with the deceased characterized by ambivalence or excessive dependency (Worden, 1991)

Anticipatory Grief

Anticipatory grief is the occurrence of grief work before an expected loss. Anticipatory grief may be experienced by the terminally ill person as well as family. This phenomenon promotes adaptive grieving by freeing up the mourner’s emotional energy. Although anticipatory grieving may be helpful in adjusting to the loss, it may also result in some disadvantages. For example, for the dying client, anticipatory grieving may lead to family members’ distancing themselves and not being available to provide support. Also, if the family members have separated themselves emotionally from the dying client, they may seem cold and distant, thus, not meeting society’s expectations of mourning behavior. This response can prevent the mourners from receiving their own much needed support from others.

Factors Affecting Grief

The experience of grief is individual and is influenced by various factors. Factors that influence grief include the person’s developmental level, religious and cultural

beliefs, relationship to the lost object, and the cause of death.

Developmental Considerations

Depending on a client’s development level, the grief response to a loss will be experienced differently. Nurses practice in many settings in which children, adolescents, and adults, as a result of growth and development, experience changes that result in loss. For example, a pregnant woman will, to some degree, experience loss after delivery, even delivery of a normal healthy infant. See Table 21-3 for other examples of developmental losses that may precipitate grieving. Certain kinds of loss at key developmental points may have a profound effect on a person’s ability to work through grief, as well as possible inadequate achievement of the developmental task.

Childhood

Children vary in their ability to comprehend the meaning of death. It is important to understand how a child’s concept of death evolves, because it varies with developmental level and may affect mastery of developmental tasks (Table 21-4).

Well-meaning adults often try to protect children from the realities of death by excluding them from mourning rituals. However, children need to be included as appropriate to their developmental level, “or they may feel abandoned and left to face their fear alone” (Bateman, 1999, p. 144). Children who are grieving need explanations about death that are honest and in language that can be comprehended. See Table 21-5 for suggestions on talking to children about death.

Adolescence

Most adolescents value physical attractiveness and athletic abilities. Grief may occur when the adolescent suffers the loss of a body part or function. Because of the strong influence of peer groups, adolescents seek approval of their friends and fear being rejected if a loss affects their acceptance by others (e.g., grief after a disfiguring accident is usually intense in adolescents). Even though they have an intellectual understanding of death, adolescents feel they are immune to death and therefore do not accept the possibility of their own mortality. This perception is caused by the sense of invulnerability that normally occurs during adolescence.

Early Adulthood

In the young adult, grief is usually precipitated by loss of role or status. For example, unemployment or breakup of a relationship causes significant grief for the young adult. The concept of death in this age group is primarily a reflection of cultural values and spiritual beliefs.

Middle Adulthood

During middle adulthood the potential for experiencing loss increases. The death of parents begins to occur.

TABLE 21-3
Losses Associated with Developmental Stage

Developmental Stage	Related Loss	Developmental Stage	Related Loss
Infants	<ul style="list-style-type: none"> • Intrauterine environment (warmth and protection) • Comfort of sucking breast or bottle 	Young adults	<ul style="list-style-type: none"> • Friends through leaving school, moving, changing jobs • Financial support from parents when leaving home • Freedom when assuming more adult responsibilities • Sexual partner
Toddlers/Preschoolers	<ul style="list-style-type: none"> • Spontaneity of bodily function as a result of toilet training • Immediate gratification of needs as child gains independence • Familiar environment as child attends daycare or nursery school 	Middle adults	<ul style="list-style-type: none"> • Spouse, through separation, divorce, or death • Children as they leave home • Friends through job changes, moving, or death • Parents through death • “Youth” (as related to physical appearance, decreased libido, physical stamina) • Women experience loss of fertility through menopause
School-aged children	<ul style="list-style-type: none"> • Periodic loss of body function caused by normal childhood illnesses and injuries • Friends and significant others (teachers, coaches) as they progress through school 	Older adults	<ul style="list-style-type: none"> • Spouse and friends through death • Sensory perceptual acuity • Job, as a result of retirement • Body image changes related to decline in some physiological functions • Independence
Adolescents	<ul style="list-style-type: none"> • Familiar body with onset of puberty • Childhood freedoms in response to social expectation to act mature • First love (as adolescent “crushes” end) • Familiar environment when leaving home for work or education 		

As an individual ages, it can be especially threatening for peers to die because their death forces acknowledgment of one’s own vulnerability to death. Other losses frequently experienced during middle age are those associated with changes in employment and relationships (e.g., divorce), children leaving home, and decreasing functional abilities.

Older Adulthood

During late adulthood, most individuals recognize the inevitability of death. Most older adults experience numerous losses as they age. Losses commonly experienced by the elderly include loss of (Bowlby, 1961):

- Loved ones and friends
- Occupational role as a result of retirement
- Material possessions
- Dreams and hopes

In the United States, women are more likely than men to experience the death of a spouse or partner (Bateman, 1999). Regardless of gender, the bereaved may need to develop new skills in order to adapt. For example, a man who was married for 50 years may have to learn meal preparation after his wife dies.

Religious and Cultural Beliefs

Religious and cultural beliefs can have a significant effect on an individual’s grief. Every culture has certain religious beliefs about the significance of death, as well as rituals for care of the dying. See Chapters 15 and 16 for discussion of the impact of religious and cultural beliefs. Beliefs about an after-life, faith in God, redemption of the soul, and reincarnation are important aspects that often assist one in grief work.

TABLE 21-4
Perception of Death by Children and Adolescents

Developmental Stage	Perception	Potential Developmental Disruptions
Infancy, Toddler	<ul style="list-style-type: none"> • Not aware of death • Is aware of disruptions in normal routine • Can react to family's expressions of grief 	<ul style="list-style-type: none"> • If the mother or surrogate dies during the first 2 years of life, may have significant long-lasting psychosocial problems
Preschool	<ul style="list-style-type: none"> • Views death as a temporary separation • Able to react to the gravity of death in accordance with the reactions of parents or other adults 	<ul style="list-style-type: none"> • May have significant psychosocial problems if either parent is lost at this stage, especially between ages 4 and 6 (owing to <i>magical thinking</i>, in which children may believe death is their fault)
School-age	<ul style="list-style-type: none"> • Appreciates that death is final and inevitable • Fantasizes about and tends to personify death ("the boogie-man") 	<ul style="list-style-type: none"> • May have nightmares • May engage in death-avoidance behaviors (e.g., hiding under the covers, leaving the lights on, closing closet doors) • May experience intense guilt and a sense of responsibility for the death
Preadolescent and adolescent	<ul style="list-style-type: none"> • Recognizes that death is final • Understands that death is inevitable • Preadolescents: tend to worry about dying • Adolescents: tend to deny that death could happen to them 	<ul style="list-style-type: none"> • Loss of a parent may interfere with mastery of the young adulthood task of forming an intimate relationship with members of opposite sex

TABLE 21-5
Communicating with Children about Death

Therapeutic	Nontherapeutic
<ul style="list-style-type: none"> • Use simple, concrete language 	<ul style="list-style-type: none"> • Use of euphemisms (e.g. "he's gone to sleep" or "she passed away")
<ul style="list-style-type: none"> • Involve the child in mourning rituals (take to funeral home and/or cemetery); explain what is going to happen 	<ul style="list-style-type: none"> • Overexplanations
<ul style="list-style-type: none"> • Encourage the child to express feelings 	<ul style="list-style-type: none"> • Minimizing child's experience
<ul style="list-style-type: none"> • Reassure children that they will not be abandoned 	<ul style="list-style-type: none"> • Judgmental statements
<ul style="list-style-type: none"> • Answer all questions truthfully 	

Relationship with the Lost Object

It is usually more difficult to cope with the loss of an ambivalent relationship as such relationships are characterized by many "if only" and "I should have" thoughts. "Unfinished business" and regrets about the deceased make coping with their loss more problematic. "The greater the dependency on and importance of the lost object, the greater the risk for ineffective coping" (Bateman, 1999, p. 142). When individuals of stormy

relationships have time to work on issues prior to the death, grieving is usually facilitated.

In general, the more intimate the relationship with the deceased, the more intense the grief experienced by the bereaved. The death of a child poses a particular risk for dysfunctional grieving to occur.

The death of a parent or a sibling can pose a major challenge for children. The child's feelings may often go unrecognized by adults who fail to understand the child's need to mourn.

Individuals experiencing parental grief usually have intense reactions and responses. It is expected that children outlive their parents. When a child dies, the parent loses not only the child, but also experiences losses of the parental role. Bowlby (1961) describes parents who talk about losing a part of themselves as a result of their child's death. "The death of a child disrupts family homeostasis and the psychological and physiologic equilibrium of family members" (Levin, 1998, p. 70). The uniqueness of parental grief for a deceased child may be the loss of the perceived potential for that child who has died. It is the loss of the hopes of the parents for the child, for "the things that could have been." Table 21-6 provides a listing of characteristics of parents of infants and children who have died.



RESEARCH FOCUS

Title of Study

"Chronic Sorrow: The Experience of Parents with Children Who are Developmentally Disabled"

Authors

Mallow, G. E., & Bechtel, G. A.

Purpose

To compare chronic sorrow experiences of mothers with those of fathers of developmentally disabled children.

Methods

A qualitative survey design was used to identify patterns of feelings and emotions among parents residing in the same household with a developmentally disabled child.

Findings

Different patterns of chronic sorrow among mothers and fathers of developmentally disabled children were identified. Adaptation mechanisms differ between mothers and fathers. Mothers' emotions evolve into chronic sorrow, while fathers' reactions move toward resignation.

Implications

This study points out the need for continued support to parents; involvement in community support groups may be helpful in coping with chronic sorrow and resignation.

Mallow, G. E., & Bechtel, G. A. (1999). Chronic sorrow: The experience of parents with children who are developmentally disabled. *Journal of Psychosocial Nursing*, 37(7), 31–35.

Cause of Death

The intensity of the grief response changes according to the cause of death, be it unexpected, traumatic, or a suicide.

Unexpected Death

The loss occurring with an unexpected death poses particular difficulty for the bereaved in achieving closure. As Roach and Nieto (1997) stated, any death, even anticipated death, is a traumatic experience to the surviving loved ones. Unanticipated death, such as a death resulting from a natural disaster or other tragedy (e.g., airplane crash), leaves survivors shocked and bereaved. Often, the inability to say goodbye compounds the trauma of the death and may be a factor contributing to altered grieving.

Traumatic Death

Complicated grief is associated with traumatic death such as death by homicide, suicide, or an accident. Although traumatic death does not necessarily predispose the survivor to complications in mourning, survivors suffer emotions of greater intensity than those associated with normal grief.

When loved ones die violently, the griever may suffer from traumatic imagery, that is, the reliving the terror of the incident or imagining the feelings of horror felt by the victim. Traumatic imagery is a common occurrence with traumatic death. Such thoughts, coupled with intense grief, can lead to *post-traumatic stress disorder* (PTSD). Nurses must be aware of the possibility of PTSD and be alert for the presence of symptoms, which may include:

- Sleep disturbances, such as recurrent, terror-filled nightmares
- Psychological distress
- Chronic anxiety

Unless this problem is recognized and the survivors are encouraged to express the intense feelings, they will not be able to progress through the normal, adaptive grieving process.

Suicide

The loss of a loved one to suicide is frequently compounded by feelings of blame in the survivors. They feel guilty for failing to recognize clues that may have enabled the victim to receive help. These feelings of guilt and self-blame can be transformed into anger at the victim for inflicting such pain, at themselves, and at caregivers. Feelings of shame for having a suicide in the family may also be present.

Nursing Care of the Grieving Person

Resolution of a loss is a painful process and must be done by clients in their own way. Nurses can assist by providing support as the client moves through the process of mourning. Grief changes people by affecting self-esteem, triggering the development of new ways of coping, and precipitating a change in lifestyle without the deceased.

TABLE 21-6
Characteristics of Parents Whose Children Die

Death	Characteristics
Spontaneous abortion (miscarriage) and stillbirth	<p>Parents, especially the mother, may have feelings of intense sadness, anger or guilt.</p> <p>The death is often inadequately recognized by others, especially if the loss occurs in early weeks of pregnancy.</p> <p>The death may be considered a personal failure.</p> <p>Parents may dwell on details, designating blame to themselves or others.</p> <p>Grief from previous miscarriages may be relived.</p> <p>Anticipatory grief may occur if the condition of the infant is known early.</p> <p>Ambivalence experienced in early pregnancy may increase grief.</p> <p>Hopes for the future must be modified or changed.</p> <p>Despair may peak when the parents must leave the hospital without the baby.</p>
Neonatal death	<p>Feelings are similar to stillbirth.</p> <p>Parents have had the time to form a bond with the infant, intensifying the grief.</p> <p>Grief may be intense by both parents.</p>
Sudden infant death syndrome (SIDS)	<p>Death is unexplainable and totally unexpected.</p> <p>Pain is increased by lack of knowledge and misinformation.</p> <p>Parental bonding is complete.</p> <p>Death is silent, no signs of distress.</p> <p>Guilt may be present.</p> <p>Police may investigate, adding to the guilt.</p> <p>Grief is acute because there is no time to prepare.</p> <p>Parents, especially the mother, may be preoccupied with the details of the death.</p>
Abortion	<p>Shame, secrecy, and guilt may accompany grief.</p> <p>Highly ambivalent feelings may be present.</p> <p>Little support or comfort is offered by others.</p> <p>Feelings of relief are expected, but despair and depression may surface.</p> <p>No guilt may be felt, especially if the woman did not want a child.</p>

Nurses can play an active role in assisting people to grieve. Encourage clients to do their grief work, that is, to experience their feelings to the fullest in order to work through them. Provide support and explain to the bereaved that it will take time to grieve the loss and to gain some closure to the relationship.

Assessment

A thorough assessment of the grieving client and family begins with a determination of the personal meaning of the loss. Another key assessment area is deciding where the person is in terms of the grieving process. The nurse understands that the stages of grieving are not necessarily mastered sequentially, but that instead individuals may vacillate in progression through the stages of grief. Levin (1998) recommends that assessment be done to differentiate the signs of healthy grieving from at-risk behavior.

Diagnosis

The North American Nursing Diagnosis Association (NANDA) defines *Dysfunctional Grieving* as “extended, unsuccessful use of intellectual and emotional

responses by which individuals (families, communities) attempt to work through the process of modifying self-concept based upon the perception of potential loss” (NANDA, 2001). Another diagnosis that may be applicable is *Anticipatory Grieving*, defined as “intellectual and emotional responses and behavior by which individuals (families, communities) work through the process of modifying self-concept based on the perception of potential loss” (NANDA, 2001). See the accompanying Nursing Process Highlight for a discussion of the two NANDA diagnoses specifically developed to address grieving individuals.

Outcome Identification and Planning

It is important to clarify the expected outcomes when planning care for the grieving client. Listed below are some expected outcome criteria for the person experiencing grief:

- Verbalize feelings of grief
- Share grief with significant others
- Accept the loss
- Renew activities and relationships

Nursing Process Highlight

DIAGNOSIS: DYSFUNCTIONAL GRIEVING

Defining Characteristics

Major

- Unsuccessful adaptation to loss
- Prolonged denial or depression
- Inability to resume normal living patterns
- Delayed emotional response

Minor

- Failure to restructure life after the loss
- Social isolation or withdrawal from others
- Failure to develop new interests or relationships

Related Factors

- Loss of physiological function related to disease or trauma
- Surgery (colostomy, hysterectomy, mastectomy, amputation)
- Terminal illness
- Chronic pain
- Death
- Developmental life changes
- Loss of a relationship

DIAGNOSIS: ANTICIPATORY GRIEVING

Defining Characteristics

Major

- Expressed emotional pain over a potential loss

Minor

- Sorrow
- Anger
- Guilt
- Altered sleep patterns
- Changes in eating patterns
- Decreased libido
- Communication alterations

Related Factors

- Diagnosis of terminal illness (self or significant other)
- Upcoming lifestyle change (divorce, child leaving home)
- Potential job loss
- Loss associated with aging

(Data from Carpenito, L. J. [1999]. *Handbook of nursing diagnosis* [8th ed.]. Philadelphia: Lippincott; North American Nursing Diagnosis Association. [2001]. *Nursing diagnoses: Definitions & classification 2001–2002* [pp. 76–77]. Philadelphia: Author.)

Some of these expected outcomes will take a long period of time to achieve, and some must be achieved before others are mastered. For example, to accept the loss, the person must begin to share grief with others by verbalizing feelings. Two expected outcomes for mourners are discussed below.

Acceptance of the Loss

Only by going through grief work are individuals able to reach some acceptance and, ultimately, resolution of feelings about the loss. Often, people try to find some meaning in their situations. This search involves introspection in which spiritual support is of therapeutic value.

Renewal of Activities and Relationships

The very core of grief work revolves around acceptance of the fact that the needs met by key people in our lives can be met in other ways and by other people. The deceased cannot be replaced; however, enough healing must occur so that new relationships can be initiated.

How long does the process of adaptive grieving take? The length of time for grief to be resolved is as individual as the person experiencing it and its intensity. Grief work takes time. There are no definite time frames in which grief should occur. Each person grieves in his or her own way and at his or her own pace.

THINK ABOUT IT

Allowing Time to Grieve

Your coworker, who is also your friend, has just lost a loved one whose funeral was today. Tomorrow your friend must return to work because his 3-day bereavement leave is over. He is dealing with many intense emotions as well as a lack of energy. Society dictates that he return to work. How would you feel if you were in his place? How do you deal with his lack of productivity at work? How do you provide support to him?

Implementation

Therapeutic nursing care is based on an understanding of the significance of the loss to the client. To understand the client's perspective, the nurse must spend time listening. As the client expresses feelings, the nurse must demonstrate acceptance, even if the client is not responding according to the nurse's expectations or belief system. The nurse's nonjudgmental, accepting attitude is essential while the bereaved expresses anger. The nurse communicates an understanding of the

client's anger—and avoids personalizing and using defensive behaviors.

Grieving people need reassurance, counseling, and support; see Figure 21-3. One mechanism of providing support on a long-term basis is support groups. Thus, the nurse needs to be aware of the availability of such groups within the community to make appropriate referrals. When bereaved people join support groups, they will be with others who have experienced the same situation. This sharing decreases the feelings of loneliness and social isolation that are so common in grief. The accompanying Nursing Checklist lists steps for working through loss.



NURSING CHECKLIST Assisting Clients to Grieve Successfully

When working with bereaved clients, encourage them to:

- Recognize the loss by acknowledging the loss.
- Express feelings related to the loss.
- Remember the deceased in a realistic (versus idealistic) manner.
- Relinquish old attachments of the deceased (e.g., give away some of the deceased's possessions).
- Readjust to the community without the deceased.
- Reinvest the emotional energy into something else (e.g., begin to socialize).

(Data modified from Schattner, J. [2000]. A ritual to help participants grieve the loss of another member in their cardiac rehabilitation program. *Journal of Psychosocial Nursing*, 38(1), 13.)



Figure 21-3 Note the nurse's nonverbal expression of support for this couple's grief over the loss of their child. What specific actions can the nurse implement to provide emotional support?

Evaluation

People follow their own time schedule for grief work. In general, it takes months or years for resolution of grief. It is important to teach grieving individuals that resolution of the loss is generally a process of lifelong adjustment. Therefore, nurses usually do not have an opportunity to be with the bereaved family when grief work is completed. However, the nurse has a unique opportunity to lay the foundation for adaptive grieving by encouraging the bereaved to share their feelings and continue to verbalize their experience with significant others. Goals mutually established with client and family are the foundation for evaluation.

DEATH

In today's social climate, death is viewed as something to be avoided at all costs; medicine, with its technological advances, pursues immortality. These scientific advances do not change the fact that death is a part of every human existence.

End-Of-Life (EOL) Care

No one expects to die. It is something that happens to someone else and to someone else's loved ones. Yet it is one of two life events that all humans share, the other being birth. Dying was once considered to be a normal part of the life cycle. Today it is often considered to be a medical problem that should be handled by health care providers. Technologic advances in medicine have caused care of those who are dying to become depersonalized and mechanical.

In an attempt to humanize care of the dying, proponents of improved EOL care are looking to nurses. "Nurses spend more time with patients who are facing the end of life (EOL) than any other member of the health care team" (Ferrell, Grant, & Virani, 1999, p. 252). In 1997, the Institute of Medicine (IOM) made six recommendations for improving EOL care; see the accompanying display.

This highly technologic world calls for application of high-touch intervention with the dying. In other words, appropriate care of the dying is administered by compassionate nurses who are both technically competent and able to demonstrate caring.

Stages of Death and Dying

In her classic works, Elizabeth Kübler-Ross (1969, 1974) identified five possible stages of dying experienced by clients and their families (Table 21-7). Every person does not move sequentially through each stage. These stages are experienced in varying degrees and for varying lengths of time. The client may express anger and, a

IMPROVING END-OF-LIFE CARE: IOM RECOMMENDATIONS

1. Create and facilitate patient and family expectations for reliable, skillful, and supportive care.
2. Ask health care professionals to commit themselves to improving care for dying patients and using existing knowledge to prevent and relieve pain and other symptoms.
3. Address deficiencies in the health care system through improved methods for measuring quality, tools for provider accountability, revised financial systems to encourage better coordination of care, and reformed drug prescribing laws.
4. Develop medical education to ensure practitioners have relevant attitudes, knowledge, and skills to provide excellent EOL care.
5. Make palliative care a defined area of expertise, education, and research.
6. Pursue public discussion about the modern experience of dying, options available to dying patients and families, and community obligations to those nearing death.

(Data from Field, M. J., & Cassel, C. K. [Eds.]. [1997]. *Approaching death: Improving care at the end of life [report of the Institute of Medicine Task Force]*. Washington, DC: National Academy Press.)

few minutes later, express acceptance of the inevitable, then express anger again. The value in Kübler-Ross's work is that it helps increase sensitivity to the needs of the dying client.

Denial

In the first stage of dying, the initial shock can be overwhelming. Denial, which is an immediate response to loss experienced by most people, is a useful tool for coping. It is an essential and protective mechanism that may last for only a few minutes or may manifest itself for months.

Anger

The initial stage of denial is followed by anger. The client's security is being threatened by the unknown. All the normal daily routines have become disrupted. The client has no control over the situation and thus becomes angry in response to this powerlessness. The anger may be directed at self, God, and others. Often the nurse is the recipient of the anger when the client lashes out; see Figure 21-4.

Bargaining

The anticipation of the loss through death brings about bargaining through which the client attempts to postpone or reverse the inevitable. The client promises to do something (such as be a better person, change lifestyle) in exchange for a longer life.

TABLE 21-7
Kübler-Ross's Stages of Dying and Death

Stage	Example
First stage: Denial	<i>Verbal:</i> "This can't be happening to me!" <i>Behavioral:</i> Client is diagnosed with terminal lung cancer; client continues to smoke two packs of cigarettes daily.
Second stage: Anger	<i>Verbal:</i> "Why me?" <i>Behavioral:</i> Client strikes out at caregivers.
Third stage: Bargaining	<i>Verbal:</i> Client prays, "Please, God, just let me live long enough to see my grandchild graduate." <i>Behavioral:</i> Client tries to "make deals" with caregivers.
Fourth stage: Depression	<i>Verbal:</i> "Go away. I just want to lie here in bed. What's the use?" <i>Behavioral:</i> Client withdraws and isolates self.
Fifth stage: Acceptance	<i>Verbal:</i> "I feel ready. At least, I'm more at peace now." <i>Behavioral:</i> Client gets financial or legal affairs in order. Client says goodbye to significant others.

(Data from Kübler-Ross, E. [1969]. *On death and dying*. New York: Macmillan.)



Figure 21-4 Anger is a common response of grieving individuals. What is the nurse's priority action in the situation depicted with this angry client?

Depression

When the realization comes that the loss can no longer be delayed, the client moves to the stage of depression. This depression is different from dysfunctional depression in that it helps the client detach from life to be able to accept death.

Acceptance

The final stage of acceptance may not be reached by every dying client. However, “most dying persons eventually accept the inevitability of death. Many want to talk about their feelings with family members . . .” (Ward, 1999, p. 1). Verbalization of emotions facilitates acceptance. With acceptance comes growing awareness of peace and contentment. The feeling that all that could be done has been done is often expressed during this stage. Reinforcement of the client’s feelings and sense of personal worth are important during this stage.

Ethical Implications

Death is no longer considered to be a normal part of life. It is fraught with ethical dilemmas that occur almost daily in health care settings. Many health care agencies have ethics committees to develop and implement policies that deal with end-of-life issues. See Chapter 24 for a complete discussion of the ethical implications of euthanasia, assisted suicide, and refusal of treatment. One of the most difficult dilemmas is determining the difference between killing and allowing someone to die by withholding life-sustaining treatment methods.

The American Nurses Association (ANA) distinguishes relieving pain and mercy killing (euthanasia or assisted suicide). Pain relief is a central value in nursing, whereas euthanasia is unethical. Increasing doses of medication to control pain in terminally ill clients is ethically justified even at the expense of maintaining life (ANA, 1992).

Assessment

Nursing interventions are based on a thorough assessment of the client’s holistic needs. See the accompanying Nursing Process Highlight for pertinent assessment information.

Diagnosis

One NANDA-approved nursing diagnosis that is applicable for many dying clients is *Powerlessness*, that is, “the perception that one’s own actions will not significantly affect an outcome; a perceived lack of control over a current situation or immediate happening” (NANDA, 2001). Another response that is often experienced by the dying is described by the diagnosis *Helplessness*, “a subjective state in which an individual sees limited or no

Nursing Process Highlight

INFORMATION NEEDED IN ASSESSMENT OF THE DYING CLIENT

- Client’s awareness of the terminal nature of illness
- Availability of support systems
- Physical condition
- Emotional status
- Presence of advance directives for health care decisions
- History of previous positive coping skills
- Unfinished business expressed by client or family

alternatives or personal choices available and is unable to mobilize energy on own behalf” (NANDA, 2001). See the accompanying Nursing Process Highlight for discussion of these two diagnoses.

Outcome Identification and Planning

The dying client must be treated as a unique individual worthy of respect rather than as a diagnosis or a case to be cured. Essential elements to consider when planning care of the dying person, include:

- Schedule time to be available to client.
- Offer to contact clergy.
- Balance the client’s need for independence and need for assistance.
- Respect the client’s confidentiality.
- Answer all questions and provide factual information to client and family.

Nursing care promotes the optimal quality of life, which means treating the client and family in a respectful manner and providing a safe environment for the expression of feelings. Sensitive nursing care recognizes and respects the cultural, ethnic, spiritual, and religious beliefs of clients and families. Planning focuses on meeting the holistic needs of the client and family.

Implementation

Proficient nursing care during the final stage of life requires a unique knowledge base and skills. The American Association of Colleges of Nursing (1999) has developed a list of competencies necessary to provide quality EOL care; see the accompanying display.

The nurse’s first priority is to communicate a caring attitude to the client. Establishment of rapport facilitates the client’s verbalization of feelings. The nurse establishes a safe environment in which the client does

Nursing Process Highlight

DIAGNOSIS: POWERLESSNESS

Defining Characteristics

Major

- Expressions of dissatisfaction about inability to change the situation

Minor

- Reluctance or refusal to be involved in decision making
- Anxiety
- Apathy
- Depression
- Resignation

Related Factors

- Diagnosis of terminal illness
- Chronic pain
- Deficient knowledge
- Lack of explanation from care providers
- Social isolation
- Being in a threatening situation

DIAGNOSIS: HOPELESSNESS

Defining Characteristics

Major

- Expressions of overwhelming apathy in response to a situation in which there is a perception of no solution (may say something like, “What’s the use? I can’t make things change.”)
- Lack of energy
- Expression of a feeling of incompetence
- Passive, giving-up behavior
- Decreased affect
- Rigid thinking patterns

Minor

- Loss of appetite
- Weight loss
- Irritability
- Muscular tension
- Social withdrawal
- Depression
- Suicidal thoughts

Related Factors

- Diagnosis of terminal illness
- Chronic pain
- Deterioration of health status
- Altered body image
- Prolonged discomfort
- Inability to care for self

(Data from Carpenito, L. J. [1999]. *Handbook of nursing diagnosis* [8th ed.]. Philadelphia: Lippincott; North American Nursing Diagnosis Association. [2001]. *Nursing diagnoses: Definitions & classification 2001–2002* [pp. 71–72]. Philadelphia: Author.)

COMPETENCIES NECESSARY FOR NURSES TO PROVIDE HIGH-QUALITY CARE TO PATIENTS AND FAMILIES DURING THE TRANSITION TO THE END OF LIFE: AACN

1. Recognize changes (social, demographic, economic) necessitating improved EOL care.
2. Promote provision of comfort care to the dying.
3. Communicate with patient, family, and colleagues about EOL issues.
4. Recognize one’s own attitudes, feelings, values, and expectations about death; acknowledge diversity (individual, cultural and spiritual) in beliefs and customs.
5. Demonstrate respect for the patient’s view and wishes during EOL care.
6. Collaborate with interdisciplinary team members during EOL care.
7. Use scientifically based standardized tools to assess symptoms experienced by patient at the end of life.
8. Use assessment data to plan and intervene using traditional and complementary approaches.
9. Evaluate the impact of traditional, complementary, and technological therapies on patient-centered outcomes.
10. Assess and treat multiple dimensions (physical, psychological, social, and spiritual needs) to improve quality at the end of life.
11. Assist patient, family, colleagues, and one’s self in coping with suffering, grief, loss, and bereavement in EOL care.
12. Apply legal and ethical principles in the analysis of complex EOL issues.
13. Identify barriers and facilitators to patients’ and caregivers’ effective use of resources.
14. Demonstrate skill at implementing a plan for improved EOL care.
15. Apply knowledge gained from palliative care research to EOL education and care.

(From American Association of Colleges of Nursing. [1999]. *Peaceful death: Recommended competencies and curricular guidelines for end-of-life nursing care*. Washington, DC: Author.)

not feel chided or chastised for experiencing those feelings. Nonverbal communication can be used very effectively with dying individuals. “You just need to make space for patients to be themselves. You don’t always have to have conversation or be doing something for them. Just be there and hold hands and listen” (Ward, 1999, p. 3).

Physiological Needs

According to Maslow’s hierarchy of needs, physiological needs must be met before others because they are essential for existence. Areas that are often problematic for the terminally ill client are nutrition, respiration,

elimination, comfort, and mobility. Table 21-8 provides information on meeting the client's physiological needs.

THINK ABOUT IT

Communicating with the Family

Relief from pain, constipation, nausea, dry mouth, and reactions to treatments are basic needs of dying people. Being able to take nourishment, to be active, and to occupy oneself are also needs. What should the nurse tell the family as physiological changes occur? How can nurses help both the client and the family deal with these changes?

Promoting Comfort

The primary activities directed at promoting physical comfort include pain relief, keeping the client clean and dry, and providing a safe, nonthreatening environment. The nurse who demonstrates a respectful, caring attitude promotes the client's psychological comfort by establishing rapport.

Clients may experience many fears related to death. They may fear helplessness, dependence on others, loss of abilities, mutilation, or uncontrollable pain. The fear of a painful death is almost universal. Many, though certainly not all, dying clients experience pain. In its position statement on pain relief for the terminally ill, the ANA states that promotion of comfort is the major goal of nursing care (ANA, 1992). Comfort should be maximized by management of pain and other discomforting factors. The American Society of Pain Management Nurses (ASPMN) advocates "for a healthcare environment that fosters humane and dignified care. ASPMN promotes ethical and effective pain and symptom management as an integral part of palliative care" (ASPMN, 1999, p. 2). The Nursing Checklist provides a list of interventions to promote comfort. See Chapter 33 for further discussion of pain management.

Hospice Care

Hospice, a type of care for the terminally ill, is founded on the concept of allowing individuals to die with dignity and be surrounded by those who love them. Hospice care is one of the fastest growing

TABLE 21-8
Meeting the Physiological Needs of the Terminally Ill Client

Area of Need	Discussion	Nursing Implications
Nutrition	Presence of nausea and vomiting decreases appetite.	Identify the cultural, social, and ethnic practices that influence eating patterns.
	Psychological factors (such as depression) may interfere with appetite.	Use specific measures that promote food intake and retention: <ul style="list-style-type: none"> • favorite foods • easy to swallow foods • eating small amounts frequently
	Some treatment modalities (e.g., chemotherapy, radiation) impair immune functioning.	Give antiemetic drugs as needed. Recommend that client avoid: <ul style="list-style-type: none"> • fried foods • alcoholic drinks • gas-producing vegetables (corn, cauliflower, beans, broccoli) Instruct client to avoid raw meat and raw eggs.
Energy	Weakness and exhaustion may occur as a result of metabolic demands.	Schedule care activities to ensure uninterrupted times for rest.
	Fatigue and weakness may impair self-care abilities.	Encourage client to conserve energy (do strenuous tasks for the client).
Hygiene	Diaphoresis and incontinence often occur in final stages of illness.	Provide bed bath as necessary.
		Perform oral care.
		Change linens frequently to keep client dry (promotes maintenance of skin integrity).

**NURSING CHECKLIST****Meeting the Comfort Needs
of the Terminally Ill Client**

1. Encourage client to verbalize presence of pain.
2. Discuss pain relief options with client and family.
3. Administer medication on a regular schedule instead of PRN to ensure maximum pain relief.
4. Assist client and family to identify the stressors that influence pain.
5. Teach noninvasive pain relief measures:
 - Relaxation techniques such as deep breathing, imagery
 - Use of heat and cold
 - Massage
 - Topical ointments, such as soothing salves, deep-heating rubs, herbal-scented lotions

segments of the health care industry. There are currently over 1,800 hospice programs in the United States (Roach & Nieto, 1997). Clients enter hospice care when aggressive medical treatment is no longer an option or when the client refuses further aggressive medical treatment.

Hospice provides an environment that emphasizes caring instead of curing. The emphasis is on **palliative care** (control of the symptoms rather than cure).

Managing the care of a dying person requires many skills. Because of the complexity of care required by the hospice client, an interdisciplinary team is essential for delivering quality, compassionate care. The interdisciplinary team consists of nurses, physicians, social workers, psychologists, clergy, ancillary personnel, and volunteers. The health care team members meet regularly to solve problems, make decisions, and assure that care is coordinated (Down, 1984; Roach & Nieto, 1997).

Home Care

A dying person is often not given the opportunity to be surrounded by family and friends. Approximately 75% of Americans die in either hospitals or nursing homes (Merritt, Fox-Grage, & Rothouse, 1998). Home care is an alternative for the dying client, if the family members are physically and emotionally able to provide care. Hospices provide therapeutic interventions to bereaved family members. Ideally, health care providers should share the responsibility of home care of the dying with the family. This sharing could include respite time and frequent visits.

Psychosocial Needs

Death presents a threat not only to one's physical existence but also to psychological integrity. See Table 21-9 for a discussion of ways to meet the psychosocial needs of the dying client.

Spiritual Needs

In times of crisis, such as death, spirituality may be a source of comfort and support for the client and family. Spiritual and religious beliefs often determine the appropriate course of action. Nurses respect clients' reliance on spiritual support by listening and contacting clergy/spiritual guides if requested.

Nurses play a major role in promoting the dying client's spiritual comfort. Dying is a personal and, frequently, lonely process. The nurse can serve as a sounding board for the client who expresses values and beliefs related to death. The following are therapeutic nursing interventions that address the spiritual needs of the dying:

- Communicating empathy
- Playing music
- Using touch
- Praying with the client
- Contacting the clergy if requested by the client
- Reading religious literature aloud at the client's request

See Chapter 14 for a discussion of complementary/alternative treatment approaches that are therapeutic to the dying.

Support for the Family

Family members need to be involved in the care of their dying loved one. Unrealistic guilt is increased by feelings of powerlessness, thus it is important to involve family members in the caregiving. Families facing the impending death of a loved one require much support from nurses and other caregivers. The nurse's presence, just being there with the family, is extremely important.

Learning Needs of Client and Family

Bereaved families need much support and information. The nurse's role is to teach family members what they need to know. For instance, families must be assisted with acquiring the tools that will help them help their loved one. An example might be the need for the family to understand that the dying person needs to conserve energy. Some simple actions on the part of the family could be to schedule activities after a rest period or early in the morning when the client is strongest. This is not an earth-shattering revelation, but simple interventions can be overlooked during this highly charged emotional time.

TABLE 21-9
Meeting the Psychosocial Needs of the Terminally Ill Client

Problem	Discussion	Nursing Implications
Anxiety	<p>A combination of factors contribute to anxiety of the dying client and family:</p> <ul style="list-style-type: none"> • Client's fear of death (and the loss of the known world) • Caregiver's fear of loss of the loved one • Client's sense of abandonment by the family, friends, and health care providers <p>Loss of independence and social isolation increase anxiety.</p>	<p>Spend as much time as possible with the dying client.</p> <p>Encourage verbalization of feelings.</p> <p>Listen in nonjudgmental manner.</p> <p>Answer all questions in an honest, factual manner.</p> <p>Provide explanation of all procedures.</p> <p>Encourage family and friends to spend time with client.</p>
Decreased independence	<p>Independence is threatened by powerlessness.</p> <p>Independence promoted by having control over one's life.</p>	<p>Seek client's opinion on treatment issues.</p> <p>Involve client in developing plan of care.</p> <p>Encourage continued interaction of client with family and friends.</p> <p>Assist the client to develop goals that are realistic within the limitations of the illness (realistic hope).</p> <p>Avoid always emphasizing limitations.</p> <p>Allow client and family to ventilate feelings about not being able to change the course of events.</p> <p>Help the client to identify those things over which he does have power.</p>
Social interaction	<p>Loneliness is increased when others detach themselves in order to disengage from the dying person's pain.</p> <p>Health care providers tend to avoid interacting with the dying.</p> <p>Sensory deprivation (dimly lit rooms and out-of-the-way rooms) can increase feelings of abandonment.</p>	<p>Encourage family to remain with the dying person.</p> <p>Stay with the dying person as much as possible.</p> <p>Provide support through your presence and active listening.</p> <p>Be available to discuss the client's situation.</p> <p>Use touch to communicate caring.</p> <p>Provide meaningful sensory stimuli.</p>

Client and family deficient knowledge can be related to:

- Insufficient information about physical condition
- Information about the treatment regime
- Inability to anticipate medical crises
- Inexperience with personal threat of death
- Unfamiliarity with protocol to follow in case of need for emergency care when not in the hospital

The accompanying Client Teaching Checklist provides guidelines for educating families of dying people.

CARE AFTER DEATH

Caring for the deceased body and meeting the needs of the grieving family are nursing responsibilities. This

**CLIENT TEACHING CHECKLIST***Guidelines for Teaching a Family Caregiver*

1. Discuss the nature and extent of the disease process.
2. Use adult education principles.
3. Reinforce material frequently.
4. Clearly explain the purpose of palliative care while maintaining a sense of realistic hope.
5. Inform client and family of available community resources; reassure them that they are not alone.
6. Teach steps for caregiver to follow if an emergency arises at home.
7. Provide written instructions for caregiver to follow. These should include important telephone numbers and persons to be contacted.
8. Inform about the purpose of hospice.

section discusses care of the body and responding to the needs of families of the dead.

Care of the Body

The body of the deceased needs to be treated in a way that respects the sanctity of the human body. Nursing care includes maintaining privacy and preventing damage to the body.

Physiological Changes

Several physiological changes occur after death. The body temperature decreases with a resultant lack of skin elasticity (**algor mortis**). Therefore, the nurse must use caution when removing tape from the body to avoid skin breakdown. Another physiological change, **liver mortis**, is the bluish purple discoloration that is a byproduct of red blood cell destruction. This discoloration occurs in dependent areas of the body; therefore, the nurse should elevate the head to prevent discoloration from the pooling of blood. Approximately 2 to 4 hours after death, **rigor mortis** occurs; this is stiffening of the body caused by contraction of skeletal and smooth muscles. To prevent disfiguring effects of rigor mortis, as soon as possible after death the nurse should close the eyelids, insert dentures (if applicable), close the mouth, and position the body in a natural position.

In preparing the body for family viewing, the nurse seeks to make the body look comfortable and natural. This means removing all tubes and positioning the body as described. After the family has viewed the body, the nurse places identification tags on the body's toe and wrist. The body is then placed in a plastic or

fabric shroud and the shroud is tagged. Then the body is transported to the morgue according to the agency's policy. The nurse is also responsible for returning the deceased's possessions to the family. Jewelry, eyeglasses, clothing, and all other personal items are returned to the family.

Legal Aspects

In most states, the physician is legally responsible for determining the cause of death and signing the death certificate. The nurse may, in certain situations, be the person responsible for certifying the death. See Chapter 23 for a complete discussion. It is important for nurses to know their legal responsibilities, which are defined by their state or provincial board of nursing.

Autopsy

An **autopsy** (postmortem examination to determine the cause of death) is mandated in situations in which an unusual death has occurred. For example, an unexpected death and a violent death are circumstances that would necessitate an autopsy. Families must give consent for an autopsy to be performed.

Organ Donation

The donation of organs for transplantation is a matter that requires compassion and sensitivity from the caregivers. Health care institutions are required to have policies related to the referral of potential donors to organ procurement agencies. It is important that families of the deceased know the importance of and process for organ donation. There is an inadequate supply of organs and tissues to meet the demand for transplants. The following organs and tissues are used for transplantation:

- Kidneys
- Heart
- Lungs
- Liver
- Pancreas
- Skin
- Corneas
- Bones (long bones and middle ear bones)

At the time the family gives consent for donation, the nurse notifies the donor team that an organ is available for transplant. Time is of the essence because the organ or tissue must be harvested and transplanted quickly to maintain viability.

Care of the Family

At the time of death, the nurse provides invaluable support to the family of the deceased. When an individual dies, family members' anxiety is increased due to their

THINK ABOUT IT

Nurses and the Vulnerability of Grieving

Nurses need to feel as free to ask for help in dealing with feelings about a dying client as they would in asking for assistance in lifting and repositioning a client in bed. Asking for help means taking a risk to being vulnerable; some nurses fear appearing emotionally vulnerable or overwhelmed. What are some ways for nurses to support each other in dealing with the grief of caring for dying people?

uncertainties about what to do (Gaguski, 1999). Informing the family of the type and circumstances surrounding the death is extremely important. The nurse provides information about viewing the body, asks the family about donating organs, and offers to contact support people (e.g., other relatives, clergy). Sometimes, the nurse needs to help the family with decision making regarding a funeral home, transportation, and removal

of the deceased's belongings. Using sensitive and compassionate interpersonal skills is essential in providing information and support to families.

NURSE'S SELF-CARE

Working with dying clients can evoke both a personal and a professional threat in the nurse. "Death, and the process of dying, represent a personal crisis not only for the dying person but for the caregivers who share life's most profound moment" (Ward, 1999, p. 3). Because many nurses are confronted with death and loss daily, grief is a common experience for nurses. Frequent exposure to death can interfere in the nurse's effectiveness because of subsequent anxiety and denial.

Whether working in a hospice, hospital, long-term care facility, or the home, nurses are at particular risk for experiencing negative effects from caring for the dying. Often nurses do not want to confront their grief and will use some of the common defenses against grieving: keeping

NURSING CARE PLAN

Terminally Ill Client with Lung Cancer

Case Presentation

Mr. Charles Jefferson is a 57-year-old man who is terminally ill with lung cancer. He has a wife and three grown children who are married. He has two grandchildren. He was employed until 2 months ago, when the radiation, chemotherapy, and cancer (which has metastasized to his bones and other vital organs) rendered him too weak to pursue regular daily activities. He is a religious and spiritual man and considered by all to be the "heart" of his family. He has always been generous, and his friends are many. He is currently bedridden. His cognitive abilities and sense of humor remain intact. His current physical problems include pain, nausea, constipation, difficulty urinating, and dry skin. He has lost 60 pounds. He has not yet received his Social Security disability income or pension money. Tomorrow he is being discharged from the hospital; he states he is going home to die.

Assessment

- 60-pound weight loss
- Constipation
- Urinary difficulty
- Dry skin

Nursing Diagnosis #1

Imbalanced Nutrition: Less than body requirements

Expected Outcomes

1. Mr. Jefferson will identify factors that affect the consumption and retention of food and fluids.
2. Mr. Jefferson will maintain his current body weight.

Interventions/Rationales

1. Ask client to state his food preferences.
Including the client in problem solving increases the likelihood of compliance. Knowing the client's food preferences helps in planning a diet that is more likely to be appealing.

(continues)

NURSING CARE PLAN**Terminally Ill Client with Lung Cancer (continued)**

2. Discuss findings about dietary preferences with the family.
Providing information to family members is essential because they are the ones preparing meals at home.
3. Weigh the client at the same time of day while he is wearing similar clothing.
Provides an accurate reflection of weight stability and fluctuations.

Evaluation

Goal partially met. Mr. Jefferson stated his food likes and dislikes to the home health nurse. He has lost 2 more pounds because he states, “I’m just not hungry any more.”

Nursing Diagnosis #2

Acute Pain related to metastasis of cancer.

Expected Outcome

1. Mr. Jefferson will verbalize pain relief.

Interventions/Rationales

1. Communicate your acceptance of his pain.
Validation of client’s experience reduces anxiety.
2. Provide frequent opportunities to rest.
Pain is exacerbated by fatigue.
3. Provide pain medication at a level that it is effective.
For a terminally ill client, pain relief is the primary goal of care.
4. Teach the client and family noninvasive pain relief measures (massage, deep breathing, imagery).
Knowledge of noninvasive methods helps the client and family feel in control. Such methods complement the effectiveness of medication in pain relief.

Evaluation

Goal partially met. Mr. Jefferson reports being pain-free for up to 2 hours at a time.

busy, taking care of others, being strong, and suffering in silence. Nurses need to stop pretending that they do not

experience grief and subsequent suffering and to talk about the intense emotions associated with caregiving.

To cope with their own grief, nurses need support, education, and assistance in coping with the death of clients. Staff education should focus on decreasing staff anxiety about working with grieving clients and families, how to seek support, and how to provide support to coworkers.

Often, the nurse’s fears and doubts about death and its meaning surface, causing anxiety related to feelings about mortality. Even though such feelings are normal, caring for the dying client and the family can be emotionally draining. Therefore, nurses must remember to care for themselves.

**NURSING TIP****Nurse’s Grief and Self-Care**

- Set aside some time for your own grieving.
- Know when to ask for help.
- Use support from within your agency—counselors, clergy, support groups.
- Find a way to say goodbye to the deceased client—rituals bring closure, which is a necessary part of grieving.

KEY CONCEPTS

- Loss is a universal response experienced by an individual when someone (or something) of value is no longer available.

- Grief is a psychological response to loss characterized by deep mental anguish and sorrow. Grieving people experience various stages of grief.
- The difference between normal and pathologic grief is the inability of the individual to adapt to life without the loved one.
- There are five psychological stages involved in the dying process: denial, anger, bargaining, depression, and acceptance.
- Complicated grief is associated with traumatic death such as by accident, homicide, or suicide.
- Hospice care offers clients an alternative to hospitalization when aggressive medical treatment is no longer an option.
- After death, the nurse focuses on supporting the family and caring for the deceased body.
- Nurses must care for themselves in order to provide quality, compassionate care to the dying person.

CRITICAL THINKING ACTIVITIES

1. When dealing with a family and client versus just the client, how do your interactions and interventions differ? What is one of the most important roles the nurse fulfills?
2. Pain and other discomfort symptoms are deterrents to quality of life. Consider how these are interrelated with psychological, spiritual, financial, and social influences. In addition to medication therapy, what other interventions can be used to help control symptoms?

3. Does everyone advance through all the stages of grief?
4. What are some of the identifying behaviors that would indicate that the survivors and family have not progressed through the grief process?
5. What emotional reactions have you had and frustrations have you faced when caring for dying clients and their families? Have you identified the things that help you maintain your own balance? Do you practice them regularly?
6. What are some subjective indicators that a dying client is experiencing pain? What objective data support the nursing diagnosis of pain?
7. Find a classmate from a cultural background different from yours. Discuss the person's:
 - a. Perception of death
 - b. Family's rituals when a relative dies

WEB RESOURCES

American Society of Pain Management Nurses
www.aspmn.org
Donor Information
www.organdonor.gov
Hospice & Palliative Nurses Association
www.hpna.org

Unit

V

Professional Accountability

- 22** Professional Accountability and Leadership
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Chapter 22

Professional Accountability and Leadership



You must pay for conformity.

—Ralph Waldo Emerson

COMPETENCIES

1. State criteria for professional nursing practice.
2. Describe the elements of professional accountability.
3. Discuss licensure of professional nurses.
4. Explain the relationship between advanced practice nursing and professional accountability.
5. Discuss the characteristics of effective leaders.
6. Describe the types of power and their sources.
7. State the actions through which nurses can increase political power.

KEY
TERMS

accountability	democratic leadership style	nurse practice act
accreditation	empowerment	nurse practitioner
advanced practice nursing	laissez-faire leadership style	organization
autocratic leadership style	leadership	politics
certification	legal regulation	power
certified nurse midwife	licensure	profession
certified registered nurse anesthetist	licensure by endorsement	professional regulation
clinical nurse specialist	licensure by examination	professional standards
competency	management	scope of practice
delegation	mandatory licensure laws	situational leadership
	networking	synergy

As nursing continues to evolve, many questions arise: Is nursing truly a profession? Are nurses really autonomous? Autonomy is related to accountability. As autonomy increases, so does the need to be accountable. To whom are nurses accountable?

This chapter addresses the above issues and, hopefully, raises awareness of the need to be involved in activities that advance the nursing profession. In addition, leadership in nursing, power, and politics of nursing are discussed in terms of their contributions to professional nursing practice.

PROFESSIONAL NURSING PRACTICE

Isabel Hampton Robb, the first president of the American Nurses Association (ANA), stated in the late 19th century that nursing lacked two elements of a profession—organization and legislation (ANA, 1976). Believing nurses were not capable of managing their own affairs, hospital authorities opposed any efforts of nurses to organize. Moreover, the lack of accepted standards for nursing education caused graduates of one nursing school to question the credentials of graduates of other nursing schools. The result of these negative responses to the autonomy of the nursing profession

THINK ABOUT IT

Indicators of Professionalism

Observe the registered nurses in the agency to which you are assigned for clinical experiences. How do the nurses interact with one another? Cite examples of behaviors that reflect collegial relationships. Interview a few of these nurses. How do they demonstrate professional commitment? Are they involved in professional activities, such as continuing education and professional association activities? How do these nurses contribute to the public's recognition of the nursing profession?

was the belief held by nurses that it was neither possible nor desirable to work collectively (ANA, 1976).

However, in the face of internal and external opposing forces, in the early 20th century, nursing did organize. The primary goal was to establish legislation that would legitimize nursing practice and gain recognition of nursing as a profession. Thus, an old art was transformed into a young profession.

Even though nursing is often referred to as a profession, there is debate as to whether nursing is a *true* profession when appraised against the criteria of a profession.

Criteria of a Profession

A **profession** is a group (vocational or occupational) that requires specialized education and intellectual knowledge. There has been much debate as to whether nursing is truly a profession rather than an occupation. Registered nurses consider nursing to be a profession similar to other professions (e.g., accounting, engineering, pharmacy, law, and medicine). However, for nursing to be recognized as a profession by the society it serves, nursing must demonstrate on an ongoing basis that it meets the criteria of a profession; see Table 22-1. Sills (2000) states:

Professions profess to know something better than the people they serve and who thus need their service. Hence the social contract is with the society. The society grants certain rights and privileges to a profession in acknowledgment of the need they have for the applied knowledge of the profession. (p. 30)

Through dedication, professional pride, and commitment, nursing has accomplished much in the way of establishing its body of knowledge, scope of practice, research base, and code of ethics. However, nursing continues to struggle with maintaining authority over its own practice. As political forces examine the health care delivery system due to the rising cost of health care, the challenge to maintain control over nursing practice will be even greater. If nursing is to maintain professional

TABLE 22-1
Comparison of Nursing to Criteria of a Profession

Criteria of a Profession	Nursing Achievements	Challenges
The work is intellectual and distinguished by a substantial body of knowledge.	Professional nursing requires knowledge, judgment, and skills based on biological, sociological, psychological, and nursing sciences.	<p>The public does not always see the knowledge and judgment required by professional nurses.</p> <p>Tasks may be delegated to more minimally prepared nursing personnel.</p> <p>Medical records do not always reflect nursing planning.</p>
Provision of a unique service to society.	<p>Since the early 20th century, the public has granted nursing the right and responsibility for self-regulation through state licensure laws.</p> <p>Historically, the public has been concerned about having an adequate number of registered nurses to provide service.</p>	<p>Traditionally, nursing has had difficulty articulating its benefits to the public. ANA's <i>Nursing: A Social Policy Statement</i> (1995), which describes nursing's unique contributions, is not widely known by members of the profession.</p> <p>Individual nurses must understand the unique contribution they bring to a specific nurse-client situation.</p>
An expanding body of knowledge.	<p>Nursing, by its nature, is expanding its knowledge base to meet the demands of health care delivery (i.e., increased technology, changing reimbursement systems, new practice settings).</p> <p>Nurse theorists and nurse researchers contribute to the knowledge base.</p>	<p>Individual nurses must be able to articulate the conceptual basis of their practice and use nursing research in the practice setting.</p> <p>There must be a commitment by all professional nurses to contribute to the development of nursing theory and research.</p>
Personal responsibility to the public for services provided.	Professional registered nurses are held individually accountable to the public through such mechanisms as legal regulations and licensure.	<p>Self-regulation is the hallmark of a profession.</p> <p>The system of professions regulating professions is being challenged by policymakers to demonstrate effectiveness in protecting the public, rather than promoting the profession.</p> <p>Registered nurses must recognize their individual accountability to provide care in accordance with nursing standards even if the standards supersede employer policy.</p>
A long period of education, including both theory and practice.	<p>Professional nursing is based on a broad knowledge base, requiring specialized knowledge, skills, and abilities.</p> <p>Nursing education is both theory and practice based.</p> <p>Nursing has successfully established its educational base away from the apprentice approach and moved into higher education.</p>	Multiple entry methods into practice (diploma, associate degree, baccalaureate degree, generic masters, and generic doctorate) are confusing to the public and members of the profession.

(continues)

TABLE 22-1 (continued)
Comparison of Nursing to Criteria of a Profession

Criteria of a Profession	Nursing Achievements	Challenges
Autonomy and the ability to develop policy about the discipline and control of the activity of one's members.	<p>Nurse practice acts generally grant authority for regulating the profession to an agency/board comprised of a majority of nurses.</p> <p>Nurse administrators have achieved positions at levels comparable with other hospital administrators.</p>	<p>New systems for health provider regulation are being explored and are resulting in diminished authority for nursing to regulate itself.</p> <p>Increased governmental regulation of practice and reimbursement arenas will affect nursing's regulation of the profession.</p> <p>Boards of nursing will need to seek methods to become regulatory partners with other agencies that regulate the practice settings (e.g., Department of Health and Human Services, Health Care Financing Administration, Office of Licensing).</p>
Members share a common identity, values, and attitudes.	<p>Registered nurses generally adhere to their dedication to care and identify their role as client advocates in the health care system.</p> <p>Professional organizations share common values.</p>	<p>Although registered nurses individually adhere to the values of the profession, they have frequently failed at collegiality and mentoring. This is reflected in the low numbers of registered nurses who belong to professional organizations. The percentage of participation increases when nurses organize within specialty areas of practice (e.g., certified registered nurse anesthetists; emergency room nurses; critical care nurses, etc.). However, this activity may further fragment the profession.</p>
Career choice of its members is motivated by altruism and reflects a long-term commitment to the public.	<p>Historically, people entered the field of nursing to care for those in need; however, few individuals (predominantly female) anticipated long-term employment. Today, more men and minorities are entering nursing. Further, more registered nurses are employed full time in nursing than ever before and anticipate continuing this practice.</p>	<p>Nursing functions in a high-tech environment. Therefore, nursing must pay particular attention to ensuring that its members are socialized into the caring role of nursing.</p>
A code of ethics to which its members adhere.	<p>The ANA has a long-standing published code of ethics. Many of the values identified within this code have been incorporated into nurse practice acts, thus establishing them as legal requirements.</p> <p>Violations of legal standards are grounds for disciplinary action against one's license.</p>	<p>It is important that the public sees nursing as a caring profession that is accountable to the public for upholding its professional standards.</p>

(continues)

TABLE 22-1 (continued)
Comparison of Nursing to Criteria of a Profession

Criteria of a Profession	Nursing Achievements	Challenges
	Traditionally, registered nurses have ascribed to and supported the professional organization's responsibility to develop a code of ethics.	
	Registered nurses have demonstrated support of boards of nursing in enforcing professional practice and participate by reporting violations.	

Data from Kelly, L. Y., & Joel, L. A. (1996). *The nursing experience: Trends, challenges, and transitions* (3rd ed.). New York: McGraw-Hill.

autonomy, it must have a strong political base that seeks to inform public policymakers about the role and scope of professional nursing.

A profession is only as good as its individual members. Every member of the profession must practice as a professional and contribute to nursing as a profession. Beginning nursing students should understand the significance of ascribing to professional attitudes and values and how their behavior can influence the public's view of the nursing profession.

As professionals, nurses are accountable for providing quality care. **Accountability** is the process in which individuals are answerable for their actions and have an obligation (or duty) to act. Accountability is demonstrated by nurses in several ways. For example, the accountable nurse is one who demonstrates caring and compassion to clients and families. By providing client-centered, holistic care, the nurse is meeting the expectations of society.

PROFESSIONAL ACCOUNTABILITY

Accountability is a term often used in nursing. How does a nurse demonstrate accountability? Nurses are accountable to many: themselves, clients and their families, the nursing profession, employers, and the general public for provision of safe, effective care established by the profession. The nursing profession is accountable for establishing and maintaining standards that promote safe, effective care. Accountability involves responsibility; that is, being able and willing to respond.

Accountability is one of the distinguishing characteristics of a profession. The professional nurse is accountable in several domains: professional, legal, and ethical. See Chapters 23 and 24 for complete discussions of legal and ethical accountability, respectively.

Elements of Professional Accountability

To appreciate one's accountability as a professional, it is important to first understand the social context of nursing. Professions arise from an identified public need for specialized knowledge and skills. The more specialized the knowledge and skills, the greater the risk to the public of an incompetent professional. Therefore, the public entrusts the profession to regulate itself on behalf of the public's best interests.

Professional nurses are held accountable by the public to possess the necessary knowledge and skills to render safe nursing care and to use proper judgment in the provision of nursing services. The profession is held accountable by the public to ensure that only qualified individuals are granted the right to practice and that those who fail to uphold the professional standards are denied the future right to practice.

THINK ABOUT IT

Accountability

Think of the following actions as ways to demonstrate accountability:

- Documenting nursing interventions
- Assuming only those responsibilities that are within one's scope of practice
- Not assuming responsibility for activities in which competency has not yet been mastered
- Evaluating the outcomes of one's own actions
- Admitting mistakes rather than blaming others

Select one day of your clinical experience and identify ways in which you demonstrated accountability.

Professional accountability within nursing is fostered through the mechanisms by which nurses obtain the right to practice. These mechanisms include rights and responsibilities, organizational accountability, legislative regulations, individual accountability, and student accountability.

Rights and Responsibilities

The nurse has responsibility to the client to be competent, to render nursing services in accordance with standards of nursing practice (discussed in the section entitled Organizational Accountability), and to adhere to the profession's ethical code.

The public trusts that an individual titled registered nurse will have appropriate knowledge and skills to render the services offered. This translates to accountability of individuals to accept assignments for which they are competent and to obtain the necessary knowledge and skills to perform such services.

When the registered nurse chooses a specific area of practice (such as emergency or home health nursing) additional knowledge, skills, and abilities will be required as the individual evolves from novice to expert. The registered nurse is accountable for acquiring and maintaining these abilities. Furthermore, the nurse is accountable to adhere to the standards of care for that specialty. This process may be accomplished by various methods such as orientation, in-service education, peer review, continuing education, journal articles, professional association activities, or formalized advanced education. Although employers may provide some of these opportunities to the registered nurse, the ultimate accountability to gain and maintain competency rests with every nurse.

Organizational Accountability

Organization is the means by which members of a profession, such as nursing, join together to promote and protect the profession. **Professional regulation** is the process by which nursing ensures that its members act in the public interest by providing a unique service that society has entrusted to them (ANA, 1995). Professional regulation is the responsibility of professional organizations. The accompanying display lists ways in which the nursing profession regulates itself.

The basis of professional regulation in nursing is the scope of nursing practice. Professional standards evolve from the scope of nursing practice and provide the framework for the development of competency statements. **Professional standards** are authoritative statements developed by the profession by which the quality of practice, service, and education can be judged (ANA, 1991a). Professional standards form the basis of educational outcomes and criteria for organized nursing services (ANA, 1995). In addition, professional standards provide the framework for accreditation and certification.

SELF-REGULATION OF NURSING PROFESSION

- Defining its practice base
- Providing for research and development of that practice base
- Establishing a system for nursing education
- Establishing the structures through which nursing services will be delivered
- Providing quality review mechanisms such as a code of ethics, standards of practice, structures for peer review, and a system of credentialing

(Data from American Nurses Association. [1995]. *Nursing: A social policy statement*. Washington, DC: Author.)

Accreditation

Accreditation is the process by which a nongovernmental agency appraises and grants status to institutions that meet predetermined criteria. The Joint Commission for Accreditation of Healthcare Organizations is one example of an accrediting body that promotes the quality of health care by evaluating agencies' achievement of performance standards. Another type of accreditation is performed by the American Nurses Credentialing Center, which develops criteria for continuing nursing education agencies and evaluates those agencies in terms of meeting the criteria.

Certification

Certification is the process by which a nongovernmental agency certifies that an individual licensed to practice a profession has met predetermined standards specified for practice (ANA, 1995). Certification is an indicator that the nurse has obtained specialized knowledge and skills. "In today's health care environment, we recognize certification as a measure of excellence and a method of consumer protection . . . By earning certifications, nurses have worked above expectations to achieve excellence in their specialties" (Gill, 1999, p. 7). Certification is a voluntary process through which nurses demonstrate their belief in the importance of ongoing education and excellence in clinical practice.

Accreditation and certification are mechanisms for promoting nursing accountability. The National League for Nursing (NLN) establishes educational standards and surveys educational programs to ensure that these standards are achieved by each accredited school of nursing. The ANA promotes the accountability of individual nurses through its certification process. The American Nurses Credentialing Center, a subsidiary of ANA, develops and administers the certification examinations. It also requires a specified amount of continuing education in each specialty area for those nurses who choose to be certified. Certification is a voluntary process that signifies a higher level of competence than is expected at the time of initial licensure.

Standards of Clinical Nursing Practice

Professional nursing is responsible for determining standards of nursing practice. Because services provided by nurses are essential to clients, the profession is accountable for the quality of care delivered.

STANDARDS OF CLINICAL NURSING PRACTICE

Standards of Care

- I. *Assessment*
The nurse collects client health data.
- II. *Diagnosis*
The nurse analyzes the assessment data in determining diagnoses.
- III. *Outcome Identification*
The nurse identifies expected outcomes individualized to the client.
- IV. *Planning*
The nurse develops a plan of care that prescribes interventions to attain expected outcomes.
- V. *Implementation*
The nurse implements the interventions identified in the plan of care.
- VI. *Evaluation*
The nurse evaluates the client's progress toward attainment of outcomes.

Standards of Professional Performance

- I. *Quality of Care*
The nurse systematically evaluates the quality and effectiveness of nursing practice.
- II. *Performance Appraisal*
The nurse evaluates his/her own nursing practice in relation to professional practice standards and relevant statutes and regulations.
- III. *Education*
The nurse acquires and maintains current knowledge of nursing practice.
- IV. *Collegiality*
The nurse contributes to the professional development of peers, colleagues, and others.
- V. *Ethics*
The nurse's decisions and actions on behalf of clients are determined in an ethical manner.
- VI. *Collaboration*
The nurse collaborates with the client, significant others, and health care providers in providing client care.
- VII. *Research*
The nurse uses research findings in practice.
- VIII. *Resource Utilization*
The nurse considers factors related to safety, effectiveness, and cost in planning and delivering client care.

From American Nurses Association. (1991a). *Standards of clinical nursing practice*. Washington, DC: Author.

CANADIAN NURSES ASSOCIATION STANDARDS FOR NURSING PRACTICE

- I. Nursing practice requires that a conceptual model(s) for nursing be the basis for that practice.
- II. Nursing practice requires the effective use of the nursing process.
- III. Nursing practice requires that the helping relationship be the nature of the client–nurse interaction.
- IV. Nursing practice requires nurses to fulfill professional responsibilities.

Reprinted with permission from Canadian Nurses Association. (1987). *CNA: A definition of nursing practice: Standards for nursing practice*. Ottawa: Author.

In 1991, the ANA revised its standards of clinical nursing practice. As the professional organization representing all registered nurses, ANA's focus was to develop a set of standards applicable to all nurses engaged in clinical practice. The ANA, as well as many specialty nursing associations, has developed standards of practice for specific areas of practice, for example, medical-surgical nursing, gerontology nursing, and perioperative nursing. Only through collaboration and commitment among nursing organizations can nursing derive professional standards that reflect the commonality of nursing practice across all areas of practice.

Nursing must be able to articulate the core of practice to which practitioners are accountable to the public regardless of clinical area of practice. The *Standards of Clinical Nursing Practice* (1991a) reflect both the caring and professional expectations of nursing (see the accompanying display).

In Canada, the Canadian Nurses Association (CNA) is the professional organization entrusted with the responsibility of developing professional standards that are listed in the accompanying display. The CNA describes nursing as “a dynamic and supportive profession guided by its code of ethics [and] is rooted in caring” (CNA, 1987, p. ii).

Legislative Accountability

For nurses to be recognized as professionals, nursing must have legislation that clearly defines the role and scope of nursing practice. **Scope of practice** refers to the legal boundaries of practice for health care providers as defined in state statutes. Legislation defines the legal rights granted to the profession by the public. It is essential to public well-being that nursing regulate its practice to assure that only those individuals qualified to practice are allowed to do so.

Legal regulation is the process by which the state attests to the public that the individual licensed to practice is at least minimally competent to do so (ANA, 1995). The **nurse practice act** (law governing the practice of nursing) defines the legal scope of practice

within a state or territory. Such laws generally authorize state boards of nursing to interpret the legal boundaries of *safe* nursing practice (ANA, 1995). Other laws may also have an impact on the scope of nursing practice, for example licensure laws of other health care providers.

Although specific duties of boards of nursing vary among states or territories, the primary purpose is to protect the public from unqualified or incompetent practitioners. Boards of nursing are authorized to:

- Approve educational programs that prepare individuals for licensure
- Grant licensure to individuals who meet minimum qualifications
- Renew licenses
- Establish legal standards of practice
- Discipline licensees as necessary to protect the public

Boards of nursing are authorized to adopt rules and regulations that establish legal standards for nursing education, practice, and licensure within the context of the nurse practice acts. Nurses are accountable for complying with the provisions of the nurse practice act and the related rules and regulations established by the board of nursing in their respective states.

Licensure

Licensure is the method by which a state holds the nurse accountable for safe practice to citizens of that state. Licensure grants the nurse permission to perform certain acts, to use a specific title that reflects one's practice rights, and to offer one's services and receive compensation for those services in the state that issues the license. Licensure is granted based on evidence that the individual has attained the minimum degree of **competency** (the ability, qualities, and capacity to function in a particular way) to ensure that one is a safe practitioner.

Mandatory licensure laws prohibit any individual from practicing as a registered nurse without a current license. Licensure laws receive authority from the U.S. Constitution that defines the protection from harm as a constitutional right of every citizen. The Constitution entrusts the individual states with the inherent power to police human activities and to protect citizens in the human needs for safety, general welfare, and health. Laws enacted under the "police power" of the state are designed to protect society from ignorance, incapacity, deception, and fraud and must benefit the public primarily, *not* the members of the profession.

Licensure Process

There are two methods by which one may become initially licensed as a registered nurse in a particular state:

- **Licensure by examination** is the process by which an individual who has completed an approved nursing program seeks initial licensure by successfully passing a standardized competency examination.

- **Licensure by endorsement** is the process by which an individual who is duly licensed as a registered nurse under the laws of one state or country has his or her credentials accepted and approved by another state or country. Individuals are licensed to practice only in the state in which they initially took the licensing examination. Endorsement allows registered nurses to practice in states other than the one of initial licensure.

The mutual recognition model for nurse licensure would allow a nurse to hold licensure in one's state of residency and practice across state lines provided the nurse follows the practice laws in the respective states. Following several years of study regarding whether there was a need for regulatory reform to meet the changing health care delivery environment, the National Council of State Boards of Nursing, Inc. (NCSBN) in August of 1997, adopted a recommendation endorsing a mutual recognition model for nursing regulation. In taking this action, the NCSBN cited the following as the driving forces for such a revolutionary change for nursing regulation:

- The increase in practice occurring across state lines
- Nurses practicing in a variety of settings using technologies that may cross state lines (i.e., telehealth)
- The need for expedient access to qualified nurses without regard to state boundaries

The vision for the future system of nurse regulation was stated as "a state nursing license recognized nationally and enforced locally" (NCSBN, 1997a).

The mutual recognition licensure system is based on states entering into an agreement, known as an interstate compact, to authorize practice by individuals licensed in one state to practice in the other state. The interstate compact defines such issues as jurisdiction, discipline and information exchange among and between party states. The individual nurse has the responsibility to be knowledgeable and abide by the practice laws of the state of practice. Utah was the first state to adopt the interstate compact. As of January 2000, six states (Arkansas, Maryland, North Carolina, Texas, Wisconsin and Utah) had enacted an interstate compact to allow practice of licensees who reside in one state to practice between party states. Four other states (Iowa, Mississippi, Nebraska and South Dakota) have introduced interstate compact legislative proposals (NCSBN, 2000).

While there seems to be movement toward the mutual recognition model as the future regulatory model for nursing practice in the United States, initial states will serve as a testing ground for the model. The party states will have the opportunity through the interstate compact to work together to resolve issues which may arise as a result of this revolutionary model. Up-to-date information regarding the mutual recognition model for nurse licensure may be accessed through the

National Council of State Boards of Nursing web site, www.ncsbn.org. For information on specific state licensure laws or how to contact a state board of nursing, contact NCSBN at www.nursingboard.org.

The state boards of nursing have the authority and responsibility to determine that only qualified individuals are granted licensure. The boards of nursing may deny licensure based on information that indicates one to be “unfit” for such licensure. Examples of such activities are:

- A criminal history (especially a criminal act that affects one’s ability to render safe nursing care)
- Chemical addiction
- Practicing without a current, proper license
- Aiding someone else who is unlicensed to pose as a nurse

Effective November 22, 1999, state boards of nursing are required to report adverse actions taken against licensees to the Healthcare Integrity and Protection Data Bank (NCSBN, 1999). Congress identified a need for a comprehensive source of adverse action information on health care providers, suppliers and practitioners out of concern about health care fraud and the competency of providers employed by health plans or federal and state programs. The Health Insurance Portability and Accountability Act (HIPDA) of 1996 directs the Secretary of the Department of Health and Human Services to create the HIPDA data bank for the purpose of combating fraud and abuse in the health care delivery system.

Types of adverse actions that must be reported to the HIPDB include:

- Health care–related civil judgments against health care practitioners, providers, and suppliers
- Health care–related criminal convictions against health care practitioners, providers, and suppliers
- Adverse actions taken by federal or state agencies responsible for licensing and certification of health care practitioners, providers, and suppliers
- Exclusions of health care practitioners, providers, and suppliers from participation in federal or state health care programs
- Any other adjudicated actions or decisions as established by regulations, such as actions taken by boards of nursing against licensees who violate state licensure laws

As of January 2000, the HIPDB information will be available only to federal and state agencies, law enforcement officials, and health plans. The general public does not have access to the HIPDB. Individual practitioners, suppliers, or providers may request information on themselves for a fee as established by the Department of Health and Human Services regulations. Current information can be obtained through the

Health Resources and Services Administration of the Bureau of Health Professions, Division of Quality Assurance at www.npdb-hipdb.com.

Licensure Examination

It is the responsibility of each state to determine the licensing requirements for an individual to practice in that state. Boards of nursing are entrusted to determine the appropriate examination to measure minimum competency for practice as a registered nurse. In the United States, through the National Council of State Boards of Nursing (NCSBN), the same examination is given nationally to qualified candidates. Known as the NCLEX-RN (National Council Licensure Examination for Registered Nurses), this examination has been adopted as the standard licensure examination by all 50 states and the U.S. territories. A separate test (National Council Licensure Examination for Practical Nurses, NCLEX-PN) is administered to practical and vocational nurses. Use of a national licensure examination ensures uniformity in testing and facilitates endorsement of licensure in other states.

The examination is designed to distinguish qualified candidates from those who do not possess the necessary competencies for safe practice. The NCLEX-RN measures the competencies expected of a new nursing graduate at the generalist level.

The NCLEX-RN is not an examination for which one prepares in the last few weeks before graduation. Nursing students successfully complete this examination through careful study and achievement of nursing courses. Activities offered during the academic experience prepare students for registered nurse practice. Clinical experiences through which students learn the practice of nursing contribute to the ability to pass the licensure examination.

The NCLEX-RN reflects the belief that the practice of nursing requires knowledge of:

- Phases of the nursing process
- Management and coordination of a safe and effective care environment
- Physiological integrity needs of clients
- Psychosocial integrity needs of clients
- Promotion and maintenance of health (NCSBN, 1997b)

The method of administering the NCLEX-RN is computerized adaptive testing (CAT). CAT is a method of administering test items in such a manner that each candidate’s examination is unique. Each of the test items in the pool of about 3,000 questions is weighed for difficulty. The candidate cues the computer to present the next item based on the response to the previous item. The computer initiates the testing with a relatively easy test item. If the candidate answers correctly, then each item becomes progressively more difficult. If the candidate misses questions, the items become easier until the candidate begins

to answer correctly. The computer continues this method until the candidate has taken at least the minimum number of items required in accordance with the test plan and is answering 50% of the items correctly. The computer compares the level of difficulty of the question being administered with the competence level required to pass. A pass/fail determination is made based on the level of difficulty of the items being answered correctly at least 50% of the time (NCSBN, 1994).

Individual Accountability

Professional nurses must understand the method by which the board of nursing adopts rules and regulations in their state of licensure so that they can be active participants in the development of such regulations. Nurses can use a variety of ways to demonstrate individual accountability; two methods are continued competency and professional development.

Continued Competency

A registered nurse has the professional responsibility to attain and maintain competency. There has been much debate within the profession and consumer advocacy groups about the roles and responsibilities of health profession licensing boards to assure that its members have maintained minimum competency to remain safe practitioners.

Once licensed, it is the responsibility of the registered nurse to maintain a current active license to practice in accordance with state requirements. Registered nurses must renew their licenses on an annual or biannual cycle before the expiration date and meet other such requirements for license renewal as required by the individual state board of nursing.

The nursing profession has traditionally used three methods of assuring accountability to the public—licensure examination, continuing education, and certifications. These three methods are currently being scrutinized by the American Nurses Association in an attempt to assure that nurses demonstrate competency. A variety of mechanisms are being considered as measures to improve accountability. Development of a professional portfolio is being considered as one avenue for demonstrating continued competence. Green and Ogden (1999) recommend that nurses “[g]et involved with groups setting the pace for the future of continued competency for the nursing profession” (p. 2).

Professional Development

Professionalism must be lived, not just learned. Content in schools of nursing relative to such topics as history and future trends, professional organizations, and regulation is not sufficient for developing an involved, committed professional. Rather, it is the participation of nursing students in extracurricular activities that enriches academic experiences and fosters professional development.

Membership and active involvement in student organizations at the school, state, and national levels enable nursing students to develop critical professional skills and participate in events that may have an impact on their careers. Table 22-2 lists some professional organizations in which nurses can participate.

Involvement with district and state nurses associations is also encouraged. Nursing students can participate in these groups through continuing education, legislative activity, or political action. In addition, students have the opportunity of making contacts with registered nurses within these associations who will

TABLE 22-2
Professional Organizations

Organization	Description
National Student Nurses Association (NSNA) Established: 1953	<p><i>Purpose:</i></p> <ul style="list-style-type: none"> To prepare nursing students to become contributing members of the nursing profession To advocate for quality health care <p><i>Activities:</i></p> <ul style="list-style-type: none"> Help students prepare for NCLEX-RN examination Generate scholarship funds for nursing education Provide opportunities for student nurses to become involved in political education activities <p><i>Membership:</i></p> <p>Active membership is open to:</p> <ul style="list-style-type: none"> Students in state-approved programs preparing for registered nurse licensure Registered nurses in programs leading to a baccalaureate in nursing <p><i>Publication:</i></p> <ul style="list-style-type: none"> <i>Imprint</i>

(continues)

TABLE 22-2 (continued)
Professional Organizations

<p>American Nurses Association (ANA) Established: 1911</p>	<p><i>Purpose:</i> To improve the quality of nursing care</p> <p><i>Activities:</i></p> <ul style="list-style-type: none"> • Establish standards for nursing practice • Develop educational standards • Promote nursing research • Establish a professional code of ethics • Oversee a credentialing system • Influence legislation affecting health care • Protect the economic and general welfare of registered nurses • Assist with the professional development of nurses (i.e., by providing continuing education programs) <p><i>Membership:</i></p> <ul style="list-style-type: none"> • Federation of state nurses' associations • Individual registered nurses can participate in ANA by joining their respective state nurses' association <p><i>Publications:</i></p> <ul style="list-style-type: none"> • <i>American Journal of Nursing</i> • <i>American Nurse</i>
<p>Canadian Nurses Association (CNA) Established: 1908</p>	<p><i>Purpose:</i> To achieve quality nursing care for the people of Canada by:</p> <ul style="list-style-type: none"> • Promoting high standards of nursing practice, education, and research • Fostering uniform regulatory practices among licensure/regulatory agencies • Influencing the development of national health policy <p><i>Activities:</i></p> <ul style="list-style-type: none"> • Define nursing practice • Establish standards for nursing practice, education, and administration • Promote nursing research <p><i>Membership:</i></p> <ul style="list-style-type: none"> • Federation of 11 provincial/territorial nurses' associations • Consists of registered nurses who are members of their respective provincial/territorial associations <p><i>Publication:</i></p> <ul style="list-style-type: none"> • <i>Canadian Nurse</i>
<p>National League for Nursing (NLN) Established: 1952</p>	<p><i>Purpose:</i> To identify the nursing needs of society and to foster programs designed to meet these needs</p> <p><i>Activities:</i></p> <ul style="list-style-type: none"> • Accredite (with voluntary participation from the schools) nursing education programs • Conduct surveys to collect data on educational programs • Provide continuing education programs • Offer testing services, including: <ul style="list-style-type: none"> —Licensure examination (NCLEX-RN) for state boards of nursing —Achievement tests for use in nursing schools —Preadmission testing for potential nursing students <p><i>Membership:</i></p> <ul style="list-style-type: none"> • Open to any individual or agency interested in improving nursing services or nursing education • Composed of both nurses and nonnurses <p><i>Publication:</i></p> <ul style="list-style-type: none"> • <i>Nursing and Health Care</i>

(continues)

TABLE 22-2 (continued)
Professional Organizations

Organization	Description
International Council of Nurses (ICN) Established: 1899	<p><i>Purpose:</i> To encourage collaboration between national nurses' associations to improve health services and recognition of nursing's role in health care</p> <p><i>Activities:</i></p> <ul style="list-style-type: none"> • Assist national nurses' associations in establishing regulatory mechanisms • Provide an international ethical code for nursing behavior • Promote nursing research worldwide <p><i>Membership:</i> Independent non-governmental federation of 112 national nurses' associations</p> <p><i>Publication:</i></p> <ul style="list-style-type: none"> • <i>International Nursing Review</i>

Data from American Nurses Association. (1991b). *American Nurses Association bylaws*. Washington, DC: Author; Canadian Nurses Association. (1995). *Canadian Nurses Association 1995 report*. Ottawa: Author; International Council of Nurses. (1995). *Constitution and regulations*. Geneva, Switzerland: Author; National League for Nursing. (1995). *Bylaws*. New York: Author; National Student Nurses Association. (1996). *Getting the pieces to fit 1996/97: A handbook for state associations and school chapters*. New York: Author.

eventually be their colleagues. Such contacts are helpful when seeking guidance in employment opportunities and can develop into valuable mentoring relationships.

Student Accountability

Nursing students' accountability is directly related to their legal authority to practice. Nursing students function legally as an *exception* to the state licensure requirements *while enrolled in a nursing program* that is approved by the state board of nursing. Such exception is only granted when the student is engaged in learning activities structured within the program of studies. Performing nursing activities (other than those assigned to unlicensed individuals) outside the formalized clinical practicum of the nursing curriculum would constitute the illegal practice of nursing. Accountability for nursing care is shared by the student, faculty, educational institution in which the student is practicing, and clinical agency. The various responsibilities of each of these parties are determined by the respective state board of nursing.

For nursing students, accountability for competency begins with the first clinical day and continues throughout their careers. Therefore, students have the responsibility to:

- Be prepared for clinical practice
- Engage only in those skills for which they have gained competence
- Seek instruction as necessary

Students must not engage in client care activities without proper preparation, prior validation of competency by their instructor, and appropriate supervision (Figure 22-1). Nursing students have a responsibility to request clear information regarding the instructor's expectations, if uncertain, and to seek direct supervision when uncertain of competency.

NURSING ALERT

It is *absolutely critical* to client safety that nursing students verbalize any questions or concerns relative to their assignments before instituting care.

THINK ABOUT IT

Student Accountability

You are working as a nursing assistant (unlicensed personnel) during your school break. What would be your appropriate response if asked to perform a nursing procedure such as medication administration? Would the fact that you have performed the procedure previously as a nursing student affect your response?

ADVANCED PRACTICE NURSING

Advanced practice nursing is the practice of nursing at a level requiring an expanded knowledge base and clinical expertise in a specialty area. Advanced practice registered nurses (APRNs) have an increased level of accountability to the public, the profession, and themselves. The autonomy that is experienced by nurses in



Figure 22-1 This nursing student is being taught to measure the client's blood pressure. If the instructor were temporarily called away from the bedside and the client asked the student about the measurement and its significance, do you think the student should discuss this information with the client or wait until the instructor returns?

advanced practice roles increases the sense of responsibility for personal decisions and actions. The general public also expects a higher level of ability and skills from APRNs just as it does from specialists in the medical profession. As APRNs assume leadership roles in the nursing profession, they will promote increased accountability as a standard for the entire profession.

Currently, advanced practice nursing is one of the most debated areas of practice. A changing health care environment has brought new attention to and demand for nursing's advanced practice roles. Further, a lack of uniformity in the educational base for entry into advanced practice nursing and the method by which states regulate this area have led to confusion.

Advanced practice nursing, which represents new opportunities for registered nurses, requires specialized knowledge and clinical proficiency (ANA, 1995). Advanced practice nursing is differentiated from specialty practice in that specialization involves concentrating one's practice in one particular field of nursing and advancement involves expanded practice roles (ANA, 1995). Preparation for advanced practice has evolved

from hospital-based certificate programs to university course work. Although APRNs are prepared primarily in graduate programs, some individuals in current practice have been prepared in post-basic programs. Currently identified roles of APRNs are (ANA, 1995):

- Clinical nurse specialist (CNS)
- Nurse practitioner (NP)
- Certified nurse midwife (CNM)
- Certified registered nurse anesthetist (CRNA)

Table 22-3 provides a description of the advanced practice nursing roles.

APRNs are contributing to the dynamic health care delivery environment in numerous ways. Every state has some form of statutory or regulatory prescriptive authority privileges for APRNs. Reimbursement mechanisms for APRNs are expanding. Although the practice of APRNs is being challenged on several fronts, including physician organizations and some third-party payers, APRN "legislative autonomy is continuing to grow despite all challenges" (Pearson, 2000).

LEADERSHIP IN NURSING

Leadership is a method of modeling accountable behavior to others. Nursing has numerous leaders who demonstrate and encourage accountability. Leadership and management are terms often used interchangeably; however, some significant differences exist. **Management** is the accomplishment of tasks either by oneself or by directing others. **Leadership** is the interpersonal process that involves motivating and guiding others to achieve goals. "Management is about power, and leadership is about influence—control versus vision . . . Leaders inspire staff to contribute to the organization's mission" (Cullen, 1999, p. 28). Every nurse, regardless of title or position, is a manager; each has the potential to be a leader.

Managerial Functions

Essential functions that are performed by effective managers include:

- *Planning*: Determining objectives and identifying methods that lead to achievement of those objectives
- *Organizing*: Using resources (human and material) to achieve pre-determined outcomes
- *Directing*: Guiding and motivating others to meet the expected objectives
- *Controlling*: Using performance standards as criteria for measuring success, and taking corrective action, if necessary, to see that others comply with performance standards
- *Decision making*: Identifying a problem and deciding which alternatives can best achieve the objectives

TABLE 22-3
Advanced Practice Nursing Roles

Advanced Practice Role	Educational Preparation	Major Responsibilities
Clinical Nurse Specialist	Graduate degree in a recognized nursing specialty	Authorized to provide direct nursing care to a select population Plans, guides, and directs care provided by other nursing personnel
Nurse Practitioner	Advanced preparation in a specific area of care	Authorized to provide primary care to individuals, families, and other groups in a variety of settings, including but not limited to: <ul style="list-style-type: none"> • Homes • Institutions • Offices • Industry • Schools • Community agencies Conduct physical examinations Take medical histories Order and interpret laboratory and other diagnostic tests Diagnose Treat minor illnesses (acute or chronic) or injuries Counsel and educate clients
Certified Nurse Midwife	Advanced preparation in nursing and midwifery	Authorized to manage the care of women during all phases of pregnancy and newborns
Certified Registered Nurse Anesthetist	A registered nurse who is prepared in the science of anesthesiology	Authorized to select and administer anesthetics and ancillary services to clients

Leadership Styles

Effective leaders accomplish goals by using (in a positive sense) other people. In other words, they use the concept of **synergy** (the combined power of many) rather than attempting to achieve success alone.

The leader's behavior greatly determines the behavior of the group. There are basically three styles of leadership: autocratic, democratic, and laissez-faire (Table 22-4).

The **autocratic leadership style** is leader-focused; that is, the leader maintains strong control, makes all decisions, and solves all problems. The leader dominates the group by issuing commands rather than making suggestions or seeking input.

The **democratic leadership style** (also called participative leadership) is based on the belief that every group member should have input into development of goals and problem solving. The democratic leader acts primarily as a facilitator and resource person. Concern

for each member of the group as a unique individual is demonstrated by the leader.

In the **laissez-faire leadership style**, the leader assumes a passive, nondirective, and inactive approach. Leadership responsibilities are either assumed by the members of the group or completely abdicated. All decision making is left to the group with the leader giving little, if any, guidance, support, or feedback. Almost any behavior by the group is permissible due to the leader's lack of limit-setting and stated expectations. The tasks are unmet and the relationship needs of group members are ignored.

No single style is superior to the other. Each leadership approach has its advantages and disadvantages (Table 22-4). The effective leader will use **situational leadership**, which is a blending of styles based on current circumstances and events. The leader knows that behavior does not occur in a vacuum; thus, leadership styles are assumed according to the needs of the group and tasks to be achieved.

TABLE 22-4
Leadership Stages

Style	Description	Leader Behaviors	Potential Impact on Group Members	Advantages	Disadvantages
Autocratic	Basic premise: leader knows best. Communication flows downward.	Controlling Directive Makes all decisions and solves all problems Issues commands	Hostility Rebellion	Task oriented, high productivity Facilitates a quick response Often necessary in crisis situation	Inhibits creativity and autonomy of members Promotes mistrust and fear among followers Members may become hostile or passive
Democratic ("Participative Leadership")	Basic premise: every member should have input. Communication is open and mutual.	Acts as a facilitator Serves as resource person Encourages members' active participation	Improved productivity More opportunity for personal growth Increased cooperation and teamwork	Promotes empowerment of team members Facilitates communication Increased creativity and autonomy	Time-consuming May be less efficient (in quantifiable terms) Disagreements may happen as members express their viewpoints
Laissez-Faire	Leadership responsibilities are assumed by group. Almost any behavior by the group is permissible due to the leader's lack of limit-setting and stated expectations.	Passive, nondirective approach Provides little, if any, support, guidance, or feedback Sets no limits	Unmet tasks Relationship needs of group members ignored Apathy	Promotes autonomy and creativity in members	May evoke passivity in team members Aimless behavior often occurs Chaos common Inefficiency and low productivity

Leadership Characteristics

There is debate about the development of effective leaders; is leadership innate or acquired through experience? The characteristics of effective leaders are discussed in the following sections.

Communication

Effective leadership relies on the individual's ability to communicate. An effective nurse leader will:

- Listen actively to others
- Articulate thoughts in an intelligent, persuasive manner
- Differentiate aggressive, passive, and assertive behavior in order to communicate appropriately in a given situation

Aggressive behavior occurs when an individual meets one's needs regardless of the impact on others. *Passive behavior* is giving up one's rights and not having one's needs met. *Assertive behavior* occurs when an individual seeks to meet one's needs while respecting the rights of other people. Effective leaders communicate in an assertive manner; they speak directly and honestly to others.

Credibility

A leader motivates others by demonstrating enthusiasm and exerting influence. To be influential, the leader must be credible. Credibility, the quality or power of inspiring beliefs, is based on competence. From competence comes confidence. Individuals who know what they are doing and perform well are those who can influence others.

Delegation

The nurse leader must be able to delegate effectively to coordinate the delivery of care. **Delegation** is the process of transferring a selected task in a situation to an individual who is competent to perform that specific task. Delegation is a multifaceted process involving: communication, conflict resolution, feedback and evaluation, and knowledge of the person to whom a task is delegated (Hansten & Washburn, 1998).

Delegation is a helpful tool for nurse leaders in that it encourages team members to develop skills. When delegating, it is important to (Costello-Nickitas, 1997):

- Determine which tasks can be delegated and to whom
- Match the task to the delegatee
- Communicate a feeling of confidence to the delegatee

As health care facilities restructure to address cost-containment issues, nurses delegate tasks to unlicensed assistive personnel (UAP) (i.e., nursing assistants, care partners, nurse extenders). In addition to UAP, the reg-

THE "FOUR RIGHTS" OF DELEGATION

<i>Right task</i>	The task can be delegated.
<i>Right person</i>	The person is competent to do the task.
<i>Right communication</i>	The expectations are clearly stated
<i>Right feedback</i>	The worker is given feedback promptly after the task is performed.

Data from Hansten, R. I., & Washburn, M. J. (1998b). *The nurse manager's answer book*. (pp. 129–131). Gaithersburg, MD: Aspen

istered nurse also delegates tasks to licensed practical or licensed vocational nurses.

The nurse practice act defines which aspects of care can be delegated and which must be performed by the registered nurse. Because nurse practice acts vary among the states and provinces, it is imperative that the nurse stay current with the rules and regulations promulgated by the respective state (or provincial) board of nursing regarding the delegation of nursing tasks.

Even though a task may be delegated to someone, the nurse who delegates maintains accountability for the overall nursing care of the client. Only the task, not the ultimate accountability, may be delegated to another.

Critical Thinking

Another characteristic of an effective leader is the ability to think critically. According to Alfaro-LeFevre (1998), "Critical thinking is the key to resolving problems. Nurses who don't think critically become *part* of the problem" (p. 15). The critical thinker has an open-minded questioning attitude (Figure 22-2). This underlying curiosity leads the individual to search for answers based on rationales. The ineffective leader is one who

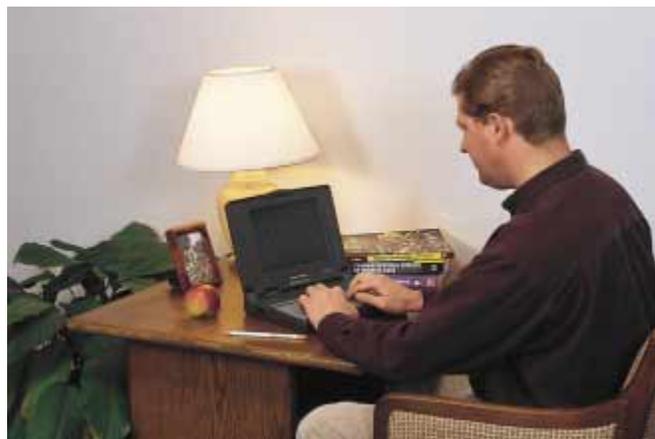


Figure 22-2 Critical thinking skills are integral to the analysis of problems and the development of leadership skills. How does critical thinking contribute to professional accountability?

falls into routine ways of thinking without even being aware of what is happening. See Chapter 5 for more information on critical thinking.

Initiating Action

In addition to thinking critically, a leader initiates action. Only by putting ideas into action does a person become a leader. A leader does not adopt a “wait-and-watch” attitude with problems. Instead, a leader initiates measures to solve problems. When taking action, the effective leader demonstrates flexibility. If one behavior is ineffective, the leader is not hesitant to try another approach. “Creating positive reinforcement for quality behaviors and results is the key to a successful quality initiative” (Daniels, 2000, p. 132). The proactive leader role models successful behaviors and encourages others to strive for quality.

Risk Taking

Taking action to solve problems (i.e., to initiate change) involves taking a risk. People who take risks are those who are not satisfied with the status quo and strive continually for improvement. Effective risk takers are not reckless or haphazard; instead, their risk-taking activities are goal directed.

People engage in risk taking every day and are not even aware of this behavior. Some common examples of risk-taking behaviors are:

- Volunteering to be in charge of a project
- Giving constructive criticism to others
- Expressing opinions even when they are unpopular

Effective leaders understand that the benefits of risk taking far outweigh the potential negative consequences and, therefore, act accordingly.

THINK ABOUT IT

Risk Taking

It is not always comfortable to assume the role of initiator. However, whether you choose to act or not to act, you have made a choice. The question that must be answered is: Can I accept the consequences of my choice(s)?

Persuasiveness and Influence

An effective leader uses influence to motivate and inspire others to achieve goals. A leader understands how to use power effectively, not to dominate but, rather, to motivate others. According to Breisch (1999), nurse managers motivate others by addressing the staff’s needs, promoting accountability, encouraging success, and communicating with the group.

THINK ABOUT IT

Leadership Characteristics

How can you, in the pre-professional role, function as a leader? Think of all the situations in which you will attempt to motivate others to change, for example:

- Encouraging clients and families
- Interacting with team members
- Collaborating with classmates and instructors

Which leadership characteristics, such as communication, credibility, delegation, critical thinking, initiating action, risk taking, and persuasiveness and influence, would be appropriate for each of the above situations?

Persuasiveness is a tool that managers can use to create enthusiasm for a project, encourage collaboration, and increase cohesiveness among team members. The persuasive leader is one who communicates effectively and demonstrates personal power.

Power

A leader is a powerful person. **Power** is the ability to do or act and results in the achievement of desired results. Power causes things to happen. Powerful people are able to modify behavior and influence others to change, even when others are resistant to change. Every person uses power to some degree to meet individual goals. Effective nurse leaders use power to improve the delivery of care and to enhance the profession.

Power that is effective is power that is shared and enables all to work toward their potential. Power involves using force, even though force is certainly not always physical. Power and influence are derived from a variety of sources, including physical strength, ability to reward and punish, financial incentives, legal actions, position within an organization, and expertise.

Types of Power

The type of power used depends on various power sources or bases. Table 22-5 provides an overview of types of power according to their sources. Personal power can be developed by building trust and gaining the confidence of coworkers. Another way to develop power is to focus on solving problems rather than complaining about them. Creating outcomes is powerful!

Principles of Power

Nurse leaders must recognize certain guiding principles when obtaining and using power. Table 22-6 lists the major principles of power.

TABLE 22-5
Types and Sources of Power

Type	Source	Example
Reward Power	Ability to provide incentives	A nurse manager can decide when to schedule vacation time for staff nurses.
Coercive Power	Ability to punish	A head nurse assigns a staff nurse who has been “insolent” to an undesirable shift.
Referent Power	Charisma; others wanting to associate with one	A unit manager is powerful because he is popular with both his superiors and subordinates.
Expert Power	An excellent knowledge base and skill level The person has expertise in an area not held by those who are to be influenced by the leader.	The instructor exerts power with students.
Legitimate Power (“positional”)	Based on one’s position within a hierarchy	The nurse executive has legitimate power over a staff nurse within the same agency or institution
Personal Power	Derives from a high degree of self-confidence that is based on positive self-esteem	A nurse with a “take charge” attitude is powerful during a crisis.
Informational Power	Based on the types and amount of information that an individual can access	A staff nurse has just learned through her experience a new way to teach a client. She tells her coworkers about the approach. Knowledge is shared and power increases.

TABLE 22-6
Principles of Power

Principle	Explanation
The degree of power experienced by a person is dynamic.	A person with power must not assume that the current level of power will remain steady. A powerful person works to maintain the power base.
Power is rarely discussed openly within health care organizations.	Resentment can occur as a result of workers’ unstated concerns about the distribution and use of power.
Power is an expendable source.	Powerful people periodically renew their source(s) of power and expand their power base.
Power requires commitment to goals (personal, professional, or organizational).	A powerful person who loses sight of goals is less influential with subordinates. The ability to share one’s vision (which is goal oriented) with others increases power.
Power occurs in degrees, from minimal to extreme.	An effective leader exerts only as much force as needed to achieve desired objectives.

Data from Gillies, D. A. (1994). *Nursing management: A systems approach* (3rd ed.). Philadelphia: Saunders.

Developing a Power Base

Power can be a positive element in nursing. For example, a nurse manager can use personal power to promote cohesiveness and teamwork with subordinates. The power of a work group can be harnessed by a leader skilled in communication and time management tech-

niques. Power is a force used by nursing leaders to accomplish goals. However, many nurses do not want to be labeled as powerful because of a perceived negative connotation of the word. In the past, many nurses have tended to abdicate their power by negating their own contributions and expertise.

Expanded practice roles have increased nursing’s power. For example, nurse practitioners are empowered legally through licensure to use advanced knowledge and skills. “[T]he Health Care Financing Administration (HCFA) has not moved to decrease the autonomy granted to NPs” (Pearson, 2000, p. 16). Expansion of the scope of nursing practice results in greater accountability to one’s self, the profession, and the public. APRNs have historically demonstrated “their competence as safe, cost-effective providers” (Pearson, 2000, p. 17). Competence of APRNs increases their power to exert a positive influence on the health care delivery system.

In addition to advanced practice nursing, other avenues for nurses to achieve power include knowledge, competence, caring, and affiliation (Ferguson, 1998). There are a variety of ways to build affiliations, including mentorship, preceptorship, and networking.

Networking

Networking (the process of building connections with others) is essential for the success of nurses because it is a way to increase power. Networking helps nurses to become more influential because it encourages sharing of information and creates a synergetic effect for all those involved. Sources for developing networks are friendships, coworker alliances, and professional organizations (Vance, 1998). Establishing and maintaining

THINK ABOUT IT

Developing Power

How do you give power away? Power is abdicated by:

- Focusing on the negative
- Failing to seize power and use it
- The way one dresses
- Body language (hesitant voice tone, slouched posture)
- Always “playing it safe” rather than taking risks

What other behaviors minimize your power? How can you increase your power?

connections with others can be accomplished in a variety of ways, including mentoring and preceptorship (Table 22-7).

A mentor is an experienced person who serves as a guide to a novice. Mentors help novices develop skills. Those seeking a mentor are looking for a person who teaches rather than issues commands (Stahl, 1999). When seeking out a mentor, it is wise for nursing students or graduate nurses to look for a person who communicates directly and focuses on the positive. In selecting a mentor, the novice nurse should choose a person who can provide criticism in a supportive, constructive manner (Zerwekh & Claborn, 1997). “A mentor listens, affirms, counsels, encourages, seeks input,

TABLE 22-7
Networking Strategies

Strategy	Activities
Mentor and Preceptor Relationships	Seek opportunities to help others develop. Role model successful behaviors. Share your “secrets” for success. Encourage others to take professional risks. Provide support. Teach those who are less experienced. Seek out others who may serve as a mentor to you.
Identification with Peers	Form working relationships with your colleagues. Express pride in others’ achievements. Respect colleagues’ judgment and work. Look for ways to be mutually beneficial. Consult with colleagues and respect their input. Develop and use collaboration.
Establishment of Professional Networks	Volunteer information to contacts. Introduce others to contacts. Acknowledge all help received from contacts. Make frequent contact with network members. Be straightforward with contacts (no hidden agendas).

Data from Barnum, B. S., & Kerfoot, K. M. (1995). *The nurse as executive* (4th ed.). Gaithersburg, MD: Aspen; Gillies, D. A. (1994). *Nursing management: A systems approach* (3rd ed.). Philadelphia: Saunders.

and helps the novice develop expert status . . .” (Shaffer, Tallarica, & Walsh, 2000, p. 33).

Empowerment

Empowerment (the process of enabling others to do for themselves) is an interpersonal process. Empowerment occurs when individuals are better able to influence what happens to them.

Many elements are necessary for creating an atmosphere conducive to empowerment. Open communication built on trusting relationships is of utmost importance; the environment must be supportive and caring. Nurses who work in a nurturing environment are more likely to be empowered than those working in settings that do not attend to employee needs. Another element for establishing empowerment is mutual goal setting and decision making; personal power increases as these become shared responsibilities. Also, a common purpose is essential for empowerment to flourish.



CLIENT TEACHING CHECKLIST *Client Empowerment*

- Determine client's learning needs, focusing on the client's perception of importance.
- Speak in terms easily understood by the client and family.
- When applicable, demonstrate the skill and ask client to perform a repeat demonstration.
- Provide feedback immediately to reinforce the learning.
- Ask the client to state in own words what has been learned about the topic.

Empowerment of Clients

Client teaching is a major tool used by nurses to empower clients. By teaching clients how to better meet their needs, nurses are promoting client independence, autonomy, and power. For clients to be truly empowered (i.e., enabled to care for themselves), many health care providers need to shift their thinking away from the paternalistic paradigm that is based on the need for control. Paternalism is the process of treating adults like children by telling them what to do. Some health care providers still use a paternalistic approach to clients (e.g., telling a client to do something “for your own good.”) Empowering nurses are those who treat clients as partners in health care. An example of client empowerment is a nurse teaching a client how to self-administer

insulin injections. The accompanying display offers suggestions for empowering clients.

Another mechanism for nurses to empower clients is advocacy. Acting as client advocates, nurses can work through the political and legislative processes to bring about positive changes for vulnerable populations. For example, nurses exert influence with policymakers regarding the health care needs of the elderly, children, the economically impoverished, and the homeless.

Empowerment of Nurses

Empowerment is not something that is given to nurses. It is encouraged by enlightened leaders who value the work of their colleagues. Nurses who are empowered are the ones who are motivated to become active problem solvers. They become more confident and competent as a result of empowerment. Nurses will continue to create environments that promote the process of empowerment. Ways to promote nurse empowerment include:

- Share power and resources (including knowledge) with others
- Admit when a mistake is made (demonstrates trustworthiness and honesty)
- Avoid power struggles
- Use persuasion
- Use accurate information in decision making

An example of empowerment is self-governance (the process of having nurses work together to develop their own schedule for unit staffing coverage).

POLITICS OF NURSING

Politics is often used to refer to governmental and legislative issues. However, politics is a much broader concept in that it refers to how things are done and not done within an organization. **Politics** is the way in which people try to influence decision making, especially decisions about the use of resources. Organizational politics determines who has the power, who controls the resources, who is rewarded, and who makes the decisions. Every nurse is affected by organizational politics. It is up to the individual nurse to decide whether to join the political “game” or whether to let others make the decisions.

Nurses who are able to advance their careers have determined where the opportunities lie and have taken advantage of these opportunities. Some specific ways that nurses can increase their political power within an organization are listed in the Nursing Checklist.

Nurses need to be involved not only in organizational politics but also in politics that affect society at large. Because nurses provide essential services, they possess



RESEARCH FOCUS

Title of Study

“Key Indicators of Nursing Care Team Performance: Insights from the Front Line”

Authors

Dreachslin, J. L., Hunt, P. L., & Spranier, E.

Purpose

To determine the effectiveness of team delivery of care by studying self-directed nurse care teams (NCTs).

Methods

The following three indicators of well-functioning teams were examined in case study hospitals: (1) occurrence of role overlap, (2) team member's expressed satisfaction with interpersonal communication, and (3) team member's expression of belief that the client is their shared purpose. Transcript-based analysis of focus group members was performed.

Findings

The results of this study emphasize the significance of the registered nurses team leader's relationship skills. Analysis reveals that role overlap generally does not occur in practice. Ineffective communication was identified as the major barrier to teamwork. The focus group members also expressed that emphasis on the client was often impaired by cost containment issues and the desire of some team leaders to maintain their hierarchical positions.

Implications

This study suggests that focused attention to the development and reinforcement of leadership and interpersonal communication, especially for registered nurse team leaders, is essential.

Dreachslin, J. L., Hunt, P. L., & Spranier, E. (1999). Key indicators of nursing care team performance: Insights from the front line. *Health Care Supervisor, 17*(4), 70–76.

great potential power. However, nurses need better organization to fully actualize that potential. When that potential is realized, nursing will become even more powerful and, therefore, better able to influence the delivery of health care. Through increased power, nursing will have greater accountability.



NURSING CHECKLIST

Building Political Power Within an Organization

- Call attention to oneself by volunteering to serve on committees.
- Know what the organization values, not just the concepts written in the mission statement, but also the “unwritten rules” of expected conduct.
- Prepare oneself by earning the credentials needed for the particular position that is being sought.
- Communicate ideas, both verbally and in writing.
- Develop an extensive network by getting to know people who work in other areas of the organization and becoming involved in professional associations.
- Seek out a mentor or preceptor (membership in professional organizations facilitates this goal).
- Project a positive image, not only in dress and posture, but also in one's behavior.

KEY CONCEPTS

- The criteria for professional nursing practice include intellectual work, provision of a unique service, an expanding body of knowledge, personal responsibility to the public, an extended period of education that includes theory and practice, autonomy, a common identity shared by members, a sense of altruism and commitment to the public, and a code of ethics upheld by its members.
- Accountability is a process that requires individuals to be answerable for their actions. Being accountable means having an obligation (or duty) to act.
- As a profession, nursing is accountable for establishing and maintaining standards that promote safe, effective care.
- Professional accountability within nursing is fostered through mechanisms by which nurses obtain the right to practice and are the basis for understanding the responsibility nurses have to the public.
- Professional standards provide the framework for the development of competency statements.
- Nurse practice acts, which vary from state to state, clearly define the role and scope of nursing practice.
- Licensure gives an individual the right to offer one's services and receive compensation as a registered nurse.
- An individual can be granted the right to practice nursing within a state or territory by licensure through examination or licensure through endorsement.

- The registered nurse has the professional responsibility to attain and maintain competency.
- Nursing students have the responsibility to be prepared for clinical practice, to perform those skills for which competency has been achieved, and to seek instruction as necessary.
- Advanced practice nursing requires specialized knowledge and clinical proficiency. Advanced practice nursing roles include clinical nurse specialist, nurse practitioner, certified nurse midwife, and certified registered nurse anesthetist.
- Leadership involves motivating and guiding others to achieve goals.
- Managerial functions can be categorized into five major areas: planning, organizing, directing, controlling, and decision making.
- Characteristics of effective leaders include communication, credibility, delegation, critical thinking ability, initiating action, risk taking, and persuasiveness and influence.
- Types of power (reward, coercive, referent, expert, legitimate, personal, and informational) are derived from sources such as ability to provide incentives, ability to punish, charisma, expertise, position within an organization, self-confidence, and information.
- Through empowerment, both nurses and clients can achieve their professional and personal goals.
- Nurses influence the delivery of health care services through participation in organizational politics.

CRITICAL THINKING ACTIVITIES

1. Contact the state nurses association of the state in which your nursing school is located. Review the bylaws and newsletters for the past year. What types of programs are offered that promote the integrity of the profession?
2. Contact the board of nursing in the state in which your school is located. Request a copy of the nurse practice act and related rules and regulations. Review the nurse practice act to answer the following questions:
 - a. What are the qualifications of the board?
 - b. How are the members appointed?
 - c. What are the duties of the board?
3. Locate the address and name of the president of the state association for nursing students in your state through your school. Interview the officers of your school association. Why do they belong to the association? What issue(s) has the association addressed in the previous calendar year? How do the activities of the national, state, and school organizations contribute to the development of the profession?
4. Review a copy of your state nurse practice act and related regulations. How is nursing defined? How does the statutory definition compare to the definition of nursing as defined by the ANA? What is the authority for advanced practice nursing? Are advanced practice nurses reflected in the statutes?
5. What are some ways you can gain competencies after becoming licensed as a registered nurse?
6. Think of a leader. What characteristics or behaviors does this person demonstrate? Select one of the identified behaviors that you will work on developing.
7. In what ways do you feel powerful in your life? In what situations do you feel powerless? How can you maximize your power base?

WEB RESOURCES

- American Organization of Nurse Executives
www.aone.org
- Health Resources and Services Administration
of the Bureau of Health Professions,
Division of Quality Assurance
www.npdb-hipdb.com
- National Council of State Boards of Nursing
www.ncsbn.org
- National League for Nursing
www.nln.org

Chapter 23

Legal Accountability and Responsibilities



Men stumble over the truth from time to time, but most pick themselves up and hurry off as if nothing happened.

—Sir Winston Churchill (in Zerwekh and Claborn, 1994)

COMPETENCIES

1. Identify the sources of public law and their implications for nursing practice.
2. Describe the sources of civil law and their impact on the nursing profession.
3. Explain the actions that constitute unintentional and intentional torts.
4. List the legal responsibilities of nurses in delivering client care.
5. Identify areas of potential liability in nursing practice and the actions nurses can implement to avoid these problems.
6. Describe the safeguards that nurses can institute to decrease the risk of liability.
7. Explain the role of the nurse in the informed consent process.
8. Define the three types of advance directives.
9. Describe the legal considerations for nurses involved in client care situations involving abortion, pronouncement of death, do not resuscitate orders, euthanasia, care of the deceased, wills, organ donation, and autopsies.

KEY
TERMS

administrative law	duty	jurisprudence
advance care medical directive	equity	law
advance directive	euthanasia	liability
assault	expert witness	living will
battery	expressed contract	malpractice
causation	false imprisonment	misdemeanor
civil law	felony	negligence
consent	formal contract	plaintiff
constitution	fraud	public law
contract law	Good Samaritan acts	statutory law
criminal law	impaired nurse	testimony
defamation	implied contract	tort
defendant	informed consent	tort law
durable power of attorney	injury	understaffing
	invasive	unprofessional conduct

Law, like nursing, is responsive to the changing needs, roles, and relationships in society. As the nursing profession has continued to evolve, the scope of applicable law has enlarged considerably. This chapter discusses the laws affecting nursing practice and the legal responsibilities of nurses to clients.

LEGAL FOUNDATIONS OF NURSING

The word **law** is derived from an Anglo-Saxon term meaning *that which is laid down or fixed*. The two types of law are: **public law**, which deals with an individual's relationship to the state, and **civil law**, which deals with relations between individuals.

Sources of Law

The three sources of public law at the federal and state levels are constitutional, administrative, and criminal.

The three sources of civil law at the federal and state levels are contracts, torts, and protective/reporting laws.

Public Law

As shown in Table 23-1, public law governs the legal aspects of constitutional, administrative, or criminal law. The law of the United States is set forth in the Constitution. A **constitution** is a set of basic laws that defines and limits the powers of government. Laws enacted by legislative bodies are referred to as **statutory law**. State boards and professional practice acts, such as nurse practice acts, are created and governed under statutory laws.

Administrative law (regulatory law) is developed by groups who are appointed to governmental administrative agencies and who are entrusted with enforcing the statutory laws passed by the legislature. Under administrative law, state boards of nursing are given the power to further delineate the rules and regulations governing nursing as set forth in nurse practice acts. In these administrative rules, boards identify the specific processes for licensure, grounds for disciplinary proceedings, and the establishment of fees for the services

TABLE 23-1
Types of Public Law

Constitutional Law		Administrative Law		Criminal Law	
Federal	State	Federal	State	Federal	State
U.S. Constitution	State Constitutions	Food, Drug, and Cosmetic Act	Practice acts (e.g., nurse, medical, pharmacy)	Controlled Substance Act	Criminal codes (define murder, manslaughter, criminal negligence, rape, fraud, illegal possession of drugs, theft, assault, and battery)
Civil Rights Act		Social Security Act	Worker's Compensation laws	Kidnapping	
		National Labor Relations Act	State Labor Relations Act		
			Employment Security Act		

Data from Goldberg, K., Kaplan, H., & Shaw, M. (Eds.). (1996). *Nurse's legal handbook* (3rd ed.). Springhouse, PA: Springhouse.

and penalties rendered by the board. See Chapter 22 for a complete discussion of nurse practice acts.

The most common example of public law is **criminal law**, which refers to acts or offenses against the welfare or safety of the public. In criminal law there are two types of crimes: a **felony** (crime of a serious nature usually punishable by imprisonment in a state penitentiary at hard labor or by death, or a crime in violation of federal statute in which punishment is more than 1 year incarceration) and **misdemeanor** (an offense that is less serious than a felony and may be punished by a fine or sentence to a local prison for less than 1 year).

Civil Law

Civil law deals with crimes against a person or persons in such legal matters as contracts, torts, and protective/reporting law (Table 23-2). Most cases of malpractice (professional liability) fall within the civil law of torts (Flight, 1997).

Contract Law

Contract law is the enforcement of agreements among private individuals. A legal contract has three essential elements:

1. Promise(s) between two or more legally competent individuals stating what each individual must do or not do
2. Mutual understanding of the terms and obligations the contract imposes on each individual
3. Compensation for lawful actions performed

Contracts are recognized at the state level as shown in Table 23-2.

The terms of a contract may be agreed on orally or in writing; however, a written contract (**formal contract**) cannot be changed legally by an oral agreement. With an **expressed contract**, the conditions and terms of the contract are usually given in writing by the concerned parties. An **implied contract** recognizes a relationship between parties for services.

In accord with U.S. and Canadian contract law, the nurse is legally required to:

1. Adhere to the employer’s policies and standards unless they are in conflict with federal or state law
2. Fulfill the terms of contracted service with the employer
3. Respect the rights and responsibilities of other health care providers, especially in areas that promote the continuity of client care

Accompanying these legal responsibilities are the nurse’s rights to:

1. Expect adequate and qualified assistance in providing care
2. Receive reasonable and prudent conduct from the client
3. Expect from the employer compensation for services and provision of a safe environment with the necessary resources to perform the services
4. Be treated with prudent, reasonable behaviors from other health care providers

TABLE 23-2
Types of Civil Law

Contract Law		Torts		Protective/Reporting Laws	
Federal	State	Federal	State	Federal	State
None	Employment contracts Business contracts with clients Contracts with allied groups Uniform Commercial Code	Federal Torts Claims Act	State Torts Claims Act (to allow claims against the state) Negligence (common law claim) Malpractice statutes (professional liability) Assault Battery False imprisonment Invasion of privacy Libel Fraud	Child Abuse Prevention and Treatment Act Privacy Act of 1974	Age of Consent statutes (medical treatment, drugs, sexually transmitted disease) Privileged Communication Statute Abortion Statute Good Samaritan Act Abuse statutes (child, elderly, domestic violence) Involuntary Hospitalization Statute Living will legislation

Data from Goldberg, K., Kaplan, H., & Shaw, M. (Eds.). (1996). *Nurse’s legal handbook* (3rd ed.). Springhouse, PA: Springhouse.

Tort Law

Tort law is the enforcement of duties and rights among individuals independent of contractual agreements. **Tort** is a civil wrong committed on a person or property stemming from either a direct invasion of some legal right of the person, the infraction of some public duty, or the violation of some private obligation by which damages accrue to the person (Creighton, 1986). Tort liability can be classified as unintentional (negligence and malpractice) and intentional (assault and battery, false imprisonment, invasion of privacy, defamation, and fraud). Intentional torts must prove that the defendant intended to commit the act. Examples of tort law are listed in Table 23-2.

The Judicial Process

Equity acts in accordance with the spirit, not the letter, of the law. An outgrowth of English law, *equity allowed the king to hear an appeal when the application of the civil law became too harsh or when there was no adequate remedy in the common law to satisfy the needs of the petitioner*. Therefore, the appeal was made to *conscience* (the king's innate sense of justice).

Equity evolved with its own set of principles, rules, and precedents, and when these clashed with their counterparts in the common law courts, equity prevailed. Equity continues to play an important role in the operation of the American judicial system (Creighton, 1986).

Judicial Law

Courts interpret a state's laws as they apply to everyday events. Once a court in the same jurisdiction, such as state or city, interprets a law in a certain manner, other courts tend to follow the same interpretation. This is often referred to as "setting a precedent."

Additionally, lower courts in the same jurisdiction must adhere to the interpretations of higher courts in the same region. Thus, all of a state's lower courts must adhere to the interpretations and procedures specified by that state's supreme or highest court and all courts in the United States must follow the rules established by the U.S. Supreme Court.

This body of judge-made law is referred to as **jurisprudence**. A well-known and controversial example of jurisprudence is the constitutional right to an abortion recognized by the Supreme Court that limits a state's ability to restrict a woman's access to an abortion.

LEGAL LIABILITY IN NURSING

Negligence and Malpractice

When the nurse fails to meet the legal expectations of care, the client can initiate action if harm or injury is incurred by the client. **Liability** is an obligation one has

incurred or might incur through any act or failure to act. The term **malpractice** refers to the behavior of a professional person's wrongful conduct, improper discharge of professional duties, or failure to meet the standards of acceptable care, which result in harm to another person (Zerwekh & Claborn, 1997). **Negligence** (breach of duty) is the failure of an individual to provide care that a reasonable person would ordinarily use in a similar circumstance. In other words, action that is contrary to the conduct of a reasonable person and results in harm is considered to be negligent behavior. When a nurse commits a negligent act that results in injury, it is known as malpractice.

Proof of liability depends on four elements:

1. **Duty** is an obligation created either by law or contract or by any voluntary action. It is the first element that must be proved for malpractice as it arises from the nurse-client relationship.
2. Breach of duty occurs when a nurse fails to act in accord with the standard of care. An act of commission or omission of the nurse may constitute a breach of the standard of care.
3. **Injury** (physical, financial, or emotional harm) must be demonstrated by the person making the claim to prove negligence. Damages is the money or other compensation awarded by the court to the **plaintiff** (the party who initiates a lawsuit that seeks damages or other relief).
4. **Causation** is the breach of duty that must be proved to have legally caused the injury. A cause-and-effect relationship must be clearly established.

To succeed in a malpractice suit, the plaintiff must first show that the **defendant** (the person being sued) owed him a duty. The plaintiff must then show that the defendant did not meet the duty and that this breach of duty caused harm, requiring compensation. Once the plaintiff files charges, the defendant must either refute the charges by demonstrating that, if a duty was owed, the duty was fulfilled or that, if a duty was breached, the breach was not the cause of the plaintiff's complaint of injury. "Perhaps the most difficult concept in negligence is that of causation—proving that the negligent act was the cause of the injury" (Fiesta, 1997a, p. 24).

A person typically has no difficulty showing that a nurse owed a duty. All that needs to be demonstrated is that the nurse was working on the day of the injury and was responsible for the person's care as verified by the staffing schedules and assignment sheets. It is more difficult to prove that the duty owed was breached.

Courts usually apply the *reasonable person standard* that asks: "What would a reasonable nurse do in a similar situation?" To answer this question, courts look to the institution's policies and procedures to determine how client care is to be performed in that facility. When determining a breach of a duty, the actions of the nurse are also compared against the professional standards of

nursing care. This is done by using published nursing standards of specialty nursing groups or by having another nurse testify as an expert witness. An **expert witness** is a person called by parties in a malpractice suit who is a member of the same profession as the party being sued and who is qualified to testify to the expected behaviors usually performed by members of the profession in a similar situation.

When a nurse is called to testify in a malpractice lawsuit either as the defendant or as an expert witness, the **testimony** (written or verbal evidence given by a qualified expert in an area) must be based on “facts.” The jury and the court must form an opinion on their own; they are not interested in the witness’s opinions on the matter in dispute.

Nurses are expected to administer client care based on both institutional policy and procedure and the professional standards of care. The nurse defendant would use the same methods to prove that a breach of duty did not occur: showing that the facility’s policies and procedures were followed and that the actions followed accepted nursing standards. An expert witness is often asked to describe the relevant standards of care that will demonstrate that the client had the right to receive a *duty owed* from the nurse.

It is not sufficient to imply that the nurse breached a duty. The claimant must also show that this breach caused harm. A person cannot be compensated for a breach that caused no harm. Frequently, complaints against nurses are in one of the following categories: client falls, medication errors, failure to monitor a client in restraints, improper technique in giving treatment, failure to follow hospital procedures, and failure to supervise nonlicensed employees.

Informed Consent

Laws regarding informed consent protect the client’s right to self-determination. A client is able to make an informed decision about consenting to or refusing a treatment regime only if adequate information has been presented.

The law requires that clients or their representatives be given sufficient information regarding various treatment modalities so that the consent is an informed process. A **consent** is a voluntary act by which a person agrees to allow someone else to do something. **Informed consent** means that the client understands the reason for the proposed intervention, and its benefits and risks, and agrees to the treatment by signing a consent form (Figure 23-1). Consent forms must be obtained for all **invasive** (accessing body tissues, organs, or cavities through some type of instrumentation) procedures.

Legally the client must be mentally competent to give consent for medical procedures. It is the legal responsibility of the health care provider performing the procedure to obtain the client’s informed consent. Informed consent is a process consisting of information and con-



Figure 23-1 This nurse is witnessing the signing of a consent form after the physician has fully informed the client about the proposed treatment. How does the nurse’s compliance with the policy of informed consent lessen the nurse’s liability in terms of this client’s care?

sent, not merely the signing of a form (Switzer, 1995). Obtaining the informed consent requires client teaching by the health care provider.

The health care provider may not coerce the client to sign the consent. The client has the right to refuse the information and waive the informed consent and undergo treatment, but this decision must be documented in the medical record. The signing of an informed consent can also be waived for urgent medical and surgical intervention as long as institutional policy so indicates.

Parental or guardian consent should be obtained before treatment is initiated on a minor. There are three exceptions to this ruling: an emergency; situations where the consent of the minor is sufficient, such as treatment of a sexually transmitted disease; and a court order or other legal authorization has been obtained. If a client is a minor and the parents or legal guardian deny the lifesaving treatment, the court may overrule the decision. Under the laws of most states and Canadian provinces, an emancipated minor (one who is married, pregnant, a parent, or financially independent) can give a valid consent to treatment. Most states legally mandate that a client’s HIV status remain confidential (Cady, 1999). Therefore, nurses may be held liable for inappropriate disclosure, whether intentional or not, of information about a person’s HIV status.

Switzer (1995) discusses how the courts have not always been clear in defining nursing responsibilities regarding informed consent. The general rules to keep in mind are:

1. The physician cannot delegate the responsibility for obtaining informed consents. However, a nurse could be held liable on a battery claim if the nurse knows the client has not given informed consent.
2. As directed by institutional policy, the nurse may witness a client’s signing of a consent form or may be responsible for making sure the signed form is in the chart (Figure 23-2). As a witness to the client’s

TULANE MEDICAL CENTER Hospital and Clinic 1415 Tulane Avenue New Orleans, Louisiana 70112	
Consent for medical procedure and acknowledgement of receipt of information	
Date _____	
In keeping with the Louisiana State Law, you are being asked to sign a confirmation that we have discussed your contemplated operation or medical procedure. We have already discussed with you the common problems or risks. We wish to inform you as completely as possible. Please read the form carefully. Ask about anything that you do not understand and we will be pleased to explain it.	
1.] I hereby authorize and direct Dr. _____, with associates or assistants of his choice, to perform upon _____, the following surgical, diagnostic, or medical procedure _____ including any necessary or advisable anesthesia.	
2.] In general terms, the nature and purpose of this operation or medical procedure is: _____ _____	
3.] This procedure has been explained to me. Alternate methods have also been explained to me, as have the advantages and disadvantages. I am advised that though good results are expected, the possibility and nature of complications cannot be accurately anticipated and that, therefore, there can be no guarantee as expressed or implied either as to the result of surgery or as to cure. The possible risks include death, brain damage, quadriplegia, paraplegia, loss of organ, loss of an arm or leg, or disfiguring scars.	
4.] I authorize the administration of a blood transfusion and such additional transfusion as may be deemed advisable in judgement of the attending physician, or his associates or assistants. It has been fully explained that blood transfusions are not always successful in producing a desirable result and that there is a possibility of ill effects, such as the transmission of infectious hepatitis or other diseases or blood impairments. Also, it has been explained that emergencies may arise when it may not be possible to make adequate cross-matching tests, and that immediate need may make it necessary to use existing stocks of blood which may not include compatible blood types.	
5.] I further authorize the doctors to perform any other procedure that in their judgement is advisable for my well being. I hereby authorize and direct the above named physician and associates or assistants to provide such additional services as they may deem reasonable and necessary including, but not limited to, the administration of any anesthetic agent, or the services of the X-ray department or laboratories, and I hereby consent thereto.	
6.] I hereby state that I have read and understand this consent, all questions about the procedure or procedures have been answered in a satisfactory manner, and that all blanks were filled in prior to my signature.	
Witness _____	Signature _____ (patient or person authorized to consent)
Witness _____	Relationship _____ (required only for telephone consent or consents signed with an X)
I certify that all blanks in this form were filled in prior to signature and that I explained them to the patient or his representative before requesting the patient or his representative to sign it.	
Signature _____ (above named physician to sign)	

**CONSENT FOR MEDICAL PROCEDURE AND ACKNOWLEDGEMENT
OF RECEIPT OF INFORMATION**

- Order by priority when consenting to medical/surgical procedure (except for care and treatment of mentally ill)**
- | | |
|---|---|
| 1. Any competent adult, age 18 or older, for himself.
2. Any parent, whether an adult or minor, for his minor child.
3. Any married person, whether an adult or minor, for his/her spouse if spouse is unable to consent.
4. Any person temporarily standing in place of a parent whether formally served or not for the minor under his care and any guardian for his ward. | 5. Any female regardless of age or marital status, for herself when given in connection with pregnancy or childbirth.
6. In the absence of a parent, any adult, for his minor brother or sister.
7. In the absence of a parent, any grandparent for his minor grandchild. |
|---|---|

Figure 23-2 Example of a Consent Form (Courtesy of Tulane University Hospital and Clinic, New Orleans, LA)

signature, the nurse is confirming that the client was fully alert and aware of what was being signed.

3. When the nurse discovers circumstances that render a signed consent form invalid (such as a change in the client's condition) the nurse should notify the physician. If the client will not be harmed by a delay, the nurse is justified in refusing to assist with a procedure until the requirements for the informed consent are satisfied.

Although the law does not require staff nurses to obtain a formal informed consent for nursing procedures, the nurse has the responsibility of explaining to the client what to expect during the procedure.

Assault and Battery

Assault is a stated intent to touch a person in an offensive, insulting, or physically intimidating manner. **Battery** is the touching of another person without the person's consent. The legal issues arising from assault and battery are usually based on whether the client consented to the touching that occurred.

Because assault and battery both deal with *acts of touching*, the client's cultural values, beliefs, and practices must be respected by the nurse. If the nurse should fail to recognize cultural differences, undesired outcomes may occur in the nurse–client relationship.

False Imprisonment

False imprisonment occurs when clients are made to wrongfully believe they cannot leave a place. The most common example of this tort is telling a client not to leave the hospital until the bill is paid (Zerwekh & Claborn, 1997). Another example of false imprisonment is the use of physical or chemical restraints.

Restraints or Seclusion

The Omnibus Budget Reconciliation Act (OBRA) of 1987 outlines the rights of the client and the responsibilities of health care providers regarding the use of both physical and chemical restraints. The nurse is to use safety measures, such as keeping the client's bed in a low position and checking on the client whenever the nurse or other caregivers pass the client's room, in an effort to avoid the use of restraints. Chemical restraints, primarily psychotropic medications (such as sedatives, hypnotics, anti-anxiety agents, and neuroleptics) are used to control hyperactive behavior of agitated clients.

Restraints are legal only if they are necessary to protect the client or others from harm. If a competent client refuses to follow orders and the nurse uses restraints, the nurse can be charged with false imprisonment and/or assault and battery. In an emergency situation when a client becomes violent and is in immi-

nent danger of harming self or others, the nurse may apply restraints and then immediately obtain an order from the physician. The law mandates that the use of restraints or seclusion must have a physician order. The nurse is legally accountable for the client in restraints or seclusion. Care of clients in restraints requires documentation as prescribed in specific agency policies.

Privacy and Confidentiality

According to Badzek and Gross (1999), the concept of privacy includes the right to:

- Be left alone (i.e., freedom from intrusion)
- Determine bodily integrity (to consent to or refuse treatment)
- Control how personal information is shared

Nurses are accountable for respecting the client's right to privacy. State laws respect privilege doctrine that guarantees that no one will reveal confidential information without the client's permission. Nurses must obtain the client's permission before disclosing any information regarding the client, going through the client's personal belongings, performing procedures, and photographing the client. An essential component of nursing practice is protecting the client's confidentiality and privacy. The American Nurses Association Code for Nurses (1985) identifies privacy and confidentiality as key elements in maintaining the integrity of the nursing profession.

The Canadian Nurses' Association (CNA) has developed its own Code of Ethics. CNA's Code of Ethics has involved nurses in all provinces and territories in Canada. Within the CNA's Code of Ethics, the value that applies to confidentiality states that the nurse is responsible to hold confidential all information about a client learned in health care settings. The nurse–client relationship is based on trust. Any violation of the client's privacy or breach of confidentiality may interfere with trust.

Nurses must ensure that clients understand their privacy rights including withholding information such as their diagnoses from the family. As another example, clients with sexually transmitted diseases or who are positive for the human immunodeficiency virus (HIV) may choose to withhold this information from their family. Most states recognize 18 years as the age at which adolescents are competent to make decisions regarding themselves. Nurses must be aware of the legislation in the state of practice since issues regarding health care of children varies from state to state (Muscare, 1999).

Privacy involves more than privilege doctrine. Nursing care should be delivered with a caring attitude that provides for privacy such as keeping the door to the client's room closed, knocking before entering the client's room, closing the curtains around the bed before exposing the client, and draping the client appropriately for procedures.

A rapidly increasing problem that threatens privacy and confidentiality is access to electronic data. The technological proliferation of cellular phones, facsimile machines, and computerized medical records may jeopardize the privacy of information. In 1998, the American Nurses Association initiated a movement to regulate telecommunication technologies used in health care. “Confidentiality of client visits, client health records, and the integrity of information in our health care system is essential” (American Nurses Association, 1998, p. 4).

Defamation

Defamation occurs when information is communicated to a third party that causes damage to someone else’s reputation either in writing (libel) or verbally (slander). The most common examples of this tort are giving out inaccurate or inappropriate information from the medical record; discussing clients, families, or visitors in public areas; or speaking negatively about coworkers (Zerwekh & Claborn, 1997).

Fraud

Fraud results from a deliberate deception intended to produce unlawful gain. Examples of fraudulent claims in health care are illegal billing and deceit in obtaining or attempting to obtain a nursing license (Flight, 1997). Fraudulent billing practices include overcharging for services and billing for services that were not provided. Other examples of fraud in health care include obtaining and using false credentials and falsifying medical records.

What should nurses do when they suspect fraud is occurring in the workplace? Nursing activities to deter fraud include the following:

- Documenting facts accurately
- Reporting illegal activities
- Educating peers and the public as to what constitute fraud

The federal False Claims Act protects an employee who experiences any type of retaliation for reporting fraudulent practices (Kleinman, 1999).

Unprofessional Conduct

Conduct that could adversely affect the health and welfare of the public constitutes **unprofessional conduct**. The following actions or omissions constitute unprofessional conduct: breach in client confidentiality; failure to use sufficient knowledge, skills, or nursing judgment when practicing nursing; physically or verbally abusing a client; assuming duties without sufficient preparation; knowingly delegating nursing tasks to unlicensed personnel that places the client at risk for injury; failure to

accurately maintain a record for each client or falsifying a client’s record; and leaving a nursing assignment without properly notifying appropriate personnel.

Controlled Substances

The improper use of controlled substances may lead to criminal penalties in the United States and Canada under laws governing the distribution and use of controlled substances (narcotics, depressants, stimulants, and hallucinogens). Under law, agencies that distribute controlled substances must follow federal and state regulations regarding the security and access to these drugs. Title II of the Comprehensive Drug Abuse Prevention and Control Act of 1970 (Controlled Substances Act) requires accurate documentation of narcotic administration.

The Impaired Nurse

If a nurse suspects a coworker is abusing chemicals, the nurse has a duty to report the individual to nursing administration in a confidential manner with the goal of treatment being the priority issue. Nursing administration should then notify the board of nursing regarding the nurse’s behavior.

The ANA’s *Code for Nurses* (1985) states that the nurse acts to safeguard the client and the public when health care and safety are affected by incompetent, unethical, or illegal practice of any person. Some boards of nursing will discipline a nurse for failing to report a fellow nurse who is abusing drugs. An **impaired nurse** is habitually intemperate or is addicted to the use of alcohol or habit-forming drugs. See the accompanying display for indicators of substance abuse in nurses.

With the formation of the Task Force on Addiction and Psychological Disturbance by the ANA in 1981, many states have initiated programs to identify, treat, and assist impaired nurses. Intervention programs allow the nurse to seek and comply with a treatment regimen as an alternative to disciplinary action.

SUBSTANCE ABUSE INDICATORS

- Social isolation (e.g., requesting to work the night shift)
- Changes in personal appearance and mood
- Excessive work-related tardiness, absences, and accidents
- Excuses for being unavailable while on duty
- Resistance to change
- Defensive when questioned about client complaints and discrepancies in the narcotic control sheet
- Failure to meet schedules and deadlines
- Inaccurate and sloppy documentation

Safety

The promotion of physical safety is one of the most important responsibilities of the nurse. There are four areas regarding client safety in which nurses are at legal risk: (1) failure to monitor client status, (2) medication errors, (3) falls, and (4) use of restraints.

“Failure to monitor is a basis for liability that nurses must be particularly aware of” (Fiesta, 1997b, p. 16). The nurse must be aware of the client’s condition. This calls for frequent assessment of all clients and adherence to policy guidelines regarding assessment of clients with special needs, such as those who are immobile, critically ill, or unconscious.

It is predicted that approximately 800,000 hospitalized clients will experience an adverse drug event each year. Almost 50% of adverse drug events are preventable (Fiesta, 1997b). Nurses play a major role in the prevention of adverse drug events by careful drug administration and client assessment.

A major area for potential liability is client falls. “Numerous lawsuits have demonstrated the importance of assessing patients for fall potential and taking necessary precautions in caring for patients who are likely to fall” (Eskreis, 1998, p. 34).

Another potential problem is the use of medical equipment. The nurse has the legal duty to use reasonable care when choosing and using medical equipment (Eskreis, 1998).

Understaffing

Understaffing refers to the failure of a facility to provide a sufficient number of professional staff to meet client needs. Health care providers must have written staffing guidelines for each client population and setting to comply with the standards of the Joint Commission for the Accreditation of Healthcare Organizations. Usually staffing policies are in place to direct the decision making regarding increasing or downsizing staff numbers.

Reassignment

Questions are often raised by nurses in hospitals regarding the liabilities of “floating” (reassignment to work on an unfamiliar unit). This is an acceptable, legal practice used by hospitals to solve their understaffing problems. Legally, a nurse cannot refuse to float unless a union contract guarantees that nurses work only in a specified area or the nurse can prove the lack of knowledge for the performance of assigned tasks.

When reassignment occurs, nurses should set priorities and identify potential areas of harm to the client. Nursing experts recommend the practice of “nurses speaking out when they don’t feel competent to take care of certain patients or perform certain procedures” (Trossman, 1999, p. 2). The nurse is legally mandated to be competent before performing procedures; inexperience

is no legal excuse for errors. “When floating, it’s especially important to ask questions of the regular staff” (Ahmed & Fecik, 1999, p. 12). All pertinent facts relating to client care problems and safety issues should be documented. Nurses who are required to “float” should receive orientation prior to reassignment.

Executing Prescribed Orders

Medical practice acts of states and provinces usually define medicine as any act of diagnosis, prescription, surgery, or treatment. This definition allows for the initiation of written or verbal physician orders. In accord with nurse practice acts, nurses are obligated to follow the orders of a licensed physician or other designated health care provider *unless the orders would result in client harm*.

The nurse has a legal responsibility to the client to ensure that the order is clear and appropriate to the client’s treatment. Ahmed and Fecik (1999) state “Questioning unclear orders testifies to a nurse’s sense of responsibility” (p. 12). When the nurse questions a physician order, the physician should be contacted to obtain clarification. If, after physician clarification the nurse still questions the order, the nurse should institute agency policy; for example, notify the supervisor. Following the agency’s policy in this matter protects the nurse from employer disciplinary action.

Nurses are not encouraged to accept verbal orders from a physician because of the risks of error. See Chapter 26 for a complete discussion of how to document verbal orders.

NURSING ALERT

Remember that the nurse remains liable for incorrectly administering a medication even if it is ordered incorrectly by a physician. “You’re not exempt from liability because you were following a doctor’s order” (Eskreis, 1998, p. 36).

LEGAL RESPONSIBILITIES AND ROLES OF PROFESSIONAL NURSES

Nurses are legally responsible to practice nursing as set forth in nurse practice acts and professional standards of care. There are several roles performed by nurses related specifically to legal accountability.

Provider of Service

The nurse is legally responsible to ensure that the client receives competent, safe, and holistic care. Nurses are expected to:

- Render care based on their education, experience and circumstances (standards of “reasonable, prudent person”)
- Discuss with the client the associated risks and outcomes inherent in the plan of care as well as alternate treatment modalities
- Supervise and evaluate aspects of care that have been delegated to licensed and unlicensed caregivers
- Document the care the client receives and other significant events affecting the client
- Maintain clinical competency

The nurse is also responsible for the client’s physical safety as discussed in this chapter in the section on safety.

Expert Witness

To qualify as an expert witness, the nurse’s education and experience are presented to the court to prove the nurse is knowledgeable about current standards and practice. The credentials of an expert witness have to match or exceed a defendant’s qualifications. During the trial, the plaintiff’s and the defendant’s attorneys have the right to use the testimony of the expert witness for their respective cases.

Forensic Specialist

A relatively new role for nurses is that of forensic nurse. In 1997, the American Nurses Association published *Scope and Standards of Forensic Nursing Practice*, which describes some of the responsibilities of forensic nurses as treating incarcerated clients, investigating trauma cases, and serving as expert witness in court. As violence continues to escalate in the United States, there will be an increased demand for forensic nurses.

Reporting Responsibilities

Nurses should know which situations have to be reported because reporting statutes vary among the states and provinces; refer to Table 23-2 for protective/reporting laws. Criminal acts of rape and sexual assault must also be reported in most states and provinces.

LEGAL RESPONSIBILITIES OF STUDENTS

Nursing students must act as reasonably prudent persons, equivalent with education and experience, when performing nursing duties. When employed as caregivers, nursing students must perform only those tasks that they are competent to perform, as stated in their job description. See Chapter 22 for a complete discussion of the legal expectations of nursing students.

THINK ABOUT IT

Legal Implications for Nursing Students

When agency policy conflicts with the nurse practice act, what should you do? Remember that the state legislature empowers the board of nursing to define and monitor practice. If, as a nursing student, you willfully violate the state board’s ruling, what future implication(s) could this have on your ability to apply for licensure?

LEGAL SAFEGUARDS FOR NURSING PRACTICE

There is a common set of actions a nurse can take to protect against litigation. Although each client encountered presents unique situations that can place the nurse at legal risk, certain general nursing care activities decrease this risk (refer to the Nursing Checklist). Following the guidelines in the checklist should help protect nurses from lawsuits as well as provide defense in the event of a suit.

Institutional Policies

All health care facilities have policies. Nursing students and registered nurses are obligated to know the policies and follow the procedures/protocols that flow from policy. Although policies are not laws, courts generally rule against nurses who violate policies.

Professional Liability Insurance

Nurses should consider purchasing their own liability insurance for protection against malpractice lawsuits. Nurses may erroneously assume that they are protected by their employer’s professional liability policies. When securing liability insurance, the nurse should validate the company’s reputation. Most professional nursing organizations offer group liability insurance.

Usually when a nurse is sued, the employer is also sued for the nurse’s actions or inaction. Even though this is the norm, nurses are encouraged to have their own malpractice insurance. For example, a suit may be filed for an incident that occurred in a facility where the nurse is no longer employed. Having one’s own insurance also provides the nurse protection as an individual and allows the nurse to have an attorney who has only the nurse’s interests in mind.

Risk Management Programs

Risk management is a method of identifying, evaluating, and decreasing the agency’s risk of financial loss. Most health care facilities are required to have formal risk management programs in place by agencies such as the

**NURSING CHECKLIST****Actions to Decrease the Risk of Liability**

- Communicate with your clients by keeping them informed and listening to what they say.
- Acknowledge unfortunate incidents and express concern about these events without either taking the blame, blaming others, or reacting defensively.
- Chart and time your observations immediately, while facts are still fresh in your mind.
- Take appropriate actions to meet the client's nursing needs.
- Follow the facility's policies and procedures for administering care and reporting incidents.
- Acknowledge and document the reason for any omission or deviation from agency policy, procedure, or standard.
- Maintain clinical competency and acknowledge your limitations. If you do not know how to do something, ask for help.
- Promptly report any concern regarding the quality of care, including the lack of resources with which to provide care, to a nursing administration representative.
- Use appropriate standards of care.
- Time and document changes in conditions requiring notification of the physician and include the response of the physician.
- Delegate client care based on the documented skills of licensed and unlicensed personnel.
- Treat all clients and their families with kindness and respect

Department of Health and Human Services, accrediting bodies, and liability insurance carriers. These programs are based on systematic reporting of incidents or unusual occurrences, for example, client falls.

Incident Reports

In accord with the agency's policies, nurses are required to file incident reports when a situation arises that could or did cause client harm. When filing an incident report, the nurse should state only the *facts* surrounding the incident. The nurse's opinions or conclusions about the incident are not to be documented. Also, the client's medical record should not contain any reference to the filing of an incident report.

Client Education

Safe nursing care requires that the client has a thorough understanding of the treatment plan. Although the

physician has specific responsibilities regarding client education, the nurse must also provide client teaching and document the degree of learning. See Chapter 13 for a complete discussion of the nurse's responsibilities in client education.

LEGISLATION AFFECTING NURSING

There are legal, as well as ethical, implications inherent in nursing practice, which require nurses to know and comply with the specific existing health care laws and regulations in their state of licensure. The common legal liabilities in some nursing practice settings are discussed in the following section.

Advance Directives

The Omnibus Reconciliation Act of 1990, called the Patient Self-Determination Act (PSDA), defines an **advance directive** as a written instruction that is recognized under state law and is related to the provision of such care when the individual is incapacitated (Cate & Gill, 1991). There are three types of legal instruments that comply with the Act's definition:

1. A **living will** is a document prepared by a competent adult that provides direction regarding medical care in the event the person becomes unable to make decisions personally.
2. **Durable power of attorney** (health care proxy) is an authorization that enables any competent individual to name someone to exercise decision-making authority, under specific circumstances, on the individual's behalf.
3. **Advance care medical directive** is a document in which an individual, in consultation with the physician, relatives, or other personal advisors, provides precise instructions for the type of care the client wants or does not want in a number of scenarios.

The living will is the most widely available instrument for recording future health care-related decisions. However, it is not an enacted statute in all 50 states. Figure 23-3 presents a sample document of a living will. All states provide for a general durable power of attorney.

American Health Consultants (1995) discusses the need to provide public education about initiation of advance directives in a non-health care setting in simple, easily understood language. Follow-up systems need to be put into place on a community level to ensure that citizens are aware of the purpose and provisions of advance directives and share these documents with their primary physician and family members.

As the total number of citizens in their eighties and nineties increases (Hogstel, 2001), the numbers of those who are not able to handle their own affairs and

Declaration

Declaration made this _____ day of _____ (month, year).

I, _____, being of sound mind, willfully and voluntarily make known my desire that my dying shall not be artificially prolonged under the circumstances set forth below and do hereby declare:

If at any time I should either have a terminal and irreversible incurable injury, disease, or illness or be in continual profound comatose state with no reasonable chance of recovery, certified by two physicians who have personally examined me, one of whom shall be my attending physician, and the physicians have determined that my death will occur whether or not life-sustaining procedures are utilized and where the application of life-sustaining procedures would serve only to prolong artificially the dying process, I direct that such procedures be withheld or withdrawn and that I be permitted to die naturally with only the administration of medication or the performance of any medical procedure deemed necessary to provide me with comfort care.

In the absence of my ability to give directions regarding the use of such life-sustaining procedures, it is my intention that this declaration shall be honored by my family and physician(s) as the final expression of my legal right to refuse medical or surgical treatment and accept the consequences from such refusal.

I understand the full import of this declaration and I am emotionally and mentally competent to make this declaration.

Signed: _____

City, Parish, and State of Residence _____

The declarant has been personally known to me and I believe him or her to be of sound mind.

Witness: _____

Witness: _____

Figure 23-3 Sample of a Living Will (Courtesy of Louisiana Hospital Association, Baton Rouge, LA)

make decisions for themselves increases. This situation frequently requires the caregiver to become involved in legal affairs. Nurses who work with older clients should be aware of community resources to assist the elderly in legal matters. Local groups (e.g., the American Association of Retired Persons) are often able to refer people to agencies providing legal assistance for reasonable charges.

Abortion

The 1973 Supreme Court decision of *Roe v. Wade* increased the safety and availability of abortions in the United States. Health care agencies and practitioners in various states may be required to report abortions performed as well as other information about the client, the procedure, and any resulting complications. Some

states only require the reporting of abortions for minors.

Nurses may need to explore their own feelings or beliefs about abortion before assisting with these procedures. The nurse should also be aware of the client's feelings before the abortion so that appropriate referral can be made for postprocedure care if necessary.

The Americans with Disabilities Act

Passed by the U.S. Congress in 1990, The Americans with Disabilities Act (ADA) prohibits discrimination on the basis of disability in employment, public services, and public accommodations. The ADA defines a person with a disability as having a physical or mental impairment that substantially limits one or more of the major

IMPAIRMENTS COVERED BY THE AMERICANS WITH DISABILITIES ACT

Mental Impairments

- Learning disabilities
- Psychiatric disorders
- Organic brain syndrome
- Retardation

Physical Impairments

- Addictions
- Cancer
- Cerebral palsy
- Diabetes
- Epilepsy
- Heart disease
- HIV (symptomatic or asymptomatic)
- Multiple sclerosis
- Muscular dystrophy
- Orthopedic, visual, speech, and hearing impairments
- Tuberculosis

THINK ABOUT IT

Hearing Impaired Coworker

How would you feel about a nurse coworker who is hearing impaired and cannot hear heart, lung, and bowel sounds? What are your responsibilities in such a situation?

life activities. See the accompanying display for disabilities that are covered by the ADA.

Good Samaritan Acts

Good Samaritan acts are laws that provide protection to health care providers by ensuring immunity from civil liability when assistance is provided at the scene of an emergency when the caregiver does not intentionally or recklessly cause client injury. The caregiver will be evaluated by how a reasonable and prudent caregiver would have responded in a similar situation. Good Samaritan acts are examples of common and statutory laws as determined by the individual states. Although all 50 states and the District of Columbia have Good Samaritan acts, some of the Canadian provinces (e.g., Ontario and Quebec) do not have Good Samaritan acts.

Good Samaritan acts vary in coverage from state to state and it is the responsibility of caregivers to know the law for their own jurisdictions. Keep in mind that some states only cover nurses licensed in that state and that these acts are amended periodically by legislation. Good Samaritan acts do not provide immunity to the nurse who is providing care as an employee (Zerwekh & Claborn, 1997).

THINK ABOUT IT

Good Samaritan Acts

If, as a nurse, you charge or accept a fee for the services rendered during an emergency situation, will you still be protected by a Good Samaritan act? What are the legal implications for accepting compensation for your professional services?



Title of Study

“Elderly Patients’ Understanding of Advance Directives”

Authors

Zronek, S., Daly, B., & Lee, H.

Purpose

To determine client’s beliefs and levels of understanding about advance directives (AD).

Methods

This was a descriptive study conducted by use of medical records reviews and client interviews. During the interviews, clients were read a questionnaire and the answers were recorded by an interviewer. The questions sought information about the description of the type of AD completed, the client’s source of information about ADs, and beliefs/communications regarding the completion of the AD.

Findings

A majority of clients interviewed were able to clearly state what an AD means. Ninety percent of respondents stated that they had discussed ADs with family members. Ninety-eight percent reported that they had discussed their feelings about life-sustaining treatment measures with potential surrogate decision makers. Many of those surveyed stated the belief that ADs facilitate client choice and decrease family suffering. Generally, clients believed ADs would “make a difference” for them at the end of their lives.

Implications

The clients in this study expressed a wish to simplify end-of-life decisions. They also stated a strong belief that ADs were useful in meeting this goal.

Zronek, S., Daly, B., & Lee, H. (1999). Elderly patients' understanding of advance directives. *JONA's Healthcare Law, Ethics, and Regulation*, 1(2), 23–28.

National Practitioner Data Bank

The Health Care Quality Improvement Act was enacted in 1986 to identify unsafe health care providers and restrict their unsafe practice. The major goal of this legislation was to deter incompetent practitioners from moving to a new state without having to report on problematic care delivery in previous states. There were two major components of this law: (1) to establish a National Practitioner Data Bank, which would serve as a clearinghouse for information on unsafe practitioners; and (2) to provide immunity for reporting incompetent peers.

Occupational Safety and Health Act

In 1970, the Occupational Safety and Health Act (OSHA) was enacted to ensure safe work environments for Americans. The intent of the act was to decrease work-related injuries. The act was expanded in 1991 to develop standards for safety of those who may experience work-related exposure to blood-borne contaminants. Employers are fined if they violate OSHA rules and regulations.

LEGAL ISSUES RELATED TO DEATH

Do Not Resuscitate Orders

Sudden death from a cardiac arrest requires the initiation of cardiopulmonary resuscitation (CPR) by competent persons. In health care settings, caregivers (often a nurse) perform CPR and other lifesaving measures according to agency policy unless the primary physician has written a *do not resuscitate (DNR)* order in the client's medical record. The physician's DNR order provides an exception to the universal standing order to resuscitate.

Health care agencies are required to have policies in place that provide a mechanism for reaching a DNR decision as well as for resolving conflicts in decision making. The principles of informed consent must be respected by the physician who writes a DNR order. When the client is either comatose or near death, there should be knowledgeable concurrence by the physician and the client's family or guardian about the actions to prolong the client's life. It is the responsibility of the nurse to know and follow the client's wishes relative to resuscitation and the application of life-support systems. This information must be documented in the client's medical record.

Euthanasia

Euthanasia refers to an intentional action or lack of action causing the merciful death of someone suffering from a terminal illness or incurable condition. The issue

of euthanasia is a difficult one for society, the courts, and health care facilities (Flight, 1997). See Chapter 24 for a complete discussion of euthanasia and nursing.

Wills

The United States and Canada have laws regarding the legal requirements for written and oral wills. These laws define the format of wills, the number of witnesses needed, who can be a witness, what makes a will valid or invalid, how to invalidate a will, and how to contest a will (Goldberg et al, 1996). Nurses are usually required to notify the physician and nurse supervisor before acting as a witness and signing a will. Nurses should refrain from assisting the client with the wording of the will.

Pronouncement of Death

Medicine has yet to agree on one acceptable definition of death. The various definitions are as follows: the absence of awareness of external stimuli, lack of movement or spontaneous breathing, absent reflexes, a flat brain wave repeated twice in 24 hours, and the Uniform Definition of Brain Death, which requires irreversible cessation of all functioning of the brain (Zerwekh & Claborn, 1997).

THINK ABOUT IT

What Constitutes Death?

Considering the various definitions of death, is it absolutely clear when the moment of death occurs? Based on these definitions, when can the life-supporting machines be turned off? Although the right of the client to refuse treatment, which may lead to death, has been established, can you identify clinical circumstances where the client might be deprived of the right to die?

State regulatory boards have initiated laws to protect the public when dealing with issues of death. It is usually within the scope of practice of medicine to pronounce a client dead. However, some boards of nursing allow the nurse, in certain circumstances and with thorough documentation, to make a determination and pronouncement of death (Bosna, 1995; State of Alaska, 1994). Because state laws vary concerning this issue, it is important for the registered nurse to know the laws in the state(s) or province(s) of licensure.

Care of the Deceased

When a client dies, the nurse is obligated to treat the deceased with respect and dignity. The nurse should prepare the body for removal to the morgue in accord with

agency policies. The nurse is responsible for properly identifying the body. In *Lott v. State (1962)*, a nurse mislabeled two bodies, causing a Roman Catholic to be prepared for an Orthodox Jewish burial, and an Orthodox Jew to be prepared for a Roman Catholic burial; the court found the nurse liable (Goldberg et al, 1996).

Organ Donation

All 50 states have adopted the Uniform Anatomical Gift Act for cadaveric organ donation. In the United States and Canada, any person 18 or older may become an organ donor by written consent. In the absence of appropriate documentation, a family member or legal guardian may authorize donation of the organs. Nurses and other caregivers are expected to approach families for organ donation in the absence of documentation of the client's wishes. Consent for an organ donation requires the collaborative efforts of the nurse with physicians, social workers, and clergy to ensure timely removal of the organ(s).

Autopsies

An autopsy is performed to determine the *cause of death*. Autopsy results are used in cases of suspicious death or the presence of communicable disease. The cause of death also has implications regarding payment from insurance policies and worker's compensation.

Autopsy cases are the most frequent cause of litigation involving dead bodies and hospitals (Roach, 1994). A few states require the consent in writing, whereas other states accept telegrams or documented telephone conversations. Regardless of how the consent is obtained, the physician must document that the consent was obtained and identify in the client's record who authorized the autopsy. In some states, the consent for an autopsy is not required in unwitnessed deaths because this situation requires a mandatory autopsy. The nurse has the responsibility for ensuring that all documentation is in place before releasing the body for autopsy.

KEY CONCEPTS

- Laws define and limit relationships among individuals and the government.
- The three sources of public law at the federal and state levels are constitutional law, administrative law, and criminal law.
- Administrative law empowers state boards of nursing to protect the public by regulating the scope of nursing practice.
- The three sources of civil law at the federal and state levels are contract law, tort law, and protective/reporting laws.

- A nurse employed by a health care facility is legally responsible for the terms of a implied contract.
- The two types of tort law at the state level are unintentional torts, which include negligence and malpractice, and intentional torts, which include assault and battery, false imprisonment, invasion of privacy, defamation, and fraud.
- Protective/reporting laws such as The Americans with Disabilities Act and Good Samaritan acts protect a designated group of individuals.
- The legal responsibilities of the nurse, defined in practice acts and standards of care, include elements such as providing services to clients and acting as expert witnesses in malpractice suits.
- Incident reports are filed by the nurse when a situation arises that could or did cause client harm.
- To prevent incurring liability due to the policy of "floating," nurses should set priorities and identify potential areas of harm to the client, receive orientation and cross-training before reassignment and document all pertinent information about client care problems and safety issues.
- Legal instruments such as informed consent and advance directives uphold the right of all people to control decisions relating to their own health care.
- Nurses may witness the signing of a consent form by a client as permitted by institutional policies; however, if the nurse discovers circumstances that render a signed consent form invalid, the nurse should notify the physician and, if necessary, the nurse manager.
- In terms of specific client care issues such as abortion, pronouncement of death, do not resuscitate orders, euthanasia, care of the deceased, wills, organ donation, and autopsies, nurses must know and comply with the existing laws and regulations that pertain to these areas in their individual states and provinces of licensure.

CRITICAL THINKING ACTIVITIES

1. A nurse practice act is an example of:
 - a. Public law
 - b. Civil law
2. Which type of law authorizes state boards of nursing to regulate nursing practice?
 - a. Constitutional
 - b. Administrative
 - c. Criminal
 - d. Protective/reporting
3. List the three essential elements of a legal contract.
4. Identify the types of intentional torts.
5. What are the four elements that must be proven by the plaintiff in a malpractice case?
6. Discuss the relationship of the reasonable person standard in relation to professional standards of practice.
7. Identify common acts of commission and omission that lead to nursing malpractice complaints.

8. List the actions or omissions by the nurse that constitute unprofessional conduct.
9. What are the legal responsibilities of nursing students when employed as caregivers?
10. A competent, depressed client clearly refuses an enema. The nurse gently turns the client on his side and administers the enema. The client becomes upset and telephones his son; within 30 minutes from the telephone call, the client is transferred to the coronary care unit and is diagnosed with a heart attack. The client's son initiates malpractice action against the nurse in behalf of his father. The nurse is found liable for assault and battery. Why?

WEB RESOURCES

- American Association of Colleges of Nursing
www.aacn.nche.edu
- American Association of Legal Nurse Consultants
www.aalnc.org
- American Association of Nurse Attorneys
www.taana.org
- American Nurses Association
www.ana.org

Chapter 24

Ethical Obligations and Accountability



[If] there were none who were discontented with what they have, the world would never reach for anything better.

—F. Nightingale

COMPETENCIES

1. Explain the relationship between ethics and law.
2. Discuss the ethical theories of teleology and deontology.
3. Describe the major ethical principles that affect health care.
4. Explain the link between ethics and values.
5. Relate the ethical codes developed by the International Council of Nurses, the American Nurses Association, and the Canadian Nurses Association to daily nursing practice.
6. Identify the rights of the client as established by the American Hospital Association.
7. Apply the steps identified in the framework for ethical decision making to issues such as euthanasia, refusal of treatment, and utilization of scarce resources.
8. Discuss the roles of the nurse as client advocate and whistle-blower in the delivery of ethical nursing care.

KEY
TERMS

active euthanasia
 assisted suicide
 autonomy
 beneficence
 bioethics
 categorical imperative
 client advocate
 deontology
 ethical dilemma

ethical principles
 ethical reasoning
 ethics
 euthanasia
 fidelity
 justice
 material principle of justice
 morality
 nonmaleficence

passive euthanasia
 paternalism
 teleology
 utility
 values
 values clarification
 veracity
 whistle-blowing

Every day, nurses encounter situations in which they must make decisions based on the determination of right and wrong. How do they make such decisions? Which values determine the rightness of an action?

The delivery of ethical health care is becoming an increasingly difficult and confusing issue in contemporary society. Nurses are committed to maintaining clients' rights in terms of the provision of information about health care and treatment. This desire to maintain clients' rights, however, often conflicts with professional duties and institutional policies. It is essential to balance these two perspectives so that the primary objective, delivery of quality care, is achieved.

In considering the situations presented throughout this chapter, realize that there are no absolute right answers. Dealing with the gray areas (ambiguities) causes discomfort for some nurses. Unlike mathematics or other empirical sciences, there are no apparent absolute rules governing ethics. Scientists can say for certain that two plus two always equals four—regardless of the time factors, circumstances, feelings, or beliefs of those involved in the calculations. Ethical rules are less clear, and difficult or impossible to prove (Burkhardt & Nathaniel, 1998, p. 25). Because clients and nurses are humans, no two situations can ever be exactly alike. This chapter explores the concept of ethics, ethical theories and principles, values and ethics, ethical codes, ethical decision-making, and the application of ethical guidelines to nursing practice.

CONCEPT OF ETHICS

Ethics is the branch of philosophy that examines the differences between right and wrong. Simply put, ethics is the study of the rightness of conduct. Ethics deals with one's responsibilities (duties and obligations) as defined by logical argument. Ethics looks at human behavior—what people do under what type of circumstances. But ethics is not merely a philosophical discussion; ethical persons put their beliefs into action.

Often the term *morals* is mistakenly used when ethics is meant. **Morality** is behavior in accordance with custom or tradition and usually reflects personal or religious beliefs. An example of a moral belief is a person's

desire to maintain his or her right to die. Ethics is the free, rational, and publicly stated assessment of alternative actions in relation to theories, principles, and rules. Ethics is rooted in the legal system and reflects the political values of our society. An example of an ethical belief is the practice of parents' teaching their children the importance of telling the truth.

Relationship between Legal and Ethical Concepts

There is a connection between acts that are legal and acts that are ethical. Sometimes, it is difficult to separate legalities from ethics (see Chapter 23 for discussion about the legal responsibilities of nurses). There are some legal acts that are considered to be unethical and vice versa. According to Burkhardt and Nathaniel (1998), the following contribute to the occasional discrepancies between law and ethics:

- Ethical opinions reflect individual differences.
- Human behavior and motivation are too complex to be accurately reflected in law.
- The legal system judges action rather than intention.
- Laws change according to social and political influences.

Professional nursing actions are both legal and ethical.

THINK ABOUT IT

Legal and Ethical Concepts

Which of the following behaviors is (or are) ethical and illegal? Legal and unethical? Illegal and unethical? Legal and ethical?

- Working in a clinic that performs abortions
- Honoring a terminally ill client's request to have "no heroic" actions taken
- Discontinuing a comatose client's life support at the request of the family
- Diverting medications from a client for your own use

Ethics in Health Care

The application of general ethical principles to health care is referred to as **bioethics**. Ethics affects every area of health care, including direct care of clients, allocation of finances, and utilization of staff. Ethics does not provide easy answers, but it can help provide structure by raising questions that ultimately lead to answers.

Ethics is exerting an ever-increasing influence on health care today. Several factors contribute to an increased need to provide health care in an ethical manner. Some of these factors are:

1. An increasingly technological society. The nature of advanced technology creates situations that involve complicated issues that never had to be considered before. As a result of technological advances:
 - Many newborns are surviving at earlier gestational ages, and many of them have serious health problems.
 - People are living much longer than ever before.
 - Organ transplants and the use of bionic body parts are becoming more common.
2. The changing fabric of our society. Family structure is moving from extended families to nuclear families, single-parent families, and nonrelated groups living together as families.
3. Clients are becoming more knowledgeable about their health and health-related interventions. As consumer demand for information increases, health care providers must adapt quickly. The result is a focus on the consumer-driven system.
4. The proportion of total federal funds allocated for health care is continually decreasing.

Nurses face situations in which they must make decisions that transcend technical and professional concerns. These situations may or may not be life-threatening. “Too often, the ‘smaller,’ more common conflicts, such as how to determine whether a patient’s refusal of treatment is informed or how to effectively advocate on a patient’s behalf, get less attention” (Kennedy-Schwarz, 2000, p. 71) than the life-or-death issues revolving around imminent death. Such situations raise complex problems that cannot be answered completely with technical knowledge

and professional expertise. Technological advances have created unprecedented choices, not only for society at large, but specifically for clients and nurses.

There is emphasis on ethical issues involving life-or-death situations. However, nurses daily encounter challenges about what *ought* to be done, even in the most ordinary circumstances. The accompanying display lists ethical dilemmas that commonly occur in nursing practice. The way in which nurses relate to clients, families, and other health care providers is the true demonstration of ethical behavior.

ETHICAL THEORIES

Ethical theories were debated by ancient philosophers such as Plato and Aristotle, and the debate continues today. No theory in and of itself can provide the “correct” answer to any single ethical conflict. Ethical theories can be used as a way to analyze ethical problems.

Teleology

Teleology is the ethical theory stating that the value of a situation is determined by its consequences. Thus, the outcome of an action—not the action itself—is the criterion for determining the goodness of that action. This theory (also called the consequentialist theory) was advocated by the philosopher John Stuart Mill. The principle of **utility** is a basic concept of teleology; utility states that an act must result in the greatest amount of good for the greatest number of people involved in a situation. “Good” refers to positive benefit. Any act can be ethical if it delivers “good” results. Every alternative is assessed for its potential outcomes, both positive and negative. The selected action is the one that results in the most benefits and the least amount of harm for all those involved.

Deontology

Deontology is the ethical theory that considers the intrinsic significance of the act itself as the criterion for determination of good. That is, in determining the ethics of a situation, a person must consider the motives of the actor, not the consequences of the act.

This theory (also called formalism) was postulated by the philosopher Immanuel Kant. Kant established the concept of the **categorical imperative**, which states that one should act only if the action is based on a principle that is universal (everyone would act in the same way in a similar situation). The categorical imperative also mandates that a person should never be treated as a means to an end. Adherence to this concept may pose an ethical concern to health care researchers, who sometimes may risk the well-being of a person participating in an experimental procedure

FREQUENTLY OCCURRING ETHICAL DILEMMAS

- Informed consent
- Refusal of treatment
- Use of scarce resources
- Cost-containment initiatives that negatively affect client well-being
- Incompetent health care providers

for the sake of finding a drug that will save many from suffering.

ETHICAL PRINCIPLES

Ethical principles are tenets that direct or govern actions. They are widely accepted and generally are based on the humane aspects of society. Ethical decisions are principled; that is, they reflect what is best for the client and society. Table 24-1 summarizes the major ethical principles. Each principle is discussed in detail in the following paragraphs.

By applying ethical principles, nurses become more systematic in solving ethical conflicts. Ethical principles can be used as guidelines in analyzing dilemmas; they can also serve as a justification (rationale) for the resolution of ethical problems. Remember that these principles are not absolute; there can be exceptions to each principle in any given situation.

Autonomy

The principle of **autonomy** refers to the individual's right to choose and the ability to act on that choice. The individuality of each person is respected when autonomy is maintained. This respect for personal liberty is a dominant value in American society.

Nurses must respect clients' right to decide and protect those clients who are unable to decide for themselves. The ethical principle of autonomy reflects the belief that every competent person has the right to determine his or her own course of action. The right to free choice rests on the client's competency to decide.

Informed consent is based on clients' right to decide for themselves. Upholding autonomy means that the

nurse accepts the client's choices, even when those choices are not in the client's best interests. Following are examples of clients' autonomous behavior that can impair recovery or treatment:

- Smoking after a diagnosis of emphysema or lung cancer
- Refusing to take medication
- Continuing to drink alcohol when one has cirrhosis
- Refusing to receive a blood transfusion because of religious beliefs

The Patient Self-Determination Act of 1990 was legislated to ensure that clients have the right to make their own health care decisions. Based on the principle of autonomy, this act requires that every person admitted to a health care facility be informed of the right to self-determination. The client's directives then need to be communicated and documented.

Nonmaleficence

Nonmaleficence is the duty to cause no harm to others. Harm can take many forms: physiological, psychological, social, spiritual. Nonmaleficence refers to both actual harm and the risk of harm. The principle of nonmaleficence helps guide decisions about treatment approaches; the relevant question is "Will this treatment modality cause more harm or more good to the client?" Determining whether technology is harmful to the client is not always a clear-cut decision. Factors to consider include:

- The treatment must offer a reasonable prospect of benefit.
- It must not involve excessive expense, pain, or other inconvenience.

TABLE 24-1
Overview of Ethical Principles

Principle	Explanation
Autonomy	Respect for an individual's right to self-determination; respect for individual liberty
Nonmaleficence	Obligation to do or cause no harm to another
Beneficence	Duty to do good to others and to maintain a balance between benefits and harms
Justice	Equitable distribution of potential benefits and risks
Veracity	Obligation to tell the truth
Fidelity	Duty to do what one has promised

THINK ABOUT IT

Nonmaleficence

Weighing the potential benefit and harm of treatment approaches is value-laden. At what point does pain, inconvenience, or expense become excessive? Who determines excessiveness? Is the result of a therapy that will prolong the client's life a benefit or a burden? Who determines what is an acceptable and what is an unacceptable quality of life?

Nonmaleficence requires that the nurse act thoughtfully and carefully, weighing the potential risks and benefits of research or treatment. Sometimes it is easier to weigh the risk than to measure the benefit. It is possible to violate this principle without acting maliciously and without ever being aware of the harm.

Nonmaleficence is considered a fundamental duty of health care providers. Both the Nightingale Pledge and the Hippocratic Oath state that providers are to cause no harm to clients. Some clinical examples of non-maleficence are:

- Preventing medication errors (including drug interactions)
- Being aware of potential risks of treatment modalities
- Removing hazards (e.g., obstructions that might cause a fall)

When upholding the principle of nonmaleficence, the nurse practices according to professional and legal standards of care. The question most frequently asked in court of a nurse is “Did you cause any harm?”

Beneficence

Beneficence is the ethical principle that means the duty to promote good and to prevent harm. There are two elements of beneficence:

1. Providing benefit
2. Balancing benefits and harms

One undesirable outcome of beneficence is **paternalism**, an occurrence in which health care providers decide what is “best” for clients and then attempt to coerce (or “encourage”) them to act against their own choices. Paternalistic health care providers treat competent adults as if they are children who need protection.

THINK ABOUT IT

Paternalism

Listen to the messages communicated to clients by health care professionals. What comments can you think of that would be considered paternalistic? Would you consider the following comments to be paternalistic? Why?

- “Just follow the doctor’s orders and everything will be OK.”
- “We know what’s best for you, trust us.”
- “This is for your own good.”

Paternalism is usually not considered an ethical approach. However, in some situations paternalism may be advisable. For example, when prevention of harm overrides the loss of individual freedom and when an individual’s ability to choose is limited by incompetency, paternalism may be justified.

Justice

The principle of **justice** is based on the concept of fairness. The major health-related issues of justice involve

fair treatment of individuals and allocation of resource distribution. Justice considers action from the point of view of the least fortunate in society. As a result of equal and similar treatment of people, benefits and burdens are distributed equally.

The ethical principle of justice requires that all people be treated equally unless there is a justification for unequal treatment. The **material principle of justice** is the rationale for determining when there can be unequal allocation of scarce resources. This concept specifies that resources should be allocated:

- Equally
- According to need
- According to individual effort
- According to the individual’s merit (ability)
- According to the individual’s contribution to society

An application of the material principle of justice is the Department of Veteran Affairs (VA). Individuals who gave to their country by serving in the military are eligible to receive health care through the VA in ambulatory, acute care, and psychiatric facilities.

According to the American Nurses Association (ANA) (1991), there are three types of actions considered to be unjust:

- Discrimination or arbitrarily unequal treatment in enforcing policies/rules
- Exploiting (taking unfair advantage of) another
- Making unfair (false or derogatory) remarks about others

In health care institutions, the principle of justice is being strenuously tested on the issue of allocation of one important resource: nursing personnel. Many institutions and agencies are downsizing their professional staff as a cost-containment measure. As a result, some health care facilities are so poorly staffed or have such a high ratio of underqualified personnel providing care that quality care is being sacrificed. “Some 72% of the respondents report that the quality of care at their hospital has deteriorated over the past year because of cost-containment decisions” (Wolfe, 1999, p. 28).

The principles of justice and beneficence often conflict. For example, should federal funds be spent on a costly transplant that will benefit only one Medicaid recipient, or should the funds be spent on less expensive measures that would prevent disease in many (e.g., immunizations)?

Veracity

Veracity means truthfulness, neither lying nor deceiving others. Deception can take many forms: intentional lying, nondisclosure of information, or partial disclosure of information. Veracity often is difficult to achieve. It may not be hard to tell the truth, but it can be very hard to decide how much truth to tell.

THINK ABOUT IT

Veracity

- Is honesty always the best policy?
- Is withholding information the same as lying?
- Can you ethically justify withholding information?
- Can you ethically justify telling white lies?

Fidelity

The concept of **fidelity** (which is the ethical foundation of nurse-client relationships) means faithfulness and keeping promises.

Clients have an ethical right to expect nurses to act in their best interests. As nurses function in the role of **client advocate** (a person who speaks up for or acts on behalf of the client), they are upholding the principle of fidelity. Fidelity is demonstrated when nurses:

- Represent the client's viewpoint to other members of the health care team
- Avoid letting their own personal values influence their advocacy for clients
- Support the client's decision even when it conflicts with the nurse's preferences or choices

THINK ABOUT IT

Client Advocate

A 15-year-old girl visits a family planning clinic because she suspects she is pregnant. Her suspicion is confirmed after an examination. She informs the nurse practitioner that she wants an abortion and she refuses to tell her parents about this situation. In considering this dilemma, keep in mind that the client is a minor. What are the ethical obligations of the nurse practitioner? Do the ethical obligations coincide or conflict with the legal responsibilities? How would you resolve this conflict?

VALUES AND ETHICS

The close relationship between ethics and values both illuminates and complicates the nurse's approach toward balancing the principles of health care delivery with those of the client. Nurses need to examine their own value systems in order to determine the best approach in managing the care of clients whose values differ. In order to practice ethically, nurses must understand the impact of their own values. **Values** influence the development of beliefs and attitudes and thus affect behaviors indirectly. Almost nothing in life is value-free, even though individuals often fail to consider the

impact of values on decisions and resultant behaviors. Values are similar to breathing; you don't think about it until there's a problem.

Nurses often care for clients whose value systems conflict with theirs. Determining what is meaningful to the client is based on an understanding of the client's value system. The nurse's values can become problematic when they conflict with the values of clients.

Values Clarification

Through values clarification, a nurse can increase self-awareness and become better able to care for people with different values. **Values clarification** is the process of analyzing one's own values to better understand what is truly important. In their classic work *Values and Teaching*, Raths, Harmin, and Simon (1978, p. 47) formulated a theory of values clarification and proposed a three-step process of valuing, as follows:

1. *Choosing*: Beliefs are selected freely (that is, without coercion) from among alternatives. The choosing step involves analysis of the consequences of various alternatives.
2. *Prizing*: The beliefs that are selected are cherished (prized).
3. *Acting*: The selected beliefs are demonstrated consistently through behavior.

Nurses must understand that values are individual rather than universal; therefore, nurses should not impose their own values on clients. The provision of ethical nursing care is directly related to one's values. For example, the nurse who strongly values the sanctity of life may experience an ethical conflict when caring for a terminally ill client who refuses treatment that may extend life for a short time.

ETHICAL CODES

One hallmark of a profession is the determination of ethical behavior for its members. According to Sills (2000):

... the profession has certain obligations to the society: to do no harm, to be proficient in one's work, to behave and reason with high moral and ethical standards, to control the entrance of a person to the professional ranks, to discipline professionals who fail to meet acceptable standards, and to use its knowledge to treat people in need and to teach the public what it needs to know for self-care. (p. 30)

Several nursing organizations have developed codes as guidelines for ethical conduct. In its 1973 Code for Nurses, the International Council of Nurses (ICN)

AMERICAN NURSES ASSOCIATION CODE FOR NURSES

1. The nurse provides services with respect for human dignity and the uniqueness of the client, unrestricted by considerations of social or economic status, personal attributes, or the nature of health problems.
2. The nurse safeguards the client's right to privacy by judiciously protecting information of a confidential nature.
3. The nurse acts to safeguard the client and the public when health care and safety are affected by the incompetent, unethical, or illegal practice of any person.
4. The nurse assumes responsibility and accountability for individual nursing judgments and actions.
5. The nurse maintains competence in nursing.
6. The nurse exercises informed judgment and uses individual competence and qualifications as criteria in seeking consultation, accepting responsibilities, and delegating nursing activities to others.
7. The nurse participates in activities that contribute to the ongoing development of the profession's body of knowledge.
8. The nurse participates in the profession's efforts to implement and improve standards of nursing.
9. The nurse participates in the profession's efforts to establish and maintain conditions of employment conducive to high-quality nursing care.
10. The nurse participates in the profession's effort to protect the public from misinformation and misrepresentation and to maintain the integrity of nursing.
11. The nurse collaborates with members of the health professions and other citizens in promoting community and national efforts to meet the health needs of the public.

(Reproduced with permission from the American Nurses Association. [1985]. *Code for nurses, with interpretive statements*. Kansas City, MO: Author.)

CANADIAN NURSES ASSOCIATION CODE OF ETHICS FOR NURSING*

Clients

- I. A nurse treats clients with respect for their individual needs and values.
- II. Based upon respect for clients and regard for their right to control their own care, nursing care reflects respect for the right of choice held by clients.
- III. The nurse holds confidential all information about a client learned in the health care setting.
- IV. The nurse is guided by consideration for the dignity of clients.
- V. The nurse provides competent care to clients.

Nursing Roles and Relationships

- VI. The nurse maintains trust in nurses and nursing.
- VII. The nurse recognizes the contribution and expertise of colleagues from nursing and other disciplines as essential to excellent health care.
- VIII. The nurse takes steps to ensure that the client receives competent and ethical care.
- IX. Conditions of employment should contribute in a positive way to client care and the professional satisfaction of nurses.
- X. Job action by nurses is directed toward securing conditions of employment that enable safe and appropriate care for clients and contribute to the professional satisfaction of nurses.

Nursing Ethics and Society

- XI. The nurse advocates the interests of the clients.
- XII. The nurse represents the values and ethics of nursing before colleagues and others.

The Nursing Profession

- XIII. Professional nursing organizations are responsible for clarifying, securing, and sustaining ethical nursing conduct. The fulfillment of these tasks requires that professional nurses' organizations remain responsive to the rights, needs, and legitimate interests of clients and nurses.

*This represents only one element of the code of values. For each value noted, the CNA Code of Ethics for Nursing provides obligations that provide more specific direction for conduct. In two instances, limitations are also listed that describe exceptional circumstances in which a value or obligation cannot be applied.

(Reproduced with permission from the Canadian Nurses Association. [1991]. *Code of ethics for nursing*. Ottawa: Author.)

states: “The nurse, in providing care, promotes an environment in which the values, customs, and spiritual beliefs of the individual are respected.”

The ANA has also established a code for ethical conduct (see the accompanying display). The ANA Code of Ethics spells out the nurse’s obligations to clients and society at large. “A code of ethics indicates a profession’s acceptance of the responsibility and trust with which it has been invested by society” (American Nurses Association, 1985, p. 1). The ethical code, which provides broad principles for determining and evaluating nursing care, is not legally binding for registered nurses. In most states, however, the Board of Nursing has authority to reprimand nurses for unprofessional conduct that results from violation of the ethical code.

The Canadian Nurses Association (CNA) developed a code of ethics in 1980 and revised it in 1991 (see the accompanying display). The CNA code serves as a guide for professional nursing actions.

CLIENTS’ RIGHTS

The concept of rights is often misused, overused, and abused. Our society tends to take rights for granted; rights and obligations are culturally defined. The dominant American society has an ethnocentric perspective in believing that its rights and values are shared globally.

Clients have certain rights including, but not limited to, the right to

- Make decisions regarding their care
- Be actively involved in the treatment process
- Be treated with dignity and respect

These rights apply to all clients regardless of the setting for delivery of care. For example, during the initial assessment, the home health nurse discusses these rights with the client.

When clients are admitted to short-term acute care agencies or extended care facilities, they are also entitled to certain rights. In 1972, the American Hospital Association (AHA) established a *Patient’s Bill of Rights*, which includes the rights and responsibilities of clients receiving care in hospitals. This document was revised in 1992 (see the accompanying display). The *Patient’s Bill of Rights* increases health care providers’ awareness of the need to treat clients in an ethical manner and encourages all health care providers to protect the rights of clients.

ETHICAL DILEMMAS

An **ethical dilemma** occurs when there is a conflict between two or more ethical principles. Ethical dilemmas are situations of conflicting requirements in that

there is no right or wrong option. The most beneficial decision depends on the circumstances. When an ethical dilemma occurs, the nurse must make a choice between two alternatives that are equally unsatisfactory. Ethical analysis is not an exact science. In some cases, even after a dilemma seems to have been resolved, questions remain. This ambiguity makes it emotionally painful for the persons involved. The emotional discomfort is often a result of the nurse’s trying to second-guess the decision and may lead to such self-messages as “If only I had done this” or “Maybe I should have . . .”

THINK ABOUT IT

Ethical Conflicts

As a nurse, you will often be caught in a dilemma involving what you *ought* to do (on the basis of one ethical principle) and what you *ought not* to do (on the basis of another principle). For example, should you tell a client who has been diagnosed as having breast cancer the complete truth about the diagnosis, or should you soft-pedal the bad news because it might result in loss of hope? The dilemma is a conflict between the principles of veracity and nonmaleficence. Also, the principle of autonomy is violated. Not telling denies the client the right to make an informed choice.

ETHICAL DECISION MAKING

Nurses must understand the basis on which they make their decisions. **Ethical reasoning** is the process of thinking through what one ought to do in an orderly, systematic manner to provide justification of actions based on principles. Ethical decisions cannot be based entirely on intuition or emotions. Ethical decision making is used in situations in which the right decision is not clear or in which there are conflicts of rights and duties. A framework for resolving ethical dilemmas follows.

Framework for Ethical Decision Making

Once an ethical dilemma is identified, the nurse must determine the relevant parts of the conflict in order to resolve it. When making an ethical decision, the nurse must consider the following relevant parts:

- Which theories are involved?
- Which principles are involved?
- Who will be affected?
- What will be the consequences of the alternatives (ethical options)?

A PATIENT'S BILL OF RIGHTS

Bill of Rights

1. The patient has the right to considerate and respectful care.
2. The patient has the right to and is encouraged to obtain from physicians and other direct caregivers relevant, current, and understandable information concerning diagnosis, treatment, and prognosis.
3. The patient has the right to make decisions about the plan of care prior to and during the course of treatment and to refuse a recommended treatment or plan of care to the extent permitted by law and hospital policy and to be informed of the medical consequences of this action.
4. The patient has the right to have an advance directive (such as a living will, health care proxy, or durable power of attorney for health care) concerning treatment or designating a surrogate decision maker with the expectation that the hospital will honor the intent of that directive to the extent permitted by law and hospital policy.
5. The patient has the right to every consideration of privacy.
6. The patient has the right to expect that all communications and records pertaining to his/her care will be treated as confidential by the hospital, except in cases such as suspected abuse and public health hazards when reporting is permitted or required by law.
7. The patient has the right to review the records pertaining to his/her medical care and to have the information explained or interpreted as necessary, except when restricted by law.
8. The patient has the right to expect that, within its capacity and policies, a hospital will make reasonable response to the request of a patient for appropriate and medically indicated care and services.
9. The patient has the right to ask and be informed of the existence of business relationships among the hospital, educational institutions, other health care providers, or payers that may influence the patient's treatment and care.
10. The patient has the right to consent to or decline to participate in proposed research studies or human experimentation.
11. The patient has the right to expect reasonable continuity of care when appropriate and to be informed by caregivers of available patient care options.
12. The patient has the right to be informed of hospital policies and practices that relate to patient care, treatment, and responsibilities. The patient has the right to be informed of available resources for resolving disputes, grievances, and conflicts. The patient has the right to be informed of the hospital's charges for services and available payment methods.

(Data from American Hospital Association. [1992]. *A patient's bill of rights*. Chicago: The Association.)

To resolve ethical dilemmas, the nurse must be able to make decisions in a systematic fashion. Figure 24-1 illustrates a method for making ethical judgments that uses steps similar to those of the nursing process.

The first step of ethical analysis is to gather relevant data in order to identify the problem. Determine what type of ethical problem exists: Do principles conflict with principles? Do actions conflict with actions? Do actions conflict with principles?

Next, consider all the people involved. What are their rights, responsibilities, duties, and decision-making abilities? Who is the most appropriate person to make the decision? It is important to identify several possible alternatives and predict the outcome of each. Then, and only then, select a course of action—one that, it is hoped, ends in resolution of the problem. The final step of ethical decision making is evaluation of the resolution process. Consider the following two issues: euthanasia and refusal of treatment.

Euthanasia

Most people hope to experience a peaceful gentle death when their “time comes.” The word **euthanasia** comes from the Greek word *euthanatos*, which literally means

“good, or gentle, death.” In current times, *euthanasia* refers to mercy killing (deliberate ending of life as a humane action).

Active euthanasia refers to taking deliberate action that will hasten the client's death. In contrast, **passive euthanasia** means cooperating with the client's dying process. Passive euthanasia is the omission of an action that would prolong dying.

THINK ABOUT IT

Ethical Debate: Euthanasia

What does the phrase “good death” mean to you? For some people, it means:

- Dying with dignity
- Being pain-free
- Dying in the company of loved ones and friends

To others, dying a good death means:

- Being at home
- Determining when death will occur (maintaining control)

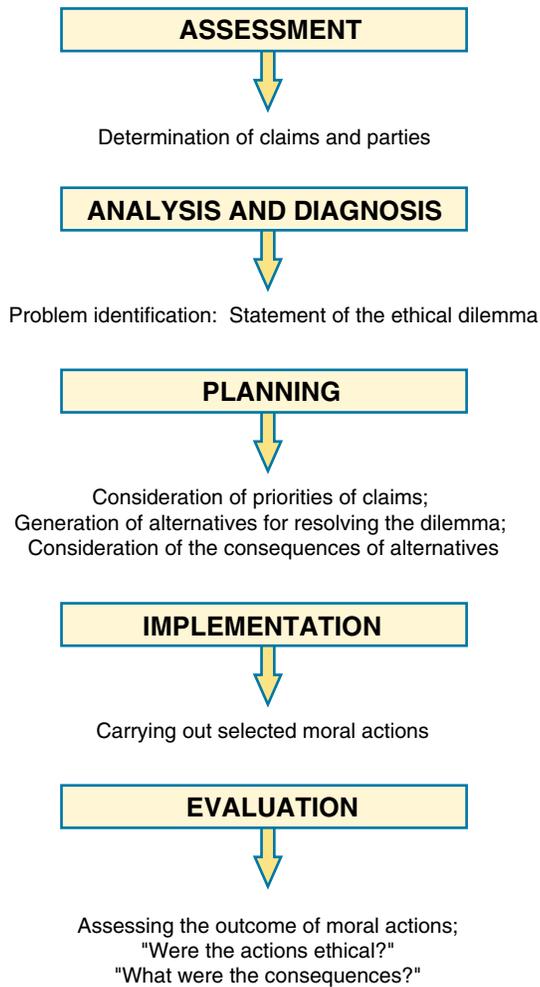


Figure 24-1 Ethical Decision-Making Model

Assisted suicide is a form of active euthanasia in which a health care professional provides a client with the means to end his or her own life. Recently, physician-assisted suicide has been the topic of much controversy. Nurses have differing opinions regarding assisted suicide. Some view it as a violation of the ethical principles upon which the practice of nursing is based: autonomy, nonmaleficence, beneficence, justice, veracity, and fidelity. Other nurses view assisted suicide as a humane act. Regardless of a nurse's personal viewpoint, assisted suicide is still illegal except in Oregon, the only state that has designated assisted suicide as a legal action. Other nurses may see assisted suicide as an ethical dilemma; they agree that it violates some ethical principles but question whether it violates others. For example, does assisted suicide violate the principle of autonomy? From one standpoint, it is *refusal* to assist a suicide that violates a client's autonomy. In its Position Statement on Active Euthanasia, the ANA (1994) states that participation in active euthanasia violates nursing's ethical code.

Refusal of Treatment

The client's right to refuse treatment is based on the principle of autonomy. In fairness, the client can refuse

only after the treatment methods and their consequences have been explained. A client's right to refuse treatment and the right to die challenge the values of most health care providers.

Consider the use of ventilators. Medical technology makes it possible for clients to continue breathing as long as they are connected to a machine; without the machine, these clients would die. But what are the costs—emotional, physical, psychological, and fiscal? And what is the quality of a life prolonged by technology?

RESEARCH FOCUS

Title of Study

"A Phenomenologic Study of the Interface of Caring and Technology in Intermediate Care: Toward a Reflexive Ethics for Clinical Practice"

Author

Ray, M. A.

Purpose

To determine the meaning of the experience of caring for technologically dependent clients.

Methods

Twelve critical care nurses participated in a phenomenologic study of the meaning of caring. Participant narratives were analyzed to determine the meaning of caring for clients in a technologically driven care unit.

Findings

The sample narratives demonstrate an ethical crisis in an intermediate care unit. Participants expressed their own suffering and vulnerability in relation to ethical conflicts. The vulnerability expressed was in relation to a feeling of being "overwhelmed to the last degree." Nurses felt disillusioned but not indifferent.

Implications

The findings of this study suggest that attention should focus on the following areas: interdisciplinary continuing education, interdisciplinary support groups for nurses and physicians, mentorship programs for staff and families, and research about reflexive ethics in health care.

Ray, M. A. (1998). A phenomenologic study of the interface of caring and technology in intermediate care: Toward a reflexive ethics for clinical practice. *Holistic Nursing Practice*, 12(4), 69–77.

Scarce Resources

With the current emphasis on containing health care costs, the use of expensive services is being examined closely. The use of specialists, organ transplants, and distribution of services is being influenced by social and political forces. For example, the length of stay in a hospital and the number of office visits allowable for individual clients are already predetermined by many third-party payers. In addition to economics, the availability of goods (such as organs) is contributing to a scarcity of resources. In many situations, clients experience extended waiting periods before receiving a donated organ. The allocation of scarce resources is emerging as a major ethical dilemma in today's health care environment. "When nursing care is viewed as a kind of commodity or resource, it must be distributed fairly and equitably to meet the needs of a population group" (American Nurses Association, 1991, p. 2).

THINK ABOUT IT

Allocation of Scarce Resources

The following two people are in desperate need of a liver transplant:

- A 62-year-old alcoholic who is destitute and has no family
- A 24-year-old mother of three young children

One liver is available. In your opinion, who should get the liver? What influenced your decision?

Our population is living longer, giving rise to increases in the demand for services. As improvements in health care technologies lead to further declines in mortality, the number of Americans with disabilities and functional restrictions will increase, as will the number with chronic, irremediable conditions. As costs increase, so too will the demand to contain costs. . . . We are spending more on health care than any other industrialized country but providing less coverage for our citizens. (Koloroutis & Thorstenson, 1999, p. 9–10)

As the above quotation illustrates, something must be done about the way in which health care resources are used.

ETHICS AND NURSING

As professionals, nurses are accountable for protecting the rights and interests of the client. Consequently, sound nursing practice involves making ethical deci-

sions. Ethics affects nurses in every health care setting, and each practice setting presents the nurse with its own set of ethical concerns. For example, consider home health nursing. With the increased acuity level of clients cared for in the home setting, home health nurses face ever-increasing ethical challenges of continuing to provide quality care under federally mandated cost-containment initiatives.

Whatever the setting, nurses need to balance their ethical responsibilities to each client with their professional obligations. Often there is an inherent conflict. The Nursing Checklist provides guidelines for promoting ethical care.



NURSING CHECKLIST

Providing Ethical Care

- Initiate dialogue concerning the client's wishes. Do more listening than talking. (For example, the following is a question you might ask to help determine the client's wishes: "If your heart stopped, would you want us to try to start it again?")
- Assess the client's understanding of the illness and available treatment options.
- Allow time for the client to explore values and to communicate.
- Facilitate communication of the client's desires to family and other health care providers

Ethics Committees

The provision of ethical health care requires self-examination of the care provider and the opportunity for dialogue with other health care providers. Many health care agencies now recognize the need for a systematic manner to discuss ethical concerns. Formation of multidisciplinary committees (also referred to as Institutional Ethics Committees) is one approach for facilitating dialogue regarding ethical dilemmas. In addition to serving as a forum where ethical issues are discussed, ethics committees can lead to the establishment of policies and procedures for prevention and resolution of dilemmas.

Nurse As Client Advocate

When acting as a client advocate, the nurse's first step is to develop a meaningful relationship with the client. The primary ethical responsibility is to protect clients' rights to make their own decisions. The nurse who functions as a client advocate is adhering to the ANA Code

of Ethics. Specific examples of advocacy behaviors include empowerment of clients through education, providing support, actively listening to client's concerns, and acting as a liaison between client and other health care providers.

Nurse As Whistle-Blower

The term **whistle-blowing** refers to calling attention to unethical, illegal, or incompetent actions of others. This behavior is based on the ethical principles of veracity and nonmaleficence. Even though nurses are expected to “blow the whistle” on incompetent health care providers, many are reluctant to do so. Why? Because there are inherent risks in whistle-blowing behavior. Haddad (1999) identified some of the questions the person has to consider when deciding to report unethical or incompetent behavior:

- Has the wrongdoing created (or is it likely to create) serious harm?
- Is the nurse competent to make a judgment about the wrongdoing?
- Has all the appropriate information been collected?
- Has the nurse consulted others to confirm the information?
- Have all internal resources been used to resolve the problem?
- Will reporting of the problem likely correct wrongdoing or prevent future harm?
- Is the harm created by the act of whistle-blowing likely to be less than the harm done by the wrongdoing?

Federal law and state laws (to varying degrees) provide protection to whistle-blowers. Unfortunately, however, the inclination to protect one's coworkers and fear of reprisal may deter a nurse from fulfilling the ethical obligation to report substandard behaviors.

THINK ABOUT IT

Whistle-Blowing

A coworker often takes Tylenol from a client's medication drawer. When you confront her about the behavior, she states: “It's only Tylenol. Besides, the patient's not taking it anymore anyway.” Should you blow the whistle? Why or why not? Would your response be different if your coworker were taking narcotics from the client?

KEY CONCEPTS

- Ethics is the study of the rightness of conduct.
- Ethics examines human behavior—what people do under what circumstances.

- Morality is not the same as ethics. Morality is behavior in accordance with custom or tradition and usually reflects personal or religious beliefs.
- There is a connection between acts that are legal and acts that are ethical. Professional nursing actions are both legal and ethical.
- Teleology is an ethical theory that states that the moral nature of a situation is determined by its consequences.
- Deontology is an ethical theory that considers the intrinsic moral significance of the act itself as the criterion for determination of good.
- Ethical decisions are based on principles such as autonomy, nonmaleficence, beneficence, justice, veracity, and fidelity.
- Because ethics and values are closely associated with each other, nurses need to explore their own values in order to acknowledge the sometimes different value systems possessed by their clients.
- Values clarification is a process through which nurses can gain knowledge of their values and apply that understanding to the care of clients.
- Ethical codes that have been developed by nursing organizations such as the International Council of Nurses, the American Nurses Association, and the Canadian Nurses Association establish guidelines for the ethical conduct of nurses with clients, coworkers, society, and the nursing profession.
- The Patient's Bill of Rights is designed to guarantee ethical care of clients in terms of their decision making about treatment choices and other aspects of their care.
- Nurses must apply the process of ethical reasoning to resolve ethical dilemmas in which conflict exists between principles and duties.
- The framework for ethical decision making consists of five steps: assessment, analysis and diagnosis, planning, implementation, and evaluation.
- The roles of client advocate and whistle-blower enable nurses to protect their clients' rights and ensure the ethical and competent actions of their peers within the nursing profession.

CRITICAL THINKING ACTIVITIES

1. Read the American Nurses Association's *Code for Nurses* in this chapter.
 - a. Determine some specific behaviors that you can perform to actualize each tenet of the code.
 - b. Identify the ethical principle(s) upon which each ethical statement is based.
2. Apply the ethical analysis framework to each of the following case situations.

Case Example 1:

Mary Washington delivers a baby with multiple congenital defects. The prognosis is poor; the infant is not expected to live longer than 12

months at most. Mary says, “We can’t afford to pay for the baby’s care.” Who should determine the degree of intervention? Should the cost of care be the foremost basis for the decision?

Case Example 2:

An 80-year-old woman is in a persistent vegetative state as a result of a cardiovascular accident. She has always talked about “someday” signing a living will requesting that heroic measures not be taken. But her family wants “everything to be done that can be done.” Whose wishes should prevail? Can her undocumented statements be legally honored?

3. Read the following situation and determine the ethical ramifications of each scenario. How do your values influence your decisions?
A married couple seek an abortion:
 - Because the wife was raped by a stranger
 - As a birth control measure
 - Because the woman has been told by her doctor that going through another pregnancy will threaten her life
 - To select a female baby because they already have a son
4. Assumption: *The client’s right to privacy and confidentiality must always be upheld by the nurse.* Do you agree? Think about a young sexually active female who is diagnosed as HIV-positive. Your conflict is the client’s right to privacy versus the public’s right to safety. What do you do?
5. Clients have a right to self-determination, even when their decisions result in self-harm.
 - Do you agree with this statement?
 - How will you support a client’s right to refuse treatment?
 - How do you respond to a client’s decision to continue self-harmful practices?

6. Our responses to clients are based on our values. How do your feelings toward people with AIDS (acquired immunodeficiency syndrome) change in the context of values? For example, will your response be the same for all of these clients?
 - A child infected through a contaminated blood transfusion
 - A homosexual male who was infected by a promiscuous partner
 - A female prostitute who became infected by sharing needles with other drug users
7. What impact does the following information have on your provision of professional care?
 - The client is a convicted rapist.
 - The client is homeless.
 - The client is a member of a very wealthy and influential family.
 - The client is a nurse.
 - The client is a physician.

WEB RESOURCES

Biomedical Ethics Resources

www.nova.edu

Ethics of Reproductive Technology

www.acusd.edu

The Hastings Center for Bioethics

www.thehastingscenter.org

Kennedy Institute of Ethics

www.georgetown.edu

Reproductive Technologies: Cloning, Bioethics, Ethics

www.ethics.acusd.edu

Chapter 25

The Role of Quality Management in Accountability



“If you shut your door to all errors, truth will be shut out.”

—Rabindranath Tagore

COMPETENCIES

1. Discuss the historical development of the quality movement in health care.
2. Describe the nine dimensions of quality performance as identified by the Joint Commission on Accreditation of Healthcare Organizations.
3. Identify factors influencing the quality movement in health care.
4. Discuss the role of law and ethics in quality care.
5. Describe basic principles and concepts of quality improvement.
6. Explain the concept of customer perspective and its relationship to quality management.
7. Discuss the organizational structure and management factors affecting quality improvement.
8. List the steps of the scientific approach used in process improvement.
9. Identify various tools used for quality measurement.
10. Discuss the nurse’s role in quality management.

KEY
TERMS

benchmarking
continuous quality
improvement
cross-functional team
customer

empowerment
functional team
leadership
organizational culture
performance improvement

process improvement
quality
quality assurance
team
total quality management

As a result of a global economy, increased competition, and spiraling health care costs, health care organizations must work to continually improve and strive for higher performance. For health care organizations to operate successfully and instill the drive for excellence in each employee, structures must be in place to empower employees to take ownership in their work. A new style of leadership that can facilitate teamwork and process improvement must prevail.

Quality of care, cost, and access are dominant themes in health care delivery. Health care services must be delivered in a manner that increases the likelihood of desired health outcomes and they must be consistent with current knowledge (Joint Commission on Accreditation of Healthcare Organizations [JCAHO], 1999). Nurses, as well as all other health care providers, are accountable for quality care. The challenge for nursing has never been greater as political, economic, and regulatory requirements increase and the demand for quality care intensifies.

This chapter discusses the historical development of quality management in health care and describes the principles that form the basis of quality improvement. It also presents the structure on which quality management programs can be established and explains the mechanisms and tools by which process improvement can be introduced and maintained within health care organizations.

THE QUALITY MOVEMENT IN HEALTH CARE

A quality management system in health care is similar to quality management in other businesses. A brief overview of the development of the quality initiative as it relates to health care is discussed in the following sections.

Evolution

Table 25-1 provides a historical perspective on the development of the quality movement. The American College of Surgeons, established in 1913, was the first organized effort to develop quality standards in health care. This body later established the Hospital Standardization Program, which evolved into today's Joint Commission on the Accreditation of Healthcare Organizations (JCAHO).

Role of the JCAHO in the Quality Movement

Founded in 1951, JCAHO has become the largest accrediting organization in health care today. JCAHO provides standards for hospitals, mental health care facilities, ambulatory care facilities, home health care agencies, and long-term care facilities. Participation in the accreditation process is a voluntary process that is not a condition of licensure but is often a condition for reimbursement by many payers, such as the Federal Health Care Finance Administration (HCFA).

In the 1980s, *quality assurance* was introduced into JCAHO accreditation standards with emphasis on a problem-solving approach. Each department of an organization was monitored and evaluated for service delivery. The 1990s marked a significant change in quality management in health care. There was a shift from departmental review to interdisciplinary performance improvement. This subsequent transition from quality assurance to the current approach of *continuous quality improvement* was derived from quality management in industry. The section entitled Quality Improvement discusses the concepts of quality assurance and continuous quality improvement in more detail.

JCAHO has made the following modifications in their survey process (effective January 2000):

- Random unannounced surveys will be conducted.
- Health care organizations will no longer receive advance notification of impending random surveys.
- The focus and scope of the review during the survey will vary from agency to agency.
- On-site surveys will occur during evenings, nights, and weekends rather than be limited to weekdays (Gropper, 1999).

All of these changes have been made in an attempt to improve the quality of health care delivered in organizations participating in JCAHO's accreditation process.

Defining Quality

Health care has struggled for many years to define and measure quality. **Quality** is defined as meeting or exceeding requirements of the customer/client. A **customer** is anyone who uses the products, services, or processes of an organization. Quality is measured in terms of customer perspective. Clients are concerned with the following:

TABLE 25-1
Historical Development of Quality Movement

Timeframe	Method of Production	Method of Management	Impact on Quality
18th and 19th centuries	Individually built Designed and constructed to last	By example	Nonstandardized High-quality design Individually inspected
Early 20th century	Mass production (assembly line) Designed to wear well	Controller	Standardized Average quality Inspected by supervision
Mid 20th century	Planned obsolescence Automation	Goal setting	Standardized Average quality Inspected through quality control
Late 20th century	High technology Built to last	Collaboration	High quality Inspection in work groups

Fisher, K. (2000). *Leading self-directed work teams: A guide to developing new team leadership skills*. New York: McGraw-Hill.

- Accessibility and availability of service
- Timely and safe delivery of service
- Coordination and continuity of care between services
- Effectiveness of services, that is, the delivery and outcome of care

In its 1998 report, JCAHO identified nine dimensions of quality performance. These dimensions are described in the accompanying display. Basically, a health care organization must be concerned with *doing the right thing* (efficacy, appropriateness) and *doing the right things well* (availability, timeliness, effectiveness, continuity, safety, efficiency, and respect and caring). **Performance improvement** consists of those activities and behaviors that each individual does to meet customers' expectations. It is doing the right thing well and continually striving to do better (JCAHO, 1998).

In measuring quality, there are three domains to measure: structure, process, and outcome. Each of these components is interrelated. The American Nurses Association's (ANA's) *Standards of Clinical Nursing Practice* (1991) uses these three components of care to guide nursing practice within the framework of the nursing process.

Factors Influencing the Quality Movement in Health Care

Today there are many consumers of health care in addition to clients and their families. One major consumer of health care is third-party payers, such as insurance companies, managed care organizations, and federal and state governments. The diversity of needs represented by these consumers requires improvement in health care delivery systems. The major factors that have influenced the development of the quality movement in

DIMENSIONS OF QUALITY PERFORMANCE

- **Efficacy**—degree to which the intervention has been shown to accomplish the intended outcome
- **Appropriateness**—degree to which the intervention is relevant to client needs
- **Availability**—degree to which appropriate interventions are available to meet client needs
- **Timeliness**—degree to which the intervention is provided at the most beneficial time to the client
- **Effectiveness**—degree to which the intervention is provided in the correct manner to achieve the intended client outcome
- **Continuity**—degree to which the interventions are coordinated between organizations, among care providers and across time
- **Safety**—degree to which the risk of an intervention and risk in the environment are reduced for both client and health care provider
- **Efficiency**—degree to which care has the desired effect with the minimum of effort, expense, or waste
- **Respect and caring**—degree to which clients are involved in health care decisions and are treated with sensitivity and respect for their individual needs, expectations, and differences by health care providers

Data from Joint Commission on Accreditation of Healthcare Organizations. (1998). *1999 Accreditation Manual for Hospitals*. Oakbrook Terrace, IL: Author.)

health care are consumer demands, financial viability, professional accountability, regulatory requirements, progress in quality improvement techniques, and changes in health care delivery.

THINK ABOUT IT

Dimensions of Quality Performance

Which of the JCAHO dimensions of quality—efficacy, appropriateness, availability, timeliness, effectiveness, continuity, safety, efficiency, or respect and caring—would be the most important to you as a consumer of health care?

Consumer Demands

Health care consumers are sophisticated, knowledgeable, and selective. Clients no longer place blind trust in their physicians and realize that variables in practice and results occur. Today's consumers negotiate services and compare health care costs among providers.

Financial Viability

Health care has entered an era of increased competitiveness for services, staff, and customers. There is a demand to reduce spending and contain costs. Budgetary constraints continue to increase in both the private and public health sectors. Health care organizations must strive to reduce professional liability, increase reimbursement eligibility, and promote cost effectiveness through increased efficiency.

Professional Accountability

Emphasis on clinician accountability and adherence to codes of ethical practice is increasing. Health care professionals must be dedicated to reducing practice variances to protect the public.

Regulatory Requirements

The Health Care Financing Administration (HCFA) standards, JCAHO standards, and numerous laws require quality improvement programs. HCFA is a subsidiary of the Department of Health and Human Services and is the federal agency responsible for administering the Medicare and Medicaid programs. The regulations established by these organizations for accreditation and reimbursement have facilitated the quality initiative in health care. Such externally mandated regulations have promoted the development of internal monitoring and evaluation systems within health care organizations.

Progress in Quality Improvement Techniques

During the past decade, health care providers have spent valuable resources on defining and measuring quality. As a result, evaluation methodologies have

improved considerably. Information systems are available through which national and regional norms for comparative data can be obtained. Measurability methods have been upgraded and include a variety of process improvement models. **Process improvement** examines the flow of client care between departments to ensure that the processes work as they were designed and that acceptable levels of performance are achieved. Seminars, workshops, videotape training programs, and educational consultants are now available to teach process improvement in health care. Overall quality improvement methodologies enhance performance and work processes.

Changes in Health Care Delivery

Significant changes in health care delivery have occurred and unprecedented change is anticipated in the future. Clients being admitted to hospitals today are sicker, yet are being discharged more quickly. Alternative care options such as home health care, in-home intravenous therapy, and intermediate care facilities have proliferated, resulting in an even greater need to coordinate a continuum of services.

Factors that have influenced the quality movement in health care have also protected those populations most vulnerable to inadequate health care; for example, the uninsured, the elderly, and low-income families. The quality movement has promoted access to care, standards of care, cost-effective service, and a continuum of care. Thus, the quality movement in health care has served as an advocate for consumers.

THINK ABOUT IT

Factors Influencing the Quality Movement

Which factors—consumer demands, financial viability, professional accountability, regulatory requirements, progress in quality improvement techniques, or changes in health care delivery—do you think have had the greatest impact on the quality movement? Why?

Legal and Ethical Implications

Nurses, as well as other health care providers, must understand the roles that law, regulations, and ethics play in the quality movement. These aspects define professional practice. Laws define legal practice, regulations define guidelines for delivery of care, and ethics define personal performance.

Legal Considerations

Legal considerations have an impact on quality management in several ways:

- Laws and regulations create the external structure for quality management.
- Failure to provide quality health care can result in lawsuits.
- Institutions can face liability for action taken against a practitioner if objective measures are not applied to performance and due process is not provided.

Quality management programs must protect against substandard care and ultimately reduce litigation. Organizations must have clearly defined processes for professional review. These responsibilities are based on case law and federal regulations.

Case Law

Case law refers to the legal opinion rendered in court cases. Numerous legal cases have resulted in rulings that affect quality management. Several landmark cases have established the following issues within the quality management movement:

- Hospitals are liable for the care provided to clients.
- Hospitals are responsible for a department's practice.
- Limited immunity for peer review exists. See Chapter 21 for a discussion of peer review.

Federal Regulations

A number of federal agencies regulate health care standards; for example, HCFA, the Food and Drug Administration (FDA), and the Occupational Safety and Health Administration (OSHA). Specific regulations issued by these agencies that directly affect quality of care are shown in the accompanying display.

Failure to adhere to the guidelines in these legislative acts can result in sanctions for violation of standards. Federal funding and payment for services can be denied for failure to provide quality care.

Ethical Considerations

Laws establish standards of acceptable conduct; however, they often represent only a minimum acceptable standard. For example, registered nurse licensure indicates that the nurse possesses the *basic* knowledge, skills, and abilities to safely practice general nursing. Professionals are expected to adhere to a code of ethical practice that espouses a responsibility to self, profession, client, and society. Ultimately, nurses have an ethical responsibility to deliver the highest possible quality of health care. Nurses are obligated by licensure to be knowledgeable about the care they are providing and to practice according to an established code of ethics and standards of practice, as exemplified by the ANA's *Code for Nurses* (1985). See Chapter 24 for a complete discussion about ethical responsibilities.

Laws provide guidelines, and ethics provide a sense of obligation. Individual practitioners and institutions have a legal and ethical requirement to deliver quality care.

FEDERAL REGULATIONS AFFECTING QUALITY MANAGEMENT

- **Social Security Act** (1965, 1972): established Medicare and Medicaid standards for payment and professional review activities.
- **Consolidated Omnibus Budget Reconciliation Act (COBRA)** (1985, 1986): established payment denial for substandard care and developed hospital transfer policies to prevent "dumping" of indigent or uninsured clients.
- **Healthcare Quality Improvement Act (HQIA)** (1986): enacted to promote peer review by providing immunity and established a National Practitioner Data Bank that maintains a record of malpractice, mandates reporting action against physicians, and requires hospitals to check the Data Bank every 2 years for status.
- **Omnibus Budget Reconciliation Act (OBRA)** (1987, 1989, 1990): expanded scope of peer review; required notification of health care providers regarding quality issues and denials, established the Agency for Health Care Policy and Research (AHCPR) to investigate appropriateness of procedures, and added transfer guidelines to cover labor and emergency care.
- **Clinical Laboratory Improvement Act (CLIA)** (1988): established mandatory requirements for laboratories and lab personnel.
- **Patient Self-Determination Act** (1990): established advance directive requirements that prescribe care provisions for the client who is incapacitated.
- **Safe Medical Devices Act (SMDA)** (1990): established requirement to report serious injury, illness, or death resulting from specific medical device usage.
- **Occupational Safety and Health Administration (OSHA)** (1991, 1993): enacted to require employers to protect workers from occupational exposure to blood-borne pathogens and other potentially infectious material and to adhere to guidelines for control of transmission of tuberculosis.

Data from Gropper, E. I. (1999). Expect truly unannounced surveys (and more) from the Joint Commission. *Nursing Management*, 30(1), 36–38.

THINK ABOUT IT

Can You Mandate Quality?

You are working in a skilled nursing facility. Regulations require that unlicensed personnel complete training and testing for certification as nursing assistants. You discover that there has been a recent turnover in staff and many newly employed nursing assistants are not yet certified. What are the legal and ethical ramifications of this situation? What should you do?

Quality and Cost

Health care costs have skyrocketed in the past decade. The primary source of health insurance in the United States is employer coverage. Payers are becoming increasingly concerned about health care costs, and the issue of health care expenditures is being debated furiously.

Delivery of poor quality care has a negative financial impact on health care organizations. Yet, management will often argue that the quality improvement initiative is costly because of staff time involved in such activities. However, one must consider the cost of poor quality, which results in the following problems:

- Duplicated work between departments
- Loss of time due to inefficient task performance
- Loss of staff due to job dissatisfaction
- Recruitment and training of new employees
- Expenditure of energy and time in investigation of complaints and allegations
- Litigation and malpractice settlements
- Employees continually executing tasks incorrectly despite direction
- Reporting and correcting errors
- Expenses related to overutilization of diagnostic tests to avoid malpractice

Originally, the perception of quality was that of doing more, that is, the performance of more tasks that resulted in intensive intervention. Today, it is believed that efficiency can be improved without compromising quality.

Health care leaders must now look at individual and collective effectiveness of organizational management. Organizations must also begin to examine the cumulative cost associated with a less-than-optimal ability to plan, delegate, communicate, and listen. The prevailing philosophy is to do more with less. Such an approach to health care management has resulted in downsizing, cross-training, and reduction of middle management staff.

The primary cost-containment measure in health care delivery has been the proliferation of managed care systems. Ongoing debate over the effect of cost containment on quality of care continues. The Survey of Physicians and Nurses, a survey of 1,053 physicians and 768 nurses, was conducted by the Kaiser Family Foundation and the Harvard School of Public Health in 1999. The nurses in this survey (Kaiser Family Foundation, 1999) stated that managed care has led to the following:

- Decreased the amount of time they spend with clients
- Decreased clients' ability to see medical specialists
- Decreased the quality of care for individuals who are ill
- Increased the likelihood that clients would receive preventive services

QUALITY IMPROVEMENT

Quality management has its own array of terminology. Despite the similarities, there are differences in the concepts, as outlined below:

- **Quality assurance (QA)** is the traditional approach to quality management in which monitoring and evaluation focus on individual performance, deviation from standards, and problem solving.
- **Continuous quality improvement (CQI)** is the approach to quality management in which scientific, data-driven approaches are used to study work processes that lead to long-term system improvements. This concept has evolved into systems such as process improvement or performance improvement.
- **Total quality management (TQM)** is the method of management and system operation used to achieve CQI. TQM promotes an organization culture that supports customer need, empowers employees to work as teams, emphasizes self-development, and requires a new leadership style in which employees are viewed as resources.

TQM is a system of operation, whereas CQI is the desired outcome of a quality management program. It is difficult to achieve performance improvement without a TQM culture. The goal of a quality management program is to focus on process improvement, which will ultimately improve the quality of care.

Principles

Because CQI examines ways in which the entire organization can improve, the involvement of everyone, especially administration is required. CQI is based on the following principles:

1. Quality is a central theme to the organization. It is part of the organization's mission and the core of daily activities.
2. Leadership is committed to an involved in creating an **organizational culture** (commonly held beliefs, values, norms, and expectations that drive the work force) for process improvement.
3. All staff members are personally responsible for quality; therefore, decision making is done by the people doing the work.
4. Education and training must be continual to improve skills and promote self-development.
5. Processes and system operation, in addition to individual performance, are monitored.
6. Work processes that influence outcome are studied and improved, rather than relying solely on problem solving.
7. A scientific approach based on analysis of data is used.

8. Good information is available and must be used in decision making. Individuals and institutions can no longer use opinion and intuition; they must manage by facts.

Customer Perspective

Promoting customer satisfaction requires an organizational commitment from top to bottom with every employee, especially direct care workers, being sensitive to the needs, wants and expectations of customers. This commitment requires putting the customer first. Customers include those internal and external to the organization, such as clients, suppliers, third-party payers, families, visitors, employees, and the community. Managers must meet employee needs and service delivery demands. The direct care provider must meet client needs, coworker's needs, and organizational needs.

THINK ABOUT IT

Customer Orientation

Consider the service/care provided in the hospital setting. Who are the customers (all the people who participate in the service system, both internally and externally)? What does each customer expect as quality service?

Organizations rely on customer relations programs to develop strategies to keep their customers satisfied. A program of customer relations can be costly to operate. It involves staff education, cost of survey materials, public relations representation, administrative time for evaluation and follow-up, and expenses for corrective action. Corrective action may involve equipment, staffing, education, structural renovations, or new procedures. Focusing on the customer can be both time consuming and stressful because it may require change, which may evoke resistance in both employees and managers.

The reality is that health care agencies do not have unlimited resources allocated solely to keeping customers happy. Therefore, the organization and each employee must understand the implications of customer dissatisfaction from a financial perspective. The loss of one admission is relatively insignificant to a multimillion dollar budget; however, multiple losses can have a substantial effect on a health care facility's financial well-being.

There is additional potential revenue loss from related ancillary services following hospitalization, such as home health care, laboratory procedures, pharmaceutical supplies, and office follow-up. A customer's dissatisfaction with one facet of service can be generalized to all related delivery systems.

Anderson and Zemke (1998) have identified the 10 leading causes of customer dissatisfaction. As you read the accompanying display, think of how these factors

10 DEADLY SINS OF CUSTOMER SERVICE

The following are phrases that are extremely annoying to customers:

1. "I don't know."
2. "I don't care."
3. "I can't be bothered."
4. "I don't like you."
5. "I know it all."
6. "You don't know anything."
7. "We don't want your kind here."
8. "Don't come back."
9. "I'm right and you're wrong."
10. "Hurry up and wait."

Data from Anderson, K., & Zemke, R. (1998). *Delivering knock your socks off service*. New York: AMA-COM, American Management Association.

can adversely affect a client's satisfaction with health care services.

Another effect of customer dissatisfaction is a tarnished community image. There is a multiplier effect in which one bad encounter can affect the attitude and opinion of many. An unhappy client may inform the immediate family, extended family, neighbors, friends, and coworkers. Seemingly simple acts, such as those listed below, can result in client dissatisfaction despite a positive health outcome:

- A cold food tray
- Failure to respond to a call light
- Waiting for tests
- Late treatment
- Unemptied bedpan
- Delayed pain medication

Health care organizations must have a strong dispute resolution program to mediate customer complaints. In addition, strong efforts must be made to solicit customer feedback about services. Satisfaction is a subjective perception; therefore, health care providers must listen to the customer constantly to determine satisfaction and dissatisfaction. Then, improvements can be initiated.

ORGANIZATIONAL STRUCTURE FOR QUALITY MANAGEMENT

Because quality has become a central issue in health care delivery, nurses must consider the impact of organizational structure on the quality of care provided. Nurses are key in establishing a culture for excellence in most health care organizations.



Title of Study

“The Impact of Systems Redesign on Staff, Patient, and Financial Outcomes”

Author

Barry-Walker, J.

Purpose

The purpose of this study was to measure the impact of a clinical initiative using the strategies of inpatient bed consolidation on staff, patient, and financial outcomes.

Methods

This was an exploratory, single case, longitudinal field study. Both quantitative and qualitative data were collected.

Findings

Unit-level hours per patient day increased during or immediately after the merger of major patient populations on two units. There was no significant variation in medication errors or patient falls. The nursing staff was dissatisfied with many aspects of their jobs, worried about job security, had low morale, and were concerned about the quality of care provided.

Implications

Consolidation may cause an increase in hours per patient day and might also negatively affect the morale and job satisfaction of nursing staff.

Barry-Walker, J. (2000). The impact of systems redesign on staff, patient, and financial outcomes. *Journal of Nursing Administration, 30*(2), 77–89.

Several factors within an organization affect quality management: organizational culture, work force diversity, empowerment, leadership, and teamwork. To improve the quality of care, the organization should be viewed as a system that is comprised of governance, management, clinical, and support devices. Many processes within the system involve more than one group. Therefore, a framework must be established to promote collaboration.

Organizational Culture

Organizations have both formal and informal cultures. Incongruence between the formal operational style espoused by management in meetings and documents

and the style demonstrated and felt by staff members may be evident. This can result in an ineffectual organization in which achieving continual improvement is difficult. Thus, the culture of an organization can affect the quality of care. A positive culture promotes trust, information sharing, collaboration, and risk taking, whereas a negative culture produces divisiveness, resistance, and a desire to maintain the status quo. In a negative culture, inertia develops and there is a lack of creativity and self-direction by employees. Table 25-2 compares characteristics of organizational culture within traditional and high-performance organizations.

Work Force Diversity

Health care will be delivered by a more diverse work force throughout the 21st century. The organization, managers, and workers must be able to maximize diversity. Tomorrow’s work force and population will consist of more women, older Americans, people of color, and college-educated individuals. Despite increases in these groups, the overall available work force will decrease due to declining population growth. Employees can become more selective in job placement and seek new employment opportunities if dissatisfied. Employees desire self-actualization; therefore, job satisfaction will become imperative.

The slower growth in the work force will result in fewer applicants and a shortage of technical and professional staff. Rapid advances in technology will increase complexity of jobs and lead to increased competition for skilled workers. A flatter organizational structure, in which middle management is reduced, will require increased interaction and ability to work together. Groups must enhance ways of communicating to be more productive.

This change in the work force will affect methods of delivery; therefore, the organization must be able to maximize the potential of each employee. To achieve a work environment that capitalizes on diversity, the organization must implement a program that addresses individual, group, and organizational biases. Education must be provided to eliminate stereotyping. Such educational programs are aimed at:

- Identifying individual beliefs and values
- Discussing assumptions and biases based on gender, race, age, and religion
- Explaining cultural differences
- Identifying legal responsibilities
- Valuing differences of specific groups.

Management practices must build an organizational climate that values each individual’s contribution to group achievement, and the organization must develop policies to promote and support cultural needs and differences. These actions are essential in reducing the costs of employee turnover and litigation from discrimination and sexual harassment suits. The outcome of

TABLE 25-2
Organizational Culture

Dimension	Traditional Organization	High-Performance Organization
Structure	Authoritarian, hierarchical	Team focused
Decision making	Limited input, based on politics and alliances, dissonance	By consensus, based on resources, commitment to action
Cooperation	Territorial, departmentalized	Organizational success emphasized Widespread consideration
Conflict	Open discussion of issues avoided	Regarded as natural, even helpful Focuses on issues, not person
Relationships	Competitive, withholding, suspicious, partisan	Trusting, respectful, supportive, collaborative
Information and communication	Controlled at the top Hoarded, withheld, flows mainly downward Fiscal information secretive Line staff uninformed, management unaware of staff opinion	Full sharing, open, honest Flows freely up, down, sideways Fiscal information shared Information considered credible
Listening	Information from the lowest level does not reach the top Management unresponsive	Genuine listening at all levels Feedback sought
Commitment and motivation	Lack of strategic planning Resistance to change Individual interest considered over the group Fear of punishment	Commitment to vision, mission, and goals at all levels Group achievement desired
Reward and compensation	Based on subjective appraisal Longevity considered over skills and positive reinforcement for negative performance	Merit system based on ability Unacceptable behavior results in termination
Atmosphere	Intimidating, guarded, closed, political	Open, nonthreatening, noncompetitive, participative
Labor-management relationship	Adversarial “We-they” mentality Focus on grievance	Collaborative problem solving with both parties committed to organizational welfare
Role of manager	Expected to follow system Conservative approach Seniority system for promotion Dictatorial style with emphasis on disciplinary action	Managers considered important asset Emphasis placed on recruitment, selection, development, training, and compensation of managers Coaching skills essential
Attitude toward clients	They need us; we know what is best	Service attitude Client is customer Client’s opinion is valued
Measurements of success	Machines, equipment, materials Quantitative output, volume	Process improvement Customer satisfaction

Daniels, A. C. (2000). *Bringing out the best in people*. New York: McGraw-Hill; Fisher, K. (2000). *Leading self-directed work teams: A guide to developing new team leadership skills*. New York: McGraw-Hill.

such efforts can be an increase in retention, productivity, market share, creativity, flexibility, and optimism of staff while effecting a decrease in complaints, grievances, litigation, and cost. Specific advantages of having a culturally diverse work force in nursing are shown in the accompanying display. Health care providers must consider transcultural principles and human rights in managing the work force and delivering quality care. See Chapter 16 for complete discussion of cultural diversity and health care.

ADVANTAGES OF A CULTURALLY DIVERSE WORK FORCE IN NURSING

- Increased sensitivity to clients from varying cultures
- Enhanced problem-solving ability
- Increased productivity
- More creativity

Empowerment

For organizations to operate successfully and instill the drive for excellence in each employee, the staff must be empowered to take ownership of their jobs. **Empowerment** is the process of enabling others to do for themselves. Employees need responsibility and authority to solve problems and take action in their work group. Empowerment recognizes the uniqueness of employees and conveys a message of value. As a result of empowerment within a work group, an environment is created in which the collective creativity is more diverse than the ideas and knowledge of a single individual.

To survive in today's health care environment, all providers must work together to accomplish the organization's mission, vision, and goals to achieve a philosophy of continual improvement. Restructuring health care delivery requires each individual to improve work processes. Work redesign, downsizing, consortiums, managed care, and cross-functional task sharing are but a few of the many efforts underway to reorganize health care in order to reduce waste, duplication of work, and cost. All health care providers must be involved in the process of change to minimize fear, reduce resistance, promote accountability, add credibility, and produce lasting results. To accomplish change, health care organizations need to maximize employees' capabilities and motivate them toward continual improvement.

Leadership

Leadership is the interpersonal process that involves motivating and guiding others to achieve goals. Leaders in a health care organization include the governing body, chief executive officer, senior managers, leaders of the medical staff, department heads, nurse executives, and senior nursing leaders.

Effective leadership works across departmental lines to address multidisciplinary work functions and processes. Traditionally, territorial issues (the so-called turf battles) have produced divisiveness and competition among departments and disciplines. The tools for combating such divisiveness and building effective work groups are collaboration and facilitation.

Organizational leadership contributes to the creation of the culture based on CQI beliefs and practice. Leadership must create a people-oriented culture. In today's fast-paced, high-tech, cost-driven health care environment, the human factor is frequently overlooked. Although staffing incurs the greatest expense and is a primary target for cost reduction, it is the people in the health care organization who are the greatest asset, and management must focus on ensuring a return on this important resource.

Empowering employees, valuing diversity, creating organizational change, and promoting process improvement requires a new style of leadership that shifts from high manager/low employee participation. The manager becomes a coach instead of a supervisor. In this role, the manager facilitates collaboration and advocacy, serves as a consultant, and provides support.

Teamwork

Human resource management has become an essential function of health care managers. Authoritarian, hierarchical, and traditional ways of management are no longer effective; therefore, health care organizations are turning to team-based strategies for organizing labor. Improving quality requires team effort.

A **team** is a group of individuals who work together to achieve a common goal. The dynamics of team interaction are important. Teams must demonstrate commitment, cooperation, and communication. The way the team communicates and solves problems has a significant impact on outcome and delivery of service. For quality care to occur, work groups must function as teams.

For quality improvement, teams are used to study processes. There are two types of process improvement teams: functional and cross-functional. A **functional team** is a departmental or unit-specific group whose scope is limited to departmental or work area processes. A **cross-functional team** is an interdepartmental, multidisciplinary group that is assigned to study an organization-wide process (Figure 25-1). An effective team demonstrates mutual respect and trust, displays open communication, builds on skills of members, and seeks consensus.

The use of teams to restructure and improve work processes has many advantages, such as:

- Increased involvement and understanding
- More opportunities to share ideas
- Assistance in building relationships
- Involvement of staff in problem solving



Figure 25-1 Shown above are members of a cross-functional health care team. How is the quality of health care improved by the involvement of more than one discipline?

The team approach is effective for coordinating and integrating interdepartmental work processes.

PROCESS IMPROVEMENT

For years, the focus of health care quality has been on performance improvement. It was eventually recognized that no individual's performance really stands alone. Each person's action in an organization is actually a performance step that is connected to the action of others. This series of interconnected steps is known as a process; processes interconnect to form a system.

Prioritization

Quality improvement focuses on processes or systems within organizations that significantly contribute to outcome. This requires refocusing from solely departmental issues to cross-departmental lines. Prior to a process improvement philosophy, quality improvement efforts were performed within departments. However, processes operate between departments and require multidisciplinary involvement.

To continually improve, an organization must realize that it is a system of interdependent parts all with the same mission of meeting the needs and expectations of customers. Understanding interdepartmental processes is crucial to quality improvement.

In process improvement, the emphasis is on system variation, not performance of individuals. Process improvement does not just address problem solving; it also

promotes ongoing improvement of stable processes and correct establishment of new systems. Process improvement is intended to reduce variability, improve efficiency, and reduce complexity in systems.

Process improvement efforts must be directed at analyzing systems that have significant impact on the organization of care delivery. *Important aspects of care* involve activities or processes that are:

- *High volume*: occur frequently or affect large numbers of clients
- *High risk*: place clients at risk of serious consequences if not provided or provided incorrectly
- *Problem prone*: tend to produce problems for clients or staff (JCAHO, 1998)

Organizations must effectively use resources by focusing on high-priority systems that affect client outcome.

Scientific Approach

Typically, problem solutions are generated without timely analysis. A “ready, fire, aim” approach to process analysis is frequently used, in which action is taken without first thoroughly evaluating the problem. To counter this haphazard method, a scientific approach to performance improvement must be undertaken. In the scientific approach, data are used to measure process. Such an approach results in the following:

- Minimal use of intuition and opinion
- More accurate and effective problem identification
- Increased understanding of root causes of variation
- Improved evaluation of alternative solutions
- Ability to statistically measure improvement

The scientific approach to improving quality performance consists of the following steps:

1. Identify an important process to evaluate.
2. Measure the current process.
3. Assess variations.
4. Formulate improvements.
5. Implement change in the process.

Tools

A variety of tools are used to collect and analyze data so that decisions can be made about organizational performance. The accompanying display describes mechanisms frequently used to obtain and measure data.

In addition to measuring processes, data can also be used in **benchmarking** (a process that evaluates products, services, and priorities against the performance of others). Comparative data can be obtained from the literature, practice guidelines, and an increasing number of external reference databases.

MECHANISMS FOR OBTAINING QUALITY MEASUREMENT DATA

- **Audit:** Client records are reviewed for compliance to predetermined criteria that measure process and outcome of care.
- **Peer review:** Care is evaluated based on the judgment of a colleague with equal education and experience.
- **Benchmarking:** Measuring service or practice against the competition.
- **Clinical pathways:** Measuring the performance of care according to critical outcomes and key incidents that must occur within given time frames.

NURSING'S ROLE IN QUALITY MANAGEMENT

The primary purpose of nursing is to provide quality care to clients. To do so means always seeking to improve the care delivered. Nurses function as clinicians, team members, and managers. Each role has specific responsibilities for quality performance and requires certain skills to achieve the expected level of performance (Table 25-3).

There are several characteristics of quality nursing care, including the following:

- Maintenance of a current knowledge base and competencies
- Interpersonal skills (with clients and coworkers)
- Caring and compassion
- Mutual decision making with client and nurse
- Individualized treatment

Whether functioning as a clinician, team member, or manager, nurses continually strive for excellence in everything they do. By using a CQI approach, which examines structure and process instead of individual performance, nurses can move forward in the provision of quality care. Quality improvement identifies situations when nursing teams are more productive and functioning at a higher quality level.

KEY CONCEPTS

- The nine dimensions of quality performance as identified by JCAHO are efficacy, appropriateness, availability, timeliness, effectiveness, continuity, safety, efficiency, and respect and caring.
- The quality movement was initiated by consumer demands, financial viability, professional accountability, regulatory requirements, progress made in quality improvement techniques, and changes in health care delivery.

TABLE 25-3
Nursing Roles and Responsibilities:
Quality Improvement

Role	Responsibilities
<i>Clinician</i>	<ul style="list-style-type: none"> • Maintain ethical standards of practice • Seek self-development via continuing education • Be self-directed • Serve as change agent • Practice efficient time management • Achieve customer satisfaction • Be committed to reducing cost and improving performance
<i>Team Member</i>	<ul style="list-style-type: none"> • Be knowledgeable about group dynamics • Support colleagues • Promote mutual trust and respect • Build rapport with other disciplines • Practice active listening • Praise coworkers
<i>Manager</i>	<ul style="list-style-type: none"> • Develop leadership skills • Be knowledgeable about statistical analysis • Provide clear and direct communication • Delegate to and empower staff • Lead by example

- Case law and federal regulations establish guidelines for quality management.
- Health care professionals adhere to ethical codes of practice that espouse a responsibility to self, profession, client, and society.
- Continuous quality improvement focuses on studying work processes that promote system improvements.
- Total quality management is a method of organizational operation that establishes a work environment to achieve continuous improvement.
- A customer is anyone who uses the products, services, or processes within an organization. Clients, families, visitors, employees, suppliers, and the community are all considered customers within the health care system.
- Customer dissatisfaction can have significant financial implications for health care organizations.
- Quality management requires positive organizational culture, work force diversity, empowerment, leadership, and teamwork.
- A variety of tools, such as audits, peer reviews, and benchmarking are available through which data about variations in process improvement can be collected and analyzed.
- The nurse is responsible for quality improvement as a clinician, team member, and manager.

CRITICAL THINKING ACTIVITIES

1. Read the following situation to answer the questions:
Process: Timely filing of information into the client's chart.
Problem: The current process requires delivery of lab results to the unit secretary who files the results in the physician's mailbox until they are reviewed and initialed. Once initialed, the report is placed in the client's chart. This process causes a delay in chart entry.
Solution:
 - a. Who is involved in the process?
 - b. What are some possible solutions?
2. *Case Study:* Data on medication errors are monitored for the calendar year and plotted on a control chart. January, May, and July exceeded upper control limits; the remaining 9 months were within acceptable limit. On analysis, it was determined that:
 - New nursing graduates entered the system in January and May.
 - July was vacation month with staffing shortages.
 Based on the above data:
 - a. What processes would you analyze?
 - b. What would be possible solutions for each variance?
3. Using the nine dimensions of quality improvement as defined by JCAHO, explain the following phrases: "doing the right thing" and "doing the right things well."
4. What is the difference between "quality assurance" and "quality improvement"?
5. In what ways do nurses improve quality of care?

WEB RESOURCES

- Agency for Health Care Research & Quality
www.ahrq.gov
- Best Practice Network
www.best4health.org
- Institute of Medicine
www.iom.edu
- Joint Commission on Accreditation of Healthcare Organizations
www.jcaho.org
- National Guideline Clearinghouse (a public resource for evidence-based practice guidelines)
www.guideline.org

Chapter 26

Accountability: Documentation and Reporting



*Much more precise might be our observation even than this and
much more correct our conclusions.*

—Nightingale (In Skretkowicz, 1992)

COMPETENCIES

1. Explain the purposes of documentation in health care.
2. Discuss the principles of effective documentation.
3. Describe various methods of documentation.
4. Describe various types of documentation records.
5. Describe the latest advances in computerized documentation.

KEY
TERMS

advance directive
case management
charting by exception (CBE)
communication
critical pathway
documentation
durable power of attorney
focus charting
incident report

informed consent
Kardex
narrative charting
nursing intervention
classification (NIC)
nursing minimum data set
(NMDS)
point-of-care charting
problem, intervention,
evaluation (PIE) charting

problem-oriented medical
record (POMR)
SOAP charting
source-oriented (S.O.)
charting
variations
walking rounds

Throughout the development of modern nursing, a variety of documentation systems have emerged in response to changes inherent in health care delivery. Changes in consumer and legal expectations, federal and state regulations, accreditation standards, and research findings direct provider accountability for the documentation of services. Systems of recording and reporting data pertinent to the care of clients have evolved primarily in response to the demand for health care practitioners to be held accountable to societal norms, professional standards of practice, legal and regulatory standards, and institutional policies and standards.

As with all facets of health care, advanced technology has affected the expectations for documentation. Benchmarking activities in quality improvement and cost containment have also increased the demands on health care practitioners to create efficient documentation systems. Efficiency is measured in terms of time, thoroughness, and the quality of the observations being recorded. The documentation systems in use today reflect the specific needs and preferences of the numerous health care agencies. Selected systems and their ramifications are discussed in this chapter.

DOCUMENTATION AS COMMUNICATION

Communication is a dynamic, continuous, and multidimensional process for sharing information as determined by standards or policies. Reporting and recording are the major communication techniques used by health care providers to direct client-based decision making and continuity of care. The medical record serves as a legal document for recording all client activities assessed and initiated by health care practitioners.

Documentation Defined

Documentation is defined as written evidence of:

1. The interactions between and among health professionals, clients, their families, and health care organizations

2. The administration of tests, procedures, treatments, and client education
3. The results or client's response to these diagnostic tests and interventions (Eggland & Heinemann, 1994)

Documentation provides written records that reflect client care provided on the basis of assessment data and the client's response to interventions.

Nurses rely on documentation tools that support the implementation of the nursing process. These tools are the charting records and systems that facilitate a logical sequencing of events. All the tools used by nurses to record their nursing care should form a system. Systematic documentation is critical because it presents the care administered by nurses in a logical fashion, as follows:

1. Assessment data (obtained by interviewing, observing, and inspecting) identifies the client's specific alterations and provides the foundation of the nursing care plan.
2. The risk factors and/or the identified alteration in the functional health pattern directs the formulation of a nursing diagnosis.
3. Identifying the nursing diagnosis promotes the development of the client's short-term goals, long-term goals, and expected outcomes, and also triggers the nursing interventions. These activities occur during the planning and implementation phases of the nursing process.
4. The plan of care identifies the actions necessary to resolve the nursing diagnosis.
5. Implementation is evidenced by actions the nurse performed to assist the client in achieving the expected outcomes.

The effectiveness of the nursing interventions in achieving the client's expected outcomes becomes the criterion for evaluation which determines the need for subsequent reassessment and revision of the plan of care.

The system becomes a vehicle for expressing each phase of the nursing process. Nurses rely on systems that provide thorough, accurate charting reflective of the nurse's decision-making ability and the client's plan of care. The nurse's critical-thinking skills, judgments, and evaluation must be clearly communicated through proper documentation.

Purposes of Health Care Documentation

Professional responsibility and accountability are two primary reasons why practitioners document. Other reasons to document include communication, education, research, meeting legal and practice standards, and reimbursement. Documentation is the professional responsibility of all health care practitioners. It provides written evidence of the practitioner's accountability to the client, the institution, the profession, and society.

Communication

Recording is a method of communication that validates the care provided to the client. It should clearly communicate all important information regarding the client. Thorough documentation provides:

- Accurate data needed to plan the client's care in order to ensure the continuity of care
- A method of communication among the health care team members responsible for the client's care
- Written evidence of what was done for the client, the client's response, and any revisions made in the plan of care
- Compliance with professional practice standards (e.g., American Nurses Association)
- Compliance with accreditation criteria (e.g., the Joint Commission on Accreditation of Healthcare Organization [JCAHO])
- A resource for review, audit, reimbursement, education, and research
- A written legal record to protect the client, institution, and practitioner

The client's medical record contains documents for record keeping. The type of document that constitutes the medical record is determined by the health care institution. References will be made to the various types of medical record documents throughout this chapter; refer to Table 26-1 for an explanation of these documents.

Education

The documentation contained within the client's medical record can be used for the purpose of education. Health care students use the medical record as a tool to learn about disease processes, complications, medical and nursing diagnoses, and interventions. The results of physical examination and laboratory and diagnostic testing provide valuable information regarding specific diagnoses and interventions.

Nursing students can enhance their critical-thinking skills by examining the records in chronological order, analyzing the results, and following the health care team's plan of care such as how it was developed, implemented, and evaluated. Students and all health care



NURSING CHECKLIST

Reviewing a Chart

- Can the assessment data that triggered the nursing diagnosis be identified?
- When the defining characteristics of a specific nursing diagnosis are compared to the client's presenting signs and symptoms, is there supporting evidence?
- Were critical questions asked during the client interview?
- Did the nurse use the data obtained from both the interview and physical assessment in establishing the diagnoses?
- Can any assumptions that might have misled the nurse's judgment be identified?
- Are the nursing data correlated with the results of the physical examination and findings from diagnostic tests?
- Are the expected outcomes realistic?

professionals need to be aware of confidentiality issues before reading any client's chart; these are discussed later in the chapter.

Clinical rounds and case conferences, which rely heavily on information contained in the medical record, have also proved to be effective teaching tools. These learning experiences usually involve several disciplines that contribute to the review and discussion of client outcomes.

Student nurses need to learn the "flow" of documenting clinical data according to institutional policy in a legible, descriptive, and time-sequenced fashion (Grulke, 1995). A good way to learn the "flow" is to review the client's condition as presented in the chart before hearing the report. The data obtained from chart review should direct the assessment of signs and symptoms on rounds.

Research

Researchers rely heavily on clients' medical records as a clinical data source to determine if clients meet the research criteria of a study. Documentation also can validate the need for research. For example, if documentation demonstrates an increased infection rate with intravenous catheters, researchers can identify and study the variables that may be associated with the increased infection rate.

Legal and Practice Standards

"Failure to document appropriately is a key factor in clinical mishaps and a pivotal issue in many malpractice cases" (Springhouse, 1995, p. 184) because the client's medical record is a legal document, and in the case of a lawsuit the record serves as the description of exactly

TABLE 26-1
Medical Record Documents

Document	Information
Face sheet	Biographical data: name, date of birth, address, phone number, Social Security number, marital status, employment, race, gender, religion, closest relative; insurance coverage; allergies; attending physician; admitting medical diagnosis; assigned diagnosis-related group; statement of whether the client has an advance directive.
Consent form	<i>Admit:</i> Gives the institution and physician the right to treat. <i>Surgery:</i> Explains the reason for the operation in lay terms, the risks for complications, and the client's level of understanding. <i>Blood transfusion:</i> Permission to administer blood or blood products.
Medical history and physical examination	Results of the client's initial history and physical assessment as performed by the health care provider.
Prescriber order sheet	Medical orders to admit and the treatment plan.
Progress notes	Evaluation of the client's response to treatment; may contain the progress recording of interdisciplinary practitioners (e.g., dietary or social services)
Consultation sheet	Initiated by the physician to request the evaluation or services of other practitioners.
Diagnostic results	Contains the results from laboratory and diagnostic tests (e.g., X-ray, hematology)
Nursing admit assessment	Recording of data obtained from the interview and physical assessment conducted by the RN.
Nursing plan of care	Contains the treatment plan (e.g., nursing diagnosis or a problem list, initiation of standards of care, or protocols)
Graphic sheet	Data recording regarding vital signs and weight.
Flow sheet	Contains all routine interventions that can be noted with a check mark or other simple code; allows for a quick comparison of measurement.
Nurses' progress notes	Additional data that do not duplicate information on the flow sheet (e.g., client's achievement of expected outcome or revision of the plan of care)
Medication administration record (MAR)	Contains all medication information for routine and prn drugs: date, time, dose, route, site (for injections).
Patient education record	Recording of the nurses' teaching of the client, family, or other caregiver and the learner's response.
Health care team record	Treatment and progress record for nonmedical and nonnursing practitioners, when the physician's progress notes are not used by other practitioners (e.g., respiratory, physical therapy, dietary)
Clinical pathway	A multidisciplinary form for each day of anticipated hospitalization that identifies the interventions and achievement of client outcomes; the practitioner's initial implementation and variances from the norm are explained in the progress notes. (See Appendix XX.)
Discharge plan and summary	A multidisciplinary form used before discharge from a health care facility containing a brief summary of care rendered and discharge instructions (e.g., food-drug interactions, referrals or follow-up appointments)
Advance directive or living will	Federal law requires that health care providers discuss with clients the use of advance directives, commonly known as the living will or durable power of attorney. Most states recognize the living will as a legal document. If the client has advance directives, they are reviewed at the time of admission and placed in the medical record.

NURSING ALERT

The Importance of Communication

Important information obtained from an assessment that warrants immediate intervention should not only be documented in the medical record but also communicated orally to the other practitioners. The element of time must direct decision making when critical information is obtained.

what happened to a client. In 80% to 85% of malpractice lawsuits involving client care, the medical record is the determining factor in providing proof of significant events (Iyer & Camp, 1999). The legal issues of documentation require:

- Legible and neat writing
- Proper use of spelling and grammar
- Use of authorized abbreviations
- Factual and time-sequenced descriptive notations

These elements of effective documentation are discussed later in this chapter.

Nurses are responsible for the care the client receives and can be held liable if appropriate interventions are not implemented in a timely manner when information is available that would dictate otherwise. The nurse is responsible for documenting on the chart when a “physician was notified” along with what significant information was orally communicated. If the nurse does not get a response from the physician that recognizes the urgency of the information, the nurse must document the physician’s response and notify the supervisor of the situation. Stephen Torsty, JD, MHA, director of risk management services for a major corporation, states that “the better the communication between the care-

givers and the patient, the less likely you will see some type of lawsuit or claim” (American Health Consultants, 1995, p. 95).

Informed Consent

Informed consent means that the client understands the reason for and the risks of the proposed intervention and agrees to the treatment by signing a consent form. Legally, the client must be mentally competent, and the physician who is to perform the procedure is responsible for obtaining the client’s informed consent (refer to Chapter 23). “Failure to provide educational opportunities for a patient to participate in decision making (i.e., failure to ensure informed consent) could open the door to litigation” (American Health Consultants, 1995, p. 105).

In order to assist the physician with proper documentation of teaching, many facilities have preprinted informed consent documents that explain procedures in lay terms and identify the risk factors and possible complications. These documents are usually duplicate copies: the original goes in the medical record, and the copy is given to the client. This procedure provides the client with a written copy of the information that can be reviewed at a later time in a more relaxed environment.

Nurses are responsible for ensuring that the client understands the procedure or intervention and has signed the informed consent. The best way to assess a client’s knowledge of an intervention is to ask him to explain, in his own words, what is going to be done and the common risks and possible complications. If the informed consent has not been signed or if the nurse assesses a lack of understanding on the client’s part, the physician should be notified and the client should not be allowed to undergo the procedure. If the intervention is a surgical procedure, the nurse should notify the operating room at the time the physician is notified.

Although most informed consents deal with medical interventions, nurses are sometimes responsible for implementing the interventions: for example, administering blood or blood products requires informed consent. It is also the responsibility of the nurse to obtain oral consent for certain nursing interventions, such as initiating intravenous therapy or inserting a nasogastric tube or urinary catheter. Remember that consents require client education with an explanation of

THINK ABOUT IT

Completeness in Charting

Is this just a cliché: “If it wasn’t charted, it wasn’t done”? Since the purpose of the medical record is to document the care administered to the client, how can a practitioner convince a jury that care was administered if it is not documented in the medical record? Consider the following. A nurse, by habit, always administers an intramuscular injection in the ventrogluteal site (although both the ventrogluteal and dorsogluteal sites are within the accepted guidelines of care). The nurse, however, fails to chart the site on the medication administration record (MAR). The client files a suit for sciatic nerve damage. Knowing that there is an identified greater risk factor for sciatic nerve injury with the dorsogluteal site, do you think it would be difficult to defend care given in this case?

NURSING ALERT

Consent from Sedated Clients

Sedated clients should never be requested or allowed to sign an informed consent; the client may not be capable of understanding the nature of and risks associated with the procedure, so the consent will be invalid, and the nurse and institution will be at legal risk. Wait instead for the client to be competent and free of sedation, or have a legally acceptable family member brought into the decision.

outcomes and documentation of the client's understanding of the procedure.

Once the client has been educated by the physician and nurse of the intervention, the informed consent needs to be signed by the client and witnessed. Witnessing the signing of the consent confirms that the person who signs the consent is in fact the client and *is competent, alert, and aware of all actions at that point in time*. Refer to Chapter 23 for further discussion of informed consent.

Advance Directives

An **advance directive** is a statement made by clients that defines care they deem acceptable if they become incapacitated. It effectively allows clients, while competent, to participate in end-of-life decisions and to choose the types of life-sustaining procedures they will permit if they become unable to make their own decisions at a later time. A **durable power of attorney** allows the client to appoint a person to make health-related decisions when the client is incapable of making them. The Patient Self-Determination Act of 1990 requires health care facilities (hospitals, skilled-nursing facilities, and home health agencies) to inform adult clients of their rights regarding advance directives and to document in the medical record whether the client has such a directive. The implementation of advance directives is discussed in Chapter 23.

American Nurses Association (ANA) Standards of Care

Standards of documentation are established by professional organizations. ANA's Standards of Clinical Nursing Practice serve as a guideline for determining safe, quality nursing care and practice. The nursing process gives structure to the standards of care, with specific measurement criteria for each phase in the process. For each of the six standards (assessment, diagnosis, outcome identification, planning, implementation, and evaluation) there is a measurement criterion that states "are documented." ANA standards make explicit the role of data collection and documentation in nursing practice and specify that data collection be systematic and continuous and that data are accessible, communicated, and recorded (ANA, 1997).

State Nurse Practice Acts

In an attempt to recognize and control the practice of nursing, nurse practice acts, on a state-by-state basis, have established guidelines to ensure safe practice and to demonstrate accountability to society. The standards of care, as set forth in the practice acts, are based on the phases of the nursing process and require evidence of compliance by documentation. Nurses should be familiar with the practice acts and rules of the state in which they work.

Joint Commission on Accreditation of Healthcare Organizations (JCAHO)

The JCAHO surveys health care facilities to measure compliance with its standards for safe health care provi-

sion. Although facilities voluntarily submit to this accreditation process, reimbursement eligibility for Medicare, Medicaid, and private funding is dependent upon JCAHO accreditation.

The JCAHO no longer requires that health care organizations have traditional nursing care plans, but documentation of an individualized plan of care must be evident for each client. JCAHO's standards require:

- The involvement of the client or family in the development of the plan, which must be documented in the medical record
- Interdisciplinary planning and implementation of all aspects of care

The use of interdisciplinary tools has proved to be an effective approach to documenting client and family education for agencies not yet using critical pathways (discussed later in the chapter) or care mapping. Compliance with JCAHO's client and family teaching standards through the use of an interdisciplinary record improved education documentation from 30% to 84% in one medical center studied (Tucker, 1995).

During the accreditation survey, the reviewer looks for evidence of an organized and systematic method of monitoring and evaluating client care that is reflected through documentation in the medical record. Documenting the steps of the nursing process ensures compliance with JCAHO's plan of care requirements.

Reimbursement

Peer review organizations (PROs), consisting of physicians and nurses, are required by the federal government to monitor and evaluate the quality and appropriateness of care given. Medical record documentation is the mechanism for the PRO review, which evaluates the intensity of services and the severity of illness on the basis of a comparison of sample medical records from different facilities against specific screening criteria.

The federal enactment of the diagnosis-related group (DRG) classification system changed the health care provider reimbursement process from a cost-per-case formula to a prospective payment system (PPS). With PPS, the medical record must provide documentation that supports the DRG and the appropriateness of care. Nursing documentation must also show evidence of client and family education and discharge planning.

From a hospital's perspective, when information in the medical record demonstrates compliance with Medicare and Medicaid standards, the reimbursement is maximized. If nurses fail to document the equipment or procedures used daily (e.g., feeding pump; daily weight, intake and output; intravenous therapy; drug additives), reimbursement to the facility can be denied.

Another federal law, the Comprehensive Omnibus Budget Reconciliation Act (COBRA) allows employees

to temporarily carry their employer-provided health insurance benefits for 90 days after termination, reduction in the work hours, or retirement. The law requires that for any COBRA client receiving care in an emergency room, the client's condition must be stabilized before the client can be transferred to another facility. If the client's condition is not stable, then the institution cannot initiate a transfer.

Facilities in violation of COBRA laws are fined and stand to lose their eligibility to Medicare and Medicaid funding. Compliance with this law is evaluated through medical record review. The documentation concerning client transfers must include:

- Chronology of the event
- Measures taken or treatment implemented
- Client's response to treatment
- Results of measures taken to prevent the client's condition from deteriorating

THINK ABOUT IT

Meeting COBRA Laws

Why would an emergency room want to transfer a COBRA client who has insurance? Do you think these clients are considered high risk? Suppose a pregnant client in the seventh month of gestation comes to the emergency room in labor. The client is assessed by the physician and nurse. Labor is in progress, but delivery is not imminent, and the client's blood pressure is 210/124. Treatment is initiated; however, the blood pressure remains high (190/110). Can this client be transferred? If not, why not? Why would this health care provider want to stabilize and transfer the client before delivery?

APPLICATION: HOME CARE

Home health agencies also keep documents: physician orders, history and physical form, home care team records, and nursing records (initial assessment form, plan of care, problem list for daily progress notes, client teaching activities, and discharge summary). Home health care providers are required to comply with state and federal regulations that affect health care, documentation, and reimbursement.

PRINCIPLES OF EFFECTIVE DOCUMENTATION

Documentation requirements will differ depending on the health care facility (hospital, nursing home, home health agency) and the setting within the facility (e.g.,

emergency room, perioperative, medical-surgical unit) and with specific client populations (e.g., obstetrics, pediatrics, geriatrics). Regardless of what client care is administered, the documentation of that care must reflect the nursing process. General documentation guidelines are listed in Table 26-2.

Nursing notes must be logical, focused, and relevant to care, and must represent each phase in the nursing process (Iyer & Camp, 1999). Nursing documentation based on the nursing process facilitates effective care because client needs can be traced from assessment, through the identification of the problems, to the care plan, implementation, and evaluation. A brief reminder of the elements of the nursing process follows:

- *Assessment:* Summarize, without duplication, assessment data that are related to an actual or potential health care need. With reassessment, highlight any new findings or any changes in the client's condition (e.g., increased pain). Table 26-3 outlines some assessment-specific documentation guidelines.
- *Diagnosis:* Identify the client's problem or need using NANDA terminology.

TABLE 26-2
General Documentation Guidelines

- Ensure that you have the correct client record or chart and that the client's name and identifying information are on every page of the record.
- Document as soon as the client encounter is concluded to ensure accurate recall of data (follow institutional guidelines on frequency of charting).
- Date and time each entry.
- Sign each entry with your full legal name and with your professional credentials, or per your institutional policy.
- Do not leave space between entries.
- If an error is made while documenting, use a single line to cross out the error, then date, time, and sign the correction (check institutional policy); avoid erasing, crossing out, or using correction fluid.
- Never change another person's entry, even if it is incorrect.
- Use quotation marks to indicate direct client responses (e.g., "I feel lousy").
- Document in chronological order (if chronological order is not used, state why).
- Write legibly.
- Use a permanent-ink pen (black is usually preferable because of its ability to photocopy well).
- Document in a complete but concise manner by using phrases and abbreviations as appropriate.
- Document all telephone calls that you make or receive that are related to a client's case.

(Adapted from Estes, M. E. Z. [2002]. *Health assessment and physical examination* [2nd ed.]. Albany, NY: Delmar Publishers.)

TABLE 26-3
Assessment-Specific Documentation Guidelines

- Record all data that contribute directly to the assessment (e.g., positive assessment findings and pertinent negatives).
- Document any parts of the assessment that are omitted or refused by the client.
- Avoid using judgmental language such as “good,” “poor,” “bad,” “normal,” “abnormal,” “decreased,” “appears to be,” and “seems.”
- Avoid evaluative statements (e.g., “client is uncooperative,” “client is lazy”); cite instead specific statements or actions that you observe (e.g., “client said ‘I hate this place’ and kicked trash can”).
- State time intervals precisely (e.g., “every 4 hours,” “bid,” instead of “seldom,” “occasionally”).
- Do not make relative statements about findings (e.g., “mass the size of an egg”); use specific measurements (e.g., “mass 3 cm × 5 cm”).
- Draw pictures when appropriate (e.g., location of scar, masses, skin lesion, decubitus, deep tendon reflex, etc.).
- Refer to findings using anatomical landmarks (e.g., left upper quadrant [of abdomen], left lower lobe [of lung], midclavicular line, etc.).
- Use the face of the clock to describe findings that are in a circular pattern (e.g., breast, tympanic membrane, rectum, vagina).
- Document any change in the client’s condition during a visit or from previous visits.
- Describe what you observed, not what you did.

(Adapted from Estes, M. E. Z. [2002]. *Health assessment and physical examination* [2nd ed.]. Albany, NY: Delmar Publishers.)

- *Outcome identification and planning:* Discuss with the client and communicate to members of the multidisciplinary team the expected outcomes or goals of client care.
- *Implementation:* After the intervention has been performed, document on the flow sheet and progress notes observations, treatments, teaching, and related clinical judgments. Client teaching should include learning needs, teaching plan content, methods of teaching, who was taught, and the client’s response.
- *Evaluation:* Evaluate and document the effectiveness of the interventions in terms of the expected outcomes: progress toward goals; client response to tests, treatments, and nursing interventions; client and family response to teaching and significant events; questions, statements, or complaints voiced by the client or family.
- *Revisions of planned care:* Document the reasons for the revisions with the supporting evidence and client and family agreement.

Charting in accordance with the nursing process ensures thorough documentation in compliance with ANA’s standards of care, practice acts, and reimbursement and accreditation criteria.

Elements of Effective Documentation

Effective documentation requires:

- Use of a common vocabulary.
- Legibility and neatness.
- Use of only authorized abbreviations and symbols.
- Factual and time-sequenced organization.
- Accurately including any errors that occurred.

The following discussion of effective charting refers to all nursing documents, such as flow sheet, progress notes, and so on. Add to the nursing documents when:

- A change occurs in the client’s condition
- Measuring the client’s response to an intervention or expected outcome
- The client or family voices a complaint

Use of Common Vocabulary

During the last decade, nurse researchers have observed inadequacies in the clinical record that prevent data collection and comparison among large groups of clients. One reason these inadequacies exist is that the documented clinical data cannot be correlated without a common vocabulary for addressing client outcomes for specific nursing interventions (McCloskey & Bulechek, 1995). Nursing practice reflects the use of multiple terms for nursing interventions, preventing cross-institutional comparisons of nursing care. The current efforts under way to establish a taxonomy for nursing interventions determined by specific nursing diagnoses will enhance the quality of documentation and support the efforts of researchers. (Refer to Chapter 9.) Use of common vocabulary will also improve intra-team communication and lessen the chance of misunderstandings.

Legibility

Whatever is charted must be easily readable, without any chance of error. If your handwriting is not readable, print. If you make a mistake, do not erase or obliterate it; draw one line through the erroneous entry and state the reason for the error, then sign and date the correction, as shown in Figure 26-1.

Abbreviations and Symbols

Facilities usually have a list of acceptable abbreviations and symbols, approved by the Medical Records Committee, to be used when documenting information in the client’s record. Always refer to the facility’s approved listing. (See Appendix A, Commonly Accepted Abbreviations and Symbols). Avoid abbreviations that can be misunderstood (refer to Figure 26-2).

12/11/01	1400	Client complains of pain (6 on a 0-to-10 pain scale) <i>mistaken entry Pt still</i> when positioned on hip hip — P. Palmer, RN

Figure 26-1 Correcting a Documentation Error

THINK ABOUT IT

Abbreviations

What does the abbreviation *Pt* mean? Does *Pt* refer to patient, prothrombin time, physical therapy, or part-time?

Organization

Start every entry with the date and time. Chart in a chronological order—assessment data, observation, intervention, and evaluation (see Figure 26-3). Comply with the time frame indicated in the facility’s guidelines for documentation: for example, the frequency of charting observations for a client with restraints or the time frame within which the admit assessment must be completed.

Percodan 5mg qd

Is the abbreviation:

q.d. - every day

or

q.i.d. - four times a day?

12/11/01 1800 administered 7 of Mylanta
— P. Palmer, RN

Is the symbol:

℥ - dram

or

℥ - ounces?

Figure 26-2 Misleading Abbreviation and Symbol

Nurses Progress Record		
Date	Hour	Progress Notes
12/11/01	1730	Client complains of a burning pain (5 on a 0- to-10 pain scale) in U&P, leaning forward; burning pain RT gastric secretion reflux; admin. Mylanta 30 cc po PRN as ordered, head of bed elevated 45° — P. Palmer, RN
12/11/01	1815	client states burning pain + 2. P. Palmer, RN

Figure 26-3 Charting a prn Medication

Chart in a timely fashion to avoid the omission of pertinent data; it is not a good practice to wait until the end of the shift to chart on all the clients. Chart medications immediately after administration to avoid errors. Sign your name after each entry.

When the nurse forgets to document significant data, it is appropriate and advisable to include these data at a later date (Fiesta, 1996). There are several reasons why a late entry might have to be made:

- The chart was not available (e.g., the chart was with the client in special procedures lab).
- Entries had to be added after notes were completed.
- Information was documented on the wrong record.

As with other aspects of documentation, follow the facility’s policy for charting a late entry. Common practice is to enter the date and time and label “Late entry” to indicate that it is out of sequence. Then record the date and time it should have been made in the body of the entry as shown in Figure 26-4.

Accuracy

Accuracy and objective data are crucial if the documentation is to be useful either clinically or for research. Use

12/11/01	2000	Late entry (8/11/97 - 1730) client stated "I received an upsetting phone call from my daughter 30" ago." — P. Palmer, RN
----------	------	--

Figure 26-4 Charting a Late Entry

factual, descriptive terms to chart exactly what was observed or done; for example:

INCORRECT	CORRECT
"Wound appears the same."	"Wound is 2.5 cm by 1.0 cm."
"Large amount of drainage."	"Foul-smelling, yellowish drainage completely saturated two 4 × 4s."

Use correct spelling and grammar, and write complete sentences.

Differentiate who does what; for example, "Dr. Smith inserted a triple-lumen, 20-gauge catheter into the right subclavian vein." Read the notes recorded by nurses on previous shifts and make further comments on their findings to maintain the continuity of care.

Documenting a Medication Error

Facilities require nurses to report medication errors on incident reports (discussed later in this chapter and Chapter 23). This information should also appear on the medication administration record (MAR) with a notation in the nurses' progress notes. Remember, the purpose of the medical record is to report any care or treatment the client receives.

When a medication error occurs, the following should be charted:

1. Chart the medication on the MAR to prevent other caregivers from giving the client additional doses of the drug, or similar drugs, or drugs that may be contraindicated.
2. Document the error in the nurses' notes as follows: name and dosage of the medication; time it was given; client's response to the medication; name of the practitioner who was notified of the error; time of the notification; nursing interventions or medical treatment to counteract the error; and client's response to treatment.

Confidentiality

Nurses are bound by ethical codes and laws to treat all client information in a confidential and professional manner; this includes the client's record. The written documentation contained in the client's chart is a legal record of care, and it should be available only to members of that client's health care team. The client's significant others, insurance companies, or other parties not directly involved in the care provided by the health care team may not have access to clients' records; it is the nurse's responsibility to protect the privacy and confidentiality of client interactions, assessments, and care. Even clients themselves must submit a written request to have their information released, and then they must specify exactly what information is to be released and to whom. In many institutions, particularly teaching hospitals, client records may be used for educational or research purposes. Members of these educational and research teams are held to the same standards of privacy protection and may not legitimately use client information for any purposes other than education or research or in any manner that would identify specific clients in any way.

METHODS OF DOCUMENTATION

Documentation must reflect the complexity of care, and it must embody accuracy, completeness, and evidence of professional practice with efficient and cost-effective systems. The clinical standards (structure, outcome, process, and evaluation) are used to develop a system that complies with legal, accreditation, and professional practice requirements of documentation.

There are many methods used for documentation, including:

- Narrative charting
- Source-oriented charting
- Problem-oriented charting
- PIE charting
- Focus charting
- Charting by exception (CBE)
- Computerized documentation
- Case management with critical paths

Narrative Charting

Narrative charting, the traditional method of nursing documentation, is a story format that describes the client's status, interventions and treatments, and the client's response to treatments. Before the advent of flow sheets, this was the only method for documenting care. About 30% of nurses' time, during an 8-hour shift, was spent on narrative charting (Miller & Pastorino, 1990).

Narrative documentation is easy to use in emergency situations, in which a simple, chronological order is needed. However, in this type of documentation it is often difficult to avoid being subjective, and there is normally a lack of analysis and critical decision making on the part of the nurse. Narrative charting is now being replaced by other formats because:

- The flow of care is disorganized. It is difficult to show a relationship between data and critical-thinking skills. Each nurse writes with a unique style, making continuity of care difficult to identify.
- It fails to reflect the nursing process. The focus is on tasks without emphasis on assessment data or progress toward achievement of outcomes.
- It is time-consuming. The paragraphs are free-flowing, so it takes more time to record accurate data and for others to read it.
- The information is difficult to retrieve. The same problems may not be addressed from shift to shift, so it is difficult to track the client's progress. Auditors often disallow charges for equipment and supplies because consistent usage cannot be identified.

Source-Oriented Charting

Source-oriented (S.O.) charting is described as a narrative recording by each member (source) of the health care team on separate records. Because each discipline has a separate record, care is often fragmented and communication between disciplines becomes time-consuming. S.O. charting has similar advantages and disadvantages to narrative charting since nurses use an unstructured approach in documenting in the progress notes.

Problem-Oriented Charting

Problem-oriented medical record (POMR) was introduced in 1969 by Lawrence Weed, a physician at Case Western Reserve University. The focus of POMR documentation is on the client's problem, with a structured, logical format to narrative charting called **SOAP**:

- S: subjective data (what the client or family states)
- O: objective data (what is observed/inspected)
- A: assessment (conclusion reached on the basis of data formulated as client problems or nursing diagnoses)
- P: plan (actions to be taken to relieve client's problem)

SOAPIE and SOAPIER refer to formats that add:

- I: intervention (measures to achieve an expected outcome)
- E: evaluation (effectiveness of interventions)
- R: revision (changes from the original plan of care)

Figure 26-5 shows a sample of SOAPIE charting. As you chart according to these systems, think about which

piece of information corresponds with each letter in the SOAP(IE) entry.

The POMR system was modified by nonmedical caregivers and is referred to as problem-oriented record (POR). The system is used by hospitals, nursing homes, and home care agencies (Egglund & Heinemann, 1994).

There are four critical components of POMR/POR:

- Database: Assessment data, representative of all disciplines (history, physical, nursing admit assessment, laboratory findings, educational and discharge needs), which become the basis for a problem list evaluation of the client's condition.
- Problem list: Derived from the database: a listing of the client's problems as identified, with each problem numbered and labeled as acute, chronic, active, or inactive. Nurses use NANDA terminology in writing client problems as nursing diagnoses; the list is revised as new problems arise and others are resolved.
- Initial plan: Based on problem identification; the starting point for care plan development with client participation in setting goals, expected outcomes, and learning needs.
- Progress notes: Charting based on the SOAP, SOAPIE, or SOAPIER format.

The POR system uses flow sheets to record routine care and a discharge summary that addresses each problem on the list and notes whether it was resolved. SOAP entries are usually made every 24 hours on any unresolved problem or whenever the client's condition changes.

PIE Charting

After SOAP charting gained in popularity, the **problem, intervention, evaluation (PIE)** system was instituted at Craven Regional Medical Center in 1984 to streamline documentation. Whereas SOAP was developed on a medical model, PIE charting has a nursing origin. PIE is an acronym for problem, intervention, and evaluation of nursing care. The key components of this system are assessment flow sheets and nurses' progress notes with an integrated plan of care that eliminates the need for a separate care plan. Each client problem is labeled and numbered for easy reference. When interventions are implemented to manage the client's problem, the problem number is identified, as shown in Figure 26-6. This system eliminates the traditional care plan by incorporating an ongoing plan of care into the daily documentation.

Focus Charting

Focus charting is a method of identifying and organizing the narrative documentation of client concerns to include data, action, and response. This method is not

Nurses Progress Record

Date	Hour	Progress Notes
12/11/01	0730	<p>Problem #2 Ketoacidosis</p> <p>S: Client states "I feel sick all over." Client claims difficulty in breathing, abdominal pain + nausea.</p> <p>O: Lungs clear, R 28/min, labored. Abdomen distended, bowel sounds underactive all 4 quadrants. 5+ abdominal pain.</p> <p>A: Alteration in nutrition + comfort R/T ketoacidosis. Blood glucose 458 mg/dl. Ketones strongly positive. pH < 7.3.</p> <p>P: Maintain IV infusion of 0.9% NS + regular insulin as ordered. NPO. Oral hygiene hourly. Maintain accurate I+O. Assess for rales, hypotension, cardiac dysrhythmias. Monitor blood glucose + electrolytes. P. Padner, RN</p>

limited to client "problems" but allows for the identification of all "concerns" such as a significant event (e.g., results of a diagnostic test). Focus charting was created in 1981 at Eitel Hospital in Minneapolis, when the results from a SOAP audit revealed weaknesses in writing care plans (18% compliance) and charting the client's response to care (12% compliance) (Iyer & Camp, 1999). Focus charting uses a columnar format within the progress notes to distinguish the entry from other recordings in the narrative notes, as shown in Figure 26-7.

Charting by Exception

Charting by exception (CBE) is a charting method that requires the nurse to document only deviations from preestablished norms. CBE was instituted in 1983 by St. Luke Medical Center in Milwaukee to overcome the recurring problem of lengthy, repetitive notes and to enable the identification of trends in client status. The CBE system has three key components:

12/11/01	0730	<p>I: Called Dr. Smith, blood glucose 458 mg/dl. IV bolus regular insulin given as ordered. 1000 ml. 0.9% NS infusing C1/H central line #1 via infusion pump. 50u regular insulin in 500 ml NS infusing C 50ml/H, central line #2 via infusion pump. EKG taken, placed on telemetry.</p>
12/11/01	0835	<p>E: Lungs clear, R 24/min, non-labored. NSR. 3+ abdominal pain. Urinary output 750 ml/hr. Blood glucose 360 mg/dl. - P. Padner RN</p>

Figure 26-5 Sample SOAPIE Charting

Nurses Progress Record		
Date	Hour	Progress Notes
12/11/01	0730	<p>P#4: nutrition R/T ketoacidosis. Blood glucose 458 mg/dl ketones strongly positive; pH 7.2.</p> <p>I#4: called Dr Smith, blood glucose 458 mg/dl IV bolus regular insulin given as ordered. 1000ml 0.9% NS infusing C1/H1 central line #1 via infusion pump. 50 u regular insulin in 500 ml N.S. infusing C 50 ml/H. central line #2 via infusion pump. EKG taken, placed on telemetry.</p>
12/11/01	0835	<p>E#4: Lung clear, ROPair non-labored. NSR. 3+ abdominal pain. Urinary output 750 ml H (0730-0830) Blood sugar 360 mg/dl. — P Jader, RN —</p>

Figure 26-6 Sample PIE Charting—The client problem is “Imbalanced Nutrition R/T Ketoacidosis”; once the problem is stated, the problem is referred to by its number only (#4) in subsequent entries.

1. Flow sheets: Highlight significant findings and define assessment parameters and findings.
2. Reference documentation: Is related to the standards of nursing practice. (All standards are met unless otherwise documented.)
3. Bedside accessibility: Is related to the documentation forms. CBE requires the nurse to document significant findings or exceptions to predefined norms.

Computerized Documentation

The contemporary health care system has directed nurse leaders to develop computerized records in response to the large demand for clinical, administrative, and regulatory information. “The health care industry has learned from other industries that computers facilitate speed in communication, accuracy in information, capability of information storage, data retrieval, and data revision” (Eggland & Heinemann, 1994, p. 54). Nursing information systems (NIS) are being developed that will complement existing hospital information systems (HIS). The NIS will collect, store, process, retrieve, display, and communicate timely information that supports:

- Administration of nursing services and resources
- Management of standardized client care information
- Linkage of research resources and educational applications to nursing practice

12/11/01	0730	<p>Assess nutrition R/T ketoacidosis</p>	<p>D: Client experiencing altered (breathing), 5+ abdominal pain, + nausea. Blood sugar 458 mg/dl; ketones strongly positive; pH 7.2 T 99.8, R 28, SpO₂ 110, BP 100/56</p> <p>A: Auscultation reveals lung clear - no adventitious bowel sounds in abd. 4 quadrants (Abdomen distended) by Smith notified of blood glucose, ketones, + pH. IV bolus of regular insulin given as ordered. IVs infusing as ordered through central lines to infusion pumps. Stat EKG done, telemetry NPO, oral hygiene admin. <u>overriding</u> J.S.O. P Jader, RN</p>
	0830		<p>R: Within 1 H (0730-0830) blood glucose 360 mg/dl. R.O. non- labored. Urinary output 750 ml/H. Client identified abdominal pain, 3+. — P Jader, RN —</p>

Figure 26-7 Sample Focus Charting

Health care facilities work in collaboration with producers of computer software to design medical record documents that complement existing documentation systems.

There are several advantages of computerized documentation. It enhances the systematic approach to client care through standardized protocols, teaching documents, data management, and communication. Computers are cost-effective and increase the quality of documentation. The practical advantages to staff nurses are:

- Saves documentation time: Data entry needs to be done only once; the system avoids duplication of effort. For example, a physician's medication order goes immediately to the pharmacy, eliminating the need to transcribe and transmit orders; the pharmacy receives the order (at preestablished computer-acceptable doses and routes), and the client's MAR is immediately updated. This system increases job satisfaction and saves more than 30% of nurses' time spent on charting.
- Increases legibility and accuracy: A computer printout is easy to read and legible. Accuracy is achieved through standardized documents that prompt the nurse for information, making the charting more complete, thorough, concise, and organized. For example, the fall-prevention standard is automatically initiated for all high-risk clients. Bedside terminals allow for client care data to be entered in a timely fashion.
- Provides clear, decisive, and concise key words: Standardized nursing terminology provides for usage of consistent key words (e.g., *alert*) and avoids ambiguous phraseology (e.g., "appears to be"). Nurses can select nursing choices on a screen that automatically builds a comprehensive record of an event.
- Facilitates statistical analysis of data.
- Enhances implementation of the nursing process: Uses documentation tools that provide an individualized plan of care: admission and nursing history data, diagnosis, goals, measurable outcomes, and interventions, inclusive of client teaching. Improved documentation of interventions has improved the PRO reimbursement.
- Enhances critical thinking and decision making: Provides access to other data, such as laboratory results, that can be correlated with the nurses' assessment data. If a trend is developing (e.g., decreasing levels of oxygenation), the nurse will recognize it quickly.
- Supports multidisciplinary networking: Information is quickly coordinated and integrated by other departments; all departments have access to the data.

Many of the disadvantages of computerized documentation are inherent in the computer and software itself: cost of installation, which limits the number of terminals at nursing stations; slow processing speed at peak

usage times; and downtime (time for routine servicing or sudden unexpected failure). Practitioners are also often reluctant to change from the comfortable "pen-and-paper" methods to a high-tech electronic system.

A series of legal issues has developed from computerized documentation: problems in protecting client confidentiality; sharing of access codes (passwords); determining who should have access to the clinical database and how it should be used. Computerized software can be designed to record all transactions, thus permitting the identification of all staff members who request sensitive information.

Point-of-Care System

Point-of-care charting allows health care providers to gain immediate access to client information. The system allows for inputting and retrieving client data at the bedside through a hand-held portable computer. At the beginning of the shift, the nurse receives a client assignment and report with all client data downloaded from the main computer into the hand-held portable computer. The nurse enters data (e.g., assessment, interventions, client's response, and evaluation) into the computer at the bedside. The information is enhanced at the bedside by interfacing the new data with other data to clarify options. At the end of the shift, or when the client's condition changes, the data from the hand-held computer are downloaded back into the main computer.

The advantages of point-of-care charting are based on the efficiency of the computer system. Since health care providers can record client data at the point of care, it:

- Controls operating costs
- Complements existing information systems
- Eliminates redundant data entry
- Allows the provider more one-on-one time for client care
- Provides crucial client information to all health care providers in a timely fashion

Point-of-care computerized documentation also facilitates the transition to a managed-care system (an integrated health care team) by focusing on the continuum of care. The focus is to provide each health care practitioner with all pertinent client data to ensure continuity of care without duplication. Because the client's status can be reviewed at the bedside, practitioners have more time for interactions with their clients.

Because it is based on focus and outcome, this type of documentation system should promote quality of care, decrease the length of stay, and foster compliance with accreditation and regulatory standards.

Case Management Process

Case management is defined as a methodology for organizing client care through an episode of illness so that specific clinical and financial outcomes are

achieved within an allotted time frame (Eggland & Heinemann, 1994). The outcome of this process is a DRG-specific case management plan that contains daily assessment documentation, care plan, outcome-oriented multidisciplinary interventions, teaching, and discharge planning.

At admission, the nurse case manager and the admitting practitioner individualize the case management plan (called a critical pathway) to meet the client's specific needs. A **critical pathway** (or critical path) is an abbreviated summary of key elements from the case management plan. The pathway is used by all health care providers as a monitoring and documentation tool to ensure that interventions are performed on time and that client outcomes are achieved on time.

Variations, sometimes referred to as a variance, are goals not met or interventions not performed within the time frame. The nurse documents on the back of the critical pathway the unexpected event (e.g., hospital-acquired decubiti), actions taken in response to the event, and appropriate discharge planning.

The advantages of case management are that it makes efficient use of time and increases the quality of care, with the expected outcomes identified on the plan. It also promotes collaboration, communication, and teamwork, which work to the advantage of the client and the facility, with discharge occurring in a timely manner. Case management also has several limitations; mainly, it is useful for clients with only one or two diagnoses. When clients have more than two diagnoses or variations, documentation becomes complicated because of limited space. This situation requires additional documentation forms to complement the pathway, such as intervention flow sheets and nurses' notes.

FORMS FOR RECORDING DATA

There are several types of forms used in record keeping: Kardex, flow sheets, nurses' progress notes, and discharge summaries. All of these forms are designed to facilitate record keeping, reduce duplicate activity, and ensure quick and easy access to information.

Kardex

A **Kardex** (client profile and client summary sheets) is a summary worksheet reference of basic client care information that traditionally is not part of the medical record. The Kardex, a concise client data source, is used as a reference throughout the shift and during change-of-shift reports. Kardexes come in various sizes, shapes, and types (and they may also be computer-generated). The Kardex is designed to complement the care delivery setting. For example, a home health Kardex would

contain information related to family contacts, practitioners (physician), other services, and emergency referrals. The Kardex usually contains the following information:

- Client data: Name, age, marital status, religious preference
- Medical diagnoses: Listed by priority
- Nursing diagnoses: Listed by priority
- Medical orders: Diet, medications, IV therapy, treatments, diagnostic tests and procedures (inclusive of dates and results), and consultations
- Activities permitted: Functional limitations, assistance needed in activities of daily living, and safety precautions

Figure 26-8 offers a brief case scenario with a sample of a computer-generated Kardex for the case.

Flow Sheets

Flow sheets have vertical or horizontal columns for recording dates and times to show assessment and interventions, making it easy to track changes in the client's condition. Client teaching, use of special equipment, and IV therapy are other aspects of the flow sheet. Because the flow sheets have small spaces for recording, these forms usually contain legends that identify the approved abbreviations to chart data (see Figure 26-9). It is important to fill out flow sheets completely because blank spaces imply that an intervention was not completed, attempted, or recognized.

The information on the flow sheet can be formatted to meet the specific needs of client populations (special needs, activity, and measurement and intervention). For example, recording assessment data may be different in pediatric clinics and pediatric hospital units than in facilities for adults. Flow sheets in critical care settings are more comprehensive than are those on a medical-surgical unit. Flow sheets can also complement other types of records of specific interventions (e.g., MAR, IV therapy).

Flow sheets are used as supplements to most documentation systems because they decrease the redundancy of charting in the nurses' progress notes. But they do not replace the progress notes. Nurses still need to document observations, client responses and teaching, detailed interventions, and other significant data in the progress notes.

Nurses' Progress Notes

The nurses' progress notes are used to document the client's condition, problems, and complaints; interventions; response to interventions; and achievement of outcomes. Progress notes include the following forms: nurses' notes, medication administration record (MAR), personal care flow sheets, teaching records, intake and

Case Presentation

Mrs. White is admitted with medical diagnoses of hyperglycemia, ketoacidosis, and a history of diabetes mellitus (DM), all diagnostic indicators of diabetic ketoacidosis (DKA). Mrs. White is having labored breathing, vomiting, and weakness. Mr. White states that his wife takes insulin for her diabetes, she doesn't follow her diet, and she has been complaining of thirst and frequent urination. On examination, the client complains of weakness and abdominal pain, and she has an acetone breath.

White, Mary	F 56
MR#: 000135039	ACCT#: 9710144268
Dr: J. Smith	2/W 402-01
DX: Diabetic Ketoacidosis	DATE: 12/14/01

SUMMARY: 12/14 0701 to 1501

CLIENT INFORMATION

10/14 ADVANCE DIRECTIVES: No. Advance directive does not exist
 10/14 ORGAN DONOR: Unknown
 10/14 ADMIT DX: Diabetic Ketoacidosis (DKA)
 10/14 ALLERGIES: None Known
 10/14 ISOLATION: Not at this time

MISC. CLIENT DATA

10/14 History of Diabetes Mellitus (DM): Insulin-Dependent Diabetic

MEDICAL DIAGNOSES

10/14 PROBLEM # 1: Hyperglycemia
 10/14 PROBLEM # 2: Ketoacidosis
 10/14 PROBLEM # 3: Hyperventilation
 10/14 PROBLEM # 4: Dehydration
 10/14 PROBLEM # 5: Hypotension
 10/14 PROBLEM # 6: Hypokalemia

NURSING DIAGNOSES

10/14 PROBLEM 1: Deficient fluid volume related to osmotic diuresis associated with hyperglycemia
 10/14 PROBLEM 2: Ineffective breathing pattern: Kussmaul respirations/air hunger related to metabolic acidosis associated with DKA
 10/14 PROBLEM 3: Decreased cardiac output related to hypokalemia associated with metabolic acidosis
 10/14 PROBLEM 4: Risk for injury: circulatory collapse, renal shutdown, and coma related to persistent, untreated hyperglycemia
 10/14 PROBLEM 5: Risk for injury: seizure susceptibility if hyperglycemia is corrected too abruptly
 10/14 PROBLEM 6: Ineffective airway clearance: aspiration related to presence of vomiting and altered level of consciousness
 10/14 PROBLEM 7: Risk for infection related to invasive procedures
 10/14 PROBLEM 8: Imbalanced nutrition: less than body requirements related to anorexia, nausea, or vomiting associated with ketoacidosis and hypokalemia
 10/14 PROBLEM 9: Deficient knowledge: prevention of DKA related to proper management of DM
 10/14 PROBLEM 10: Ineffective management of therapeutic regimen related to inadequate motivation for incorporating strategies for prevention of DKA into daily living

(continues)

ALL CURRENT MEDICAL ORDERS**NURSING ORDERS:**

- 10/14 Activity: Bedrest
VS: Q15" first 2 Hours, then Q30" until within normal limits, then Q1H
- 10/14 Telemetry
- 10/14 Daily Weight: 0600
- 10/14 Intake & Output: Q 15" first 2 Hours, then Q 30" until output stable at 30 ml/H, then Q1H
- 10/14 Urine: Specific Gravity Q1H
- 10/14 Measure blood glucose levels: Q1H, notify physician when serum glucose is less than 300 mg percent and anticipate addition of dextrose to IVs
- 10/14 Oral Hygiene Q1H
- 10/14 Monitor for signs and symptoms of infection: IV site, Triple-lumen, central line, right subclavian and indwelling foley catheter
- 10/14 Institute fall precautions

SUMMARY: 10/14 0701 to 1501

DIET:

- 10/14 NPO; Diabetic: 1600 cal., start with breakfast tomorrow

IVS:

- 10/14 Central line #1...0.9 percent normal saline, 1000 ml @ rate of 1 L/H for first 2 H, infusion pump; then decrease infusion of 0.9 percent normal saline, 500 ml @ rate of 500 ml/H for the next 2 H; then decrease infusion of 0.9 percent normal saline, 250 ml @ rate of 250 ml/H
- 10/14 Central line #2...50 U of regular insulin to 500 ml normal saline to produce a concentration of 0.1 U/ml, infuse @ 7 U/kg per hour, infusion pump
- 10/14 Administer KCL IV: If serum K⁺ is <3.5 give 40 mEq/H; 3.5–5.5 give 20 mEq/H; >5.5 give no K⁺

SCHEDULED MEDICATIONS:

- 10/14 None

STAT/NOW MEDICATIONS:

- 10/14 IV bolus of regular insulin of 0.2 U/kg

PRN MEDICATIONS:

- 10/14 None

LABORATORY:

- 10/14 Stat Chem 7
Blood Glucose Q1H
Stat Arterial Blood Gases
Urinalysis Now

ANCILLARY:

- 10/14 Stat EKG

Last Page

TULANE UNIVERSITY MEDICAL CENTER Tulane Hospital for Children																									
Date: _____		7A - 7P PHYSICAL ASSESSMENT																							
ASSESSMENT TIME		07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	01	02	03	04	05	06
RESPIRATORY	Quality																								
	Cough																								
	Sputum																								
	Breath Sounds																								
	Suction (Y / N)																								
	Cough, Deep Breathe (Y / N)																								
	Other:																								
CARDIOVASCULAR	Heart Sounds																								
	Edema																								
	Capillary refill Sec.																								
	Nail bed color																								
	Peripheral pulses: Radial																								
	Pedal																								
	Other:																								
NEUROLOGICAL	LOC																								
	Pupils																								
	Fontanel (<2YRS.)																								
	Other:																								
ELIMINATION	Bowel sounds																								
	Abdomen																								
	Stool Color																								
	Urine Color																								
	Other:																								
SKIN INTEGRITY	Oral mucosa																								
	Turgor																								
	Skin discoloration																								
	Break in skin integrity (Y / N)																								
	IV site																								
	IV tubing change (Y / N)																								
COMFORT / PAIN	Discomfort/Pain (Y / N)																								
	Rating																								
MOBILITY	Range of motion																								
	Upper extremity strength																								
	Lower extremity strength																								
	OOB/ambulate (Y / N)																								
	Turn/Position																								
	Other:																								
SAFETY	Attendant																								
	Safety check (Y / N)																								
	Initials																								

Figure 26-9 Assessment and Intervention Flow Sheet (Courtesy of Tulane University Medical Center New Orleans, LA)

output forms, vital sign records, and specialty forms (e.g., diabetic flow sheet and neurologic assessment form) (Egglund & Heinemann, 1994). The progress notes can be completely narrative or incorporated into a standardized flow sheet to complement SOAP(IE), PIE, focus charting, and other documentation systems.

Discharge Summary

Discharge summaries highlight the client's illness and course of care. When a narrative discharge summary is entered into the progress notes, it includes:

- The client's status at admission and discharge
- A brief summary of the client's care
- Intervention and education outcomes
- Resolved problems and continuing care needs for unresolved problems, inclusive of referrals
- Client instructions regarding medications, diet, food-drug interactions, activity, treatments, follow-up instructions, and other special needs

Many facilities have a documentation form that itemizes discharge and client instructions. The form has a duplicate copy for the client; the original goes in the medical record. Figure 26-10 shows the common elements of this tool.

TRENDS IN DOCUMENTATION

"Health care is increasingly driven by information, and consequently, patient care will demand effective management of information" (Travis & Brennan, p. 162, 1999). In the 21st century with complex clinical practice, nurses face escalating information challenges inherent in processing and communicating computerized information.

Computerized nursing documentation requires the skills of technically competent nurses to improve client care and change the delivery of health care; however, technical competence includes not only equipment competence but also skill in the efficient use of information (Travis & Brennan, 1998). "To harness innovative technologies, nurses must recognize them and know what to do with them" (Brennan, 1999, p. 128).

With the transition to managed care and the introduction of capitation by insurers, computerized charting is now prevalent in hospitals and is one of the strongest trends in documentation with home health agencies. In order for computerized nursing documentation to demonstrate the quality, effectiveness, and value of the services that nurses provide, standardized data bases have to be developed to ensure accuracy and precision in nursing information systems.

Nursing Minimum Data Set (NMDS)

In 1985, Werley and Lang convened an invitational working conference at the University of Wisconsin–Milwaukee to identify the elements that should be included in a **nursing minimum data set (NMDS)**; these are the elements that should be contained in clinical records and abstracted for studies on the effectiveness and costs of nursing care (Werley & Lang, 1988). Sixteen elements, grouped into three categories, were identified:

1. Demographics: Personal identification, date of birth, gender, race and ethnicity, and residence
2. Service: Unique facility or service agency number, episode admission or encounter date, discharge or termination date, disposition of client, expected payer, unique health record number of client,* and unique number of principal registered nurse provider*
3. Nursing care: Nursing diagnosis,* nursing intervention,* nursing outcome,* and intensity of nursing care* (Werley & Lang, 1988)

There are several challenges inherent in the development of the four nursing care categories: diagnoses, interventions, outcomes, and intensity (Hayes, Norris, Martin & Androwich, 1994). Automated information systems must be capable of supporting cost-effective nursing practice through efficient, comprehensive documentation. Basic to standardizing databases is the consistent use of a taxonomy that promotes validity and reliability. NMDS, however, does not specify taxonomy for any of the four elements, for example, NANDA (2001) diagnoses, the Omaha System, Nursing Interventions Classification (NIC) (1995), and acuity ratings. Nursing needs to achieve consensus of terminology for clinical data to be included in nursing care elements of a NMDS.

Nursing Diagnoses

A nursing diagnosis is a clinical judgment about individual, family, or community responses to actual or potential health problems or life processes (NANDA, 2001). The ANA endorsed NANDA to develop a classification for nursing diagnoses, and in 1992 the NANDA terms were accepted into the Unified Medical Language System (Ozbolt, Fruchtnight & Hayden, 1994). (Refer to Chapter 7 for a complete discussion of nursing diagnoses.)

Nursing Intervention Classification (NIC)

The **nursing intervention classification (NIC)** is a comprehensive standardized language for nursing interventions organized in a three-level taxonomy (McCloskey &

*Elements not included in the Uniform Hospital Discharge Data Set.

Bulechek, 1995). Initiated by a research team (Iowa Intervention Project) at the University of Iowa in 1987, the three-level taxonomy contains 6 domains, 26 classes, and 366 interventions. Each nursing intervention has a label, a definition, and a set of activities to carry out the interventions. *Activities are not interventions and should not be labeled as such in nursing information systems* (NIC, 1995).

The six domains are physiological–basic, physiological–complex, behavioral, family, health system, and safety. Within each domain is a set of classes (groups). An example of a class is perioperative care, which contains the nursing interventions (e.g., “Teaching Preoperative”) that contain sets of activities to carry out a specific intervention, such as, “Provide time for the patient to ask questions and discuss concerns” (Steelman, Bulechek, & McCloskey, 1994). Refer to Chapter 9 for additional discussion of NIC.

NIC interventions have been incorporated into health care data sets and the computerized client medical record. NIC has been recognized by the ANA as one of the first nursing languages to be included in the National Library of Medicine’s Metathesaurus for the Unified Medical Language System (McCloskey & Bulechek, 1995).

Grobe and colleagues at the University of Texas at Austin have been developing a lexicon and taxonomy of nursing interventions taken from home care records. Omaha Visiting Nurses Association have developed and used intervention statements to direct client care.

Nursing Outcomes

A nursing outcome is defined as the resolution status of the nursing diagnosis according to the NMDS (Ozbolt et al., 1994). Efforts are in progress with the Omaha Visiting Nurses Association and the University of Iowa to develop a taxonomy of client outcomes for nursing care. See Chapter 8 for further discussion of outcomes.

REPORTING

Reporting is the verbal communication of data regarding the client’s health status, needs, treatments, outcomes, and responses (Egglund & Heinemann, 1994). When a report is given, it needs to summarize the current critical information that facilitates clinical decision making and continuity of care. As with recording, reporting is based on the nursing process, standards of care, and legal and ethical principles. The nursing process provides structure for an organized report, a challenge inherent in verbal communications. In order to verbally communicate an efficient and well-organized report, the nurse must consider

- What needs to be said
- Why it needs to be said
- How to say it
- What the expected outcomes are

Considering these aspects of reporting before the communication will provide for a concise, organized report.

Another critical element in reporting is listening (refer to Chapter 12). Reports require participation from everyone present. When receiving a report, the nurse focuses behaviors to enhance listening skills: the nurse eliminates distractions, puts thoughts and concerns aside, concentrates on what is being said, and does not anticipate what the presenter will say next. The reporting process is an integral component of developing effective interpersonal and intrapersonal relationships that promote continuity of client care. Regardless of the type of communication, planned presentation of client data is a key to accurate, concise, effective reporting. Summary reports, walking rounds, telephone reports and orders, and incident reports are all types of reporting.

Summary Reports

Summary reports summarize pertinent client information that focuses on the client’s needs as identified by the nursing process for the new caregiver. Summary reports commonly occur at the change of shift and when the client is transferred to another area.

A summary, or end-of-shift, report should be presented as follows:

- Background data obtained from client interactions and assessment of the functional health patterns
- Primary medical and nursing diagnoses and priority problems
- Identification of client risk problems
- Recent changes in condition or in treatments (e.g., new medications, elevated temperature)
- Effective interventions or treatments of priority problems, inclusive of laboratory and diagnostic results (e.g., client’s response to pain medication)
- Progress toward expected outcomes: priority problems, teaching or discharge planning
- Adjustments in the plan of care
- Client or family complaints

This format will provide structure and organization to the data that are both logical and time-sequenced since the format follows the nursing process. The new caregiver needs to receive an accurate, concise report about

THINK ABOUT IT

Recording and Reporting

How do recording and reporting data differ? Both serve as a method of communicating information about the client’s care and other significant data. What would happen in a change-of-shift report if the two were identical?

what has happened during the previous shift in order to provide continuity of care. Client and family complaints should be addressed last for each client because these situations usually generate questions and discussion.

Walking Rounds

Walking rounds can be either nursing rounds, physician-nurse rounds, or interdisciplinary rounds. **Walking rounds** is a reporting method used when the members of the care team walk to each client's room and discuss care and progress with each other and with the client.

Nursing rounds are used most frequently by charge nurses as their method of report. During the rounds, the on-coming nurse is introduced to the client and the off-going nurse discusses with the client and the on-coming nurse changes in the plan of care. Rounds are more time-consuming than the end-of-shift report but give the nurses and the client the opportunity to evaluate the effectiveness of care together (see Figure 26-11).



Figure 26-11 Nursing rounds: What are some advantages of nursing rounds compared to traditional end-of-shift reports?

THINK ABOUT IT

Nursing Rounds

Can nursing rounds foster team building among the nurses from different shifts? Do you think nursing rounds promote client satisfaction? If your critical analysis identifies that nursing rounds have the potential for fostering team building and client satisfaction, why do you think this method of reporting is not used by all charge nurses?

Nursing rounds are also used as a teaching method. The instructor introduces the client to the student, and together they discuss the client's care. The instructor can also use this time to appraise the student's observation, communication, and decision-making skills.

Nurse-physician rounds can involve either the staff nurse or the charge nurse with the physician. These rounds usually occur daily and provide the nurse, physician, and client the opportunity to evaluate the effectiveness of care.

Interdisciplinary rounds, in which many disciplines are involved, usually occur less frequently than the other types of rounds. Continuity of care, patient satisfaction, and decreased costs are often the outcomes of daily interdisciplinary rounds (Curley, McEachern & Speroff, 1998). The interdisciplinary concept recognizes that health care providers do not work independently of one another, but address patients' needs within the context of all team members. Interdisciplinary rounds are done most commonly in place of or to supplement case conferences and to discuss discharge planning. Interdisciplinary rounds support the concept of critical pathways and are seen most frequently in teaching hospitals.

Telephone Reports and Orders

Telephone communications are another way nurses report transfers, communicate referrals, obtain client data, solve problems, and inform a physician and/or client's family members regarding a change in the client's condition. Nurses are expected to demonstrate phone courtesy and professionalism when initiating and receiving telephone reports and orders.

When initiating a phone call, organize the information to be reported or received. For example:

1. Make sure all lab results are back; if they are not, identify in advance which ones are missing and phone the lab or check the computer to determine if other results are available. Write down which tests have been performed and the results. Spell the client's name and provide the client's medical record number to avoid error in getting the results on the wrong client.
2. Review your notes, have your assessment data readily available, especially any significant client data that are related to the call. If you have not assessed the client, do an assessment before telephoning the practitioner; otherwise, the practitioner might ask you questions that you will not be able to answer.
3. Let the charge nurse or someone else at the nurses' station know that you are placing the call so that you will not be interrupted while on the phone.

When you place the call, state the reason you are calling: for example, "I am calling Dr. Smith regarding the blood sugar results for Mrs. White." Be brief and listen carefully. Repeat the test results and any orders the physician gives over the phone.

Record accurately in the medical record the date and time the phone call was placed, the client data you reported on the phone, the name of the person you spoke with, and whether an order was obtained. Do not chart "physician notified, no orders obtained." Rather, chart "Dr. Smith notified by phone, blood sugar 260 mg



Title of Study

“Interdisciplinary Rounds Reduced Hospital Stay and Costs and Improved Staff Satisfaction”

Authors

Curley, C., McEachern, J.E., & Speroff, T.

Purpose

To determine whether interdisciplinary rounds improve efficiency of patient care and staff satisfaction, and decrease costs on inpatient medical units.

Methods

A randomized controlled trial of three inpatient medical units was conducted in an acute care, tertiary referral and teaching hospital in Cleveland, Ohio. The study population consisted of 1,102 patients who were admitted to and discharged from the medical unit, with a mean age of 53 years (52% women). First admission patients were allocated to one of three inpatient medical units from which they received all care for this and subsequent admissions; each of the three units had two physician teams—567 patients were allocated to interdisciplinary rounds, and 535 were allocated to traditional rounds. Daily interdisciplinary rounds were conducted on both teams from unit 1 and one team from another unit. The interdisciplinary team, designed by a continuous quality improvement team, consisted of physicians, a nurse patient care coordinator, a pharmacist, a nutritionist, and a social worker; patient orders were written during rounds. The other units conducted traditional rounds that consisted of daily rounds by physicians only and weekly interdisciplinary rounds; orders were written throughout the day, and patient charts were left at the nursing station. The outcome measures dealt with length of hospital stay, total charges, number of hospital deaths, type of hospital disposition, and health care provider satisfaction.

Findings

Compared with traditional rounds, interdisciplinary rounds led to decreased length of hospital stay, lower costs for patients on medical units, and improved staff satisfaction. There was no difference in the rate of hospital deaths, patients discharged to home, and discharges to an interim care facility.

Implications

To decrease hospital cost and increase patient satisfaction, nurses working on adult inpatient units should consider practice changes to support more frequent formal communication among nurses, physicians, and other health care providers; and to encourage orders written once a day during rounds when all team members are present.

Curley, C., McEachern, J.E., & Speroff, T. (1998). Interdisciplinary rounds reduced hospital stay and costs and improved staff satisfaction. *Medical Care*, 36(5), 4–12.

(drawn by the lab at 1300), orders received and recorded on the physician order sheet.” Charting telephone orders and documentation in the nurses’ progress notes should be done as soon as possible after the phone call to prevent an entry by another caregiver before you chart the telephone report.

Figure 26-12 demonstrates how to write a telephone order onto the physician order sheet: date and time the entry; record the order as given by the physician; then sign the order beginning with *t.o.* (telephone order), write the physician’s name, and sign your name. If another nurse witnesses the phone order, that nurse’s signature should go after yours.

The physician needs to countersign the order within a time frame as specified by the facility’s policy. Fax machines have decreased the need for lengthy or complicated telephone orders, both saving time and avoiding error. To confirm the physician’s identity as the initiator of the fax orders, telephone the physician. The physician needs to countersign the fax orders according to agency policy.

Incident Reports

Incident reports, or occurrence reports, are used to document any unusual occurrence or accident in the delivery of client care, such as falls or medication errors. The

12/14/01	0845	Decrease IV infusion of 50u of regular insulin in 500ml of N.S. to infuse @ 5u/kg per hour.
		T.O. Smith / Pat Faber, RN.

Figure 26-12 Documenting a Telephone Order

Code for Nurses (ANA, 1985) states that nurses are expected “to protect the client when safety is affected.” Ethical practice requires that nurses file an incident report to protect the client not to punish the caregiver.

The filing of incident reports is not only an internal device for the facility but is also a requirement by federal, national, and state accrediting agencies. Nurses are often advised not to document the filing of an incident report in the nurses’ notes for legal reasons, but, as previously discussed, documenting medication errors (Fiesta, 1996) requires an incident report and documentation in the nurses’ notes to ensure that the client receives safe care.

The incident report serves two functions:

1. It informs the facility’s administration of the incident, so risk management personnel can consider changes that might prevent similar occurrences in the future.
2. It alerts the facility’s insurance company to a potential claim and the need for further investigation.

Litigation can be avoided if the facility takes prompt action by investigating an occurrence. The incident report is not part of the medical record, but it may be used later in litigation.

Each person with firsthand knowledge of the occurrence should fill out and sign a separate report. Although the incident report format varies from one facility to another, there are key elements that must be addressed when filing a report:

- Record the date, exact time, and place you discovered the occurrence.
- Identify the person(s) involved in the occurrence, including witnesses.
- Document accurately and objectively the exact occurrences that you witnessed or first saw after the incident; for example, record “found the client sitting on the floor. Client stated that . . .” rather than “client fell.”
- Record the exact details, in time sequence, what happened, and the consequences for the persons involved.

- Record your actions to provide care and results of your assessment for injuries or client complaints.
- Notify the supervisor on duty and record the time and name of the physician notified; if telephone orders were received from the physician, document as previously discussed and implement the orders.
- Do not record your opinions, judgments, conclusions, or assumptions about what occurred, point blame, or suggest how to prevent occurrence of a similar incident.
- Forward the incident report to the designated person as defined in the facility’s policy.

Iyer and Camp (1999) suggest an additional safeguard for the nurse; write a brief, accurate description of the incident and keep it at home. In the description, include the details of the incident and the names of the people who were involved, especially if they can substantiate your information. Lawsuits may take several years from the time of an incident until the case goes to court; your personal notes will help you with accurate recall of the incident. Use the same elements described above in filing an incident report because your personal notes may be read by the plaintiff’s attorney.

Special attention should be given to documenting falls, because current research shows that patient falls constitute 75% to 80% of all incident reports on clinical

Nursing Process Highlight

DOCUMENTATION OF CLIENT FALL

Assessment

- Check for bruises, lacerations, or abrasions.
- Check blood pressure, pulse, respirations.
- Perform a neurologic assessment (slurred speech, weakness, mental status).
- Check for incontinency (urinary or fecal).
- Note any pain or deformity in the extremities (arm, lumbar spine, hip, or leg).

Interview the Client

- Were there any symptoms prior to the fall (lightheadedness, impaired vision, dizziness, weakness, palpitations, shortness of breath, chest pain)?
- What were your actions prior to the fall (movements, muscle jerks, breathing pattern)?
- How did the fall occur (getting out of bed, while walking in the room)?
- Did anyone witness the fall?

Be sure to chart what you observe (“Client prone on floor”), not what you conclude (“Client fell out of bed”). Document all data in the nurses’ progress notes and on the incident report.

units (Springhouse, 1995). Client falls are the main reason nurses are sued (Iyer & Camp, 1999). (Refer to Chapter 23 for information on how to prevent client falls and their legal ramifications.) The Nursing Process Highlight identifies the required nursing documentation when a client falls.

KEY CONCEPTS

- Documentation provides a system of written records that reflect client care provided on the basis of assessment data and the client's response to interventions.
- The medical record can be used by health care students as a teaching tool and is a main source of data for clinical research.
- Nurses are responsible for assessing and documenting that the client has an understanding of the treatment prior to the intervention.
- Competent adult clients have the right, through an advance directive, to make decisions regarding life-sustaining interventions when they become incapacitated or terminally ill.
- Standards of care, as set forth by State Boards of Nursing and the American Nurses Association, require nurses to use the nursing process in their documentation.
- Accreditation and reimbursement agencies require accurate and thorough documentation of the nursing care rendered and the client's response to interventions.
- Effective documentation requires clear, concise, accurate recording of all client care and other significant events in an organized and chronological fashion, representative of each phase of the nursing process.
- Client safety requires appropriate reporting and recording of medication errors and other occurrences in compliance with the facility's policy.
- Narrative charting requires an organized presentation of the client's problems and response to interventions in chronological order.
- Problem-oriented charting provides structure when documenting the client's problems and responses in the nurses' progress notes.
- Computerized documentation saves time, increases legibility and accuracy, provides standardized nursing terminology, enhances the nursing process and decision-making skills, and supports continuity of care.
- Managed care incorporates client participation in planning the care while focusing on the quality of care provided in a timely fashion.
- Critical pathways document the key interventions of managed care plans.
- Kardexes are concise documents used to direct the daily activities of client care.
- Flow sheets are used to document assessment findings, activity, measurements, treatments, and equipment.

- The discharge summary is used to highlight the client's illness, course of care, and aftercare instructions.
- Incident reports are used to document any unusual occurrence in the delivery of client care.

CRITICAL THINKING ACTIVITIES

1. During your clinical laboratory, review the documentation tools:
 - Do they form a system?
 - Is the nursing process evident?
 - Do you have to chart the same data on more than one form?
2. Read a client's medical record. Can you identify what was done for the client and the client's responses? If you cannot, what significant data are missing?
3. When planning the care for your clients, identify the critical elements of assessment that you will need to document. Analyze these data in relation to the documentation system of your assigned clinical facility and the types of forms for charting.
4. Given a flow sheet from the clinical facility you are assigned and Mrs. White's Kardex, Figure 26-8, what critical elements must be documented to maximize reimbursement?
5. Mrs. White's (Figure 26-8) blood sugar has been within normal limits for 48 hours, and she has been discharged by Dr. Smith. Write a narrative discharge summary that highlights her illness and course of treatment. Does she need any special instruction or a referral to a home health care agency?
6. Given the information on the computer-generated Kardex (Figure 26-8), give a change-of-shift report on Mrs. White to a classmate.
7. What information must be documented in the nurses' progress notes when using an assessment and intervention flow sheet?
8. Label each of the following statements that describes the acronym components of problem-oriented charting (SOAP):
 - ___ Abdomen distended; on auscultation, bowel sounds absent in all 4 quadrants
 - ___ Imbalanced nutrition: less than body requirements related to inability to digest or absorb nutrients; first day postop. Risk for deficient fluid volume.
 - ___ "I'm nauseated, I think I'm going to vomit."
 - ___ Notified Dr. James of symptoms and client's complaints. Placed NPO; increase intravenous fluids of normal saline to 150 ml/hr; measure I&O; keep environment quiet; reassure client.
9. Describe the format for focus charting.
10. What are the advantages and disadvantages of computerized documentation?

WEB RESOURCES

American Association of Legal Nurse Consultants

<http://www.aalnc.org>

American Health Information Management
Association

<http://www.ahima.org>

American Nurses Association

<http://www.nursingworld.org>

Health Informatics Standards—Nursing

<http://www.mcis.duke.edu/standards/specialties/nursing.htm>

Healthcare Information and Management
Systems Society

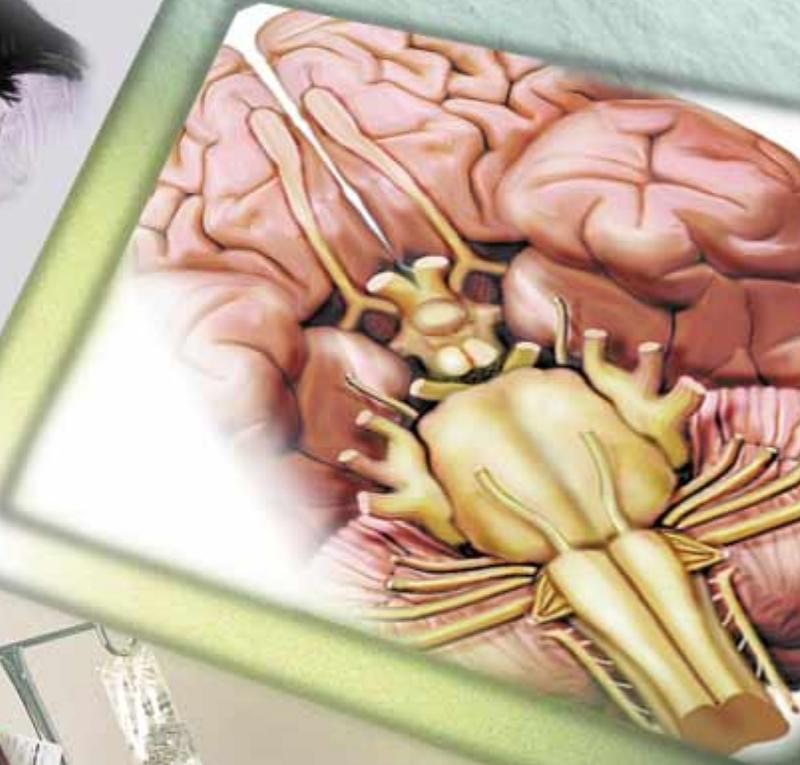
<http://www.himss.org>

Information Technology in Nursing

<http://www.man.ac.uk/bcsnsg/itinindx.htm>

Nursing Informatics Working Group of the American
Medical Informatics Association

<http://www.amia-niwig.org>



Unit

VI

Diagnostic and Therapeutic Interventions

- 27** Vital Signs and Physical Assessment
- 28** Diagnostic Testing
- 29** Medication Administration
- 30** Responding to the Needs
of the Perioperative Client

Chapter 27

Vital Signs and Physical Assessment



Nurses (need) to have technical skills and a strong knowledge base, (yet) it is especially important to be fully present with patients, and listen to the story they have to tell . . .

—Dossey (in Gray, 1995)

COMPETENCIES

1. Describe the physiological mechanisms governing temperature, pulse, respiration, and blood pressure.
2. Identify the normal age-related variations for vital sign measurements.
3. Select the appropriate equipment used to take the vital signs and perform a physical examination.
4. Describe the correct positioning of the client for performing a physical examination.
5. Demonstrate the psychomotor techniques used in conducting a physical examination.
6. Describe the assessment alterations obtained from a physical examination.
7. Document the normal findings of a physical examination.

KEY
TERMS

adventitious breath sounds	dyspnea	pleural friction rub
aneurysm	dysrhythmia	pulse
angina	eupnea	pulse deficit
aphasia	evaporation	pulse pressure
apnea monitor	expiration	pulse quality
arthritis	external respiration	pulse rate
ascites	extinction	pulse rhythm
atherosclerosis	Glasgow Coma Scale	pulse volume
atrophy	goniometer	pyrexia
auscultatory gap	graphesthesia	pyrogens
basal metabolic rate (BMR)	heaves	radiation
baseline values	hemodynamic regulation	regurgitation
blood pressure	hypertension	respiration
bradycardia	hypertonicity	rhonchi
bradypnea	hypertrophy	Snellen chart
bronchial sounds	hyperventilation	stenosis
bronchovesicular sounds	hypotension	stereognosis
bruits	hypotonicity	striae
cachexia	hypoventilation	stridor
cardiac output	insensible heat loss	stroke volume
conduction	inspiration	systole
convection	integumentary system	tachycardia
costal breathing	internal respiration	tachypnea
crackles	ischemia	tactile fremitus
crepitus	murmur	thermoregulation
cyanosis	myocardial infarction	thrills
cystocele	nystagmus	tympany
degree	orthostatic hypotension	vasoconstriction
dermatome map	osteoarthritis	vasodilation
diaphoresis	osteoporosis	vesicular sounds
diaphragmatic breathing	oximeter	vital capacity
diastole	piloerection	vital signs
dullness	pleura	wheezes

 Physical assessment, an essential nursing function, is performed on every client. The measurement of vital signs and the execution of the physical examination as part of the assessment process are done to gather information regarding the physiological functioning of the body. This chapter discusses the normal physiological functioning of the body and the common deviations from normal, measurement and evaluation of these functions, preparation of the client for the physical examination, and the techniques used to perform a physical examination.

VITAL SIGNS

The “taking of **vital signs**” refers to measurement of the client’s body temperature (T), pulse (P) and respiratory (R) rates, and blood pressure (BP). Vital signs are fundamental to physical assessment (the first step in the physical examination) to establish baseline values of the

client’s cardiorespiratory integrity. **Baseline values** establish the norm against which subsequent measurements can be compared. Variations from normal findings may indicate potential problems with the client’s health status. Nurses should confirm “normal” measurements with clients because the perception of what is normal may vary among clients.

Vital signs are taken whenever the client is admitted to a health care facility or service, for example, home health care, clinic, or other ambulatory setting, and on a routine basis in the hospital. The frequency of vital sign measurements for the hospitalized client is determined by the client’s health status, physician orders, and the established standards of care for the particular clinical setting or service. Whenever a change is suspected in the client’s status, the nurse should measure the vital signs, regardless of the setting.

The sequence for recording vital signs measurement in the nurses’ notes is T-P-R and BP. Agencies usually have special graphic forms used to record vital signs findings. These forms facilitate data comparison at a glance because the data are plotted on a graph.

Physiological Function

Healthy people have the ability to meet their own needs; however, during illness, people need assistance (in proportion to the degree of dysfunction) in meeting their basic needs. The assessment of physiological functioning provides specific data regarding the client's current condition. Data analysis allows the nurse to plan nursing care that is responsive to the preventive and restorative needs of the client. See Chapters 5 through 10 for a complete discussion of the steps of the nursing process.

Thermoregulation

Thermoregulation is the body's physiological function of heat regulation to maintain a constant internal body temperature. The heat of the body is measured in units called **degrees**. The "core" internal temperature of 98.6° Fahrenheit (F) (37° centigrade [C]) does not vary more than 1.4°F (0.77°C) and is higher than the skin and external temperature. In contrast, the skin temperature rises and falls in accordance with changes in environmental temperature.

Heat Production

Heat is produced in the body's cells through food metabolism that results in the release of energy. The body converts energy supplied by metabolized nutrients to energy forms that can be used directly by the body. One form of this energy is thermal energy for regulation of body temperature. Energy is measured in terms of heat. A kilocalorie is an energy value (heat measure) of a given food; 1 kilocalorie equals 1000 calories (the amount of heat required to raise the temperature of 1 kilogram of water 1°C). This type of heat liberation is usually expressed as the metabolic rate and measured as the **basal metabolic rate**, or **BMR** (the rate of energy use in the body needed to maintain essential activities). See Chapter 38 for a complete discussion of calories, kilocalories, and metabolic rate.

Factors that affect the metabolic rate of heat liberation, such as age and exercise, are discussed later in this chapter. The thyroid hormones thyroxine and triiodothyronine increase basal metabolism by breaking down glucose and fat. Muscular activity also produces heat from the breakdown of carbohydrates and fats and through shivering.

Body temperature is controlled by balancing metabolic heat production with heat loss. Most heat production comes from the deep tissue organs (brain, liver, and heart) and the skeletal muscles. The skin, subcutaneous tissues, and fat of the subcutaneous tissues serve as heat insulators for the body. Sweat glands in the dermis are innervated by sympathetic nerves of the autonomic nervous system and are controlled by the anterior hypothalamus to regulate sweating.

When body heat rises, the hypothalamus transmits impulses to reduce body heat by triggering perspiring, **vasodilation** (the widening of blood vessels), and the

inhibition of heat production. The opposite physiological functioning occurs in response to a decrease in body heat. In this situation the hypothalamus transmits impulses to stimulate heat production through **vasoconstriction** (the narrowing of blood vessels), muscle shivering, and **piloerection** (hairs standing on end).

Heat Loss

Most body heat is lost from the skin's surface to the environment by the processes of radiation, conduction, convection, and evaporation as presented in Table 27-1. **Insensible heat loss** is the heat that is lost through the continuous, unnoticed water loss that occurs with vaporization, accounting for 10% of basal heat production. Evaporation accounts for the greatest heat loss when body heat increases.

Behavioral Control of Body Temperature

In addition to the heat production and heat loss mechanisms described above, the body has another potent mechanism for temperature control, known as behavioral control. In response to the body's signaling conditions of either being overheated or too cold, the person makes appropriate environmental adjustments to reestablish comfort. Guyton, Hall, & Schmitt (1997) recognize this mechanism as the most effective mechanism for body heat control in severely cold environments.

Respiration

Respiration is the act of breathing. Respiration is defined by physiological functioning as:

- **External respiration**—the exchange of oxygen and carbon dioxide between the alveoli of the lungs and the pulmonary blood system
- **Internal respiration**—the interchange of oxygen and carbon dioxide between the circulating blood and cells throughout the body
- **Inspiration** (inhalation)—the intake of air into the lungs
- **Expiration** (exhalation)—the movement of gases from the lungs to the atmosphere
- **Vital capacity**—the amount of air exhaled from the lungs after a minimal full inspiration

The following five major physiological pulmonary functions provide oxygen to the tissues and remove carbon dioxide:

1. **Ventilation**—the inflow and outflow of air between the atmosphere and the lung alveoli.
2. **Circulation**—the quantity of blood flowing through the lungs is approximately 4 to 6 L/min.
3. **Diffusion**—the exchange of oxygen and carbon dioxide between the alveoli and the blood.
4. **Transport**—the carrying of oxygen and carbon dioxide in the blood and body fluids to and from the cells.

TABLE 27-1
Methods of Heat Loss

Method	Characteristics	Example
Radiation: Loss of heat in the form of infrared rays	All objects that are not at absolute zero radiate heat rays from the surface of one object to the surface of another object that is not in physical contact with the first object.	If the temperature of the body is greater than the surroundings, heat is lost from the body to the environment. A nude person in a room with normal temperature will lose about 60% of total heat loss by radiation.
Conduction: Loss of heat to an object in contact with the body	Heat is lost to other objects that are cooler than the skin. As much as 15% of the body's total heat loss is transferred to the air. Once the temperature of the air adjacent to the skin equals the skin temperature, there is no further loss of body heat.	Bathing a client in cool or tepid water will lower the client's temperature.
Convection: Movement of heat away from the body's surface	Convection accompanies conduction when the warmed air or water is replaced with cooler elements.	The use of fans enhances convected heat loss by air. Water adjacent to the skin can absorb far greater quantities of heat than can air. Clothing entraps air next to the skin, decreasing heat loss from the body by conduction and convection.
Evaporation: Continuous insensible water loss from the skin and lungs when water is converted from a liquid to a gas	It takes approximately 0.58 calories of heat for a gram of water to evaporate.	Insensible water loss is continuous. Insensible loss occurs regardless of body temperature; thus, it is not a major regulator of temperature.

5. Regulation—the neurogenic system that adjusts the rate of alveolar ventilation to meet the demands of the body. The arterial blood oxygen pressure (P_{O_2}) and arterial blood carbon dioxide pressure (P_{CO_2}) may be altered during times of strenuous exercise and other types of respiratory stress. See Chapter 32 for a complete discussion about oxygenation.

The mechanics of pulmonary ventilation depend on abdominal recti and internal intercostal muscles that cause lung expansion and contraction. Normal breathing is accomplished by:

1. The downward and upward movement of the diaphragm to lengthen or shorten the chest cavity
2. The elevation and depression of the ribs to increase and decrease the anteroposterior diameter of the chest cavity

Children and men normally breathe with their diaphragm muscles; adult women generally breathe with their upper chest muscles (Firth & Watanabe, 1996).

Hemodynamic Regulation

Hemodynamic regulation is the physiological function of blood circulating to maintain an appropriate environment in tissue fluids. Circulation transports nutri-

ents to the tissues, removes waste products, and carries hormones from one part of the body to another. When the body's circulatory needs change, the heart rate either accelerates or decelerates. This is a compensatory mechanism under the control of the cardiac centers that are located in the medulla of the brain stem. The sensory receptors in the tissues transmit impulses to the cardiac centers, which in turn trigger a change in the heart rate through the sympathetic and parasympathetic nervous systems that innervate the heart. When the physiological needs of the tissues are met, the heart rate returns to normal.

Systemic circulation supplies blood to all the tissues of the body except the lungs (which is accomplished through pulmonary circulation). Approximately 84% of the entire blood volume is in the systemic circulation, with the heart containing 7% and the pulmonary vessels containing 9%. The circulatory system is composed of:

- Arteries—large vessels that transport systemic blood under high pressure to the tissues
- Arterioles—the smallest branches of the arterial system that act as control valves to release blood into the capillaries
- Capillaries—thin-walled vessels permeable to small molecular substances that exchange fluids, nutrients, electrolytes, hormones, and other substances between the blood and interstitial fluid

- Venules—vessels that collect blood from the capillaries and gradually coalesce into progressively larger veins
- Veins—vessels that transport systemic blood from the tissues back to the heart and serve as a reservoir for extra blood

The normal physiological function of the cells requires continuous blood flow and appropriate volume and distribution of blood to the cells that need nutrients. This is accomplished through the heart's contraction and ejection of blood into the aorta and the distensibility of the arterial system. The combination of the arterial distensibility and resistance reduces the pressure pulsations, allowing continuous blood flow to the tissues. The dynamics of distensibility and resistance maintain a constant blood flow; otherwise, blood would flow to the tissues only during **systole** (phase in which the ventricles contract to eject blood) with an absence of blood flow during **diastole** (phase in which ventricles are relaxed and no blood is being ejected).

The cardiac cycle has two phases: systole and diastole. At the onset of systole there is an increase in ventricular pressure that causes the mitral and tricuspid valves to close. The closing of these valves produces the first heart sound (S_1). Ventricular pressure continues to increase until it exceeds the pressure in the pulmonary artery and the aorta, causing the aortic and pulmonic valves to open and allowing the ventricles to eject blood into these arteries. Ventricular emptying and relaxation cause a decrease in the ventricular pressure and closure of the aortic and pulmonic valves. Closure of these valves produces the second heart sound (S_2). During diastole the pressure in the ventricles is less than that in the atria, causing the mitral and tricuspid valves to open and allowing blood to flow from the atria into the ventricles until the end of diastole, when the atria contract to send the rest of the blood into the ventricles. Ventricular filling causes an increase in pressure that closes the mitral and tricuspid valves (the beginning of systole) and starts another cardiac cycle.

Stroke volume is the measurement of blood that enters the aorta with each ventricular contraction. With each ventricular contraction, the heart ejects 60 to 70 ml of blood into the aorta. **Cardiac output** is the volume of blood pumped by the heart in 1 minute and is measured by multiplying the heart rate by the ventricle's stroke volume. For example, a client with a heart rate of 80 beats per minute times a stroke volume of 60 ml of blood would have a cardiac output of 4800 ml. **Pulse pressure** is a measurement of the ratio of stroke volume to compliance (total distensibility) of the arterial system.

Pulse

The **pulse** is the bounding of blood flow in an artery that is palpable at various points on the body. The pulse is caused by the stroke volume ejection and distension of the walls of the aorta, which creates a pulse wave as it

travels rapidly toward the distal ends of the arteries. As the pulse wave reaches a superficial peripheral artery and travels over an underlying bone or muscle, the pulse can be palpated by applying gentle pressure over a pulse point (a specific area where the peripheral pulses can be palpated). Figure 27-1 shows the location of pulse points throughout the body.

Blood Pressure

Both the blood pressure and pulse are measurements that determine the volume of ejected blood into the arterial system with each ventricular contraction. **Blood pressure** is the measurement of pressure pulsations exerted against the blood vessel walls during systole and diastole. It is measured in terms of millimeters of mercury (mm Hg). In a healthy young adult, the pressure at the height of each pulse (the systolic pressure) is approximately 120 mm Hg, and the pressure at the lowest point of each pulse (diastolic pressure) is approximately 80 mm Hg. The pulse pressure is the difference between these pressures, which is 40 mm Hg. If 1 mm Hg caused a vessel originally containing 10 ml of blood to increase its volume by 1 ml, the distensibility would be 0.1/mm Hg, or 10%/mm Hg (Guyton, Hall, & Schmitt, 1997).

The body has four hemodynamic regulators for blood pressure control:

1. **Blood volume**—the volume of blood in the circulatory system. Blood pressure is proportional to the blood volume. Hemorrhage causes a loss in blood volume that, in turn, lowers the blood pressure. Rapid infusion of intravenous fluids causes an increase in volume and subsequent rise in pressure.

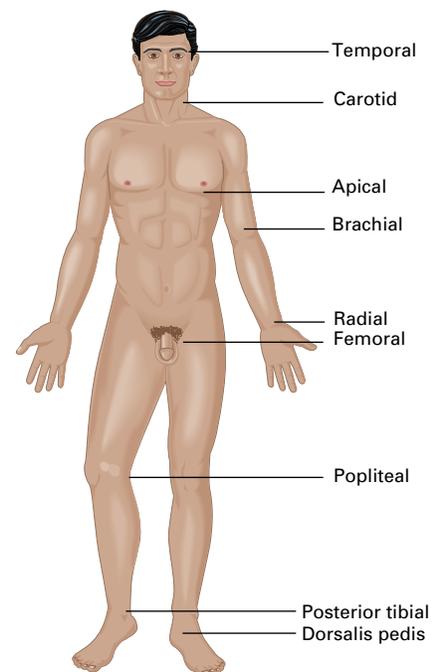


Figure 27-1 Pulse Points

2. Cardiac output—the major factor that influences systolic pressure.
3. Peripheral vascular resistance—the size and distensibility of the arteries, which is the most important determinant of diastolic pressure. Arterial resistance (decreased distensibility) is encountered when the left ventricle pumps blood from the heart under pressure during the systolic phase. The arteries contain smooth muscles that allow them to contract, which decreases their compliance (tone) and causes resistance. The varying degrees of tone allow some of the arterioles to remain constricted while others dilate to protect the body's circulatory system from accommodating a greater blood capacity than the actual blood volume. If all of the arterioles were to dilate at one time, there would not be enough blood to fill them.
4. Viscosity—the thickness of the blood based on the ratio of proteins and cells to the liquid portion of blood. The greater the viscosity, the harder the heart must work to pump blood, with a resultant increase in blood pressure.

These regulators work in unison to create a constant blood pressure. For instance, when the blood volume decreases, the body compensates with an increased heart rate and vasoconstriction that increases peripheral resistance to maintain normal pressure and functions of the vital organs.

Blood pressure is a result of the cardiac output and peripheral vascular resistance. Normal arteries expand during systole and contract during diastole, creating two distinct pressure phases:

- Systolic blood pressure is a measurement of the maximal pressure exerted against arterial walls during systole (when myocardial fibers contract and tighten to eject blood from the ventricles), primarily a reflection of cardiac output.
- Diastolic blood pressure is a measurement of pressure remaining in the arterial system during diastole (period of relaxation that reflects the pressure remaining in the blood vessels after the heart has pumped), primarily a reflection of peripheral vascular resistance.

Serial blood pressure readings provide significant clinical data relative to the client's cardiovascular and fluid volume status. See Chapter 37 for a complete discussion of maintenance of fluid volume.

FACTORS INFLUENCING VITAL SIGNS

Several factors can cause changes in one or more of the vital signs: age, gender, heredity, race, lifestyle, environment, medications, pain, and other factors such as exercise and metabolism, anxiety and stress, postural changes, diurnal variations, and hormones.

Age

The normal values and variations in vital sign measurement are usually based on age (see the accompanying displays that present age-related changes in temperature, pulse, and respiration). In newborns, thermoregulation and the respiratory center are immature. The newborn's temperature fluctuates with the environment. Clothing must be adequate to maintain body heat. For example, the newborn's head should be covered because up to 30% of body heat can be lost through the head. The newborn's respiratory rate is from 30 to 50 breaths per minute with a slightly irregular rhythm.

NORMAL AGE-RELATED VARIATIONS IN BODY TEMPERATURE

Age	Normal Range	Celsius	Fahrenheit
		Newborn	Axillary
1 yr	Oral	37.7°C	99.7°F
3 yr	Oral	37.2°C	99.0°F
5 yr	Oral	37.0°C	98.6°F
Adult	Oral	37.0°C	98.6°F
	Axillary	36.4°C	97.6°F
	Rectal	37.6°C	99.6°F
70+ yr	Oral	36.0°C	96.8°F

NORMAL AGE-RELATED VARIATIONS IN RESTING PULSE

Age	Normal Range	Average Rate/Minute
Newborn	100–170	140
1 yr	80–170	120
3 yr	80–130	110
6 yr	75–120	100
10 yr	70–110	90
14 yr	60–110	90
Adult	60–100	80

NORMAL AGE-RELATED VARIATIONS IN RESTING RESPIRATION

Age	Normal Range	Average Rate/Minute
Newborn	30–50	40
1 yr	20–40	30
3 yr	20–30	25
6 yr	16–22	19
14 yr	14–20	17
Adult	12–20	18

In the elderly, the efficiency of thermoregulation is reduced by the physiological changes of aging, including loss of subcutaneous fat, decreased sweat gland activity, reduced metabolism, and poor vasomotor control. Financial status and environmental conditions experienced by the elderly may also affect diet, activity, and ability to control the external temperature.

The normal aging process causes changes in the elderly person's respiratory functions. Major physiological alterations include:

- **Ventilation**—Bony changes in the thorax and vertebrae and the decline in respiratory and abdominal musculature reduce the ability of the lungs to distend.
- **Circulation and diffusion**—The increase in dead air space in the respiratory tree decreases the quantity of blood flowing through the lungs and gaseous exchange.
- **Transport**—**Atherosclerosis** (plaques in the inner walls of arteries) and **dysrhythmia** (irregular heartbeat) reduce the amount of blood flow available to tissues.
- **Regulation**—The inability of lung function to perform maximal breathing for extended periods of time reduces the rate of alveolar ventilation to meet the demands of the body.

See Chapter 18 for a complete discussion of the physiological changes that occur in the elderly.

Blood pressure varies throughout life (see the accompanying display). From early childhood throughout adolescence, the blood pressure varies according to body size. An adult's blood pressure continues to increase with age.

NORMAL AGE-RELATED VARIATIONS IN BLOOD PRESSURE

Age	Systolic (mm Hg)	Diastolic (mm Hg)	Average
Newborn	65–95	30–60	80/60
Infant	65–115	42–80	90/61
3 Years	76–122	46–84	99/65
6 Years	85–115	48–64	100/56
10 Years	93–125	46–68	109/58
14 Years	99–137	51–71	118/61
Adult	100–140	60–90	120/80
Elderly	100–160	60–90	130/80

Gender

Women usually experience greater temperature fluctuations than men because of hormonal changes. Temperature variations occur during the menstrual cycle

mainly in response to the progesterone level. As the progesterone level increases during ovulation, temperature gradually rises. During menopause, the instability of the vasomotor controls may cause periods (30 seconds to 5 minutes) of intense body heat and sweating. Males in general have higher blood pressure than do females of the same age.

Heredity

Although many studies have been conducted to relate hereditary factors to specific cardiovascular disease occurrence, the results are often inconclusive regarding the influence of heredity versus environmental factors. For example, studies have been conducted to relate elevated blood cholesterol levels to a single gene. Giger and Davidhizar (1995) describe studies of Jews and non-Jews and compare Ashkenazi Jews with Oriental Jews based on the theory that elevated blood cholesterol levels may be caused by a single gene. These studies indicate a higher occurrence of elevated blood cholesterol levels among Jews than among non-Jews and that Ashkenazi Jews may have a higher frequency of the gene than Oriental Jews. The conclusions of these studies indicate a need for further studies to be done to determine the frequency of heart disease among Jews, as well as the interplay between heredity and environment (Giger & Davidhizar, 1995).

Race

Some ethnic groups are more susceptible than others to hemodynamic alterations. The incidence of hypertension is higher in African-Americans than in European Americans. For example, African-American men over the age of 35 have higher blood pressure than do European American men of the same age.

Lifestyle

Lifestyle factors, such as cigarette smoking, cause chronic changes in the lungs as manifested by impaired ventilation. Stimulants such as caffeinated beverages and tobacco elevate heart rate. The effects of exercise and stress are discussed below.

Environment

Environmental factors such as temperature and noise level can alter heart rate. Acid rain and industrialized areas are often associated with a high occurrence of respiratory conditions, such as infections and chronic lung diseases.

Primary prevention is a major role of occupational (industrial) health nurses. A health screening examination relies heavily on vital sign measurements and

physical examination findings. The occupational health nurse should perform health screening examinations that focus on the short-term results of certain environmental conditions (diseases) and monitor for the development of chronic trends; see the accompanying display for screening criteria.

Medications

Some medications can directly or indirectly alter the pulse, respirations, or blood pressure. Digitalis preparations (cardiac glycosides) decrease the pulse rate. Narcotic analgesics (pain medications) can depress the rate and depth of respirations and lower the blood pressure.

HEALTH SCREENING CRITERIA

The performance of a health screening examination is justified when the disease being screened for has:

- A significant effect on the longevity or the quality of life
- A sufficiently high prevalence rate to justify the cost of the screening program
- Been shown to have better therapeutic results if detected in the early stage and worse results with delayed detection and treatment
- A significant asymptomatic period allowing an opportunity for detection and treatment that will reduce the rate of morbidity and mortality
- An acceptable method of treatment

(Data from Edelman, C. L., & Mandel, C. L. [1997]. *Health promotion throughout the lifespan* [4th ed., p. 231]. St. Louis, MO: Mosby Yearbook.

NURSING ALERT

Vital Signs and Medications

Always ask clients what medications they are currently taking and be aware of the side effects of any medications you administer. Certain drugs may either increase or decrease pulse rate and blood pressure. If the drug alters the client's pulse, respiration, or blood pressure, provide appropriate client teaching so that the client is able to compensate for the variations in these functions.

Pain

Each person reacts to pain in varying degrees. With acute pain, sympathetic stimulation increases the heart rate, which increases the cardiac output and vasoconstriction, causing an increased peripheral vascular resistance. These changes result in increased pulse and respiratory rates, depth of respirations, and blood pressure. Chronic pain causes parasympathetic stimulation and decreases

the pulse rate. See Chapter 33 for a complete discussion about pain and measures to promote comfort.

Other Factors

Table 27–2 discusses the effects of exercise and metabolism, anxiety and stress, postural changes, and diurnal (daily) variations (also called circadian) on the vital sign measurements. Routine exercise increases metabolism and heat production and strengthens the cardiac muscles. The normal untrained person can increase cardiac output fourfold with exercise, and the trained athlete can increase cardiac output about sixfold (Guyton, Hall, & Schmitt, 1997).

Anxiety and stress stimulate the sympathetic nervous system to:

- Increase the production of epinephrine and norepinephrine, with a resultant increase in metabolic activity and heat production
- Increase the heart rate, which, in turn, increases the cardiac output and causes vasoconstriction with a subsequent increase in peripheral vascular resistance

Sympathetic stimulation causes an increase in the pulse rate and blood pressure. See Chapter 20 for a complete discussion about stress, anxiety, and adaptation.

Postural changes occur in response to stimulation of the baroreceptors (spray-type nerve endings of the autonomic nervous system) that are located in the walls of the arteries. The baroreceptor reflex is the primary mechanism for maintaining a relatively constant arterial pressure. When a person stands up after lying down, the arterial pressure in the head and upper part of the body immediately tends to fall. This falling pressure elicits an immediate baroreceptor reflex, resulting in strong sympathetic discharges throughout the body. This response minimizes the decrease in pressure in the head and upper body (Guyton, Hall, & Schmitt, 1997). The person's blood pressure decreases when a person goes from a lying to a sitting or standing position. However, the pulse is lower in a lying position and increases in a sitting or standing position.

Each person has a different temperature pattern, with a normal variance ranging from 0.5° to 1°C (0.9°–1.8°F) for a 24-hour period. Table 27–2 identifies when the lowest temperature and pulse variances occur.

The skin temperature rises and falls with a change in environmental temperature. Infants and older adults are most susceptible to environmental changes because their temperature-regulating mechanisms are less effective. Warm environments decrease conduction and increase body temperature, which, in turn, increases the metabolic rate, resulting in an increased pulse rate. Improper clothing in cold climates may lead to a decrease in body temperature through radiation and conductive heat loss that results in shivering to raise the body temperature.

TABLE 27-2
Factors Influencing Vital Signs

Factor	Temperature	Pulse	Respiration	Blood Pressure
Exercise and metabolism	Increases	Short-term: increases Long-term: lowers the resting rate and return time to the resting rate postexercise	Rate and depth increase	Increases
Anxiety and stress	Increases	Increases	Increases	Increases
Postural changes	No change	Increases with sitting or standing; decreases when lying down	Decreases with stooped or slumped positions due to decreased chest expansion	Decreases with sitting or standing
Diurnal variations (Circadian rhythm)	Lowest level: 0400–0600 h Highest level: 2000–2400 h	Decreases during sleep	None	Lowest level: early morning Highest level: late afternoon or early evening

Other factors can contribute to the vital signs' being above or below the established normal limits. Review of the client's health history data will reveal pertinent information regarding the factors that influence the vital signs.

MEASURING VITAL SIGNS

Measuring a client's vital signs is a routine yet important nursing function that all nurses must master and execute skillfully.

Equipment

The measurement of the client's vital signs requires the appropriate instruments. All pieces of equipment should be maintained to function accurately. Table 27-3 describes the common types of equipment used to assess the vital signs.

Equipment should be gathered before entering the client's room. However, certain pieces of equipment, such as the sphygmomanometer, may be permanently installed in the examination and inpatient rooms. The nurse should observe what equipment is in the client's room during the first visit with the client. The necessary equipment for clients who are maintained on isolation precautions should be kept inside the room because items should not be taken in and out of isolation rooms.

Measurement of Height and Weight

Measuring height and weight is as important as assessing the client's vital signs. Routine measurement provides data related to growth and development in infants and

children and signals the possible onset of alterations that may indicate illness in all age groups. The client's height and weight are routinely taken on admission to acute care facilities and on visits to physicians' offices, clinics, and in other health care settings.

Height

Measurement of height is expressed in inches (in.), feet (ft), centimeters (cm), or meters (m). See the accompanying display for conversion equivalents from one system to another.

CONVERSION EQUIVALENTS FOR HEIGHT MEASUREMENT

1 in. = 2.5 cm	1 cm = 0.4 in.
1 ft = 30.5 cm or 0.3 m	1 m = 39.4 in. or 3.28 ft

A scale for measuring height, calibrated in either inches or centimeters, is usually attached to a standing weight scale. This type of scale is used for measuring the height of children and adults. The nurse should ask the client to stand erect on the scale's platform. The metal rod attached to the back of the scale should be extended to gently rest on the top of the client's head, and the measurement should be read at eye level.

When measuring an infant's length, the nurse should place the child on a firm surface. Extend the knees, with the feet at right angles to the table. Measure the distance from the vertex (top) of the head to the soles of the feet with a measuring tape. The procedure usually requires two nurses: one to hold the infant still and the other to measure the length. If the nurse needs to

TABLE 27-3
Equipment Used for Vital Sign Measurement

Instrument	Description
Thermometer Glass	Mercury in glass, calibrated with Centigrade or Fahrenheit measurements
Oral	Slim tip
	
Rectal	Stubby, pear-shaped tip
	
Electronic	Battery-powered display unit with a sensitive probe (blue for oral and red for rectal) covered with a disposable plastic sheath for individual use
	
Disposable (chemical), single-use	Thin strips of plastic with chemically impregnated dots that change color to reflect temperature
	
Tympanic	Battery-powered display unit with disposable speculums and infrared-sensing electronics. (Courtesy, The Gillette Company.)
	

(continues)

TABLE 27-3 (continued)
Equipment Used for Vital Sign Measurement

Instrument	Description
Stethoscope Acoustic	Closed cylinder that prevents dissipation of sound waves and amplifies the sound through a diaphragm. Flat-disc diaphragm transmits high-pitched sounds, and the bell-shaped diaphragm transmits low-pitched sounds.
Ultrasound (Doppler)	Battery-operated headset with earpieces attached to a volume-controlled audio unit and ultrasound transducer that detects movement of red blood cells through a vessel.
Sphygmomanometer Mercury manometer	Wall or portable unit that contains a mercury-filled glass column, calibrated in millimeters; the mercury rises and falls in response to pressure created when the cuff is inflated. (Courtesy of Omron Marshall Products, Inc.)

(continues)

TABLE 27-3 (continued)
Equipment Used for Vital Sign Measurement

Instrument	Description
Aneroid manometer	Portable unit with a glass-enclosed gauge containing a needle to register millimeter calibration and a metal bellows within the gauge that expands and collapses in response to pressure variations from the inflated cuff.



perform the measurement without assistance, an object should be placed at the infant's head, the infant's knees should be extended, and a second object should be placed at the infant's feet. Lift the infant and measure the distance between the two objects.

Height increases gradually from birth to the prepubertal growth spurt. Girls usually reach their adult height between the ages of 16 and 17 years, whereas boys usually continue to grow until the ages of 18 to 20 years. The older adult usually decreases in height as a result of a gradual loss of muscle mass and changes in the vertebrae that occur in conditions such as **osteoporosis** (a process in which reabsorption exceeds accretion of bone).

Weight

Measurement of weight is expressed in ounces (oz), pounds (lb), grams (g), or kilograms (kg); see the accompanying display for conversion equivalents. Weight increases gradually from birth until the prepubertal growth spurt. Height and weight changes occur in the adolescent's torso. The resulting redistribution of body fat gives the body an adult appearance (see the accompanying display for the normal ranges of body height and weight according to age). The loss of muscle mass and changes in dietary habits usually cause weight loss in the elderly.

CONVERSION EQUIVALENTS FOR WEIGHT MEASUREMENT

1 lb = 0.45 kg	1 kg = 2.2 lb
1 oz = 28.4 g	1 g = 0.35 oz

When a client has an order for "daily weight," the weight should be obtained at the same time of the day on the same scale, with the client wearing the same type of clothing. Standing scales are used for clients who can bear their own weight (Figure 27-2). The Nursing Checklist describes the procedure for calibrating a scale and measuring the weight for children and adults (Figure 27-3).

NORMAL AGE-RELATED VARIATIONS IN HEIGHT AND WEIGHT

Age	Height	Weight
Newborn	50 cm (20 in.)	3.38 kg (7.5 lb)
1–6 mo	63 cm (25 in.)	2 × birth weight
6–12 mo	71 cm (28 in.)	3 × birth weight
Toddler	75–83 cm (30–33 in.)	15 kg (33 lb)
Preschooler	100 cm (40 in.)	18.2–20.5 kg (40–45 lb)
School-age	115–140 cm (46–56 in.)	35.5–38.6 kg (75–85 lb)
<i>Growth Spurt</i>		
Girls 8–14 yr	120–160 cm (48–64 in.)	40.9–63.6 kg (90–140 lb)
Boys 10–16 yr	125–170 cm (50–68 in.)	40.9–68.2 kg (90–150 lb)

Several types of scales, such as stretcher, chair, and bed scales, are available for clients who are unable to bear weight or are confined to a bed. Figure 27-4 shows a scale that is equipped with a mechanical lift. A sheet should be placed between the client's skin and the surfaces of the belts.

Infants can be weighed on platform or cradle scales. Before weighing the infant, the nurse should make sure the room is warm. The infant's clothing and diaper should then be removed and the nurse should place a light blanket on the scale's surface. The nurse should face the infant, keeping one hand over the top of the infant to prevent accidental injury while adjusting the scale with the other hand. The reading should be noted as quickly as possible and the nurse should return the infant to the crib and dress the child.

Nursing Considerations

Accurate recordings of weight are imperative because they are used in drug dosage calculations and to evaluate the effectiveness of drug, fluid, and nutritional therapy.



Figure 27-2 Weighing a Client on a Standing Scale

Weights above the normal range may indicate obesity or fluid retention. Weights below the normal range may indicate malnutrition, delayed growth and development, or **cachexia** (weight loss marked by weakness and emaciation that usually occurs with a chronic illness such as tuberculosis or cancer). Height is compared with weight to evaluate growth of infants and children.



NURSING CHECKLIST

Calibrating the Scale and Measuring Weight of Children and Adults

1. Calibrate the standing scale by setting both weight indicators to zero. The balance beam will be at the top (Figure 27-3A). When calibrated the balance beam will be at the midway point.
2. Digital display scales should read zero. If they do not, follow the manufacturer's instructions to recalibrate the scale.
3. Assist the client to a standing position. Have the client empty his or her bladder before the weight measurement.
4. Make sure the scale is sitting evenly on the floor and assist the client onto the scale. Instruct the client to remain still. Avoid touching the client.
5. Slowly move the standing scale's weight indicators on the balance beam until the tip of the beam registers in the middle of the mark (Figure 27-3B). Digital scales will automatically display the weight.
6. Read and record the weight.
7. Assist the client back to the former position.

NURSING ALERT

Measuring Weight

When standing on a scale, the client should wear some type of light foot covering, such as disposable operating room slippers, to prevent the transmission of infection and to enhance comfort.



A.



B.

Figure 27-3 Calibrating the Scale and Weighing the Client. A. Set both weight indicators to zero. B. With the client standing on the scale, move the weight indicators on the balance beam until the tip of the beam registers in the middle of the mark.



Figure 27-4 Scales equipped with mechanical lifts are used for clients who are either unable to bear their weight on standing scales or who are confined to bed. (Photo courtesy of Healthometer®)

Documentation

The height and weight measurements are recorded on the appropriate form, such as the admit assessment form. Daily weights are usually recorded on the vital signs record. If the weight is taken at a different time or on a different scale, the variation should be recorded.

Body Temperature

Body temperature is measured during the routine physical examination by using one of the instruments described in Table 27–3. Frequent monitoring is required for clients who have or are at risk for infection; for example, postoperative clients or those with suppressed white blood cell count. Accuracy of temperature measurement is essential because it guides nursing and medical decision making and interventions.

Temperature Scales

The nurse should consistently measure and record the temperature using either the centigrade or Fahrenheit scale as defined in specific health care agency policies. A centigrade-calibrated scale ranges from 34° to 42°C, and a Fahrenheit-calibrated scale ranges from 94° to 108°F. Conversions from one scale to another are based on the formula that 0°C is equal to 32°F (see the accompanying display).

CENTIGRADE AND FAHRENHEIT CONVERSION FORMULAS

- Centigrade to Fahrenheit conversion: multiply the centigrade reading by 9/5 and add 32: $^{\circ}\text{F} = (^{\circ}\text{C} \times 9/5) + 32$
- Fahrenheit to centigrade conversion: deduct 32 from the Fahrenheit reading and multiply by 5/9: $^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9$

Sites

Although the physician may order a specific site to measure the temperature, nursing judgment usually determines the best site based on the client's age and physical and mental condition. Traditional sites for measuring the body's internal (core) temperature are oral (OT), rectal (RT), and axillary (AT), using either glass or electronic thermometers.

Advances in clinical thermometry provide other devices and sites, such as thermistors for pulmonary artery temperature (PAT) and infrared thermometers for ear canal temperature (ET). ET is the most common site used for temperature measurements in adults because it is a safe and efficient method; however, it is less sensitive in detecting fever in infants and young children. ET should not be used in infected or draining ears or if adjacent lesions or incisions exist. The most reliable measure of core temperature is PAT. Since PAT requires placement of a thermodilution pulmonary artery catheter, it is impractical for routine care.

Oral and rectal temperature measurements are higher than axillary because the measuring device is in contact with the mucous membrane. Rectal measurements are higher than oral because of the seal created by the anal sphincter, which decreases contact with environmental air. With the availability of electronic measuring devices, a glass thermometer should never be used for oral readings if there is danger that the client will bite and break the thermometer.

The axilla is commonly used as a site for infants and children with disabilities because it is the safest, even though least accurate, method. Axillary or rectal sites are used for clients who are uncooperative, comatose, or who have a nasogastric or feeding tube in place.

NURSING ALERT

Temperature Measurement Sites

Rectal temperature measurement is contraindicated in clients with cardiovascular alterations because the thermometer may stimulate the vagus nerve and cause an irregular cardiac rhythm. It is also contraindicated in leukemia and rectal surgery clients because the insertion of the thermometer may traumatize the mucosa or incision line, causing bleeding.

Assessing Body Temperature

Assess the client for the most appropriate site and gather the necessary equipment. When checking the client's oral temperature, the nurse should confirm that the client has neither consumed hot or cold food or beverage nor smoked for 15 to 30 minutes before the measurement. Mouth breathing and tachypnea may also cause an inaccurate oral reading. The nurse should wear nonsterile gloves when assessing oral temperature in clients with herpetic lesions (Crow, 1997). Herpes viruses are extremely contagious and require implementation of Standard Precautions of the Centers for Disease Control and Prevention. Clients with herpetic lesions should have their own glass thermometer to prevent transmission to others.

When using a glass thermometer stored in a disinfectant solution, the nurse should rinse it under cold water to remove the solution. Hot water should not be used on the thermometer because it will cause the mercury to expand and could break the thermometer. Procedure 27-1 describes the actions involved in measuring body temperature according to site.

Alterations in Thermoregulation

When heat production exceeds heat loss and body temperature rises above the normal range **pyrexia** occurs. This condition is caused by an elevation of the body's set-point in the hypothalamus. When the body's temperature rises above 37.4°C (101°F) orally or 38°C (100.4°F) rectally, the client is said to be febrile.

PROCEDURE 27-1

Measuring Body Temperature

Equipment

- Thermometer: glass (client's bedside); electronic and disposable protective sheath; disposable (chemical); tympanic
- Lubricant (rectal, glass thermometer)
- Two pairs of nonsterile gloves
- Tissues

Action

1. Review medical record for baseline data and factors that influence vital signs.
2. Explain to the client that vital signs will be assessed. Encourage client to remain still and refrain from drinking, eating, or smoking.
3. Assess client's toileting needs and proceed as appropriate.
4. Gather equipment as indicated above.
5. Provide for privacy.
6. Wash hands and don gloves.
7. Position the client in a sitting or lying position with the head of the bed elevated 45° to 60° for measurement of all vital signs except those designated otherwise.
8. *Oral Temperature: Glass Thermometer*

Rationale

1. Establishes parameters for client's normal measurements, provides direction in device selection, and determines site to use for measurement. Vital signs are measured in the order of TP-R and BP, usually without interruptions, so as to provide the nurse with an objective clinical database to direct decision making.
2. Encourages participation, allays anxiety, and ensures accurate measurements. Cold or hot liquids and smoking alter circulation and body temperature.
3. Prevents interruptions during measurements, communicates caring, and promotes client comfort.
4. Facilitates organized assessment and measurement.
5. Decreases embarrassment.
6. Hands are washed before and after every contact with a client. Gloves are worn to avoid contact with all bodily secretions and to reduce transmission of microorganisms.
7. Promotes comfort and site access for all measurements. Activity and movement can elevate heart and respiratory rates.

(continues)

PROCEDURE 27-1

Measuring Body Temperature (continued)

Action

- a. Select correct color tip of thermometer from client's bedside container.
 - b. Remove thermometer from storage container and cleanse under cool water.
 - c. Wipe thermometer dry with a tissue from bulb's end toward fingertips.
 - d. Read thermometer by locating mercury level. It should read 35.5°C (96°F).
 - e. If thermometer is not below a normal body temperature reading, grasp thermometer with thumb and forefinger and shake vigorously by snapping the wrist in a downward motion to move mercury to a level below normal.
 - f. Place thermometer in mouth under the tongue and along the gumline to the posterior sublingual pocket. Instruct client to hold lips closed.
 - g. Leave in place as specified by agency policy, usually 3–5 minutes.
 - h. Remove thermometer and wipe with a tissue away from fingers toward the bulb's end.
 - i. Read at eye level and rotate slowly until mercury level is visualized.
 - j. Shake thermometer down, and cleanse glass thermometer with soapy water, rinse under cold water, and return to storage container.
 - k. Remove and dispose of gloves in receptacle. Wash hands.
 - l. Record reading and indicate site as "OT."
9. *Oral Temperature: Electronic Thermometer*
- a. Place disposable protective sheath over probe.
 - b. Grasp top of the probe's stem. Avoid placing pressure on the ejection button.
 - c. Place tip of thermometer under the client's tongue and along the gumline to the posterior sublingual pocket lateral to center of lower jaw (Figure 27-5).
 - d. Instruct client to keep the mouth closed around thermometer.

Rationale

- a. Identifies correct device; a blue color tip usually denotes an oral thermometer.
 - b. Cleansing removes disinfectant that can cause irritation to oral mucosa. Cool water prevents expansion of the mercury.
 - c. Wipe from area of least contamination to most contaminated area.
 - d. Thermometer must be below normal body temperature to ensure an accurate reading.
 - e. Shaking briskly lowers level of mercury in the column. Because glass thermometers break easily, make sure that nothing in the environment comes in contact with the thermometer when shaking it.
 - f. Ensures contact with large blood vessels under the tongue. Prevents environmental air from coming in contact with the bulb.
 - g. Thermometer must stay in place long enough to ensure an accurate reading.
 - h. Mucus on thermometer may interfere with disinfectant solution's effectiveness. Wipe from area of least contamination to most contaminated area.
 - i. Ensure an accurate reading.
 - j. Mechanical cleansing removes secretions that promote growth of microorganisms. Hot water may cause coagulation of secretions and cause expansion of mercury in thermometer.
 - k. Reduces transmission of microorganisms.
 - l. Accurate documentation by site allows for comparison of data.
- a. Prevents transmission of microorganisms.
 - b. Pressure on the ejection button releases the sheath from the probe.
 - c. Sublingual pocket contains superficial blood vessels.
 - d. Maintains thermometer in proper place and decreases amount of time for an accurate reading.

(continues)

PROCEDURE 27-1

Measuring Body Temperature (continued)

Action



Figure 27-5 Place the tip of thermometer under client's tongue in posterior sublingual pocket lateral to center of lower jaw.

Rationale

- | | |
|---|--|
| <ul style="list-style-type: none"> e. Thermometer will signal (beep) when a constant temperature registers. f. Read measurement on digital display of electronic thermometer. Push ejection button to discard disposable sheath into receptacle and return probe to storage well. g. Inform client of temperature reading. h. Remove gloves and wash hands. i. Record reading and indicate site "OT." j. Return electronic thermometer unit to charging base. <p>10. <i>Rectal Temperature</i></p> <ul style="list-style-type: none"> a. Place client in the Sims' position with upper knee flexed. Adjust sheet to expose only anal area. b. Place tissues in easy reach. Don gloves. c. Prepare the thermometer (refer to steps 8b and 8c). d. Lubricate tip of rectal thermometer or probe (a rectal thermometer usually has a red cap). e. With dominant hand, grasp thermometer. With nondominant hand, separate buttocks to expose anus. | <ul style="list-style-type: none"> e. Signal indicates temperature reading. f. Reduces transmission of microorganisms. Ensures that the electronic system is ready for next use. g. Promotes client's participation in care. h. Reduces transmission of microorganisms. i. Accurate documentation by site allows for comparison of data. j. Ensures charging base is plugged into electrical outlet and ready for next use. <ul style="list-style-type: none"> a. Proper positioning ensures visualization of anus. Flexing knee relaxes muscles for ease of insertion. b. Tissue is needed to wipe anus after device is removed. d. Promotes ease of insertion of thermometer or probe. e. Aids in visualization of anus. |
|---|--|

(continues)

PROCEDURE 27-1

Measuring Body Temperature (continued)

*Action**Rationale*

Figure 27-6 Preparation for the Insertion of a Rectal Thermometer

- | | |
|---|---|
| <ul style="list-style-type: none"> f. Instruct client to take a deep breath. Insert thermometer or probe gently into anus: infant, 1.2 cm (0.5 in.); adult, 3.5 cm (1.5 in.) (Figure 27-6). If resistance is felt, do not force insertion. g. Length of time (refer to step 8g). h. Wipe secretions off glass thermometer with a tissue. Dispose of tissue in a receptacle. i. Read measurement and inform client of temperature reading. j. While holding glass thermometer in one hand, wipe anal area with tissue to remove lubricant or feces with other hand and dispose of soiled tissue. Cover client. k. Cleanse thermometer (refer to step 8j). l. Remove and dispose of gloves in receptacle. Wash hands. m. Record reading and indicate site as “RT.” <p>11. Axillary Temperature</p> <ul style="list-style-type: none"> a. Remove client’s arm and shoulder from one sleeve of gown. Avoid exposing chest. b. Make sure axillary skin is dry; if necessary, pat dry. | <ul style="list-style-type: none"> f. Relaxes anal sphincter. Gentle insertion decreases discomfort to client and prevents trauma to mucous membranes. h. Removes secretions and fecal material for visualization of mercury level. Prevents transmission of microorganisms. i. Encourages client participation. j. Prevents contamination of clean objects with soiled thermometer, decreases skin irritation, and promotes client comfort. Prevents embarrassment. l. Decreases transmission of microorganisms. m. Accurate documentation by site allows for comparison of data. <ul style="list-style-type: none"> a. Exposes axillary area. b. Removes moisture and prevents a false low reading. |
|---|---|

(continues)

PROCEDURE 27-1

Measuring Body Temperature (continued)

Action

- c. Prepare thermometer (refer to steps 8b and 8c).
- d. Place thermometer or probe into center of axilla (Figure 27-7A). Fold client's upper arm straight down and place arm across client's chest (Figure 27-7B).



A.



B.

Figure 27-7 A. Insert thermometer into center of axilla. B. Place client's arm across chest.

Rationale

- d. Puts device in contact with axillary blood supply. Maintains the device in proper position.
- e. Leave glass thermometer in place as specified by agency policy (usually 6–8 minutes). Leave an electronic thermometer in place until signal is heard.
- f. Remove and read thermometer.
- e. Device must stay in place long enough to ensure an accurate reading. Signal indicates temperature reading.

(continues)

PROCEDURE 27-1

Measuring Body Temperature (continued)

<i>Action</i>	<i>Rationale</i>
<ul style="list-style-type: none"> g. Inform client of temperature reading. h. Cleanse glass thermometer (refer to steps 8h and 8j) and return to storage container. i. Assist client with replacing gown. j. Record reading and indicate site as “AT.” 	<ul style="list-style-type: none"> g. Encourages client participation. h. Prevents transmission of microorganisms and breakage of glass thermometer. i. Promotes comfort. j. Promotes accurate documentation for data comparison.
12. Disposable (Chemical Strip) Thermometer	
<ul style="list-style-type: none"> a. Apply tape to appropriate skin area, usually forehead. b. Observe tape for color changes. c. Record reading and indicate method. 	<ul style="list-style-type: none"> a. Tape must be in direct contact with the client’s skin. b. Color reflects temperature reading (refer to the manufacturer’s instructions). c. Promotes accurate documentation for data comparison.
13. Tympanic Temperature: Infrared Thermometer	
<ul style="list-style-type: none"> a. Position client in Sims’ position. b. Remove probe from container and attach probe cover to tympanic thermometer unit. c. Turn client’s head to one side. For an adult, pull pinna upward and back; for a child, pull down and back. Gently insert probe with firm pressure into ear canal. d. Remove probe after the reading is displayed on digital unit (usually 2 seconds). e. Remove probe cover and replace in storage container. f. Return tympanic thermometer to storage unit. g. Record reading and indicate site as “ET.” 	<ul style="list-style-type: none"> a. Promotes access to ear. b. Prevents contamination. c. Provides access to ear canal. Gentle insertion prevents trauma to external canal. Firm pressure is needed to ensure probe contact against tympanic membrane. d. Reading is displayed within seconds. e. Protects damage to the reusable probe. f. Recharges batteries of unit. g. Promotes accurate documentation for data comparison.

Pyrogens (bacteria, viruses, fungi, and some antigens) are endogenous or exogenous substances that cause fever. When a pyrogen enters the body, it causes an increased production of white blood cells and raises the set-point of the hypothalamus. It takes the body several hours to generate and conserve sufficient heat to achieve the new set-point. It is during this time that the person experiences the clinical symptoms of chills and shivering. When the temperature and set-point are equal, chills subside and fever is manifested clinically. The fever cycle continues until the body overcomes the pyrogen either naturally or through clinical intervention (e.g., administration of antibiotics). See Chapter 31 for a nursing care plan for the febrile client.

Age, gender, and hormonal levels can influence “normal” physiological function. These factors account for the differences in individual temperature measure-

ments relative to fever. When a person is exposed to extreme environmental conditions, several alterations in thermoregulation can occur. Table 27-4 discusses the alterations that can occur in thermoregulation.

Nursing Considerations

The nurse should place the client experiencing heat exhaustion in a cool environment. The goal of nursing care is to stop diaphoresis by administering fluid and electrolytes as prescribed by a physician. See Chapter 37 for a complete discussion of fluid and electrolyte therapy.

Victims of heat stroke do not perspire because of severe electrolyte loss and impaired hypothalamic function as discussed in Table 27-4. Heat stroke victims are usually discovered outdoors, with emergency measures instituted to lower the temperature during transport to

TABLE 27-4
Alterations in Thermoregulation

Alteration	Definition	Characteristics
Heat exhaustion	An increase in body temperature (38°–40°C; 100.4°–104.0°F) in response to environmental conditions that, in turn, causes diaphoresis (profuse perspiration)	Loss of excessive amounts of water and sodium from perspiring leads to thirst, nausea, vomiting, weakness, and disorientation.
Heat stroke	A critical increase in body temperature (41°–44°C) resulting from exposure to high environmental temperatures	Dry, hot skin is the most important sign. The person becomes confused, or delirious, and experiences thirst, abdominal distress, muscle cramps, and visual disturbances. Loss of consciousness occurs if untreated.
Hypothermia	A body temperature of 35°C or lower resulting from cold weather exposure or artificial induction	Decrease in metabolism leads to impaired mental functioning and depressed pulse, respirations, and blood pressure; can result in cardiac arrest if untreated.
Frostbite	Freezing of the body's surface areas (earlobes, fingers, and toes) in extremely low temperatures	Circulatory impairment may be followed by gangrene.

an emergency center. Nursing's primary role relative to heat stroke is prevention. The nurse is usually involved in teaching preventive measures, such as drinking liquids before, during, and after exercise; avoiding strenuous exercise in humid, hot weather; and wearing light-colored, loose-fitting clothing and covering the head when working outdoors in hot climates.

Hypothermia and frostbite victims found injured in cold weather or who were immersed in cold water are treated while in transit to an emergency center with heating blankets and instillation of warm fluids into the stomach. Nursing's role is to teach preventive measures to groups at risk, such as the homeless, and to parents or guardians of mentally ill or handicapped clients who live in cold environments.

Documentation

Record the temperature measurement and the site on the designated medical record form. Schmitz and colleagues (1995) identify the importance of both consistency in the measurement process for the purpose of establishing a client's temperature trend and awareness of the method used when interpreting clinical data. Temperature measurements are usually plotted on a graph to identify alteration patterns, such as sharp elevations and declines in temperature (a condition known as spiking).

Pulse

Pulse assessment is the measurement of a pressure pulsation created when the heart contracts and ejects blood into the aorta. Assessment of pulse characteristics pro-

vides clinical data regarding the heart's pumping action and the adequacy of peripheral artery blood flow.

Sites

There are multiple pulse points. The most accessible peripheral pulses are the radial and carotid sites. Because the body shunts blood to the brain whenever a cardiac emergency such as hemorrhage occurs, the carotid site should always be used to assess the pulse in these situations.

Variances exist among health care agencies regarding which pulse sites to assess. The common sites for each type of assessment are:

- Complete physical assessment—apical and all bilateral peripheral pulses
- Initial assessment—apical and bilateral peripheral radial and dorsalis pedis pulses
- Routine vital sign assessment—apical and radial pulses in adults and apical and temporal pulses in infants and children

Disorders that alter the client's cardiovascular status require different pulse point assessments (Table 27-5). Whenever circulation is compromised, the corresponding pulse point should be assessed.

Assessing Pulse Rate

The nurse should begin the assessment by speaking with the client about the normal pulse rate. The client's medical record should be reviewed for baseline data, if

TABLE 27-5
Pulse Point Assessment

Pulse Point	Assessment Criteria
Temporal: over temporal bone, superior and lateral to eye	Accessible; used routinely for infants and when radial is inaccessible
Carotid: bilateral, under lower jaw in neck along medial edge of sternocleidomastoid muscle	Accessible; used routinely for infants and during shock or cardiac arrest when other peripheral pulses are too weak to palpate; also used to assess cranial circulation
Apical: left midclavicular line at fourth to fifth intercostal space	Used to auscultate heart sounds and assess apical-radial deficit
Brachial: inner aspect between groove of biceps and triceps muscles at antecubital fossa	Used in cardiac arrest for infants, to assess lower arm circulation, and to auscultate blood pressure
Radial: inner aspect of forearm on thumb side of wrist	Accessible; used routinely in adults to assess character of peripheral pulse
Ulnar: outer aspect of forearm on finger side of wrist	Used to assess circulation to ulnar side of hand and to perform the Allen's test
Femoral: in groin, below inguinal ligament (midpoint between symphysis pubis and anterosuperior iliac spine)	Used to assess circulation to legs and during cardiac arrest
Popliteal: behind knee, at center in popliteal fossa	Used to assess circulation to legs and to auscultate leg blood pressure
Posterior tibial: inner aspect of ankle between Achilles tendon and tibia (below medial malleolus)	Used to assess circulation to feet
Dorsalis pedis: over instep, midpoint between extension tendons of great and second toe	Used to assess circulation to feet

available, and any medications that could affect the heart rate should be noted. Because physical activity increases the heart rate, ensure that the client rests 5 to 10 minutes before the pulse is assessed.

Clinical data regarding the efficacy of blood circulation to an extremity are obtained by assessing the characteristics (quality, rate, rhythm, and volume) of the peripheral pulses. These attributes are described in the section enti-

NURSING ALERT

Carotid Pulse Assessment

When assessing a carotid pulse, apply light pressure to only one carotid artery to avoid disruption of cerebral blood flow.

ted Pulse Characteristics. Palpate a peripheral pulse by placing the first two fingers on the pulse point with moderate pressure. A firm pressure will obliterate the pulse; if the pressure is too light, the pulse cannot be felt.

A Doppler ultrasound stethoscope (DUS) is used on superficial pulse points to detect and magnify heart sounds and pulse waves when the peripheral pulse cannot be palpated. The DUS, which has an earpiece similar to that of a stethoscope, is connected by a cord to a volume-control audio unit with an ultrasound transducer. See Chapter 32 for a complete discussion about other devices to monitor the heart rate.

Normal radial and apical pulses are identical in rate. The stethoscope is used to auscultate the heart's rate and rhythm. The stethoscope should be placed on the fifth intercostal space at the midclavicular line, as described in Procedure 27-2. Count the rate for a full minute, noting the regularity (rhythm).

When an irregular peripheral pulse is present, the nurse needs to assess for a **pulse deficit** (condition in which the apical pulse rate is greater than the radial pulse rate). A pulse deficit results from the ejection of a volume of blood that is too small to initiate a peripheral pulse wave. When a discrepancy exists between the apical and radial pulses, the deficit is assessed by simultaneously measuring the apical and radial pulses for a minute. This procedure is usually performed by two nurses; however, it can be performed by one nurse if necessary.

Pulse Characteristics

A normal pulse has defined characteristics: quality, rate, rhythm, and volume (strength or amplitude). **Pulse quality** refers to the "feel" of the pulse, its rhythm and forcefulness.

Pulse rate is an indirect measurement of cardiac output obtained by counting the number of apical or peripheral pulse waves over a pulse point. A normal pulse rate for adults is between 60 and 100 beats per minute. **Bradycardia** is a heart rate less than 60 beats per minute in an adult. **Tachycardia** is a heart rate in excess of 100 beats per minute in an adult.

Pulse rhythm is the regularity of the heartbeat. It describes how evenly the heart is beating: regular (the beats are evenly spaced) or irregular (the beats are not evenly spaced). Dysrhythmia (arrhythmia) is an irregular rhythm caused by an early, late, or missed heartbeat.

Pulse volume is a measurement of the strength or amplitude of force exerted by the ejected blood against the arterial wall with each contraction. It is described as normal (full, easily palpable), weak (thready and usually

PULSE VOLUME SCALE

Scale	Description of Pulse
0	Absent pulse
1+	Weak and thready pulse
2+	Normal pulse
3+	Bounding pulse

rapid), or strong (bounding). To facilitate data comparison of this measurement, a standard pulse volume scale should be used in documenting findings (see the accompanying display). Procedure 27-2 describes the actions involved in assessing the pulse rate.

Nursing Considerations

An irregular pulse rate, if not previously documented in the medical record, should be reported immediately. The following equipment is used to identify the type of dysrhythmia causing the irregular heartbeat:

- Electrocardiogram (ECG or EKG) provides an electrical representation of the heart's activity. The primary pacemaker of the heart is the sinoatrial (SA) node. If another site within the heart initiates the electrical activity, the ECG tracing will identify the area serving as the pacemaker.

PROCEDURE 27-2**Assessing Pulse Rate****Equipment**

- Watch with a second hand
- Alcohol swab

- Stethoscope

Action**Rationale****1. Radial Pulse**

- | | |
|--|--|
| <ul style="list-style-type: none"> a. Inform client of the site(s) at which you will measure pulse. b. Flex client's elbow and place lower part of arm across chest. c. Support client's wrist by grasping outer aspect with thumb. d. Place your index and middle finger on inner aspect of client's wrist over the radial artery and apply light but firm pressure until pulse is palpated (Figure 27-8). e. Identify pulse rhythm. f. Determine pulse volume. g. Count pulse rate by using second hand on a watch: <ul style="list-style-type: none"> • For a regular rhythm, count number of beats for 30 seconds and multiply by 2. • For an irregular rhythm, count number of beats for a full minute, noting number of irregular beats. | <ul style="list-style-type: none"> a. Encourages participation and allays anxiety. b. Maintains wrist in full extension and exposes artery for palpation. Placing client's hand over chest will facilitate later respiratory assessment without undue attention to your action. (It is difficult for any person to maintain a normal breathing pattern when someone is observing and measuring.) c. Stabilizes wrist and allows for pressure to be exerted. d. Fingertips are sensitive, facilitating palpation of pulsating pulse. The nurse may feel own pulse if palpating with thumb. Applying light pressure prevents occlusion of blood flow and pulsation. e. Palpate pulse until rhythm is determined. Describe as regular or irregular. f. Quality of pulse strength is an indication of stroke volume. Describe as normal, weak, strong, or bounding. g. An irregular rhythm requires a full minute of assessment to identify the number of inefficient cardiac contractions that fail to transmit a pulsation, referred to as a "skipped" or irregular beat. |
|--|--|

(continues)

PROCEDURE 27-2

Assessing Pulse Rate (continued)

Action

Figure 27-8 Place index and middle finger on inner aspect of client's wrist over the radial artery.

2. Apical Pulse

- a. Raise client's gown to expose sternum and left side of chest.
- b. Cleanse earpiece and diaphragm of stethoscope with an alcohol swab.
- c. Put stethoscope around your neck.
- d. Apex of heart:
 - With client lying on left side, locate suprasternal notch.
 - Palpate second intercostal space to left of sternum.
 - Place index finger in intercostal space, counting downward until fifth intercostal space is located.
 - Move index finger along fourth intercostal space left of the sternal border and to the fifth intercostal space, left of the midclavicular line to palpate the point of maximal impulse (PMI) (Figure 27-9).
 - Keep index finger of nondominant hand on the PMI.
- e. Inform client that you are going to listen to his heart. Instruct client to remain silent.
- f. With dominant hand, put earpiece of the stethoscope in your ears and grasp diaphragm of the stethoscope in palm of your hand for 5 to 10 seconds.

Rationale

- a. Allows access to client's chest for proper placement of stethoscope.
- b. Decreases transmission of microorganisms from one practitioner to another (earpiece) and from one client to another (diaphragm).
 - Identification of landmarks facilitates correct placement of the stethoscope at the fifth intercostal space in order to hear point of maximal impulse. See Chapter 32 for discussion about placement of stethoscope in clients with a barrel chest.
 - Ensures correct placement of stethoscope.
- e. Elicits client support. Stethoscope amplifies noise.
- f. Dominant hand facilitates psychomotor dexterity for placement of earpiece with one hand. Heat warms metal or plastic diaphragm and prevents startling client.

(continues)

PROCEDURE 27-2

Assessing Pulse Rate (continued)

Action

Figure 27-9 Palpating the Apical Pulse

- g. Place diaphragm of stethoscope over the PMI and auscultate for sounds S_1 and S_2 to hear lub-dub sound (Figure 27-10).



Figure 27-10 Place diaphragm of stethoscope over the PMI to auscultate for sounds.

- h. Note regularity of rhythm.
- i. Start to count while looking at second hand of watch. Count lub-dub sound as one beat:
 - For a regular rhythm, count rate for 60 seconds.
 - For an irregular rhythm, count rate for a full minute, noting number of irregular beats.
- j. Share your findings with client.
- k. Record by site the rate, rhythm, and, if applicable, number of irregular beats.

Rationale

- g. Movement of blood through the heart valves creates S_1 and S_2 sounds. Listen for a regular rhythm (heartbeats are evenly spaced) before counting.

- h. Establishment of a rhythm pattern determines length of time to count the heartbeats to ensure accurate measurement.
- i. Ensures sufficient time to count irregular beats.
- j. Supports client participation in care.
- k. Record rate and characteristics at bedside to ensure accurate documentation.

- A Holter monitor is a portable device worn for a 24-hour interval to identify the dysrhythmia pattern.
- Cardiac telemetry transmits the heart's electrical activity to a site for continuous monitoring.

See Chapter 32 for additional information regarding these cardiac monitoring devices.

Clients on certain cardiac medications, such as cardiovascular agents and cardiac glycosides, need to monitor their pulse rate. Clients receiving cardiovascular agents (verapamil hydrochloride) and cardiac glycosides (digoxin) may experience an irregular pulse or pulse rate change that should be reported to their physician. In addition, clients who follow an exercise regimen should assess their pulse rate to measure their heart's response to the exercise. Routine or regular exercise lowers the resting and activity pulses. When teaching clients how to monitor their own heart rate, nurses should show them the procedure in assessing the radial or carotid pulse points.

Documentation

All pulse measurements are documented by recording in the client's medical record on the appropriate forms (e.g., the vital sign flow sheet). The nurse should report and document an irregular pulse.

Respirations

Respiratory assessment is the measurement of the breathing pattern. Assessment of respirations provides clinical data regarding the pH of arterial blood.

Sites

Normal breathing is slightly observable, effortless, quiet, automatic, and regular. It can be assessed by observing chest wall expansion and bilateral symmetrical movement of the thorax. Another method the nurse can use to assess breathing is to place the back of the hand next to the client's nose and mouth to feel the expired air.

Assessing Respirations

When assessing respirations ascertain the rate, depth, and rhythm of ventilatory movement. The nurse should assess the rate by counting the number of breaths taken per minute. Note the depth and rhythm of ventilatory movements by observing for the normal thoracic and abdominal movements and symmetry in chest wall movement. Normal respirations are characterized by a rate ranging from 12 to 20 breaths per minute. Procedure 27-3 describes the actions involved in assessing respirations.

One inspiration and expiration cycle is counted as one breath. The nurse should observe the rise and fall of the chest wall and count the rate by placing the hand lightly on the chest to feel its rise and fall. Count the number of respirations as explained in Procedure 27-3.

Movement of the Diaphragm

When the chest wall moves, so do the lungs, because the lungs are attached to the inner wall of the thoracic cavity by the outer layer of the **pleura** (lining of the chest cavity). The movement of the chest wall should be even and regular, without noise and effort. On inspiration the chest changes shape and expands as the rib cage is raised and the diaphragm is lowered. Before inspiration, the pressure inside the chest cavity is negative (−4.5 to −9.0 mm Hg below atmospheric pressure). Air flows along the concentration gradient from a higher atmospheric pressure to the lower intrathoracic pressure.

The opposite action occurs with expiration. The muscles relax, causing the rib cage to lower, and the diaphragm to rise, compressing the chest. Intrathoracic pressure decreases to −3 to −6 mm Hg to allow the air to escape into the atmosphere.

Characteristics of Normal and Abnormal Breath Sounds

Different respiratory wave patterns are characterized by their rate, rhythm, and depth. See Chapter 32 for a complete discussion of wave patterns. **Eupnea** refers to easy respirations with a normal rate of breaths per minute that are age-specific. **Bradypnea** is a respiratory rate of 10 or fewer breaths per minute. **Hypoventilation** is characterized by shallow respirations. **Tachypnea** is a respiratory rate greater than 24 breaths per minute. **Hyperventilation** is characterized by deep, rapid respirations.

The nurse can also observe alterations in the movement of the chest wall: **costal** (thoracic) **breathing** occurs when the external intercostal muscles and the other accessory muscles are used to move the chest upward and outward; **diaphragmatic** (abdominal) **breathing** occurs when the diaphragm contracts and relaxes as observed by movement of the abdomen. **Dyspnea** refers to difficulty in breathing as observed by labored or forced respirations through the use of accessory muscles in the chest and neck to breathe. Dyspneic clients are acutely aware of their respirations and complain of shortness of breath.

Nursing Considerations

Respiratory alterations may cause changes in skin color as observed by a bluish appearance in the nail beds, lips, and skin. The bluish color (**cyanosis**) results from reduced oxygen levels in the arterial blood. Changes in the level of

NURSING ALERT

Positioning for Dyspneic Clients

Dyspneic clients should never be placed flat in bed; maintain them in a semi-Fowler's or Fowler's position. To facilitate maximal lung expansion place the client in a forward-leaning position over a padded, raised overbed table with arms and head resting on the table.

PROCEDURE 27-3

Assessing Respirations

Equipment

- Watch with a second hand

Action

1. Before replacing client's gown from auscultating heart sounds, assess respirations.
2. Place your hand over client's wrist and observe one complete respiratory cycle.
3. Start to count with first inspiration while looking at second hand sweep of watch.
 - Infants and children: count a full minute.
 - Adults: count for 30 seconds and multiply by 2. If an irregular rate or rhythm is present, count for a full minute.
4. Observe depth of respirations by degree of chest wall movement and rhythm of cycle (regular or interrupted).
5. Replace client's gown.
6. Record rate and character of respirations.

Rationale

1. Facilitates observation of chest wall and abdominal movements.
2. Hand rises and falls with inspiration and expiration.
3. Respiratory rate is one complete cycle (inspiration and expiration).
 - Infants and children usually have an irregular rate.
 - Respiratory rate reflects number of breaths per minute.
4. Reveals volume of air movement into and out of the lungs. Describe as shallow, normal, or deep.
5. Prevents embarrassment and chilling.
6. Record rate and characteristics at bedside to ensure accurate documentation

consciousness may also occur with decreased oxygen levels. Dyspneic clients will assume a forward-leaning position to increase the expansion capacity of the lungs.

Clients with respiratory alterations require additional nursing assessment. Noninvasive oxygen assessment can be performed with an **oximeter** (a machine that measures the oxygen saturation of the blood through a probe clipped to the fingernail or earlobe) or an **apnea monitor** (a machine with chest leads that monitors the movement of the chest). Both noninvasive machines have alarm features that are set to specific parameters. For example, if the client's respirations fall below 6 breaths per minute, the apnea monitor alarm will sound. The apnea monitor is used in the home environment for apneic clients; when the alarm sounds, it wakes the person and causes him to breathe.

Documentation

Document the assessment findings for the respiratory rate, depth, rhythm, and character on the appropriate form (e.g., the vital sign flow sheet). Report a respiratory rate outside the normal age range, an irregular rhythm, inadequate depth, or any abnormal characteristics such as dyspnea.

Blood Pressure

Blood pressure measurement is performed during a physical examination, at initial assessment, and as part of routine vital signs assessment. Depending on the client's condition, the blood pressure is measured by

either a direct or an indirect technique. The direct method requires an invasive procedure in which an intravenous catheter with an electronic sensor is inserted into an artery and the artery-transmitted pressure on an electronic display unit is read. The indirect method requires use of the sphygmomanometer and stethoscope for auscultation and palpation as needed.

Sites

The most common site for indirect blood pressure measurement is the client's arm over the brachial artery. When the client's condition prevents auscultation of the brachial artery, the nurse should assess the blood pressure in the forearm or leg sites (see the accompanying display).

CONTRAINDICATIONS FOR BRACHIAL ARTERY BLOOD PRESSURE MEASUREMENT

When the client has any of the following, *do not* measure blood pressure on the involved side:

- Venous access devices, such as an intravenous infusion or arteriovenous fistula for renal dialysis
- Surgery involving the breast, axilla, shoulder, arm, or hand
- Injury or disease to the shoulder, arm, or hand, such as trauma, burns, or application of a cast or bandage

When pressure measurements in the upper extremities are not accessible, the popliteal artery, located behind the knee, becomes the site of choice. The nurse can also assess the blood pressure in other sites, such as the radial artery in the forearm and the posterior tibial or dorsalis pedis artery in the lower leg. Because it is difficult to auscultate sounds over the radial, tibial, and dorsalis pedis arteries, these sites are usually palpated to obtain a systolic reading.

Assessing Blood Pressure

Selecting the proper equipment and following procedural technique are basic to ensuring an accurate reading. Psychomotor skills, acquired with practice, are needed to manipulate the blood pressure equipment. Procedure 27-4 describes the actions involved in assessing blood pressure.

As shown in Table 27-3, a sphygmomanometer is a device used to measure indirect blood pressure. A sphygmomanometer consists of a mercury or aneroid manometer and a cuff that contains an inflatable rubber bladder connected to two pieces of rubber tubing. One

piece of tubing connects the bladder to the manometer or gauge, and the second tubing is attached to a pressure bulb with a release valve to inflate and deflate the cuff. When pressure is applied to the bulb, air enters the bladder and inflates the cuff.

The sphygmomanometer wears with usage. If there is a defect in any part of the system, the blood pressure reading will be inaccurate. The aneroid gauge needle or mercury in the manometer column should be at a zero reading when the cuff is deflated and should rise evenly when pressure is applied to the bulb. The valve should turn freely and all tubing should be intact, with secured connections to prevent air from leaking out of the system.

An accurate reading also requires the correct width of the blood pressure cuff as determined by the circumference of the client's extremity. The bladder cuff must encircle the width and length of the site. According to the American Heart Association (1987), the bladder width should be approximately 40% of the circumference or 20% wider than the diameter of the midpoint of the extremity. To measure the width of the bladder, the nurse should place the cuff lengthwise on the client's extremity and extend the width to cover 40% of the

PROCEDURE 27-4

Assessing Blood Pressure

Equipment

- Alcohol swabs
- Stethoscope

- Sphygmomanometer with proper size cuff

Action

1. Determine which extremity is most appropriate for reading. Do not take a pressure reading on an injured or painful extremity or one in which an intravenous line is running.
2. Select a cuff size that completely encircles upper arm without overlapping (Figure 27-11).



Figure 27-11 Wrap the blood pressure cuff on the arm 1 inch above client's brachial pulsation, with bladder centered over brachial artery.

Rationale

1. Cuff inflation can temporarily interrupt blood flow and compromise circulation in an extremity already impaired or a vein receiving intravenous fluids.
2. Provides equalization of pressure on the artery to ensure accurate measurement.

(continues)

PROCEDURE 27-4

Assessing Blood Pressure (continued)

Action

3. Move clothing away from upper aspect of arm.
4. Position arm at heart level, extend elbow with palm turned upward.
5. Make sure bladder cuff is fully deflated and pump valve moves freely.
6. Locate brachial artery in the antecubital space.
7. Apply cuff snugly and smoothly over upper arm, 2.5 cm (1 in.) above antecubital space with center of cuff over brachial artery.
8. Connect bladder tubing to manometer tubing. If using a portable mercury-filled manometer, position vertically at eye level.
9. Palpate brachial artery (Figure 27-12), turn valve clockwise to close and compress bulb to inflate cuff to 30 mm Hg above point where palpated pulse disappears, then slowly release valve (deflating cuff), noting reading when pulse is felt again.



Figure 27-12 Palpate the brachial artery with fingertips below the pressure cuff.

Rationale

3. Ensures accurate measurement.
 4. Blood pressure increases when arm is below level of heart and decreases when arm is above level of heart.
 5. Equipment must function properly to obtain an accurate reading.
 6. Designates placement of stethoscope.
 7. Ensures even pressure distribution over brachial artery. Prevents tubing from being constricted and allows visualization of aneroid manometer dial.
 8. Maintains closed system; supports accurate reading of mercury level in manometer.
 9. Inflates the cuff's bladder with pressure and temporarily impairs flow of blood through artery. Provides an estimate of maximum pressure required to measure systolic pressure.
10. Inserts earpiece of stethoscope in ears with a forward tilt, ensuring diaphragm hangs freely.
 11. Relocates brachial pulse with your nondominant hand and places bell or diaphragm chestpiece directly over pulse. Chestpiece should be in direct contact with skin and not touch cuff (Figure 27-13).

10. Enhances sound transmission from chestpiece to ears.
11. Sound heard best directly over artery; decreases muffled sounds that cause inaccurate reading. Bell chestpiece is more sensitive to low-frequency sound that occurs with pressure release.

(continues)

PROCEDURE 27-4

Assessing Blood Pressure (continued)

Action

Figure 27-13 Place bell chestpiece over brachial artery below blood pressure cuff.

Rationale

- | | |
|---|--|
| <p>12. With dominant hand, turn valve clockwise to close. Compress pump to inflate cuff until manometer registers 30 mm Hg above diminished pulse point identified in step 9.</p> <p>13. Slowly turn valve counterclockwise so that mercury falls at a rate of 2–3 mm Hg per second. Listen for five phases of Korotkoff's sounds while noting manometer reading:</p> <ul style="list-style-type: none"> • A faint, clear tapping sound appears and increases in intensity (phase I). • Swishing sound (phase II). • Intense sound (phase III). • Abrupt, distinctive muffled sounds (phase IV).
 • Sound disappears (phase V). <p>14. Deflate cuff rapidly and completely.</p> <p>15. Remove cuff or wait 2 minutes before taking a second reading.</p> <p>16. Inform client of reading.</p> <p>17. Record reading.</p> <p>18. Lower bed, raise side rails, place call light in easy reach.</p> | <p>12. Prevents air leak during inflation. Ensures the cuff is inflated to a pressure greater than the client's systolic pressure.</p> <p>13. Maintains constant release of pressure to ensure hearing first systolic sound. Identify manometer readings for each of the five phases.</p> <ul style="list-style-type: none"> • Identify two consecutive tapping sounds to confirm systolic reading.
 • Phase IV is regarded by the American Heart Association (AHA) as the best indicator of diastolic pressure in children (AHA, 1987). • Phase V is regarded by the AHA as the best index of diastolic blood pressure in clients over age 13 (AHA, 1987). <p>14. Prevents arterial occlusion and client discomfort of numbness or tingling.</p> <p>15. Releases trapped blood in the vessels.</p> <p>16. Promotes client participation in care.</p> <p>17. Ensures accuracy.</p> <p>18. Promotes client safety.</p> |
|---|--|

(continues)

PROCEDURE 27-4

Assessing Blood Pressure (continued)

Action

19. Put all equipment in proper place.
20. Wash hands.
21. Document measurements in client's medical record on appropriate form, usually vital signs flow sheet.
22. Compare data with client's baseline and normal range for age group.
23. If any measurements are abnormal, measure again and report abnormal findings to instructor or charge nurse.

Rationale

19. Fosters maintenance of equipment.
20. Prevents transmission of microorganisms.
21. Vital sign measurements are usually charted on the graphic section of the vital signs form.
22. Provides for comparative data analysis.
23. Reporting abnormal measurements alerts staff to possible problems requiring intervention.

extremity's circumference (Figure 27-14). The length of the sphygmomanometer bladder should be twice the width. Table 27-6 recommends bladder sizes based on different arm circumferences. A falsely elevated reading will result if the bladder is too narrow, and a falsely low reading will result if it is too wide.

Electronic sphygmomanometers are used by clients for self-measurements. A stethoscope is not required because the device electronically inflates and deflates the cuff while simultaneously reading and displaying the systolic and diastolic pressures. The electronic device is useful for clients who must monitor their own pressure at home. However, it must be recalibrated routinely to ensure an accurate reading.



Figure 27-14 Measure width of arm by holding cuff against client's upper arm.

TABLE 27-6
Guidelines for Sphygmomanometer Selection

Midpoint* Arm Circumference**	Bladder Cuff Width**	Bladder Length**
5–7.5 (newborn)	3	5
7.5–13 (infant)	5	8
13–20 (child)	8	13
24–32 (average adult)	13	24
32–42 (large adult)	17	32

* Distance between the acromion and olecranon processes.

** Measurement in centimeters (cm).

Auscultation

A stethoscope is used to auscultate the blood pressure (hear the sounds created by blood flowing through the artery). As discussed in Procedure 27-4, the blood pressure cuff is inflated 30 mm Hg higher than the palpated pressure so that the inflated pressure causes the artery to collapse; blood flow ceases, and sound is absent on auscultation. As the pressure is released from the bladder, blood begins to flow through the artery and creates the first sound, which is the systolic pressure.

The Korotkoff sounds, described in the accompanying display and Procedure 27-4, are named after the Russian surgeon who first identified the five distinct phases of sound heard with a stethoscope during

KOROTKOFF SOUNDS CORRELATED TO PRESSURE DYNAMICS

<i>Phase</i>	<i>Pressure Dynamics</i>
I. Clear, soft tapping that increases to a thud or loud tap (systolic sound).	1. Ventilation
II. Tapping changes to a soft, swishing sound.	2. Circulation
III. Clear tapping sound returns.	3. Diffusion
IV. Muffled, blowing sound (diastolic sound in children or physically active adults).	4. Transport
V. Disappearance of muffled, blowing sound (second diastolic sound).	5. Regulation

auscultation. Korotkoff's sounds are correlated to the pressure dynamics of measurement.

Bilateral readings should be done with the initial blood pressure assessment. A pressure variance of 5 to 10 mm Hg normally exists between arms. The arm with the higher reading should be used for routine measurements.

When measuring a popliteal blood pressure, the nurse should select a cuff wide and long enough to fit the girth of the thigh. Although the American Heart Association does not specify cuff sizes for thigh BP readings, the association emphasizes that the cuff should be wider and longer than an arm cuff to allow for the greater girth. Place the client in a supine position with the legs in a nondependent position for at least 10 minutes. (A prone position is also acceptable.) Apply the bladder cuff to the client's thigh with the center of the bladder over the popliteal artery. Wrap the cuff snugly, and place it far enough above the popliteal fossa to allow for auscultation of arterial sounds. Help the client slightly flex the knee and abduct the hip, this position will facilitate palpation of the pulse and placement of the stethoscope. Place the diaphragm of the stethoscope over the area where the pulse was palpated and follow the same procedure as presented for brachial artery auscultation (see Procedure 27-4). When the BP cuff is removed, inspect the area, and note abnormalities such as bruising, hematoma, or skin tear. Document in the medical record the systolic and diastolic BP, the site, and the size of the BP cuff. "Systolic readings in the

thigh may be 10 to 40 mm Hg higher than in the arm, but diastolic readings are generally the same" (Rice, 1999, p. 58).

Palpation

When the client's hemodynamic regulation is compromised to the degree that Korotkoff sounds cannot be heard, such as occurs with myocardial infarction or shock, the blood pressure has to be monitored by palpation or direct measurement. To palpate the systolic blood pressure, apply the cuff over the brachial artery, inflate the cuff, place the fingers over the radial artery, slowly release the pressure, and note the reading on the manometer when the first pulse (systole) is felt. With palpation, it is difficult to assess the diastolic pressure. Direct measurement is obtained with insertion of an intravenous catheter.

Hypotension

Hypotension refers to a systolic blood pressure less than 90 mm Hg or 20 to 30 mm Hg below the client's normal systolic pressure. Hypotension is caused by a disruption in hemodynamic regulation, such as:

- Decreased blood volume (e.g., hemorrhage)
- Decreased cardiac output (e.g., myocardial infarction [heart attack])
- Decreased peripheral vascular resistance (vascular dilation) (e.g., shock)

A hypotensive client manifests symptoms relative to the degree of hypotension regardless of the cause.

One of the initial compensatory responses to a falling blood pressure is an increased pulse rate. For example, if a blood vessel cauterized during surgery begins to bleed internally at the point at which the circulating blood volume is compromised, the heart will automatically beat faster to compensate for the decreased circulating volume. If the falling pressure is untreated, the body's compensatory mechanisms will fail and the client will exhibit the symptoms of shock: cool, clammy skin; fast, thready pulse; a gradual decrease in urinary output; and disruption to cerebral blood flow that causes confusion, progressing to coma.

Orthostatic hypotension (postural hypotension) refers to a sudden drop of 25 mm Hg in systolic pressure and 10 mm Hg in diastolic pressure when the client moves from a lying to a sitting or a sitting to a standing position. Orthostatic hypotension usually occurs with aging and is a common antiadrenergic side effect of several medications, such as chlorpromazine hydrochloride. When measuring orthostatic blood pressure:

1. Place the client in a supine position for 5 minutes to allow for equilibration of the blood pressure, and measure the pulse and blood pressure.

2. Assist the client to a standing position and wait 1 minute to obtain a full evaluation of the initial orthostasis, then recheck the pulse and blood pressure.
3. Reassess the vital signs after 2 minutes to allow for an evaluation of the client's mechanisms to compensate for the presence of any orthostasis (Wilson & Kneisl, 1996).

Clients with orthostatic hypotension should be advised to rise slowly from a supine position and to sit down immediately if they feel faint.

Hypertension

Hypertension refers to a persistent systolic pressure greater than 135 to 140 mm Hg and a diastolic pressure greater than 90 mm Hg. Diagnosis of hypertension is based on the average of two or more readings taken at each of two or more visits after an initial screening. Classifications of hypertension for adults have been developed with recommended medical follow-up; see the accompanying display.

A number of physiological changes occur as a result of hypertension. The arterial walls thicken and lose their elasticity, which, in turn, increases resistance to blood flow. Hypertrophy of the left ventricle develops. These changes place the client at risk for a myocardial infarction or stroke. Malignant hypertension is a diastolic pressure higher than 120 mm Hg. With this condition, the client complains of severe headaches, blurred vision, and confusion.

Nursing Considerations

Before checking a blood pressure, review the client's chart for brachial artery contraindications and make sure that the client has not exercised or eaten for

the past 30 minutes. Clients who have recently eaten, ambulated, or experienced an emotional upset will have a falsely high blood pressure reading. When the vital signs are taken correctly in sequence (T-P-R and BP), the client should be calm from sitting or lying quietly.

Faulty techniques that constrict blood flow will produce a false high pressure reading:

- A cuff too narrow for the extremity
- A cuff that does not fit snugly around the extremity
- A cuff that is deflated too slowly

Other false high readings occur when the mercury column in the manometer is not positioned flat on a firm surface or is read above eye level or the extremity is below the heart's apex level.

False low readings occur when the extremity is above the heart's apex level, the cuff is too wide for the extremity, or the mercury column in the manometer is read below eye level. If the nurse fails to recognize the **auscultatory gap**, the temporary disappearance of sounds at the end of Korotkoff phase I and beginning of phase II, the systolic pressure is read at a false low pressure.

Documentation

The nurse should record the blood pressure measurement on the appropriate form. If the brachial artery is not used for the measurement, indicate the site when recording the results. If the pressure was obtained by palpation, record "80 systolic by palpation."

Monitoring blood pressure changes in relation to T-P-R measurements is one of the major responsibilities of the registered nurse. One element of critical thinking is having concrete, objective clinical data, as provided by vital sign measurements, to direct decision making.

CLASSIFICATION OF BLOOD PRESSURE FOR ADULTS AGES 18 AND OLDER, WITH RECOMMENDED FOLLOW-UP (FOR PERSONS NOT TAKING ANTIHYPERTENSIVE DRUGS AND NOT ACUTELY ILL)

Category	Systolic (mm Hg)		Diastolic (mm Hg)	Follow-up recommended
Optimal	<120	and	<80	Recheck 2 years
Normal	<130	and	<85	Recheck 2 years
High normal	130–139	or	85–89	Recheck 1 year
Hypertension				
Stage 1	140–159	or	90–99	Confirm within 2 months
Stage 2	160–179	or	100–109	Evaluate within 1 month
Stage 3	180 or higher	or	110 or higher	Evaluate immediately or within 1 week depending on clinical situation

Data from the National High Blood Pressure Education Program; National Heart, Lung, and Blood Institute; National Institutes of Health. (1997): The Sixth Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure. *Archive of Internal Medicine*, 157, 2413, 2.

THINK ABOUT IT

Vital Signs Measurement

What happens when we do anything routinely? Do we recognize the significance of a routine action? Vital signs are taken routinely. Can you identify possible negative consequences of this routine nursing action?

PHYSICAL EXAMINATION

The physical examination is performed in all health care settings (home, outpatient facilities, extended care institutions, and acute care facilities) for all age groups to gather comprehensive, pertinent assessment data. The physical examination provides a complete picture of the client's physiological functioning. When combined with a health and psychosocial assessment, it forms a database to direct decision making. See Chapter 6 for a discussion of psychosocial assessment and health history. The nurse uses information from the assessment, health history, and physical examination to develop a client profile. Health history ascertains the client's chief complaint and directs the focus of physical examination. The critical elements of a medical, family, and psychosocial history are contained in each chapter of Unit VII, specific to the functional health pattern; this chapter provides a health history to assess sexual function and demonstrates how health history data are incorporated into the physical examination. The complete assessment data are used to:

- Ascertain the client's level of health and physiological function
- Identify factors placing the client at risk and to determine areas of preventive nursing
- Confirm alterations, disease, or inability to perform the activities of daily living
- Identify the need for additional testing or examination
- Evaluate the outcomes of treatment and therapy

The examination should be performed according to the agency's policy. Policy may vary from one agency to another.

The physical examination is done in a sequential, head-to-toe fashion to ensure a thorough assessment of each system. This method not only prevents the nurse from forgetting to examine an area, it should also decrease the number of times the nurse and the client have to change positions.

After gaining proficiency in performing the physical examination, nurses should be able to integrate assessment into daily care activities. For example, while weighing the client, observe posture, motor activity, and gait.

Preparation

The client and the environment require special consideration. Because the client will experience some anxieties regarding the examination, it is important for the nurse to keep the client informed while performing the examination. The nurse needs to be organized and demonstrate respect for the client's apprehension about physical exposure during the examination.

Although some uneasiness may be experienced when learning how to perform a physical examination, it is important that the nurse appear calm, organized, and competent at the bedside. Review the agency's physical examination/assessment form before meeting with the client. This process ensures that the nurse can fully explain the actions that will be performed and prevents omission of any area required to be assessed. The nurse usually takes the assessment form to the bedside to record the data to ensure accuracy of documentation.

Environment

The nurse should review the health and psychosocial assessment data before visiting the client so that the environment will accommodate any special needs of the client. Adjust the environment to allow for placement of the equipment on a surface that is clean and free from movement at the bedside. Check to make sure that nothing is on the floor that would place the client at risk for falling.

The room needs to be quiet, warm, without drafts, and adequately lit. Depending on the setting, make the necessary adjustments to ensure privacy. Inform other personnel about the time of the examination to avoid interruptions, which are frustrating to both the client and the nurse.

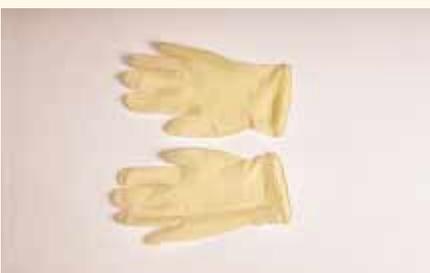
Equipment

Wash hands and gather the necessary equipment. The nurse should review the protocol relative to a physical examination and secure the forms required for documenting the assessment findings. Table 27-7 discusses the common equipment needed to conduct a physical examination. Secure enough clean gloves to change as needed throughout the examination to avoid cross-contamination.

Positioning and Draping

The nurse should position the client to ensure accessibility to the body part being assessed. Table 27-8 presents the positions used in conducting a physical examination and discusses what areas are assessed with the client in each position. Although all the positions for a complete physical examination are included in Table 27-8, it is not the expectation of this chapter for the beginning nursing student to perform a complete physical examination. For example, the lithotomy position is included in Table 27-8 for performing a vaginal examination; however, the discussion of the assessment of the female genitalia does not explain how

TABLE 27-7
Equipment and Supplies Used for a Physical Examination

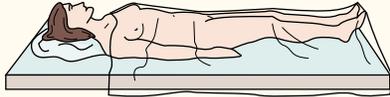
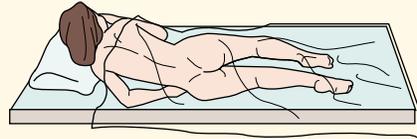
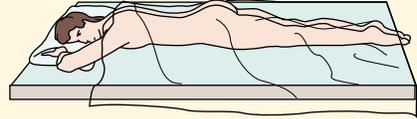
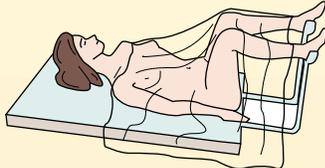
Instrument	Description/Usage
Aromatic substances (vanilla, coffee)	Test first cranial nerve (olfactory)
	
Cotton balls	Assess sensory system for light touch
	
Gloves	Reduce risk for transmission of microorganisms
	
Laryngeal mirror	Metal instrument with mirror to inspect pharynx and oral cavity
	
Ophthalmoscope	Lighted instrument attached to a battery tube to visualize the eye's interior
	
Otoscope	Special ear speculum that attaches to an ophthalmoscope to visualize external and middle ear (eardrum)
	

(continues)

TABLE 27-7 (continued)
Equipment and Supplies Used for a Physical Examination

Instrument		Description/Usage
Penlight		Flashlight to test pupillary reaction to light and third, fourth, and sixth cranial nerves (oculomotor, trochlear, and abducens)
Percussion hammer		Instrument with rubber head to test reflexes
Safety pin		Disposable sharp object to assess pain, sensory system
Tape measure		Calibrated in cm to measure circumference
Tongue depressor		Wooden tongue blade to inspect oral cavity and stimulate gag reflex to assess ninth and tenth (glossopharyngeal and vagus) cranial nerves
Tuning fork		Metal fork that vibrates when tapped and is used to perform Rinne test to assess eighth (acoustic) cranial nerve
Lubricant		Facilitates insertion of instruments into body cavities
Drape		Covers exposed body parts

TABLE 27-8
Positioning for a Physical Examination

Position	Body Part Assessed	Key Points/Contraindications
Sitting 	Head, neck, back, posterior thorax and lungs, anterior thorax and lungs, breast, axillae, heart, extremities	Client can expand lungs; nurse can inspect symmetry. <i>Institute risk precautions for elderly and debilitated clients.</i>
Supine 	Head, neck, anterior thorax and lungs, breast, axillae, heart, abdomen, extremities	Client relaxed; decreases abdominal muscle tension; nurse can palpate all peripheral pulses. <i>Contraindicated in clients with cardiopulmonary alterations.</i>
Dorsal recumbent 	Head, neck, anterior thorax and lungs, breast, axillae, heart	Client comfortable; increases abdominal muscle tension. <i>Contraindicated in abdominal assessment.</i>
Sims' 	Rectum and vagina	Relaxes rectal muscles. <i>Painful for clients with joint deformities.</i>
Prone 	Posterior thorax and lungs, hip	Assessment of hip extension. <i>Contraindicated in clients with cardiopulmonary alterations.</i>
Knee-chest 	Rectum	Maximal rectal exposure. <i>Contraindicated in clients with respiratory alterations.</i>
Lithotomy 	Female genitalia, rectum, genital tract	Maximal genitalia exposure; embarrassing and uncomfortable for client. <i>Contraindicated in clients with joint disorders.</i>

to insert a vaginal speculum because that is usually within the scope of advanced practice nursing.

The primary purpose of draping the client is to prevent unnecessary exposure during the examination. Feelings of embarrassment elicit tension and restlessness and will decrease the client's ability to cooperate. The drapes also prevent the client from being chilled.

The drape may be cloth or paper; for example, a bath blanket, sheet, or towel. The client's gown can be rearranged to expose and cover different body parts. When the client is in a sitting, supine, dorsal recumbent, Sims', or prone position, use a gown or towel to cover the upper chest and a bath blanket or sheet to cover the rest of the body.

Although you will not be expected to place the client in the lithotomy position to conduct an internal vaginal examination, you may be expected to assist another practitioner with this examination. Draping a client in the lithotomy position requires a sheet and boots. The nurse should apply the boots, if available, to cover each of the client's feet and legs. Fold and place the sheet in a diamond-shaped arrangement over the body: top diamond under chin with opposite corner pointing toward the toes and lateral corners pointing toward the sides of the table. Ask the client to flex her knees, and with the lateral corners of the sheet, wrap it in a spiral fashion around the legs and feet. The bottom corner covers the perineum and is folded back over the abdomen to expose the perineum when the examination begins.

General Survey

Assessment begins at the initial contact with the client. Proper terminology and agency-approved abbreviations should be used when recording assessment data.

Assess the following areas during a general survey:

1. Observe for signs of distress: labored breathing, pallor or cyanosis, protection of a painful part, sweating or cold moist palms, anxious face.
2. Observe the client's state of health, stature, and sexual development.
3. Weight, height, and vital signs are measured during the survey.
4. Note posture, motor activity, and gait; dress, grooming, and personal hygiene; and any odors of body and breath.
5. Observe client's facial expressions and behaviors; note manner, affect, and reaction to persons and things in environment.
6. Listen to the quality of speech and note the level of consciousness. See Chapter 36 for a complete discussion about assessing consciousness.

Document your general survey data in an organized fashion to portray a clinical picture of the client. Certain clients such as the elderly, disabled, and abused will require special consideration during the physical examination.

Sexual History

Prior to performing a physical examination of the genitalia, the nurse should refer to the information obtained from the client's sexual history. Illness and medical interventions can interfere with sexual functioning; for example, antihypertensive medication can cause men to experience ejaculation or erection difficulties. Sexual responsiveness can be altered in both men and women who are taking narcotics, sedatives, antidepressants, and antispasmodic medications. Prolonged therapies such as chemotherapy or radiation may cause physiologic changes that affect sexual desire and function; refer to the accompanying display for a sample of a sexual history.

SEXUAL HISTORY

- Age at which sexual history began
- History of sexual activity with women, men, or both
- Number of current sexual partners
- Satisfaction in current relationship
- Concerns regarding sexuality or sexual identity
- History of sexually transmitted diseases (STDs)
- Desire for parenting, at present or in the future
- Current or past contraceptive methods
- History of childhood or adult sexual trauma, rape, or domestic abuse

Adapted from Warner, P. H., Rowe, T., & Whipple, B. (1999). Shedding light on the sexual history. *American Journal of Nursing*, 99(6), 34–41.

Older Adults

When nurses assess older clients, it is important to know the normal changes that result from aging. See Chapter 18 for a complete discussion about caring for elderly clients. Aging may reduce the body's resistance to illness, tolerance of stress, and ability to recuperate from illness (Firth & Watanabe, 1996). Make sure the client understands and can follow instructions and allow extra time if the client has difficulty changing positions quickly.

THINK ABOUT IT

Cultural Values and Assessment

Cleanliness is highly valued by mainstream American society. However, in some cultures, a daily bath is not perceived as necessary or desirable. In fact, some cultures do not define natural body odors as offensive. It is important to consider the client in the context of cultural beliefs before labeling a client. Think of the terms "dirty," "unkempt," or "foul-smelling." These value-laden terms can certainly cloud the assessment process and subsequently the care provided to the client.

Disabled Clients

When assessing disabled clients, nurses should adapt their interactions to the client's ability; for example, a hearing-impaired client should be given a written questionnaire. An intellectually impaired client might require simple, direct sentences and questions or use of pictures. Determine the client's ability to participate before conducting the examination. To allay the disabled client's fears and anxiety, allow a family member to remain with the client during the examination. The nurse should ascertain the client's level of independence and feelings about the disability (Firth & Watanabe, 1996).

Abused Clients

Nurses need to be observant for signs of abuse, especially in children and the elderly. The symptoms may be psychologic as well as physical; for example, not wanting to be touched, unable to maintain eye contact, or unwillingness to talk about bruises, burns, or other injuries. Bruises or lacerations usually appear on breasts, buttocks, thighs, or genitalia. The nurse should also inspect for healed scarring or burns. The nurse needs to know state laws and agency policies for reporting possible abuse.

THINK ABOUT IT

Caring for Abused Clients

What would you do if a child in the emergency room in which you were practicing showed signs of abuse? How would you conduct the physical examination?

Techniques

Chapter 6 introduced the assessment techniques of inspection, palpation, percussion, and auscultation; this section demonstrates how these techniques are used in performing a physical examination. The specific techniques used to assess each body system are identified and explained within the context of the assessment. While practicing how to conduct a physical examination, refer to the following assessment tables to reinforce appropriate techniques for each system.

The nurse should use the senses of sight, hearing, smell, and touch when gathering information during the physical examination pertinent to the client's clinical status. The nurse uses the sense of sight by visually inspecting the client's body parts and assessing the client's normal behaviors and adaptive coping behaviors to alterations in functions. For example, the skin is inspected for color, tone, and texture, as well as scars, lesions, abrasions, and rashes. Throughout the examination the nurse should visually observe the client's general body appearances, such as movement, motor dexterity, contour and symmetry of the body, and deformities.

The nurse uses the sense of touch when performing palpation. The skin is thinner on the backs of the hands and more sensitive to temperature changes. The back of the hand can be used to assess skin temperature over an inflamed joint or a leg with impaired circulation. The fingerpads are also sensitive and are used to palpate the size, position, and consistency of various body parts, such as lymph nodes and breast tissue. Figure 27-15 demonstrates how to perform light palpation.

Learning the technique of percussion is challenging; it can be practiced on any surface. Refer to Figure 27-16 and practice percussion as follows:

1. Hyperextend the middle (pleximeter) finger of the nondominant hand and press its distal phalanx and joint firmly on the surface to be percussed (Figure 27-16A). Only the distal phalanx and joint should be touching the surface. Having other parts of the hand in contact with the surface will damp the vibrations.
2. Position the forearm of the dominant hand close to the surface, with the hand cocked upward, as shown in Figure 27-16B, with the middle finger partially flexed, relaxed, and poised to strike.
3. With a quick, sharp, but relaxed *wrist* motion, strike the pleximeter finger with the tip of the right plexor finger of the dominant hand, as shown in Figure 27-16C. Only the wrist joint is flexed, not the finger or elbow.
4. Quickly withdraw the plexor finger to avoid damping the vibration.
5. Strike one or two blows in one location, then move on, using the lightest percussion that will produce a clean note.

If the client becomes fatigued, encourage frequent rest periods. Adjust the client's position for comfort without compromising the ability to visualize the area of assessment.

The nurse uses the sense of hearing during the physical examination when performing auscultation. A stethoscope allows the nurse to listen to sounds produced in the heart, lungs, abdomen, and blood vessels.



Figure 27-15 Light Palpation

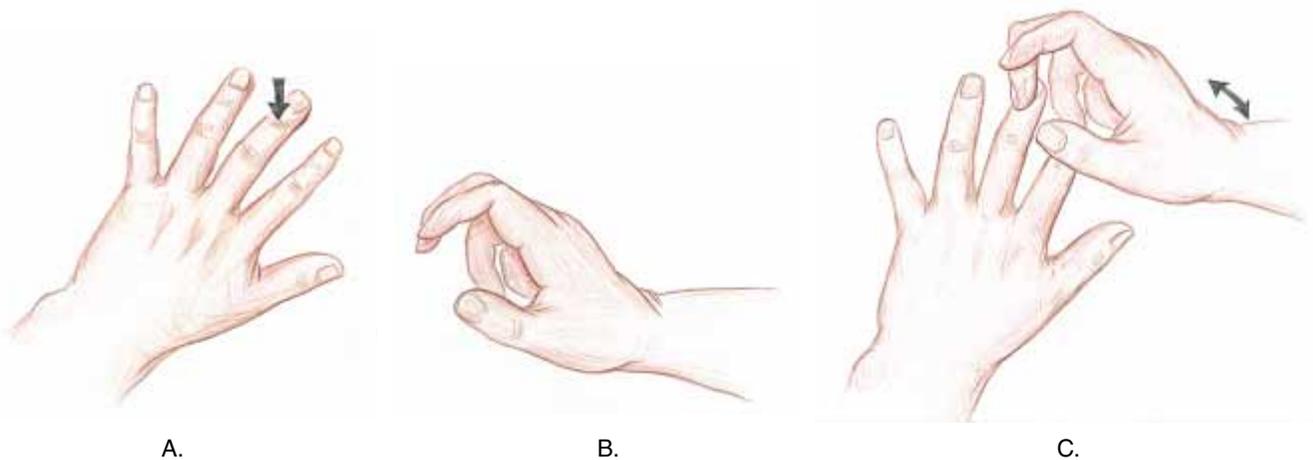


Figure 27-16 Percussion. A. Hyperextend the pleximeter finger and press the distal phalanx and joint firmly on the surface to be percussed. B. Cock the hand upward with the middle finger partially flexed and poised to strike. C. Strike the pleximeter finger with the tip of the right plexor finger.

Throughout the entire examination the nurse uses the senses of hearing and smell. Besides auscultation, the nurse should listen to what clients say relative to their health status during the examination. Smell is used to investigate any environmental, body, or fluid odors, such as drainage from a wound.

Integument

The **integumentary system** (skin, hair, scalp, and nails) provides the body with external protection, regulates temperature, and is a sensory organ for pain, temperature, and touch. The sebaceous and sweat glands are

considered appendages of the skin. Nurses should routinely assess the skin of elderly and debilitated clients for primary lesions that can lead to the development of secondary lesions such as pressure ulcers. See Chapter 35 for a complete discussion about skin integrity.

To facilitate learning and psychomotor proficiency, the integumentary system is assessed separately. However, once skills are established, the integumentary system assessment can be integrated into the examination of other systems. Table 27-9 presents the specific areas of the integumentary system to be examined and the normal and key findings of this assessment.

COMMON ALTERATIONS IN SKIN COLOR

- Melanin (naturally occurring brown pigment) is *increased* in exposed areas or points of pressure, for example, nipples, palmar creases, recent scars, with Addison's disease and some pituitary tumors. It is *decreased* in albinism (congenital inability to form melanin) and vitiligo (acquired loss of melanin).
- Cyanosis (bluish discoloration in the lips, mucous membranes, and nails) results from an increased amount of reduced hemoglobin in the blood caused by a cold environment or heart or lung disease.
- Jaundice (yellowish discoloration) results from increased bilirubin levels caused by red blood cell hemolysis in liver disease as observed first in the sclera and mucous membranes and then generalized.
- Carotenemia (yellowish discoloration) is described as normal as a result of increased levels of carotenoid pigments in the palms, soles, and face from a diet high in carotene. Also occurs in diseases such as myxedema, hypopituitarism, and diabetes.



NURSING TIP

Skin Palpation

When palpating the skin, wear gloves to prevent the transmission of microorganisms *because lesions are not always visible on general inspection.*

Skin

The skin is the largest organ system of the body, its surface area covering approximately 20 square feet in the average adult. The skin's thickness, influenced by age, varies from 0.2 to 1.5 mm. Skin assessment provides a noninvasive window to observe the body's physiological functions.

Lesions of the skin vary from superficial, involving only the epidermis, to penetrating the dermis or subcutaneous layers of the skin. Table 27-11 describes the common skin lesions.

TABLE 27-9
Assessment of Integumentary System: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
Skin: Inspect and Palpate	
<p>1. Color: inspect variations in skin color under natural sunlight to ensure accuracy in findings. <i>Color varies from light to ruddy pink or dark brown, or is yellow with olive overtones, with uniform skin color except in sun-exposed areas or normally lighted pigmented areas (nail beds, palms, lips) in dark-skinned people.</i></p> <p>2. Lesions: note color, size, and anatomic location and distribution; palpate the lesions with fingerpads for mobility, contour (flat, raised, or depressed), and consistency (soft or durable). <i>Freckles, skin tags in elderly, and some types of birthmarks and moles are normal.</i></p> <p>3. Moisture (wetness and oiliness): note amount and distribution. <i>Moisture varies with activity, body and environmental temperature, and humidity in skinfolds and the axillae.</i></p> <p>4. Temperature: palpate with back (dorsum) of hand, noting uniformity of warmth. <i>Temperature should be uniform and within normal range.</i></p> <p>5. Texture (quality, thickness, suppleness): palpate with fingerpads in different areas. <i>Texture is not uniform, for example, palms and soles are usually thicker than other areas, which are smooth, soft, and flexible. Wrinkled, leathery skin in the elderly results from the normal aging process, with decreased collagen, subcutaneous fat, and sweat glands.</i></p> <p>6. Mobility and turgor (elasticity): assessing mobility and turgor measures the elasticity of skin to determine the degree of hydration:</p> <p>a. Palpate dependent areas (sacrum, feet, ankles) for mobility by applying pressure with fingers, noting degree of indentation (Figure 27-17). If indentation occurs, firmly apply pressure with your thumb for 5 seconds: note the degree of edema based on the depth of indentation (pitting) in centimeters (see the accompanying display that follows at the end of this table).</p>	<p>1. The presence or absence of certain substances in the circulatory system or the deposition of substances in the skin are indications of disease processes. See the accompanying display for common alterations in skin color.</p> <p>2. Vascular and purpuric lesions are discussed in Table 27-10. Primary skin lesions, such as a vesicle, can give rise to secondary lesions, for example, erosion and crusting, as in chickenpox. See Table 27-11 for the different types of primary and secondary skin lesions.</p> <p>3. Excessive moisture or perspiration (hyperhidrosis) is usually caused by hyperthermia, infection, hyperthyroidism, strong emotions, menopause; excessive dryness often occurs in dehydration. Bromidrosis (body odor) is usually caused by bacterial decomposition of perspiration on the skin.</p> <p>4. Generalized hyperthermia is seen in fever; generalized hypothermia is seen in shock; localized hyperthermia is seen with an infection; localized hypothermia is characteristic of arteriosclerosis.</p> <p>5. Generalized roughness is seen in hypothyroidism.</p> <p>6. Dependent edema gives the skin a stretched, shiny appearance. The degree of pitting edema reflects the depth of indentation in centimeters (1+ to 5+). Edema is usually caused by direct trauma or impairment of venous return. Failure of the skin to reassume its normal contour or shape after being pinched indicates dehydration, which places the client at risk for skin breakdown. <i>Tenting</i> is the term used to describe skin that remains in a pinched position.</p>



Figure 27-17 Assessing for Edema

PITTING EDEMA SCALE

1+	Indentation of 1 cm or less
2+	Indentation of 2 cm
3+	Indentation of 3 cm
4+	Indentation of 4 cm
5+	Indentation of 5 cm or more

(continues)

TABLE 27-9 (continued)
Assessment of Integumentary System: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>b. Pinch a fold of skin on the sternal area using your thumb and forefinger (Figure 27-18). Note the speed with which it returns into place (turgor).</p>	
	
<p>Figure 27-18 Assessing Skin Turgor</p> <p><i>Absence of indentation in dependent areas and the resilience of the skin to spring back to its previous state after being pinched.</i></p>	
<p>Hair: Inspect and Palpate</p>	
<ol style="list-style-type: none"> 1. Quality, distribution, pattern of hair loss, if any, over the scalp. <i>Thick, evenly distributed hair.</i> 2. Texture and oiliness. <i>Silky, normally resilient hair.</i> 3. Body hair for amount, and note infestation. <i>The amount of body hair varies; hair should be free from infestation.</i> 	<ol style="list-style-type: none"> 1. Thin, brittle hair occurs with hypothyroidism. 2. Alopecia (hair loss), for example, effects from chemotherapeutic agent. Hirsutism (excessive body hair). 3. <i>Pediculus capitis</i>, <i>P. corporis</i>, and <i>P. pubis</i> are lice that adhere to head, body, and pubic hair. The eggs are white ovoid nits.
<p>Scalp: Inspect and Palpate</p>	
<ol style="list-style-type: none"> 1. Part the hair repeatedly all over the scalp and inspect for scaliness and scars. <i>The scalp should be shiny and smooth without lesions, lumps, or masses.</i> 2. Place the fingerpads on the scalp at the front and palpate down the midline and each side for tenderness, lesions, lumps, or masses. <i>Absence of redness or scaliness.</i> 	<ol style="list-style-type: none"> 1. Sebaceous cysts or trauma deformities. 2. Dry flaking, scaling occurs in seborrhea (dandruff) and psoriasis (red patches covered by thick, dry, silvery, adherent scales that result from excessive development of epithelial cells).
<p>Nails: Inspect and Palpate</p>	
<ol style="list-style-type: none"> 1. Note the nail color, shape, and texture. <i>Nail bed is highly vascular with a pink color in light-skinned clients and longitudinal streaks of brown or black pigmentation in dark-skinned clients. Angle between the fingernail and base is about 160°. When palpated the nail base is firm.</i> 	<ol style="list-style-type: none"> 1. Refer to Table 27-12 for abnormalities and variations of the nail bed.

(continues)

TABLE 27-9 (continued)
Assessment of Integumentary System: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
2. Test for capillary refill by pressing two or more nails between your thumb and index finger. Note the degree of blanching and return to normal color. <i>When pressure is released from the nail, it promptly returns to its normal color.</i>	2. Delayed return of nail bed color may indicate circulatory impairment.
3. Inspect the tissue surrounding nails for lesions. <i>Tissue surrounding the nail is intact.</i>	3. Paronychia (inflammation of the skin around the nail) is described in Table 27-12.

(From Estes, M. E. Z. [2002]. *Health assessment and physical examination*. Albany, NY: Delmar Publishers)

TABLE 27-10
Vascular and Purpuric Lesions of the Skin

Findings	Body Area Assessed	Key Points
Vascular		
		
Cherry angioma: Ruby red, 1–3 mm, round lesion.	Trunk and extremities	Pressure with a pinpoint edge causes partial blanching. Increase in size and number and may become brownish with age.
Spider angioma: Fiery red lesion up to 2 cm with a central body surrounded by erythema and radiating legs.	Face, neck, arms, and upper trunk	Occurs normally in some people. May occur with pregnancy, vitamin B deficiency, or liver disease.
		

(continues)

TABLE 27-10 (continued)
Vascular and Purpuric Lesions of the Skin

Findings	Body Area Assessed	Key Points
<p>Vascular</p> <p>Venous star: Bluish, varying in size from small to 1–2 inches, may resemble a spider or be linear, irregular, and cascading.</p>	Areas with superficial veins: legs and anterior chest	Indicates an increased pressure in superficial veins, for example, varicose veins.
<p>Purpuric</p> 		
<p>Petechia: Reddish purple, flat round lesion, 1–3 mm in size.</p> 	Variable distribution in areas with superficial blood supply	May indicate vitamin C deficiency, blood clotting disorders, liver disease, or drug reactions.
<p>Ecchymosis (bruise): Purplish blue, fading to green, yellow, and brown in time.</p>	Area of blood vessel trauma	Results from injury or with bleeding disorders.

(From Bates, B. (1994). *A guide to physical examination and history taking* (6th ed.). Philadelphia: Lippincott.

Hair

Hair is distributed over the body except for the palmar and plantar surfaces, lips, nipples, and the glans penis. The amount and texture of hair vary with age, sex, race and body part.

- Vellus: Fine, unpigmented hair that covers most of the body.
- Terminal hair: Coarser, darker hair of scalp, eyebrows, and eyelashes; axillary and pubic hair becomes terminal with the onset of puberty.

Men have coarser, thicker chest and facial hair growth than women.

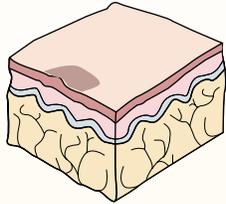
Nails

The nail plate (translucent tissue that covers the distal portion of the digits and provides protection) changes with many disease processes, as discussed in Table 27-12.

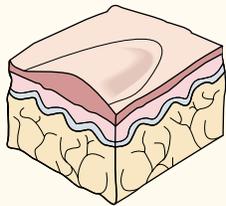
TABLE 27-11
Common Skin Lesions

Primary Lesions

Nonpalpable

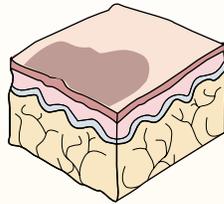


Macule: localized changes in skin color <1 cm in diameter (e.g., freckle)

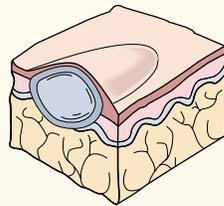


Patch: localized changes in skin of <1 cm (e.g., vitiligo, stage 1 of pressure ulcer)

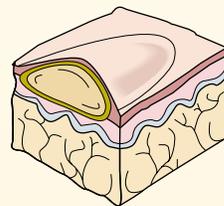
Palpable



Papule: solid, elevated lesion <0.5 cm in diameter (e.g., elevated nevi)

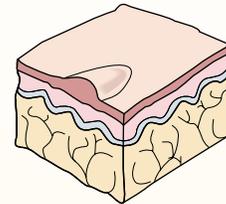


Plaque: solid, elevated lesion >0.5 cm in diameter (e.g., psoriasis)

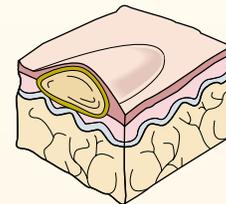


Nodule: solid and elevated; extends deeper than papule into the dermis or subcutaneous tissues, 0.5–2.0 cm (e.g., lipoma, erythema, cyst)

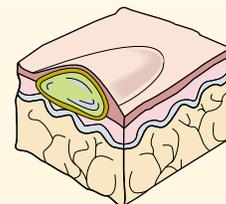
Fluid-Filled Cavities within the Skin



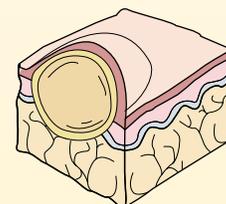
Vesicle: elevated mass containing serous fluid accumulation between the upper layers of the skin (e.g., herpes simplex and zoster, chickenpox, second-degree burns)



Bullae: same as vesicle only >0.5 cm (e.g., contact dermatitis, large second-degree burns, bulbous impetigo, pemphigus)



Pustule: pus-filled vesicle or bullae, <0.5 cm in diameter (e.g., acne, impetigo, carbuncles)



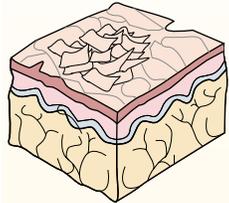
Cyst: subcutaneous or dermis mass (e.g., sebaceous or epidermoid cyst)

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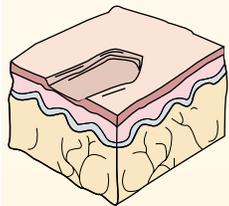
TABLE 27-11 (continued)
Common Skin Lesions

Secondary Lesions

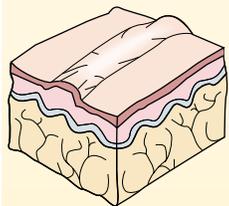
Above the Skin Surface



Scales: flaking of the skin's surface (e.g., dandruff, psoriasis)

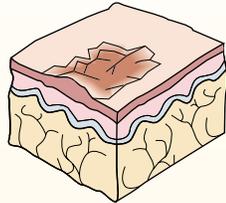


Crust: dried serum, blood, or pus on skin's surface (e.g., impetigo)

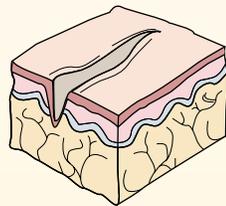


Atrophy: thinning of skin surface and loss of markings (e.g., striae, aged skin)

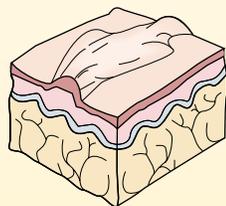
Below the Skin Surface



Erosion: loss of epidermis (e.g., ruptured chickenpox vesicle)

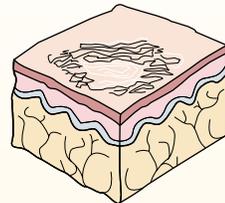


Fissure: linear crack in the epidermis that can extend into the dermis (e.g., chapped hands or lips, athlete's foot)

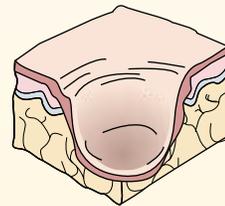


Ulcer: depressed lesion of the epidermis and upper papillary layer of the dermis (e.g., stage 2 pressure ulcer)

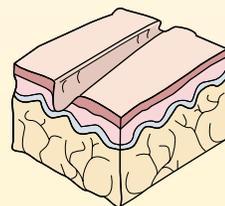
Below the Skin Surface



Scar: fibrous tissue that replaces dermal tissue after injury (e.g., surgical incision)



Keloid: enlarging of a scar past wound edges due to excess collagen formation (more prevalent in dark-skinned persons) (e.g., scar)



Excoriation: loss of epidermal layers exposing the dermis (e.g., abrasion)

Head and Neck

Areas to be included in the head and neck examination are the skull, face, eyes, ears, nose, mouth, pharynx, and neck. The carotid artery assessment is conducted either as part of the neck examination or with peripheral artery assessment. Inspection and palpation are used throughout this assessment. Auscultation is used if the carotid arteries are assessed as part of this examination. Table 27-13 containing Figures 27-20 through 27-34 presents the specific areas of the head and neck to be examined and the normal and key findings of this assessment.

Skull and Face

Assessment of the skull and face involves inspection and palpation. The client's face has its own unique charac-

teristics influenced by factors such as race, state of health, emotions, and environment.

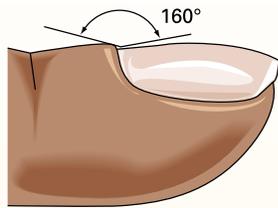
Eyes

Active client participation is needed for the various eye tests. To prevent client weakness or discomfort, the eye tests are separated by assessment of the eye's external anatomic structures. The nurse should practice holding and using the index finger to rotate the dial for the five lens settings of the ophthalmoscope before conducting the examination.

The assessment of visual acuity is a simple, noninvasive procedure that is performed with the use of a **Snellen chart** (a chart that contains various-sized letters with standardized numbers at the end of each line of letters) (Figure 27-19). The standardized numbers (called the denominator) indi-

TABLE 27-12
Variations of the Nail Bed

Normal nail angle



Normal nail: Has an angle of approximately 160° between the fingernail and nail base; nail feels firm when palpated.



Clubbing: Hypoxia causes an angle greater than 180° between the fingernail and nail base; nail feels springy when palpated.



Koilonychia (Spoon nail): Characterized by concave curves; associated with iron deficiency anemia.



Beau's line: Characterized by transverse depression in the nails; associated with injury and severe systemic infections.



Paronychia: Characterized by an inflammation at the nail base (may be swollen, red, or tender); associated with trauma and local infection.

PUPIL SIZE IN MILLIMETERS



COMMON ABNORMAL FACIES

- Exophthalmos is the protrusion or bulging of the eye that results from an increased pressure in the eye's orbit (e.g., from tumor or inflammation).
- Acromegaly is characterized by an elongated head with prominent forehead, nose, and lower jaw and enlarged nose, lips, and ears resulting from excessive growth hormone.
- Cushing's syndrome is a round or "moon" face with excessive hair growth (mustache and sideburns); it occurs in clients with excessive production of adrenal hormones or in clients taking adrenal hormone medications.
- Clients with chronic renal failure have pale, swollen tissue around their eyes.
- Parkinson's disease causes decreased facial mobility and expressions, producing a masklike face; results from progressive, degenerative, neurologic disorders.

COMMON REFRACTIVE ERRORS

- Myopia (nearsightedness): elongation of the eyeball or an error of refraction that causes the parallel rays to focus in front of the retina.
- Hyperopia (farsightedness): an error of refraction in which rays of light entering the eye are brought into focus behind the retina.
- Presbyopia (farsightedness): an error of refraction resulting from a loss of elasticity of the lens of the eye.
- Astigmatism: an unequal spherical curve of the cornea that prevents the light rays from being focused directly in a point on the retina.

COMMON ABNORMAL BREATH ODORS

- Acetone breath ("fruity" smell) is common in malnourished or diabetic clients with ketoacidosis.
- Musty smell is caused by the breakdown of nitrogen and presence of liver disease.
- Ammonia smell occurs during the end stage of renal failure from a buildup of urea.

COMMON LIP LESIONS

- Herpes simplex (cold sores or fever blisters) are painful vesicular lesions that rupture and crust over.
- Chancre (primary lesion of syphilis) is a reddish round, painless lesion with a depressed center and raised edges that appears on the lower lip.
- Squamous cell carcinoma (most common form of oral cancer) usually involves the lower lip and may appear as a thickened plaque, ulcer, or warty growth.

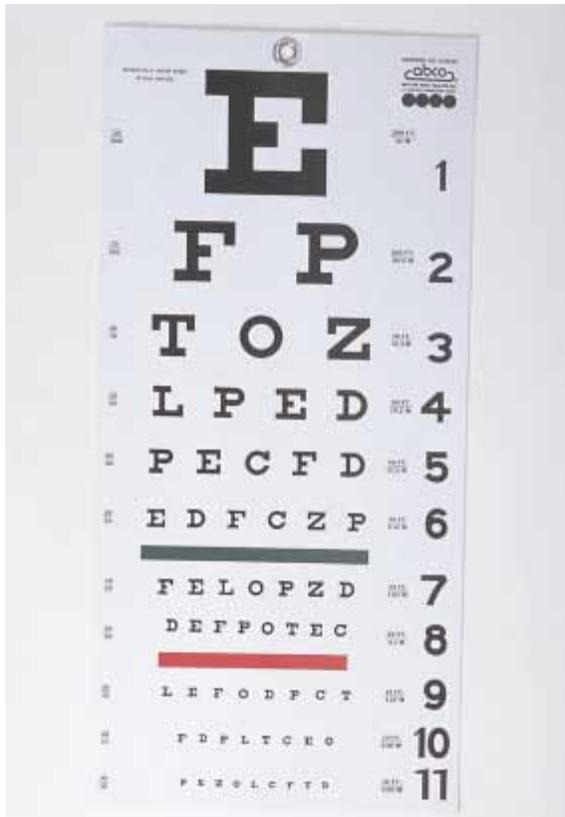


Figure 27-19 Snellen Chart

cate the degree of visual acuity when the client is able to read that line of letters at a distance of 20 feet.

Ears

Physical assessment of the ears consists of auditory screening, inspection and palpation of the external ear, and otoscopic assessment. The nurse should observe the client for signs of hearing difficulty during the physical examination, such as turning the head, lipreading, and speaking in a loud voice. If the client is wearing a hearing aid, ask if it is turned on, when the batteries were last changed, and if the device causes any irritation to the ear canal.

Nose and Sinuses

Assessment is limited to inspection and palpation of the external nose and nasal passages using a penlight. An examination with a nasal speculum to inspect the nasal chambers is usually performed only by an advanced nurse practitioner because the nasal chambers are lined with respiratory mucosa. Clients with nasal impairments are at risk of developing respiratory infections. Sinus assessment is limited to palpation of the frontal and maxillary sinuses. Transillumination of the sinuses is usually limited to advanced practitioners.

TABLE 27-13

Assessment of Head and Neck: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>Skull and Face: Inspect</p> <ol style="list-style-type: none"> 1. Observe shape and general size of skull and size of head in proportion to body. <i>Rounded, smooth skull contour.</i> 2. Inspect facial features for symmetry, involuntary movements, edema, and masses. <i>Symmetrical facial features and movement.</i> 	<ol style="list-style-type: none"> 1. Enlarged skull size is indicative of hydrocephalus and Paget's disease. 2. a. Sunken temples, eyes, and cheeks are indicative of dehydration and malnutrition (see accompanying display for a description of common facies [expression or appearance of face]). <ol style="list-style-type: none"> b. Puffy, swollen appearance anterior to ear lobes and above angles of the jaw may indicate parotid gland enlargement (e.g., mumps).
<p>Eyes: Inspect and Palpate</p> <ol style="list-style-type: none"> 1. Assess visual acuity. <ol style="list-style-type: none"> a. Position Snellen chart 20 feet in front of client. b. Remove corrective lenses. c. Instruct client to cover one eye and read lines, starting with top of chart from left to right (Figure 27-20); note the line where the client correctly reads more than half the letters. d. Record results as a fraction sc (without correction), 20/distance number, and the number of letters missed for the eye test. e. Repeat steps a–d for other eye. f. If appropriate, repeat steps a–e with client wearing corrective lenses, record result cc (with correction). <i>Normal vision, based on the Snellen chart, is 20/20 (at a distance of 20 feet the normal eye can read the chart).</i> 	<ol style="list-style-type: none"> 1. A value of 20/40 means that a client can read at a distance of 20 feet what a person with normal vision can read at a distance of 40 feet (see the accompanying display for common refractive errors).

(continues)

TABLE 27-13 (continued)
Assessment of Head and Neck: Normal and Key Findings

Area of Assessment/ <i>Normal Findings</i>	Key Findings
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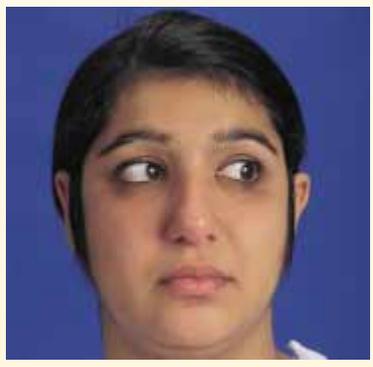
Figure 27-20 Assessing Visual Acuity



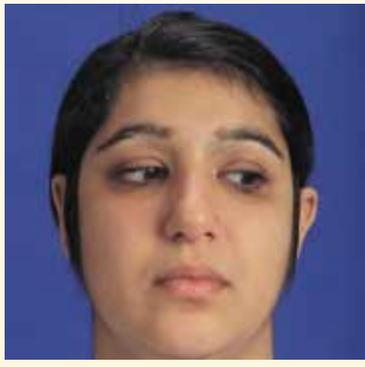
A.



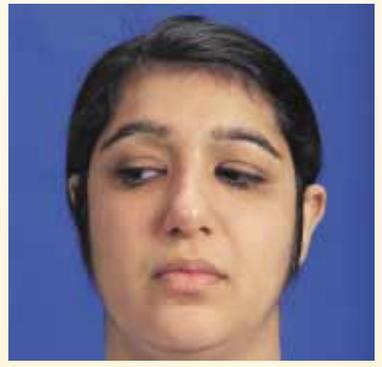
B.



C.



D.



E.



F.



G.



H.

Figure 27-21 Testing Extraocular Muscle Function. A. Basic Position. B. Normal Resting Position. C. Conjugate Left Lateral Gaze. D. Left Down and Lateral Gaze. E. Right Down and Lateral Gaze. F. Conjugate Right Lateral Gaze. G. Right Up and Lateral Gaze. H. Left Up and Lateral Gaze.

(continues)

TABLE 27-13 (continued)
Assessment of Head and Neck: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>2. Test extraocular muscle function:</p> <ol style="list-style-type: none"> Instruct client to follow your finger held 6 to 12 inches in front of eyes. Move your finger through the eight vision fields of gaze (Figure 27-21). Observe for parallel eye movement. Pause during upward and lateral gaze fields to detect involuntary movement of the eyes. Note position of the upper eyelid in relation to the iris and eyelid lag as the client's eyes move from up to down. Record results. <i>Eye movements should be symmetrical as both eyes follow the direction of the gaze. The upper eyelids cover only the uppermost part of the iris and are free from nystagmus (involuntary, rhythmical oscillation of the eyes).</i> <p>3. External anatomic structures (Figure 27-22).</p>	<p>2. Asymmetrical movement or the presence of nystagmus results from local injury to eye muscles and supporting structures or a cranial nerve disorder.</p>

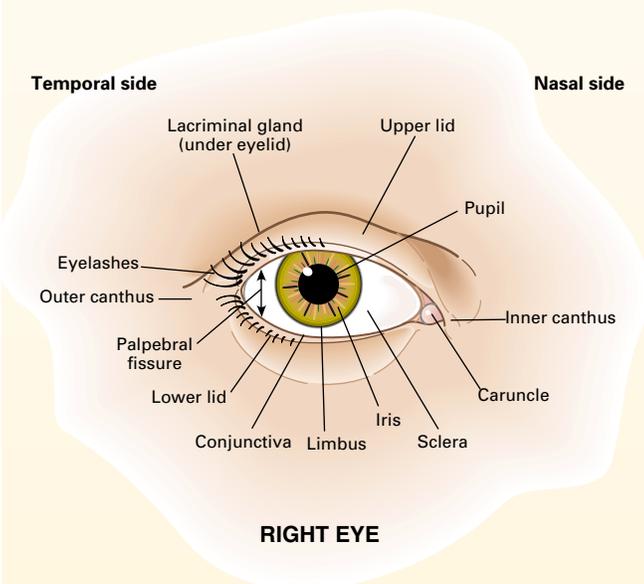


Figure 27-22 External Structures of the Eye

- Observe upper eyelid. *Upper eyelid should overlap iris.*
 - Check eyes and eyelids for inflammation, crusting, edema, or masses. *Eyes and eyelids should be free from inflammation, crusting, edema, or masses.*
 - Inspect and palpate lacrimal glands and sacs for swelling. If lachrimation is excessive:
 - Check for blockage of the nasolacrimal duct by pressing against inner orbital rim of lacrimal sac.
 - Inspect duct blockage by palpating on the lacrimal sac and observing for regurgitation of fluid. *Lacrimal*
- Upper eyelid should not overlap pupil.
 - Red lid margins with yellowish scales result from an inflammation of the eyelids (blepharitis). Presence of inflammation, crusting, edema, or masses may indicate acute hordeolum (sty), a painful, red infection of a hair follicle of the eyelashes; chalazion (chronic inflammatory lesion of the meibomian gland); or basal cell carcinoma (papule with a pearly border and a depressed or ulcerated center) of the lower lid.
 - Swelling of lacrimal sac indicates dacryocystitis (inflammation) or tumor. Regurgitation of tears through the puncta indicates blockage of lacrimal duct.

(continues)

TABLE 27-13 (continued)
Assessment of Head and Neck: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p><i>gland should not be palpable. Tears flow freely from the lacrimal gland over the cornea and conjunctiva to the lacrimal duct.</i></p> <p>d. Inspect conjunctiva and sclera by instructing client to look upward while you depress lower lid with your thumb. <i>Conjunctiva and lens should be transparent and the sclera should be a light yellow color in dark-skinned clients and a white porcelain color in light-skinned clients.</i></p> <p>e. Inspect cornea, lens, pupil, and iris. <i>Pupils are black, round, and equal in size, 3–7 mm in diameter (see the accompanying display). The margins of the iris should be intact.</i></p> <p>f. Test pupillary responses to light and reaction to accommodation in a dimly lit room.</p> <ol style="list-style-type: none"> (1) Instruct client to look straight ahead. (2) Bring the penlight from the side of the client's face to directly in front of the pupil (Figure 27-23A). (3) Note the quickness of response to light. (4) Shine light into same eye, observing response of opposite pupil for equality of size (Figure 27-23B). 	<p>d. Bright red conjunctiva with crusty drainage occurs with conjunctivitis (contagious infection of the conjunctiva). A pale conjunctiva usually indicates anemia. Bright red patch on the exposed bulbar conjunctiva is a subconjunctival hemorrhage that may result from trauma or sudden increase in venous pressure (e.g., cough or bleeding disorder).</p> <p>e. Opacity of the lens (loss of transparency) occurs with cataracts caused most commonly by aging (senile cataract). Cloudy pupils occur with cataracts.</p> <p>f. Altered pupillary reaction time and equality occur with increased intracranial pressure, lesions involving the third cranial nerve, trauma, or some medications. Pupillary constriction occurs with inflammation of the iris or in response to medication (e.g., pilocarpine or morphine). Pupillary dilation may occur with trauma, neurologic disorders, glaucoma, or in response to medication (e.g., atropine).</p>



A.



B.

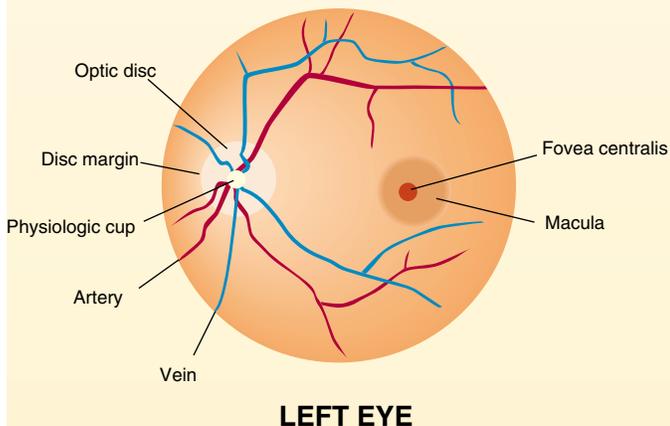
Figure 27-23 A. Move penlight from side of client's face to eye. B. Shine penlight into the eye and observe response of the opposite pupil.

- (5) Repeat steps 2–4, opposite eye.
- (6) Instruct client to gaze at your finger held 4–6 inches from her nose, then to glance at a distant object while you note pupillary reflex.
- (7) Move the finger toward the bridge of the client's nose, noting response of both pupils.

(continues)

TABLE 27-13 (continued)
Assessment of Head and Neck: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>(8) Record results PERRLA (pupils equal, round, reactive to light and accommodation). <i>Pupil should constrict quickly in direct response to light and the opposite pupil should also constrict. Pupils should be equal in size. Pupillary accommodation causes constriction in response to objects that are near, and dilation occurs to accommodate distant vision, with symmetrical convergence of eyes.</i></p> <p>4. Test visual fields.</p> <ol style="list-style-type: none"> Stand 2 feet in front of the client. Instruct client to cover the right eye, while you cover your left eye, and ask client to look into your eye directly opposite to create one vision field. Using the eight directions of gaze (see Figure 27-21), move your finger outside the vision field and slowly bring your finger back midpoint into the vision field for each direction of gaze. When testing the temporal field, bring your finger from behind the client. Instruct client to tell you when your finger becomes visible. Note if you see the finger before the client does. Repeat steps c and d for each field of vision. Record results, indicating eye tested. Repeat steps b–g with other eye. <i>Consensual peripheral vision should occur when the nurse's finger comes into the client's visual field.</i> <p>5. Inspect fundus with ophthalmoscope.</p> <ol style="list-style-type: none"> Set ophthalmoscope at 0 diopters. Instruct client to gaze at a designated point on the far wall, keeping both eyes open during the examination. With your right hand, hold the ophthalmoscope 10 inches from the client and use your right eye to examine the client's right eye. Rest your left hand on client's forehead. Shine the light on the pupil and locate the red reflex (bright, orange glow). Slowly move the ophthalmoscope closer until the retina is seen. While rotating the lens, dial to focus on the internal structures (Figure 27-24). 	<p>4. Loss of peripheral vision occurs in glaucoma (a circulatory disturbance that causes an increase in intraocular [aqueous fluid] pressure).</p> <p>5. Changes in color, size, or clarity of the margins of the optic disc or the identification of lesions should be recorded and reported; a follow-up examination by an ophthalmologist should be scheduled.</p>

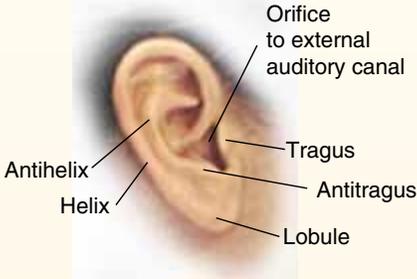


LEFT EYE

Figure 27-24 Landmarks of the Retina

(continues)

TABLE 27-13 (continued)
Assessment of Head and Neck: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<ul style="list-style-type: none"> f. Assess the size, color, and clarity of the optic disc. g. Carefully follow the blood vessel central to the optic disc into each of the four quadrants, observing for lesions (hemorrhages or exudates). h. Inspect the appearance of the macula, lateral to optic disc. i. Repeat steps a–h using your left eye and left hand to examine the client’s left eye. j. Record findings. 	
<p>Ears: Inspect and Palpate</p>	
<p>1. Examine external ears for placement, symmetry, and color (Figure 27-25). <i>Symmetrical, with upper attachment at level of eye’s corner (lateral canthus), flesh color.</i></p>	<p>1. Ears set below lateral canthus occur with congenital anomalies (e.g., Down syndrome). Redness indicates inflammation or fever. Clear or bloody drainage may indicate leakage of cerebrospinal fluid; if present, stop the examination and notify the nursing supervisor immediately.</p>
	
<p>Figure 27-25 External Structures of the Ear</p>	
<ul style="list-style-type: none"> 2. Observe auricle for discharge, swelling, and redness, and palpate for lesions or tenderness by moving auricle and pressing on tragus and mastoid process. <i>Firm, smooth, free from lesions and pain.</i> 3. Select largest ear speculum to accommodate the client’s ear canal. Attach speculum to otoscope to inspect the ear canal and eardrum. <ul style="list-style-type: none"> a. Tip client’s head and straighten ear canal by grasping and pulling the auricle upward, back, and slightly outward. b. Insert the speculum and examine the canal for ear wax, foreign bodies, discharge, scaliness, redness, or swelling. If wax or a foreign body is present, stop the examination and notify the nursing supervisor. c. Inspect the tympanic membrane by sliding speculum slightly down and forward. If membrane is not visible, gently pull the tragus slightly farther to straighten the canal. d. Identify the color, light reflex, umbo, the short process, and long handle of the malleus. Note perforations, lesions, bulging or retraction of the membrane, dilatation of blood vessels, bubbles or fluid level (Figure 27-26). e. Gently withdraw the speculum and repeat procedure in opposite ear. <i>Cerumen, a waxy yellow or brown substance is normal. Ear canal is pinkish and dry. Intact tympanic</i> 	<ul style="list-style-type: none"> 2. Flaky, scaly skin is seen with seborrhea. Sebaceous cysts are common behind the ear. Keloids (scar tissue) on the ear lobe may result from ear piercing. Yellow or green discharge, itching, or pain occurs with an ear infection (otitis media). 3. Buildup of cerumen, a normal moist, waxy yellow substance that turns hard, dry, and dark yellow-brown when impacted, may cause temporary hearing loss. Swollen or reddened canal with discharge occurs with infection. Nontender, nodular swelling deep in the ear canal suggests osteoma (usually a benign tumor composed of bone tissue). Red, bulging membrane indicates acute purulent otitis media; whitish appearance on tympanic membrane results from pus in the middle ear. Perforations of the eardrum result from infection.

(continues)

TABLE 27-13 (continued)
Assessment of Head and Neck: Normal and Key Findings

Area of Assessment/Normal Findings

Key Findings

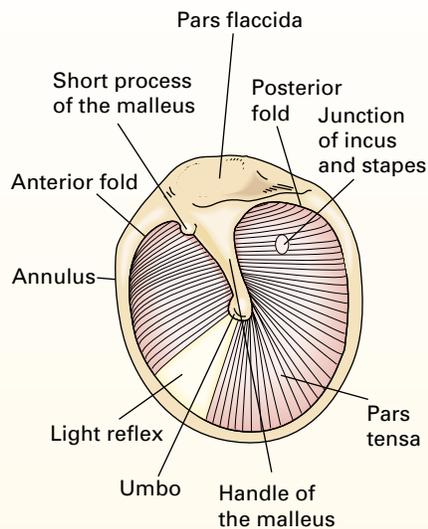


Figure 27-26 Tympanic Landmarks

membrane, translucent or pearly gray. Light reflex is seen at 5 o'clock in right ear and 7 o'clock in left ear.

4. Test auditory acuity.

a. Whispered voice test:

- (1) Instruct client to occlude one ear with finger and repeat the words when heard.
- (2) Nurse stands 1–2 feet away from client, out of view to avoid client lipreading, and softly whispers numbers on side of open ear. Increase voice volume until client identifies words correctly.
- (3) Repeat procedure on other ear.
- (4) Record results. *Client should be able to repeat whispered words.*

b. Weber test:

- (1) Strike tuning fork against your fist or pinch the prongs together.
- (2) Hold the base of the vibrating fork with your thumb and index finger and place the base of the fork on center of top of client's head (Figure 27-27).
- (3) Ask client to describe the sound.
- (4) Record results. *Sound perceived equally in both ears; results indicate a "negative" Weber test.*

c. Rinne test:

- (1) Vibrate prongs of tuning fork and place base of fork on mastoid process of ear being tested and note the time on your watch until the client no longer hears sound (Figure 27-28A)
- (2) Move the vibrating fork in front of the ear canal, noting the length of time sound is heard (Figure 27-28B).
- (3) Record results.
- (4) Repeat test, opposite ear.

Sound heard longer in front of the right auditory meatus than on the mastoid process because air conduction is twice as long as bone.

- a. Inability to hear words may indicate a high-frequency hearing loss (e.g., resulting from excessive exposure to loud noises).

- b. Results "positive" from Weber test when sound lateralizes to affected ear with a unilateral conductive hearing loss. Occurs with impacted cerumen, perforated tympanic membrane, serum or pus in the middle ear, or fusion of the ossicles. Sound can also lateralize to unaffected ear with sensorineural hearing loss. Occurs with inner ear disorders, auditory nerve damage, or results from repeated, prolonged loud noise or effects of ototoxic drugs.

- c. Bone conduction is equal to or greater than air conduction. Occurs with conductive hearing loss resulting from diseases, obstruction, or damage to outer or middle ear.

(continues)

TABLE 27-13 (continued)
Assessment of Head and Neck: Normal and Key Findings

Area of Assessment/Normal Findings

Key Findings



Figure 27-27 Weber test: Place the base of the tuning fork on the top of the client's head.

Nose and Sinuses: Inspect, Palpate, and Percuss

1. Inspect the nose for symmetry, deformity, flaring, or inflammation and discharge from the nares. *Located symmetrically, midline of the face and is without swelling, bleeding, lesions, or masses.*
2. Test patency of each nostril.
 - a. Instruct the client to close the mouth and apply pressure on one naris and breathe.
 - b. Repeat test on opposite naris. *Each nostril is patent.*
3. Inspect the nasal cavities with a penlight.
 - a. Tilt the client's head in an extended position.
 - b. Place nondominant hand on client's head. Using your thumb, lift the tip of the nose.
 - c. With the lit penlight, assess each nostril: note color of anterior nares, nasal septum for deviation, perforation, lesions, or bleeding, and inspect for swelling, discharge. *Mucosa is pink or dull red without swelling or polyps. Septum is midline and intact. A small amount of clear watery discharge is normal.*
4. Palpate the nasal sinuses (Figures 27-29 and 27-30) by applying gentle, upward pressure on frontal and maxillary areas, avoiding pressure on the eyes. Percuss area with



A.



B.

Figure 27-28 Rinne test. A. Place the base of the fork on the mastoid process. B. Place tuning fork in front of ear canal.

1. Swollen or broken as a result of trauma or surgery.
2. Air cannot move through the nostril. May occur with a deviated septum, foreign body, upper respiratory infection, allergies, or nasal polyps.
3. Rhinitis, red, swollen mucosa with copious clear, watery discharge occurs with a cold. Discharge becomes purulent if a secondary bacterial infection develops. Pale, edematous mucosa with clear, watery discharge occurs with allergies or hay fever. A normal mucosa with clear, watery nasal discharge that tests positive for glucose following head injury or nasal, sinus, or dental surgery usually indicates the leakage of cerebrospinal fluid. If present, stop the exam and notify the nursing supervisor immediately.
4. Pain or tenderness may be caused by viral, bacterial, or allergic processes that cause inflammation and obstruction, eliciting a dull sound. *(continues)*

TABLE 27-13 (continued)
Assessment of Head and Neck: Normal and Key Findings

Area of Assessment/Normal Findings

Key Findings



Figure 27-29 Palpating Frontal Sinuses



Figure 27-30 Palpating Maxillary Sinuses

middle or index finger and note the sound. *Nontender, air-filled cavities, resonant to percussion.*

Mouth and Pharynx: Inspect and Palpate

- Stand 12–18 inches in front of client and smell the breath. *Breath should smell fresh.*
 - Observe the lips for color, moisture, swelling, or lesions. Instruct client to open mouth. With a tongue depressor, retract the buccal mucosa and note color, hydration, inflammation, or lesions (Figure 27-31). Invert lower lip with your thumbs on inner oral mucosa, note muscle tone; repeat with upper lips using thumbs and index fingers. *Lips and mucosa should be pink, firm, and moist without inflammation or lesions.*
 - If present, remove dentures. Retract the cheeks with a tongue depressor and inspect gums (gingivae). Note color, edema, retraction, bleeding, and lesions. Palpate the gums with the tongue blade for texture. *Gums are pink, smooth, moist, and firm.*
- Halitosis (foul-smelling breath) occurs with tooth decay or disease of gums, tonsils, or sinuses or with poor oral hygiene (see the accompanying display for common abnormal breath odors).
 - Pale or cyanotic lips may indicate systemic hypoxemia. Dry, cracked lips occur with dehydration or exposure to weather. Swollen lips (angioneurotic edema) result from allergic reactions (e.g., medication or food; see the accompanying display for common lip lesions).
 - Pale gums that bleed easily may indicate periodontal disease or vitamin C deficiency.

(continues)

TABLE 27-13 (continued)
Assessment of Head and Neck: Normal and Key Findings

Area of Assessment/Normal Findings

Key Findings



Figure 27-31 Inspecting Buccal Mucosa

4. Instruct client to clench teeth. Note position and alignment. Inspect teeth: use tongue depressor to expose the molars. Note tartar, cavities, extraction, and color. *Properly aligned, smooth, white, and shiny.*
5. Instruct client to protrude the tongue.
 - a. Inspect dorsum of tongue. Note color, hydration, texture, symmetry, presence or absence of fasciculations (Figure 27-32).

4. Chalky white discoloration of teeth's enamel indicates early formation of dental caries (cavities). Brown or black discoloration indicates formation of caries.
5. Enlarged tongue may indicate glossitis or stomatitis or may occur with myxedema, acromegaly, or amyloidosis. Deep red, smooth surface occurs with glossitis caused by vitamin B₁₂, iron, or niacin deficiency or as a side effect from chemotherapy. Thick white coating with red, raw surface is candidiasis (thrush) indicating immunosuppression. Lesions on ventral surface or hardened areas or ulcerations on the lateral surface may indicate cancer.

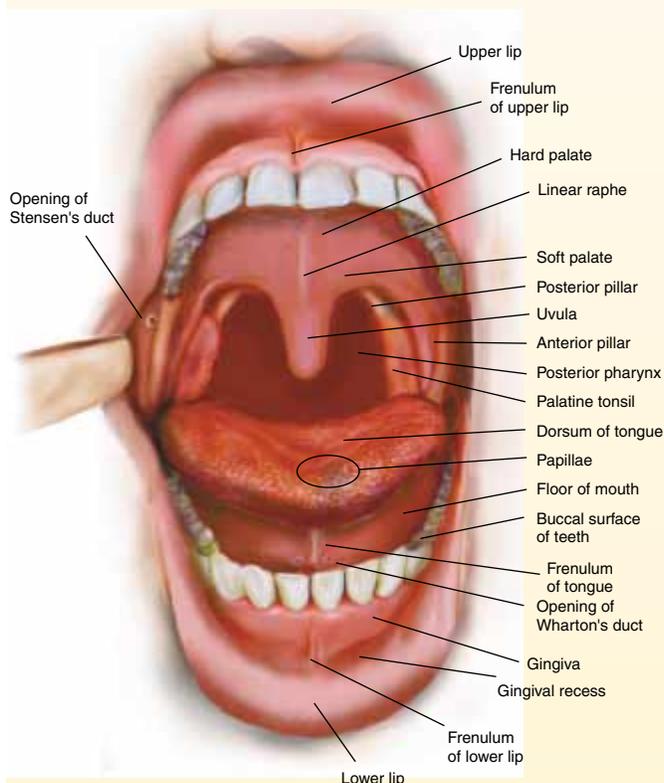


Figure 27-32 Structures of the Tongue

- b. With penlight, inspect sides and ventral surface. Note size, texture, nodules, or ulcerations.
- c. Grasp tongue with gauze. Gently pull it to one side and palpate the full length of tongue.

(continues)

TABLE 27-13 (continued)
Assessment of Head and Neck: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>d. With penlight, inspect floor of mouth, salivary glands, and duct openings. <i>When protruded, tongue lies midline, medium red or pink in color, moist and smooth along lateral margins, with free mobility. Ventral surface is slightly rough (taste buds), and dorsum is highly vascular.</i></p> <p>6. Inspect the hard and soft palate with penlight.</p> <p>a. Instruct client to extend head backward and hold mouth open.</p> <p>b. Inspect the hard palate (roof of mouth), located anteriorly, and the soft palate, which extends posteriorly to pharynx. Note color, shape, lesions. <i>Palates are concave and pink. Hard palate has ridges; soft palate is smooth.</i></p> <p>7. Inspect the pharynx using a tongue depressor and penlight.</p> <p>a. Explain procedure to the client.</p> <p>b. Instruct client to tilt head back and open mouth.</p> <p>c. With your nondominant hand, place tongue depressor on middle third of tongue. With dominant hand, shine light into back of throat.</p> <p>d. Instruct client to say “ah.” Note the position, size, and appearance of tonsils and uvula.</p> <p>e. If palate and uvula fail to rise symmetrically with phonation, inform client about eliciting gag reflex (touch the posterior one-third of tongue with blade to stimulate the gag reflex) and inspect as stated in step 7d. <i>With phonation, the soft palate and uvula rise symmetrically. The pharynx is pink, vascular, lesion-free.</i></p>	<p>6. Cleft palate (maxillary processes fail to fuse prenatally) is a congenital defect. Red, swollen, tender palates indicate infection. Eroded lesion on hard palate may indicate cancer.</p> <p>7. Reddened, edematous uvula and tonsillar pillars with yellow exudate indicate pharyngitis. Swollen, gray membranes and tonsillar enlargement may result from acute tonsillitis, infectious mononucleosis, or diphtheria.</p>
<p>Neck: Inspect, Palpate, and Auscultate</p>	
<p>1. Inspect for symmetry and musculature. Instruct client to:</p> <p>a. Flex chin to chest and to each side and shoulder to test anterior sternocleidomastoid muscle.</p> <p>b. Hyperextend the neck backward to test posterior trapezia. <i>Muscles are symmetrical with head in central position. Movement through full range of motion without complaint of discomfort or limitation.</i></p> <p>2. Palpate lymph nodes. Instruct the client to relax and flex neck slightly forward.</p> <p>a. Stand in front of client.</p> <p>b. Methodically palpate anterior cervical nodes (Figure 27-33A) and posterior cervical nodes (Figure 27-33B) with fingerpads of middle three fingers in small circles with gentle pressure.</p> <p>c. Note size, shape, mobility, consistency, and tenderness. <i>Lymph nodes should not be palpable. Small, movable nodes are insignificant.</i></p> <p>3. Inspect and palpate trachea.</p> <p>a. Note position.</p> <p>b. Place thumbs and index fingers on sides of trachea. Apply gentle pressure and palpate. <i>Midline position above the suprasternal notch.</i></p>	<p>1. Pain with flexion or rotation of head is associated with muscle spasm that may be caused by inflammation of muscles, meninges, or diseases of the vertebrae. Prominent lateral deviation of sternocleidomastoid muscles (torticollis) is commonly associated with inflammation of viral myositis or trauma (e.g., sleeping with head in unusual position). Decreased range of motion is commonly associated with degenerative osteoarthritis.</p> <p>2. Palpable nodes may result from a variety of diseases, most commonly an infectious process or malignancy.</p> <p>3. Lateral displacement may be caused by a neck or mediastinum mass or pulmonary disorders.</p>

(continues)

TABLE 27-13 (continued)
Assessment of Head and Neck: Normal and Key Findings

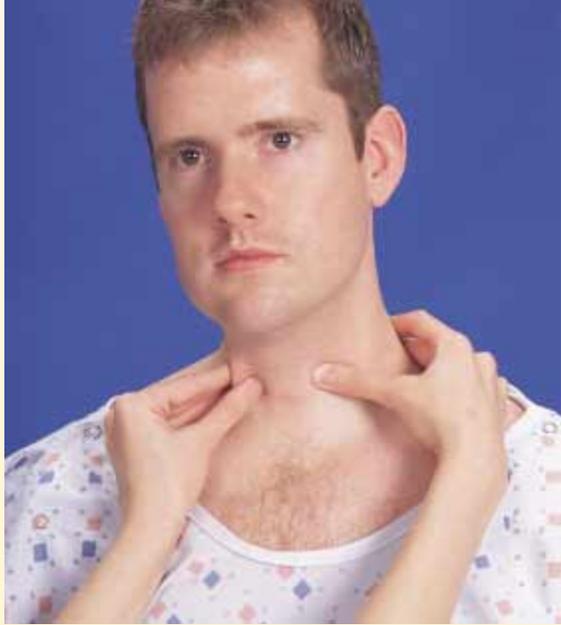
Area of Assessment/Normal Findings	Key Findings
 <p data-bbox="516 949 542 974">A.</p>	 <p data-bbox="1203 949 1229 974">B.</p>
<p data-bbox="196 993 1133 1018">Figure 27-33 Palpating the Cervical Lymph Nodes: A. Anterior Approach; B. Posterior Approach.</p>	
<p data-bbox="196 1066 836 1249">4. Palpate the thyroid by standing behind the client (Figure 27-34A). Instruct the client to slightly extend neck. (Thyroid can also be palpated standing in front of client; Figure 27-34B.)</p> <ol style="list-style-type: none"> <li data-bbox="224 1161 565 1186">a. Rest thumbs on nape of neck. <li data-bbox="224 1192 803 1249">b. Place index and middle fingers of both hands on thyroid isthmus and anterior surfaces of lateral lobes. 	<p data-bbox="889 1066 1529 1249">4. Masses or enlargement during swallowing may indicate a goiter (enlarged thyroid gland) or thyroid nodules indicating thyroid disease. Vibrations or bruits heard on auscultation occur with increased turbulence in a vessel and are caused by increased vascularization of the gland (enlarged toxic goiter).</p>
 <p data-bbox="516 1915 542 1940">A.</p>	 <p data-bbox="1203 1915 1229 1940">B.</p>
<p data-bbox="196 1959 992 1984">Figure 27-34 Palpating the Thyroid: A. Posterior Approach; B. Anterior Approach.</p> <p data-bbox="1417 1969 1529 1995" style="text-align: right;"><i>(continues)</i></p>	

TABLE 27-13 (continued)
Assessment of Head and Neck: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>c. Ask client to swallow. You should feel the isthmus rising under your fingers and feel each lateral lobe before and while client swallows.</p> <p>d. Ask client to flex neck forward and to left, and displace thyroid cartilage to right with tips of your left fingers. Note any bulging of gland.</p> <p>e. Palpate with your right hand, placing thumb deep into and behind sternocleidomastoid muscle with index and middle fingers in front. Ask client to swallow. Note any enlargement of gland.</p> <p>f. Repeat steps 4d and e on opposite side.</p> <p>g. If gland appears enlarged, place the diaphragm of stethoscope over gland. Note on auscultation a vibration (soft, rushing sound, or bruit). <i>Thyroid cannot be visualized. It should be smooth, soft, nontender, and should not be enlarged.</i></p>	
<p>(From Estes, M. E. Z. (2002). <i>Health assessment and physical examination</i>. Albany, NY: Delmar Publishers.</p>	

Mouth and Pharynx

Physical assessment of the oral cavity includes the breath, lips, tongue, buccal mucosa, gums and teeth, hard and soft palate, and pharynx. If the client is wearing dentures or removable orthodontia, remove these devices before examination to visualize and palpate the gums. The oral cavity can yield significant information regarding the client's health because systemic diseases may manifest initially in the oral cavity.

Neck

Physical examination of the neck includes the neck muscles, lymph nodes of the head and neck, thyroid gland, and trachea. The lymph nodes are normally not easily palpable. If the client has an enlarged thyroid gland, the blood supply will be increased, causing a fine vibration that can be auscultated with the diaphragm of the stethoscope.

Thorax and Lungs

Physical assessment includes inspection, palpation, percussion, and auscultation of the posterior, lateral, and anterior thorax and lungs. Figure 27-35 depicts the landmarks of the thorax. Landmarks are imaginary lines that are based on anatomic structures such as the spine and sternum. These landmarks assist with visualizing the underlying organs for percussion and auscultation and

for accurate documentation of findings. The angle of Louis is a landmark for identifying the ribs in the mid-clavicular line. Each intercostal space is named for the number of the rib directly above it; that is, the space between the third and fourth ribs is the third intercostal space. When used together, landmarks and intercostal spaces identify the specific lobes of the lungs for percussion and auscultation.

Respiratory auscultation reveals the presence of normal and abnormal breath sounds. During auscultation, the client should be instructed to breathe only through the mouth because mouth breathing decreases air turbulence that could interfere with an accurate assessment. Figure 27-36 shows the anterior, posterior, and right lateral positions of the lung lobes. Table 27-14 (containing Figures 27-37 through 27-42) presents the specific areas of the thorax and lungs to be examined and the normal and key findings of this assessment. See the accompanying display for common terms associated with respiratory assessment.

There are three distinct types of normal breath sounds with their own unique pitch, intensity, quality, location, and relative duration in the inspiratory and expiratory phases of respiration:

- **Vesicular sounds:** soft, breezy, and low-pitched sounds heard longer on inspiration than expiration that result from air moving through the smaller airways over the lung's periphery, with the exception of the scapular area

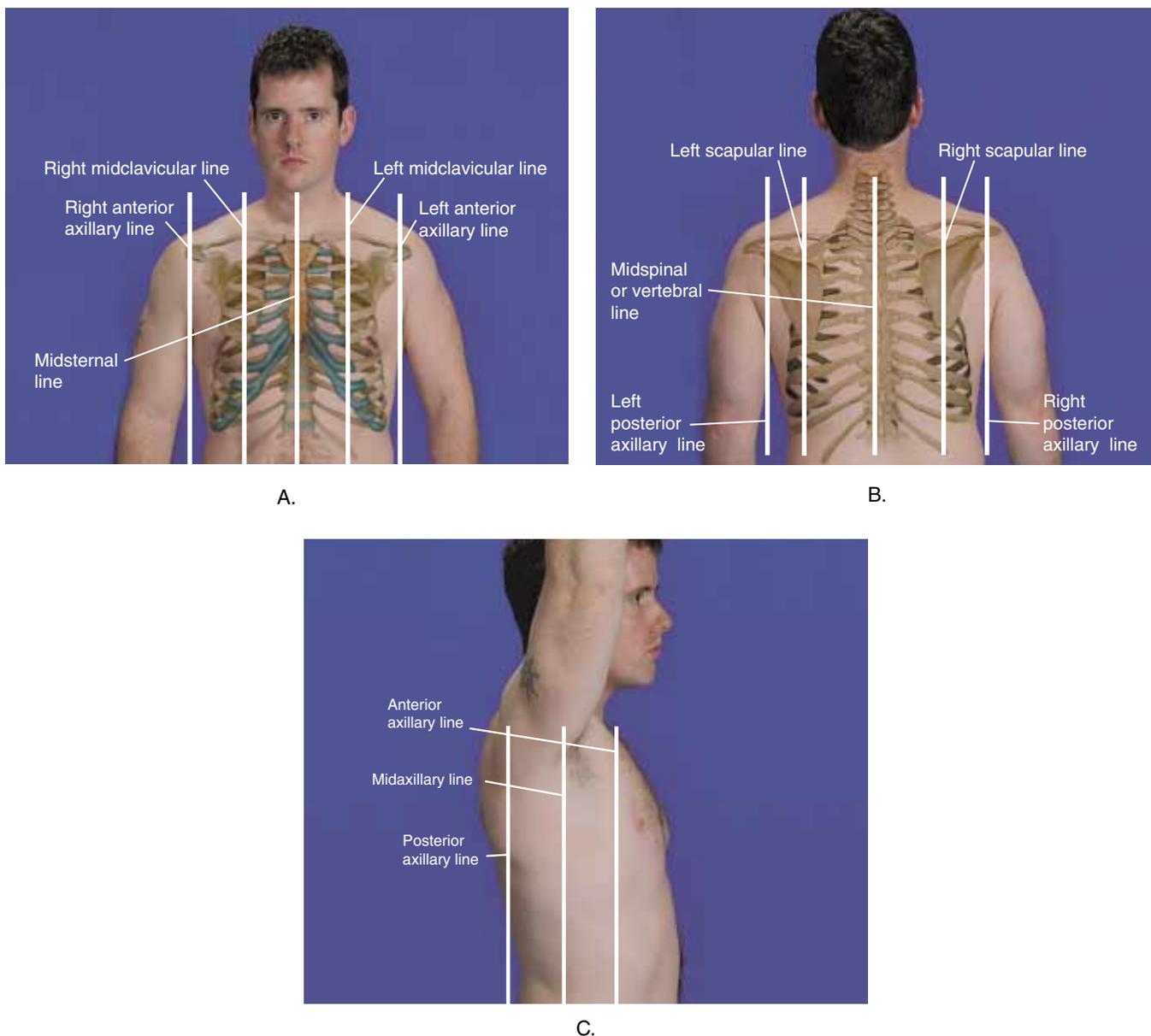


Figure 27-35 Landmarks of the Thorax: A. Anterior Thorax; B. Posterior Thorax; C. Right Lateral Thorax.

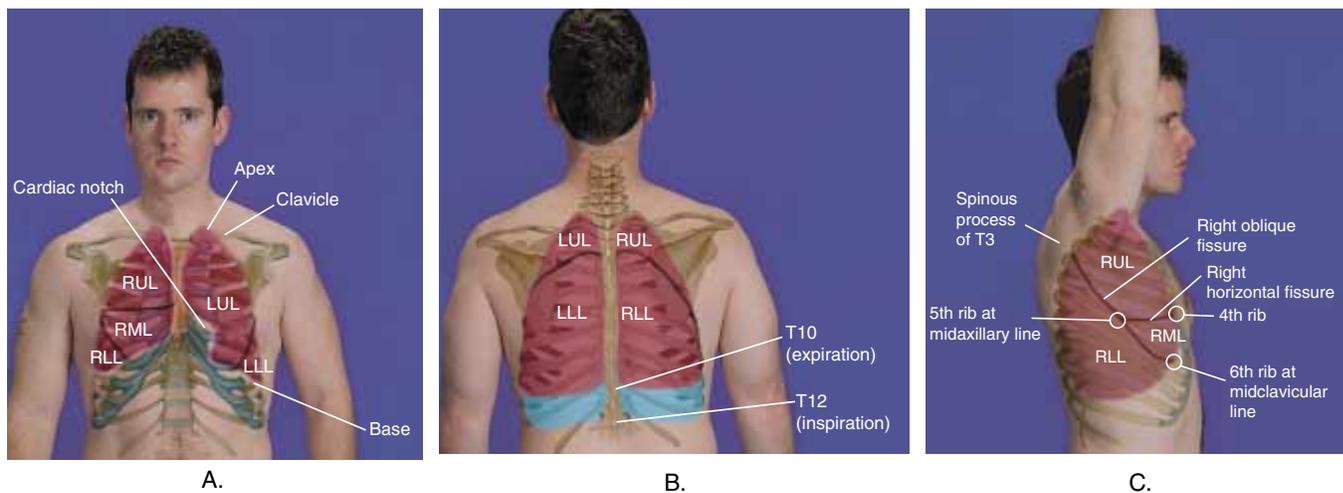


Figure 27-36 Positions of the Lung Lobes: A. Anterior View with Ribs; B. Posterior View with Ribs; C. Right Lateral View with Ribs.

- **Bronchovesicular sounds:** medium-pitched and blowing sounds heard equally on inspiration and expiration from air moving through the large airways, posteriorly between the scapula and anteriorly over bronchioles lateral to the sternum at the first and second intercostal spaces
- **Bronchial sounds:** loud and high-pitched sounds with a hollow quality heard longer on expiration than inspiration from air moving through the trachea

These normal breath sounds must be auscultated over the correct location, for example, bronchial sounds over the trachea. Otherwise, bronchial sounds in clients with emphysema are heard in the peripheral lung areas where normal vesicular sounds should be heard.

Breath sounds that are not normal are described as either abnormal or **adventitious breath sounds** (superimposed sounds on the normal vesicular, bronchovesicular, and bronchial breath sounds). Abnormal breath sounds are characterized by decreased or absent sounds. See the accompanying display for a description of the five types of adventitious breath sounds.

During the assessment of the thorax and lungs the nurse should monitor the client for symptoms of hyper-ventilation (light-headedness or dizziness). If this occurs, assist the client in restoring a normal breathing pattern. Continue with the assessment when the client's dizziness is gone and breathing is normal.

COMMON TERMS ASSOCIATED WITH RESPIRATORY ASSESSMENT

- Aortic aneurysm: localized dilatation of the aortic wall
- Asthma: recurring episodes of labored breathing, wheezing on expiration, and a productive cough of viscous mucoid bronchial secretions
- Atelectasis: collapse of lung tissue and decreased gas exchange
- Bronchiectasis: dilatation and destruction of the bronchial walls
- Emphysema: loss of alveolar elasticity and decreased gas exchange
- Empyema: accumulation of pus in a body cavity such as a pleural cavity
- Hemothorax: accumulation of blood and fluid in the pleural cavity
- Pleural effusion: accumulation of fluid in interstitial and air spaces of lungs
- Pleurisy: inflammation of the pleura
- Pneumonia: inflammation of the lungs
- Pneumothorax: collection of air in the pleural space that causes lungs to collapse

ADVENTITIOUS BREATH SOUNDS

- **Crackles:** heard predominantly on inspiration over the base of the lungs as an interrupted fine crackle (dry, high-pitched crackling, popping sound of short duration) that sounds like a piece of hair being rolled between the fingers in front of the ear or a coarse crackle (moist, low-pitched crackling, gurgling sound of long duration) that sounds like water going down the drain after the plug has been pulled on a full tub of water
- **Rhonchi:** heard predominantly on expiration over the trachea and bronchi as a continuous, low-pitched musical sound
- **Wheezes:** heard predominantly on expiration all over the lungs as a continuous sonorous wheeze (low-pitched snoring) or sibilant wheeze (high-pitched musical sound)
- **Pleural friction rub:** heard on either inspiration or expiration over the anterior lateral lungs as a continuous creaking, grating sound
- **Stridor:** heard predominantly on inspiration as a continuous crowing sound

Heart and Vascular System

Heart and vascular system assessment techniques consist of inspection, palpation, and auscultation. The nurse should review the client's profile relative to the health history for cardiac risk factors such as family history, cigarette smoking, and dietary and exercise habits.

Heart

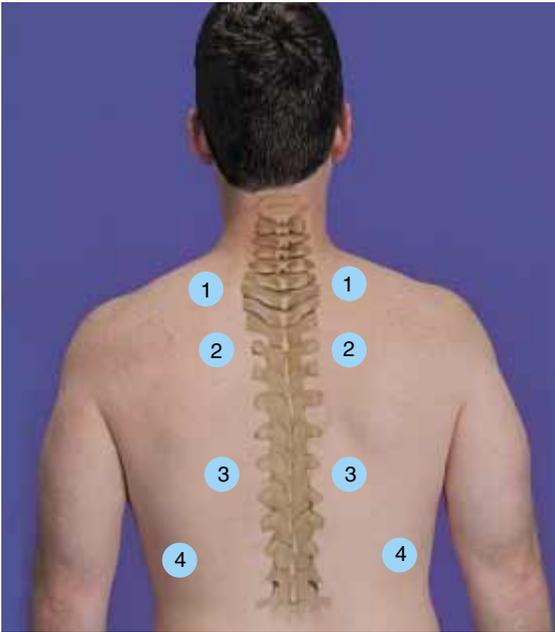
Inspection, palpation, and auscultation are performed in a systematic manner using certain cardiac landmarks. The cardiac landmarks, as seen in Figure 27-43, are defined as follows:

1. Aortic area is the second intercostal space (ICS) to the right of the sternum.
2. Pulmonic area is the second ICS to the left of the sternum.
3. Erb's point is located in the third ICS to the left of the sternum.
4. Tricuspid area (right ventricular area or septal area) is the fifth ICS to the left of the sternum.
5. Mitral area (left ventricular or apical area) is the fifth ICS at the left midcavicular line.

Whereas the mitral area is correlated anatomically with the apex of the heart, the aortic and pulmonic areas are correlated anatomically with the base of the heart. Assessment proceeds either from the base of the heart to the apex or from the apex to the base. When auscultating for cardiac sounds (S_1 and S_2) listen for:

TABLE 27-14
Assessment of Thorax and Lungs: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>Posterior Chest: Inspect, Palpate, Percuss, and Auscultate Place client in a sitting position, arms folded across chest (separates scapulae), back exposed. Refer to Figure 27-35 to review landmarks.</p> <ol style="list-style-type: none"> 1. Inspect posterior thorax. <ol style="list-style-type: none"> a. Assess shape and symmetry. Note rate and rhythm of respirations, movement of chest wall with deep inspiration and full expiration, and signs of distress. b. Estimate the anteroposterior diameter in proportion to lateral diameter. <i>Respirations are quiet, effortless, and regular, 12–20 breaths per minute. Thorax rises and falls in unison with respiratory cycle. Ribs slope across and down, without movement or bulging in the intercostal spaces. The adult ratio of anteroposterior to lateral diameter ranges from 1:2 to 5:7.</i> 2. Palpate. <ol style="list-style-type: none"> a. Lesions or areas of pain; palpate and note tenderness. b. Thoracic expansion at 10th rib: place thumbs close to client’s spine and spread hands over thorax (Figure 27-37). Note divergence of thumbs, feel for range and symmetry of movement during deep inhalation and full exhalation. 	<ol style="list-style-type: none"> 1. Structural changes that occur in the thorax are discussed in Chapter 31. Defined horizontal slope of ribs occurs with emphysema. Bulging in the intercostal spaces indicates increased effort of breathing (e.g., emphysema). Retraction of intercostal spaces during inspiration indicates airway obstruction (e.g., asthma). Impairment in respiratory movement occurs with lung or pleural disease. 2. Tenderness may result from a fractured rib. Unilateral decreased thoracic expansion occurs on the affected side (e.g., pneumonia or pneumothorax). Bilateral decreased expansion occurs when alveoli do not fully expand (e.g., emphysema or pleurisy). Absent or decreased fremitus occurs when voice is decreased, in presence of bronchus obstruction, or by fluid, air, or solid tissue in the pleural space. Fremitus is increased over areas of consolidated lung.
	
<p>Figure 27-37 Palpating Posterior Thoracic Expansion</p> <ol style="list-style-type: none"> c. Place ulnar aspect of your open hand at right apex of lung and place the hand at each location as shown in Figure 27-38. Instruct client to say “99” and palpate for tactile fremitus (vibrations created by sound waves). Note areas of increased or decreased fremitus. d. Move hands from side to side, from right to left, with client repeating the words with the same intensity every time you place your hands on the back. <i>Thumbs should separate an equal distance (3–5 cm) and in the same direction during thoracic expansion and meet in the midline on expiration. Posterior thorax is free from tenderness, lesions, and pulsations. Fremitus is equal on both sides of thorax, strongest at the level of tracheal bifurcation.</i> 	<p>(continues)</p>

TABLE 27-14 (continued)**Assessment of Thorax and Lungs: Normal and Key Findings****Area of Assessment/Normal Findings****Key Findings****Figure 27-38** Palpation Pattern for Tactile Fremitus: Posterior Thorax

3. Percuss chest systematically (Figure 27-39).

**Figure 27-39** Percussion Pattern of Posterior Thorax

- a. Start at lung apices. Move hands from side to side across the top of each shoulder. Note sound produced from each percussion strike and compare with contralateral sound.
- b. Continue downward and posterolateral every other intercostal space as shown in Figure 27-40. Note inten-

3. Hyperresonance in adults occurs in pneumothorax, emphysema, or asthma. Dull sound is created in solid or fluid-filled structures (e.g., pneumonia, pleural effusion, or tumors). Pleural fluid sinks to lowest part of pleural space (posteriorly in a supine client).

(continues)

TABLE 27-14 (continued)
Assessment of Thorax and Lungs: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>sity, pitch, duration, and quality of percussion. <i>Air-filled lungs create a resonant sound. Identify contralateral sound; bones (e.g., ribs or spine, create a flat sound). Thorax is more resonant in children and thin adults.</i></p> <p>4. Auscultate posterior and lateral surfaces.</p> <ol style="list-style-type: none"> Place diaphragm of stethoscope on right lung apex. Instruct client to inhale and exhale deeply and slowly when the stethoscope is felt on the back. Repeat on left lung apex. Move downward every other intercostal space and auscultate, placing stethoscope in the same position on both sides. Auscultate the lateral aspect by placing the stethoscope directly below the right axilla, instructing the client to breathe only through the mouth and to inhale and exhale deeply and slowly. Proceed downward, every other intercostal space on the same side. Repeat step c on left side. <i>Posterior sounds: bronchovesicular and vesicular sounds; lateral: vesicular sounds. A large chest will produce decreased breath sounds.</i> 	<p>4. Decreased breath sounds caused by an inability to inhale and exhale deeply (e.g., emphysema or by an obstruction; atelectasis or foreign object). Absent breath sounds (e.g., empyema, hemothorax, pneumothorax, or pneumonectomy). See the display for a description of adventitious breath sounds.</p>
<p>Anterior Chest: Inspect, Palpate, Percuss, and Auscultate</p> <p>Place client in a sitting or supine position.</p> <ol style="list-style-type: none"> Instruct client to inhale deeply and exhale fully. Inspect anterior thorax for: <ol style="list-style-type: none"> Symmetry and depth of movement Rhythm of respirations Slope of ribs and musculoskeletal deformities <i>Scapula at same height. Thorax rises and falls in unison with respiratory cycle, ribs at a 45° angle with sternum. Inspiratory breath sounds are not audible at a distance of more than 2–3 cm from the mouth.</i> Palpate. <ol style="list-style-type: none"> Place fingerpads on right apex, above the clavicle. Proceed downward to each rib and intercostal space and note tenderness, pulsation, masses, and crepitation. Repeat on left side. Assess respiratory excursion by placing your thumbs along each costal margin with hands on lateral rib cage (Figure 27-40). Instruct client to inhale deeply; note divergence of thumbs on expansion; feel range and symmetry of respiratory movement. Palpate for tactile fremitus as shown in Figure 27-41. Repeat steps discussed above for posterior palpation for tactile fremitus, gently displacing female breasts as necessary. Note that fremitus is usually decreased or absent over the precordium. <i>Same as normal findings for posterior palpation.</i> Symmetrically percuss anterior surface as shown in Figure 27-42. 	<ol style="list-style-type: none"> One scapula higher than the other occurs with scoliosis. Rib angle less than 45° occurs with emphysema, bronchiectasis, and cystic fibrosis. Bulging of intercostal spaces on expiration occurs with an expiratory obstruction (e.g., emphysema, tension pneumothorax, and tumors). Retraction on inspiration obstructs free inflow of air (e.g., asthma, tracheal/laryngeal obstruction, or tumor). Pulsations may indicate a thoracic aortic aneurysm. Tenderness may result from a fractured rib. Unilateral decreased thoracic expansion occurs on the affected side (e.g., pneumonia or pneumothorax). Bilateral decreased expansion occurs when alveoli do not fully expand (e.g., emphysema or pleurisy). Crepitus (a grating or crackling sensation caused by two rough surfaces rubbing together, as in subcutaneous emphysema) occurs when air escapes the lung and is trapped in subcutaneous tissue. It is palpated as a crackling sound from any condition that interrupts the pleurae (e.g., pneumothorax or thoracic surgery). Dullness over lung tissue indicates fluid-filled or solid areas (e.g., pneumonia or tumors). Because pneumonia typically occurs in right middle lobe, unless you displace the breast, you may miss the abnormal percussion note. <p style="text-align: right;"><i>(continues)</i></p>

TABLE 27-14 (continued)
Assessment of Thorax and Lungs: Normal and Key Findings

Area of Assessment/Normal Findings

Key Findings

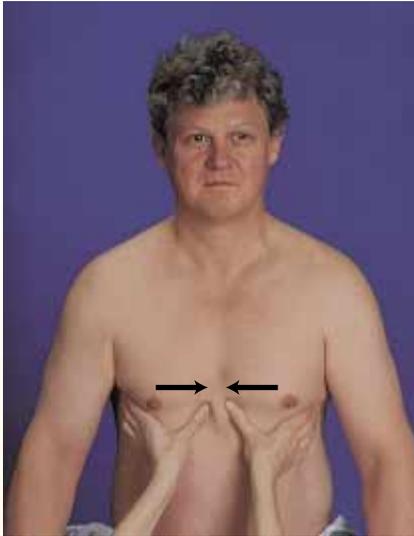


Figure 27-40 Palpating Anterior Thoracic Expansion

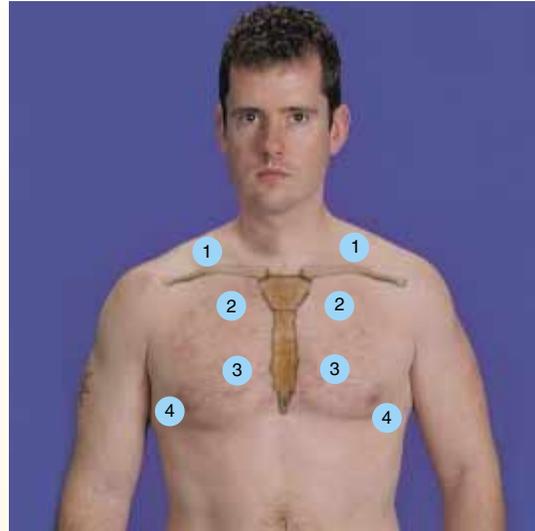


Figure 27-41 Palpation Pattern for Tactile Fremitus: Anterior Thorax

- a. Percuss 2–3 strikes along right lung apex, repeat on left lung apex. Proceed downward, percussing in every other intercostal space going from right to left in same position on both sides. Displace breast tissue as necessary.
- b. Assess in each thoracic area.
 - (1) Resonant-lung field
 - (2) Cardiac dullness: third to fifth intercostal spaces left of sternum
 - (3) Liver dullness: place your pleximeter finger parallel to upper border of expected liver dullness in right midclavicular line; percuss downward.
 - (4) Gastric air bubble: repeat procedure performed for liver dullness on left side. *Resonant sound over lung tissue (hyperresonance in children and thin adults). Cardiac, liver, and gastric silhouettes emit dull sound. Ribs are flat.*



Figure 27-42 Percussion Pattern for Anterior Thorax

4. Auscultate anterior surface: instruct client to breathe through mouth and compare symmetrical areas of the lungs, from above downward.
 - a. Listen to breath sounds. Note intensity and identify variations from normal.
 - b. Identify any added sounds by location on chest wall and time in the respiratory cycle.
 - c. If breath sounds are diminished, ask client to breathe hard and fast with mouth open. *Anterior sounds: bronchial, bronchovesicular, and vesicular sounds. A large chest will produce decreased breath sounds.*
4. Decreased breath sounds caused by an inability to inhale and exhale deeply (e.g., emphysema or by an obstruction; atelectasis or foreign object). Absent breath sounds (e.g., empyema, hemothorax, pneumothorax, or pneumonec-tomy). See the display for a description of adventitious breath sounds.

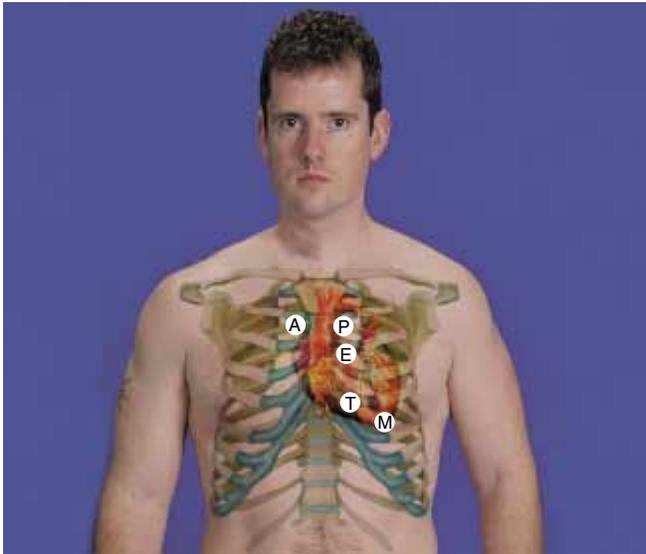


Figure 27-43 Cardiac landmarks: A, aortic area; P, pulmonic area; E, Erb's point; T, tricuspid area; and M, mitral area.

- S_1 , which is usually a quieter sound than S_2 in the aortic and pulmonic areas
- A split S_2 sound that may be heard in the pulmonic area during inspiration
- S_1 , which is usually louder than S_2 in the tricuspid and mitral areas
- A split S_2 sound that may be heard in the tricuspid area

Additional heart sounds (S_3 and S_4) may be heard during auscultation. S_3 (also called a ventricular gallop)

may be heard in the tricuspid and mitral areas during the early to mid-diastole following the S_2 sound. S_3 is heard best when the client is in the left lateral recumbent position, and the sound resembles the pronunciation of the word “Kentucky” (lub-dub-by). S_4 (also called atrial diastolic gallop) may be heard in the tricuspid and mitral areas during the late phase of diastole, before S_1 of the next cardiac cycle. S_4 is heard best when the client is in the supine position, and the sound resembles the pronunciation of the word “Tennessee” (le-lub-dub).

An S_3 can be a normal physiological sound in children and young adults; in adults it may be indicative of cardiac dysfunction (Estes, 2002). An S_4 may occur with or without any evidence of cardiac decompensation or it can be indicative of decompensation that is seen in conditions that increase the resistance to filling because of poorly compliant ventricles such as coronary artery disease and heart failure (Estes, 2002).

There are distinct abnormal findings found on palpation and auscultation. During palpation the nurse should assess for **thrills** (vibrations that feel similar to what one feels when a hand is placed on a purring cat) and **heaves** (lifting of the cardiac area secondary to an increased workload and force of left ventricular contraction). Abnormal heart sounds relative to **stenosis** (a narrowing or constriction of a blood vessel or valve) or **regurgitation** (the backward flow of blood through a diseased heart valve, also known as insufficiency) can be heard during auscultation as a **click** (a high-pitched systolic sound created by the opening of the valve) or a **murmur** (swishing or blowing sounds of long duration heard during the systolic and diastolic phases created by turbulent blood flow through a valve). Other abnormal sounds heard on auscultation are a pericardial friction rub (high-pitched, multiphasic, scratchy or grating sound that does not change with respirations) and **bruits** (blowing sounds that are heard when the blood flow becomes turbulent as it rushes past an obstruction).

Murmurs are characterized by their:

- Location: area where the murmur is heard loudest (e.g., mitral, pulmonic).
- Radiation: transmission of sound from a specific valve to other adjacent structures (mitral murmurs can radiate to the axilla).

COMMON TERMS ASSOCIATED WITH CARDIAC ASSESSMENT

- **Aneurysm:** localized (aortic) abnormal dilation of a blood vessel wall
- **Angina:** pain in the chest, neck, and/or arm resulting from myocardial ischemia
- Arteriosclerosis: buildup of plaques in the inner layers of the walls of large-to-medium-sized arteries
- Atrial fibrillation: rapid, random contractions of the atria with irregular ventricular beats
- Buerger's disease (thromboangiitis obliterans): an occlusion of a medium to small artery in the leg or foot that becomes inflamed and thrombotic
- Bundle branch block: conduction abnormality of the cardiac impulse through the bundle of His fibers
- Congestive heart failure: circulatory congestion caused by a cardiac disorder
- Coronary artery disease: any abnormal condition that may affect the arteries of the heart
- **Ischemia:** local and temporary lack of blood supply to the heart
- **Myocardial infarction:** necrosis of the heart muscle
- Thrombophlebitis: inflammation of a vein with a formed blood clot

GRADES AND CHARACTERISTICS OF MURMURS

Grade I:	Barely audible
Grade II:	Audible immediately
Grade III:	Moderate intensity
Grade IV:	Loud, may be associated with a thrill
Grade V:	Loud, with palpable thrill, audible with stethoscope in contact with chest wall
Grade VI:	Louder, heard without stethoscope, palpable thrill

(From Estes, M. E. Z. [2002]. *Health assessment and physical examination*. Albany, NY: Delmar Publishers.)

- Timing: phase in the cardiac cycle. If the murmur occurs simultaneously with the pulse, it is a systolic murmur. If the murmur is not related to the pulse, it is a diastolic murmur.
- Intensity: the loudness or intensity (see the display for a grading of murmurs).
- Quality: sound produced (harsh, rumbling, blowing, or musical).
- Pitch: high, medium, or low (auscultated with the bell of stethoscope for low-pitched murmurs and the diaphragm for high-pitched murmurs).
- Configuration: pattern that the murmur makes over time; described as crescendo (soft to loud), decrescendo (loud to soft), crescendo-decrescendo (soft to loud to soft), and plateau (sustained sound) (Estes, 2002).

Table 27-15 presents the specific areas to be examined and the normal and key findings of assessment of the heart and vascular system. See the accompanying display for common terms associated with cardiac assessment.

Vascular System

To assess blood perfusion of peripheral vessels and skin, the nurse should note changes in skin temperature, color, and sensation and in the pulses. Feeling the toes for warmth and color provides important information relative to peripheral circulation and tissue perfusion. Because the position of the extremities can affect the skin temperature and appearance, always assess extremities at heart level and at normal room and body temperature. Peripheral pulses should be compared bilaterally, and changes in strength and quality should be noted (Bosley, 1995).

TABLE 27-15
Assessment of Heart and Vascular System: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>Heart: Inspect, Palpate, and Auscultate</p> <p>Place client in supine or slightly elevated position. Expose anterior thorax using a drape. Stand at client's right side with light shining from opposite side to eliminate shadows.</p> <ol style="list-style-type: none"> 1. Inspect anterior thorax, precordium area: note pulsations, heaves, or retractions. <i>Absence of visible pulsations, heaves, or retractions.</i> 2. Inspect and palpate each of the cardiac landmarks for apical impulses. Use fingerpads to palpate pulsations and ball of the hand to palpate thrills or heaves (see Figure 27-43, for landmarks). <ol style="list-style-type: none"> a. Aortic area (second intercostal space to right of sternum): note pulsation, thrill, or vibration of aortic valve closure. b. Pulmonic area (second left intercostal space): note pulsation, thrill, or vibration of pulmonic valve closure. c. Third left intercostal space: note pulsation, thrill, or vibration of pulmonic valve closure. d. Right ventricular area (left, lower half of sternum and parasternal area): assess for a diffuse lift, heave, or thrill. e. Apex of heart (fifth intercostal space just medial to mid-clavicular line): note pulsation, thrill, or heave. <i>No pulsations, thrills, or heaves should be palpated in aortic, pulmonic, Erb's point, or tricuspid areas. An apical impulse (heard after first heart sound, lasting for half of systole) occurs in 50% of adult population. Mitral thrill or heave is absent.</i> 3. Palpate high in epigastric region for pulsations. <i>Strong pulsations thrusting upward against the fingerpads are caused by the aorta.</i> 4. Begin auscultation using the diaphragm of stethoscope for transmission of high-frequency sounds. Listen to several "lub dub" cycles in all five cardiac landmarks twice: first 	<ol style="list-style-type: none"> 1. Visible pulsations, heaves, or retractions require additional inspection with palpation to identify exact location and timing in relation to cardiac cycle (systole or diastole). <ol style="list-style-type: none"> a. Thrill may indicate aortic stenosis or regurgitation. b. Thrill may indicate pulmonic stenosis or regurgitation. c. Erb's point pulsations may indicate a left ventricular aneurysm or enlarged right ventricle. d. Thrill may indicate a tricuspid stenosis or regurgitation; a heave may also be present. e. Thrill may indicate mitral stenosis or regurgitation. A heave (sustained apex beat) may result from left ventricular hypertrophy. 3. Large pulsations and a mass may indicate an abdominal aortic aneurysm. Notify the nursing supervisor immediately if you detect signs of an aneurysm. 4. Diminished S₂ may indicate aortic stenosis and an intensified S₂ may indicate arterial hypertension. Ejection click

(continues)

TABLE 27-15 (continued)
Assessment of Heart and Vascular System: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>identify S_1 and S_2, then listen for S_3 and S_4 and murmurs and friction rubs.</p> <ol style="list-style-type: none"> Locate aortic valve landmark (second intercostal space, right sternal border) and listen for S_2. Auscultate pulmonic valve (second intercostal space, left sternal border), listening for S_2. <i>Regular intervals of time occur with a regular rhythm: time between S_1 and S_2 (systole) and then the time between S_2 and the next S_1 (diastole) with a distinct silent pause between S_1 and S_2. Aortic S_2 heralds onset of diastole, corresponds with “dub” sound, and is louder than S_1. In the pulmonic area a split of the S_2 sound is usually heard every fourth or fifth beat (aortic and pulmonic components). Splitting of S_2 occurs on inspirations because of a greater negative intrathoracic pressure when the venous return to the right side of the heart increases; thus, pulmonic closure is delayed because of the extra time needed for increased blood volume to pass through the valve. Aortic S_2 is louder than pulmonic S_2 because of the greater pressures in the left side of the heart.</i> Erb’s point (third left intercostal space): auscultate for murmurs. Tricuspid area (fifth intercostal space, left sternal border): assess for S_1. Instruct client to hold his or her breath. <i>S_1 is split because the mitral valve closes slightly before the tricuspid valve. When the client holds his or her breath, the splitting disappears.</i> Mitral area (fifth intercostal space, left midclavicular line): assess for S_1. If you are unable to distinguish between S_1 and S_2, palpate carotid artery while assessing mitral landmark; you will hear S_1 with each carotid pulse beat. <i>S_1 heralds the onset of systole (“lub” sound) and is louder than S_2 at this landmark.</i> <ol style="list-style-type: none"> Place client on left side. Use the bell of stethoscope (low-pitched sounds) and assess all five anatomic areas for extra heart sounds (S_3 and S_4 gallops, clicks, and rubs). <i>S_3 is heard in children and young adults under the age of 30 or in the third trimester of pregnancy. S_4 may occur without any evidence of cardiac decompensation. Gallops, clicks, and rubs are absent.</i> Epigastric area: place client in supine position. Place bell of stethoscope over visible aortic pulsations and auscultate for 10–15 seconds. <i>Bruits are absent.</i> 	<p>following S_1 can be heard with aortic stenosis caused by calcified valve.</p> <ol style="list-style-type: none"> A split S_2 that is abnormally wide on inspiration indicates delayed closure of the pulmonic valve resulting from a delay in the electrical stimulation of the right ventricle (e.g., right bundle branch block). A pulmonic ejection click (heard loudest on expiration) is caused by the opening of a diseased pulmonic valve. A loud pulmonic S_2 is caused by an elevated pressure in the pulmonary artery. A diminished pulmonic S_2 occurs with a calcified or thickened valve (e.g., pulmonic stenosis). A split pulmonic S_2 that is abnormally wide or occurs with every S_2 is usually indicative of an abnormality. Murmurs may indicate stenosis or regurgitation of a valve. A wide split S_1 during inspiration that is still heard on expirations is due to an electrical malfunction (e.g., right bundle branch block or a structural alteration, mitral stenosis). A variable S_1 sound (soft or loud) occurs when diastolic filling time varies (e.g., tachycardia or atrial fibrillation). <ol style="list-style-type: none"> S_3 (ventricular gallop) occurs after S_2 at the end of ventricular diastole and may be one of the earliest clinical findings of cardiac dysfunction (e.g., congestive heart failure). S_4 may indicate cardiac decompensation (e.g., coronary artery disease or myocardial infarction). A bruit in the epigastric area indicates turbulent blood flow as seen in the presence of an aneurysm.
<p>Vascular System: Inspect, Palpate, and Auscultate Place client in supine position with head of bed elevated 30° to 45°. Use a drape and uncover only those areas that are being assessed. If skin is not assessed as a separate system, inspect the skin for color, texture, temperature, and edema during this part of the examination.</p> <ol style="list-style-type: none"> Assess carotid pulse: <ol style="list-style-type: none"> Inspect right carotid artery along margin of the sternocleidomastoid muscle. <i>Absence of kinks or bulging.</i> 	<ol style="list-style-type: none"> Kinking or bulging may indicate hypertension or arteriosclerotic artery. <i>(continues)</i>

TABLE 27-15 (continued)
Assessment of Heart and Vascular System: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>b. Palpate carotid artery at lower half of neck (to avoid carotid sinus) by instructing client to turn head toward right side (relaxes sternomastoid muscle) and placing fingerpads of index and middle fingers around medial edge of sternocleidomastoid muscle.</p> <p>c. Auscultate carotid artery with diaphragm or bell of stethoscope. Instruct client to hold breath and listen for bruits.</p> <p>d. Repeat steps 1a–c on left side. <i>Pulses are equal in rate and rhythm with a strong, thrusting quality. No blowing or swishing sound is heard on auscultation.</i></p> <p>2. Identify bilateral external and internal (deep, along carotid artery) jugular veins with head of bed elevated 45° (avoid hyperextension or flexion of neck).</p> <p>a. Inspect right internal jugular vein.</p> <p>b. Measure the vertical distance in centimeters from the sternal angle (angle of Louis) to top of distended neck vein to obtain an indirect jugular venous pressure.</p> <p>c. Repeat steps 2a and b on left side. <i>Measurement of 1–2 cm above the angle of Louis with head of bed elevated 45°.</i></p> <p>3. Assess blood pressure; refer to Procedure 27-4.</p> <p>4. Inspect and palpate bilateral peripheral pulses (locate pulse points as discussed in Figure 27-1 and Table 27-5. Starting with the temporal artery, proceed in a sequential pattern with the upper extremities (brachial, radial, and ulnar pulses), then the lower extremities (femoral, posterior tibial, and dorsalis pedis pulses). Note rate, quality, rhythm, and volume of pulses. If you are unable to palpate a pulse, use a Doppler or ultrasound stethoscope to amplify the sound. <i>Bilateral equality and symmetry of peripheral pulses.</i></p>	<p>b. Decreased pulsations may indicate arterial narrowing or occlusion.</p> <p>c. Bruits may indicate distribution of blood flow from arterial narrowing or occlusion.</p> <p>2. Distended jugular veins (>2 cm) with client in a sitting position may be related to fluid volume overload (rapid infusion of an intravenous solution). Elevated jugular venous pressure, when accompanied with a third heart sound are the most specific signs of heart failure (Agency for Health Care Policy and Research, 1994).</p> <p>4. Markedly diminished or absent pulses may indicate arterial occlusion; e.g., Buerger’s disease (thromboangiitis obliterans).</p>
<p>5. Assess tissue perfusion:</p> <p>a. Perform the Allen test to determine patency of radial and ulnar arteries. Instruct client to rest hands in lap (Figure 27-44).</p> <ol style="list-style-type: none"> (1) Compress both the radial and ulnar arteries. (2) Firmly compress arteries and instruct client to open the hand. (3) Note color of palms. (4) Release one artery and note the color of the palm. (5) Then steps 1–4 are repeated for the other artery on the same hand. Then the procedure is performed on the other hand. <i>Palms should turn pink promptly.</i> <p>b. Inspect both legs from the groin and buttocks to feet. Note venous enlargement, redness or discoloration, and ulcers over saphenous veins. <i>Skin intact, free from venous engorgement and pain.</i></p> <p>c. Check for Homan’s sign by slightly bending client’s knee and sharply dorsiflexing the client’s foot. If client feels pain in calf area of leg, the test is positive. Repeat on opposite leg. <i>Absence of calf pain.</i></p>	<p>a. Persistence of pallor when one artery (e.g., radial) is manually compressed indicates occlusion of the other artery; e.g., ulnar.</p> <p>b. Edema or ulceration are indicative of venous stasis. Tenderness or pain, warmth, redness, or discoloration indicates superficial thrombophlebitis. Dilated and tortuous veins are varicosities.</p> <p>c. A positive Homan’s sign may indicate thrombophlebitis or deep vein thrombosis (DVT).</p>

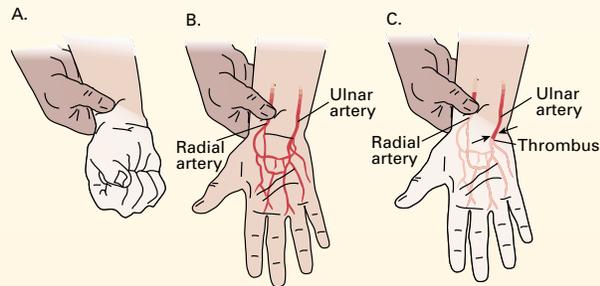


Figure 27-44 Allen Test. A. Pallor is initiated by compressing the radial artery with the client’s fist clenched. B. A patent ulnar artery reveals the return of palm perfusion despite radial artery compression. C. An occluded ulnar artery results in continued pallor of the hand while the radial artery is still compressed.

Breasts and Axillae

Breast cancer is the most commonly occurring cancer in women (one out of eight) in the United States according to the National Cancer Institute; all women should be considered at risk for developing breast cancer because 80% of women with breast cancer fail to exhibit the specific risk factors associated with cancer (Firth & Watanabe, 1996).

Long-term survival rates for breast cancer have a direct correlation to early detection of the disease. Nurses play a major role in women’s health by teaching breast self-examination (BSE) and by supporting women in achieving healthier lifestyles believed to decrease the risk factors of breast cancer (Estes, 2002).

Table 27-16 presents the specific areas of the breast and axillae to be examined and the normal and key findings of this assessment. This table *does not* describe the changes that occur with pregnancy. Inspection and palpation are used to assess the female and male breasts and axillae, and palpation is used for the axilla and lymph nodes.

The breasts are divided into four quadrants, inclusive of the tail of Spence, by lines crossing at the nipples as shown in Figure 27-45. These quadrants are used in a sequential fashion during assessment. Figure 27-46 shows a cross section of breast tissue.

Palpation of the supraclavicular, infraclavicular, and axillary nodes is included in the assessment of the breasts. The pattern of lymph drainage is illustrated in Figure 27-47. Note that not all the lymphatics drain into the axilla; therefore, depending on the location of a malignant lesion, the spread of cancer cells may occur directly to the infraclavicular nodes, deep into the chest or abdomen, or even to the opposite breast.

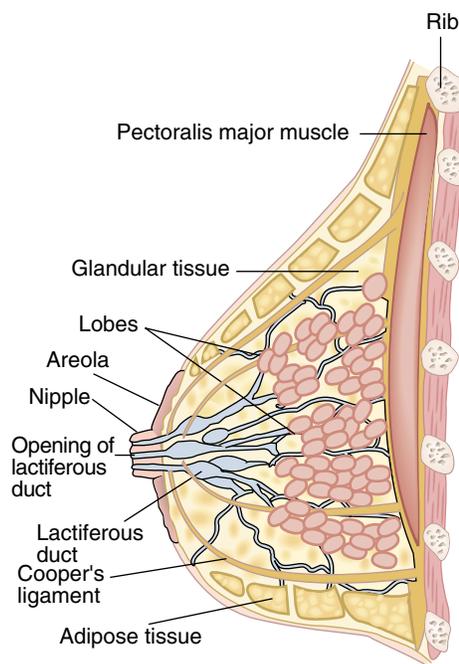


Figure 27-46 Cross Section of the Left Breast

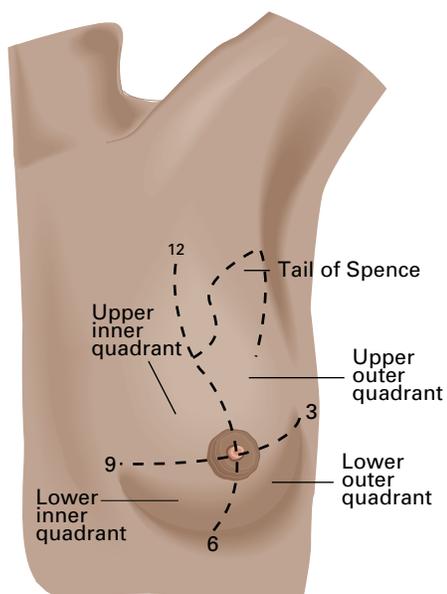


Figure 27-45 Quadrants of the Left Breast

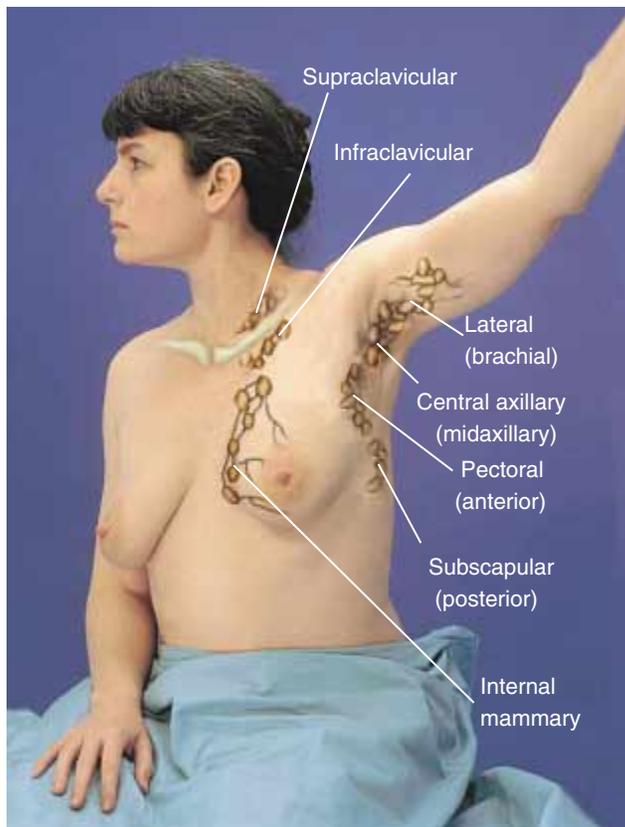


Figure 27-47 Drainage Patterns of the Left Breast

Breast Self-Examination

The nurse should use the time during the assessment to educate the client about BSE and encourage the client to ask questions. Figure 27-51 demonstrates the procedures that the client should perform in conducting a BSE. The American

TABLE 27-16
Assessment of Breasts and Axillae: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>Female Breasts and Axillae: Inspect and Palpate</p> <p>Assist client to a sitting position on the edge of examining table or bed facing you. Uncover to waist.</p> <ol style="list-style-type: none"> Inspect the breasts, areolar areas, nipples, and axillae. Note color, vascularity, thickening or edema, size, symmetry, contour, lesions or masses, and exudates. <ol style="list-style-type: none"> Instruct client to place arms at sides. Proceed with assessment in step 1. Instruct client to raise arms over head (will accentuate any retraction if present). Repeat step 1. Instruct client to press hands into hips (will contract the pectoral muscles and will accentuate any retraction if present). Repeat step 1. Instruct client to lean forward to allow breasts to hang freely away from chest, provide support as necessary; repeat step 1. <i>Breasts and areolae are flesh-colored, the areolar areas and nipples are darker in pigmentation. Moles and nevi and terminal hair may be present on the areolar areas. Superficial vascular patterns are diffuse and symmetrical. Breast on the same side as the dominant arm is usually larger. Nipples should point upward and laterally or outward and downward. Nipples may be inverted from puberty, making breastfeeding difficult. Supernumerary nipples (extra nipples) appear as pigmented moles along the “milk line.” Convex breast without flattening, retractions, or dimpling.</i> Palpate in a sequential manner. Stand in front of the client. Instruct client to place arms at side. Place client’s head in a flexed position (relaxes sternocleidomastoid muscle). <ol style="list-style-type: none"> Assess simultaneously bilateral supraclavicular nodes as demonstrated in Figure 27-49A by placing your fingerpads over client’s clavicles, lateral to tendinous portion of the sternocleidomastoid muscle, and proceed with a rotary motion of the palmar surfaces of index fingers. Probe deeply into scalene triangles to palpate the nodes. Using same rotary motion of palmar surface of index and middle fingers, palpate infraclavicular nodes as shown in Figure 27-49B. <i>Palpable lymph nodes should be less than 1 cm in diameter without additional enlargement of axillary lymph nodes.</i> Palpate breasts: stand at right side facing the client. Instruct client to place arms at side. <ol style="list-style-type: none"> Support the inferior aspect of left breast with nondominant hand. Use palmar surface of dominant hand: <ol style="list-style-type: none"> Begin palpation at outer quadrant of breast. (Small-breasted clients: use dominant hand to palpate tissue against chest wall; pendulous breasts, use both hands to palpate.) 	<ol style="list-style-type: none"> Reddened areas of breasts, areolar areas, nipples, or axillae may be an indication of inflammation, infection, or inflammatory carcinoma. Striae (red or silver-white streaks over the breasts or axillae) are caused by rapid stretching of the skin and damage to the elastic fibers of the dermis (Figure 27-48A). Focal or unilateral superficial vascular patterns result from an increased blood supply and may indicate tumor formation (Figure 27-48B). Thickening or edema of breast tissue or nipple causes enlarged skin pores that give the appearance of an orange rind (peau d’orange), which may be indicative of obstructed lymphatic drainage (e.g., a tumor, Figure 27-48C). Significant differences in size or symmetry of breasts, axillae, areolar areas, or nipples may be indicative of a tumor (Figure 27-48D). Asymmetrical nipple direction or recent nipple inversion, flattening, or depression is indicative of nipple retraction (Figure 27-48E). Thickening of a previously inverted nipple may indicate a tumor. Unilateral reduction of breast tissue or structures may result from trauma or surgery. Scaly, eczema-like nipple erosion or persistent dermatitis of the areola and nipple may indicate Paget’s disease (malignant neoplasm of breast tissue). Nipple discharge in nonpregnant or nonlactating woman may be caused by tranquilizers, oral contraceptives, manual stimulation, infection, or malignant or benign breast disease. Fixed firm, immobile lymph nodes greater than 1 cm in diameter may be indicative of metastasis (spread of tumor cells to other parts of the body). Enlarged, painful, or tender nodes that are matted together may be indicative of a systemic infection or carcinoma. Significant tenderness may indicate mammary duct ectasia (benign, inflamed lactiferous duct). Hard, poorly circumscribed nodules, loss of elasticity, and bloody discharge usually indicate cancer. Augmentation (saline or silicone implants or transposition of chest wall muscles) produces a feeling of being fluid-filled or of firmness throughout the tissue, with inferior suture line scars.

(continues)

TABLE 27-16 (continued)
Assessment of Breasts and Axillae: Normal and Key Findings

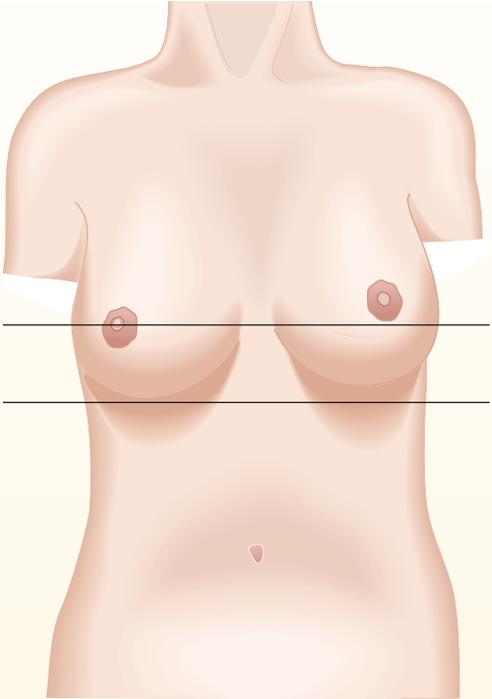
Area of Assessment/Normal Findings	Key Findings	
 <p data-bbox="370 594 394 625">A.</p>	 <p data-bbox="808 594 833 625">C.</p>	 <p data-bbox="1279 1062 1304 1094">E.</p>
 <p data-bbox="370 1260 394 1291">B.</p>	 <p data-bbox="797 1003 821 1035">D.</p>	

Figure 27-48 Abnormal Breast Findings: A. Striae; B. Superficial Vascular Patterns; C. Peau d'orange; D. Asymmetry of Breasts; E. Asymmetry of Nipples with Deviation. (Courtesy of Dr. S. Eva Singletary, University of Texas, M. D. Anderson Cancer Center.)



Figure 27-49 Palpating Lymph Nodes: A. Palpation of Supraclavicular Nodes; B. Palpation of Infraclavicular Nodes

(continues)

TABLE 27-16 (continued)
Assessment of Breasts and Axillae: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>(2) Palpate in a downward, sweeping fashion from outer quadrants to the sternal border of each breast.</p> <p>b. Repeat steps (1) and (2) with client's arms raised over head (enhances retraction). <i>Consistency or elasticity of tissue varies with age, menses or pregnancy, and size: firm elasticity of young breasts and a less-firm granular feel of older breasts. Premenstrual fullness, nodularity, and tenderness are common. Large breasts may have a firm transverse (inframammary) ridge of compressed tissue along the lower edge, which should not be confused with a tumor.</i></p> <p>4. Maintain client in a sitting position. Inspect and palpate the axillary lymph nodes. Note any rash, infection, unusual pigmentations, and nodes.</p> <p>a. Instruct client to take a deep breath and relax shoulders and arms. Use your left hand to adduct client's left arm close to chest wall (relaxes axillary muscles) and place client's left forearm on your right forearm.</p> <p>b. Place fingerpads of your right hand into apex of the client's axilla (behind the pectoral muscles) and gently roll the tissue against the chest wall and axillary muscles, working downward as you locate and palpate the four axillary lymph node groups (Figure 27-50):</p> <ol style="list-style-type: none"> (1) Posterior (subscapular) at anterior edge of latissimus dorsi muscle (2) Central (midaxillary) at thoracic wall of axilla (3) Anterior (pectoral) behind lateral edge of pectoralis major muscle (4) Lateral (brachial) on inner aspect of upper part of humerus close to axillary vein 	<p>4. Rashes may indicate allergic response to deodorant. Redness and inflammation may indicate hidradenitis suppurative (infection of sweat glands). Enlarged, painful, or tender nodes that are matted together may be indicative of a systemic infection or carcinoma. Fixed firm, immobile, irregular lymph nodes greater than 1 cm in diameter are considered suspicious for metastasis.</p>



Figure 27-50 Palpation of the Axillary Lymph Nodes

(continues)

TABLE 27-16 (continued)
Assessment of Breasts and Axillae: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>c. Repeat steps 4a and b on client's right axilla using same technique with your opposite hand. <i>Painless palpation of 1 or 2 soft, nontender nodes less than 1 cm in diameter without additional enlarged lymph nodes found in other regions.</i></p> <p>5. Place client in a supine position (spreads breast tissue thinly and evenly over chest wall). Stand to right of client and place left arm above head:</p> <p>a. With fingerpads, palpate left breast by compressing mammary tissue gently against chest wall by either concentric circles that migrate from periphery to nipple or in wedge sections from periphery to nipple.</p> <p>b. Proceed with palpation to include tail of Spence, periphery, and areola.</p> <p>c. Compress the nipple to express any discharge. If noted, palpate breast along wedge radii to distinguish from which lobe the discharge is originating.</p> <p>d. Repeat steps a, b, and c on opposite breast. <i>See steps 2 and 3 for normal breast tissue findings on palpation.</i></p>	<p>5. Loss of nipple elasticity or nipple thickening may indicate tumor formation. White-milky discharge in nonpregnant, nonlactating client may indicate nonpuerperal galactorrhea (hormonally induced discharge from lesions of anterior pituitary, or drug induced). Nonmilky discharge from nipple may be indicative of benign or malignant breast disorder.</p>
<p>Male Breasts and Axillae: Inspect and Palpate</p>	
<p>Assist client to a sitting position on the edge of examining table or bed facing you. Uncover to waist.</p>	
<p>1. Inspect the nipple and areola. Note nodules, swelling, or ulcerations. <i>The areolar areas and nipples are darker than surrounding breast tissue. Absence of edema.</i></p> <p>2. Palpate the areola and note nodules. <i>Small breasts, nipple and areola overlie a thin disc of undeveloped breast that is indistinguishable from surrounding tissues. Adolescent boys may develop temporary breast enlargement on one or both sides.</i></p> <p>3. Inspect and palpate the axillae; note any rash, infection, unusual pigmentation, and nodes.</p> <p>a. Assess left axilla, instruct client to relax with left arm down; support client's left wrist with your left hand.</p> <p>b. Cup fingers of your right hand and palpate the apex of the axilla with fingerpads.</p> <p>c. Proceed downward over the surface of ribs and serratus anterior and palpate for central nodes by compressing them against the chest wall.</p> <p>d. Stand behind client (ensuring safety from falling forward) and probe the anterior and posterior axillary fold by pressing against the humerus for pectoral, subscapular, and axillary nodes. If enlarged or tender nodes are detected, palpate for infraclavicular nodes and reexamine supraclavicular nodes.</p> <p>e. Repeat steps 3a–d, using your left hand to examine the client's right axilla. <i>One or two soft, small, nontender central nodes without additional enlarged lymph nodes found in other regions.</i></p>	<p>1. Distorted nipple and areola may indicate cancer.</p> <p>2. A firm disc of glandular enlargement may indicate gynecomastia (glandular enlargement of the male breast). Hard, irregular nodule, frequently fixed to both nipple and underlying tissue, may indicate breast cancer.</p> <p>3. Rashes may indicate a deodorant allergy. Reddened and inflamed area occurs with infected hidradenitis suppurative. Enlarged tender nodes may indicate lymphadenitis from hand or arm infection or axillary metastasis of breast cancer.</p>



A.



B.



C.



D.



E.

Figure 27-51 Breast Self-Examination. A. Before Mirror: Arms at Side. B. Before Mirror: Arms over Head. C. Before Mirror: Hands Pressed into Hips. D. Before Mirror: Compressing Nipple. E. Lying Down: Palpating Breast.

Cancer Society (1997) recommends that the following guidelines be used for early detection of breast cancer:

1. BSE performed monthly by women age 20 years and older.
2. From ages 20 to 40, examination every 3 years by a practitioner and yearly after 40 years of age.
3. Regardless of age, women with a family history should have a yearly examination by a practitioner.
4. A baseline mammogram should be performed for women aged 35 to 39. The frequency of diagnostic mammograms is determined by family history and symptoms: yearly for women 35 years of age with a family history and yearly for all women over 40 years of age (American Cancer Society, 1997).

If time permits during the examination, have the client demonstrate to you how she performs the BSE.

Abdomen

Physical examination of the abdomen provides significant data relative to the various functions of the gastrointestinal and genitourinary systems and the abdominal aorta. The order of abdominal assessment is inspection,

auscultation, percussion, and palpation. Auscultation is performed second because palpation and percussion can alter the bowel sounds. The abdominal landmarks used for assessment are presented in Figure 27-52.

Auscultate the four quadrants, as shown in Figure 27-53, when assessing bowel sounds and listening for vascular bruits. Assessment should always begin in the right lower quadrant (RLQ). Table 27-17 presents the specific areas of the abdomen to be examined and the normal and key findings of this assessment.

The nurse should percuss all four quadrants in the same systematic fashion. Visualize each organ in the corresponding quadrant; note when **tympany** (a low-pitched sound of long duration) changes to **dullness** (a high-pitched sound of short duration).

Light palpation of the abdomen is done in all four quadrants, beginning in the RLQ for resistance, tenderness, and rebound tenderness. Deep palpation is not addressed in Table 27-17 because this assessment technique usually requires supervision during the learning process. If any of the abdominal organs (gallbladder, liver, spleen, fecal-filled colon, or flatus-filled cecum) can be palpated, it is abnormal and should be reported to the nursing supervisor.

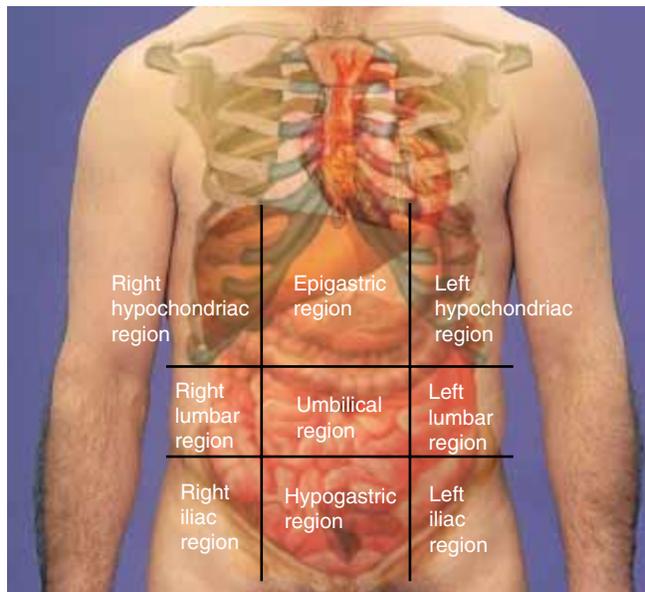


Figure 27-52 Abdominal Landmarks

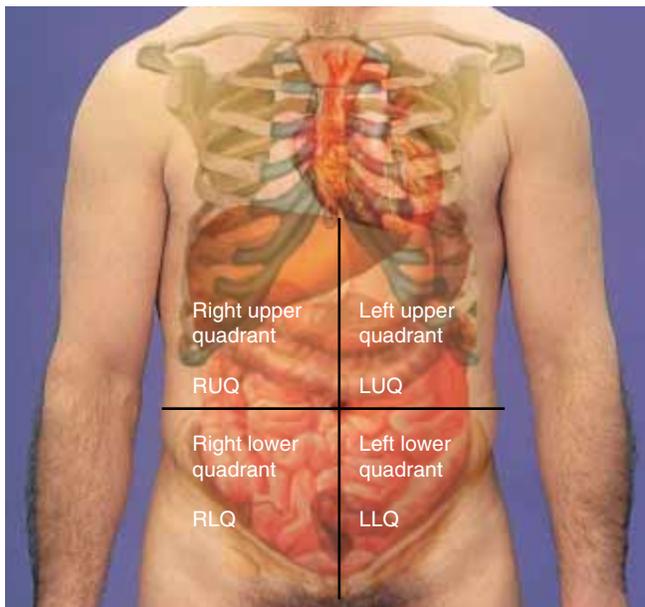


Figure 27-53 Abdominal Quadrants

Female Genitalia and Anus

Assessment of the female genitalia uses the techniques of inspection and palpation for the external genitalia and anus. Table 27-18 presents the specific areas of the female external genitalia and anus to be examined and the normal and key findings of this assessment. Speculum assessment of the internal genitalia is not presented in Table 27-18 because this function is usually within the scope of advanced practice registered nurses or registered nurses prepared in expanded roles.

Assessment of the genitalia may produce feelings of fear, anxiety, indignity, and loss of control in many women. These feelings may be reduced by the sensitivity of the nurse before, during, and after the assessment. The nurse must respect the client's wishes regarding privacy and take

COMMON ABNORMAL LESIONS OF THE EXTERNAL FEMALE GENITALIA

- **Chancere:** a reddish, round ulcer with a depressed center and raised edges that appears during the primary phase of syphilis at the site where the treponema enters the body. It lasts for 4 weeks, then disappears.
- **Condyloma acuminatum:** white, dry, painless growth (wart) that has a narrow base that is caused by the human papillomavirus.
- **Condylomata lata:** raised, round, wartlike plaque with a moist surface covered by a gray exudate that appears during the secondary stage of syphilis.
- **Herpes simplex:** small, red vesicles that fuse together to form a large ulcer that may be painful and itchy.

into consideration cultural issues concerning this aspect of health assessment. For example, many Middle Eastern women will remain veiled during an assessment. By using techniques to diminish client discomfort and by empowering the client through education and participation in the assessment process, the nurse offers a path for the client in the management of her own health care. Most states require that a male nurse be accompanied by a female nurse or assistant during a gynecologic examination.

Male Genitalia, Anus, and Rectum

Assessment of the male genitalia includes the essential organs (testes and male gonads), the accessory organs (seminal vesicles and bulbourethral glands), several ducts (epididymis, ductus [vas] deferens, ejaculatory), and the urethra. The supporting structures include the scrotum, penis, and spermatic cord. The anorectal examination allows for assessment of both the rectum and prostate gland. Table 27-19 presents the specific areas of the male genitalia, anus, and rectum to be examined and the normal and key findings of this assessment.

Female nurses may feel anxious about examining the male genitalia. If a nurse feels uncomfortable about this assessment, she needs to work through her feelings about sexuality and reproduction before she can talk comfortably with the client.

Some health care agencies do not allow nurses to perform a digital examination of the anus and rectum. Nurses must check the agency's policies relative to this part of the physical examination. Nursing students should have a qualified registered nurse with them the first time they perform a digital examination. After this procedure has been done, the color of feces on your gloved finger should be noted. Bright red or tarry, black stools are indicative of bleeding and should be reported. Usually a sample of the feces is tested for occult blood.

Middle-aged white men are at risk for testicular cancer; early detection and treatment decrease

TABLE 27-17
Assessment of Abdomen: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>Abdomen: Inspect, Auscultate, Percuss, and Palpate Place client in a supine position with knees flexed over a pillow, hands at sides or across chest. Drape the client from xiphoid process to symphysis pubis to expose the abdomen.</p> <ol style="list-style-type: none"> Stand at right side of client. <ol style="list-style-type: none"> Inspect abdomen from rib margin to pubic bone. Note contour and symmetry (observing for peristalsis, pulsations, scars, striae, or masses). Inspect umbilicus for contour, location, signs of inflammation, or hernia. Observe the abdomen for smooth, even respiratory movement. Observe for surface motion (visible peristalsis). Inspect epigastric area for pulsations. <i>Contour is flat or rounded and bilaterally symmetrical. Umbilicus is depressed and beneath the abdominal surface. Abdomen rises with inspirations and falls with expirations, free from respiratory retractions. Visible peristalsis slowly traverses the abdomen in a slanting downward movement as observed in thin clients. Pulsations of the abdominal aorta are visible in the epigastric area in thin clients.</i> Auscultate the four abdominal quadrants (see Figure 27-53) using the diaphragm of the stethoscope for bowel sounds (high-pitched). <ol style="list-style-type: none"> Begin by placing the diaphragm on the right lower quadrant (RLQ). Listen for a full minute to the frequency and character of the bowel sounds. Repeat step a, proceeding in sequence to right upper quadrant (RUQ), left upper quadrant (LUQ), and left lower quadrant (LLQ). Listen at least 5 minutes before concluding the absence of bowel sounds. <i>High-pitched sounds, heard every 5 to 15 seconds as intermittent gurgling sounds in all four quadrants as a result of air and fluid movement in the gastrointestinal tract. Bowel sounds should always be heard at the ileocecal valve area.</i> Auscultate with bell of stethoscope over the aorta, epigastric area, renal arteries, and femoral arteries. Note bruits over each area. <i>Free from audible bruits.</i> Percuss all four quadrants in a systematic fashion (Figure 27-54). Begin percussion in RLQ, move upward to RUQ, cross over to LUQ, and down to LLQ. Note when tympany changes to dullness. <i>Tympany is heard because of air in the stomach and intestines. Dullness is heard over organs (e.g., the liver).</i> Perform light palpation. Never palpate over areas where bruits are auscultated. <ol style="list-style-type: none"> Instruct client to cough. If client experiences a sharp twinge of pain in a quadrant, palpate that area last. With client's hands and forearms on a horizontal plane (see Figure 27-15), use fingerpads to depress the abdominal wall 1 cm in all four quadrants. Begin palpation in RLQ, move upward to RUQ, cross over to LUQ, and down to LLQ. Note texture and consistency of underlying tissue. <i>Should feel smooth with consistent softness.</i> 	<p>Promotes relaxation of the abdominal muscles.</p> <ol style="list-style-type: none"> A convex symmetrical profile reveals either a protuberant abdomen (results of poor muscle tone from inadequate exercise or obesity) or distension (taut stretching of skin across abdominal wall). Asymmetry may indicate a mass, bowel obstruction, enlargement of abdominal organs, or scoliosis. Umbilicus bulging may indicate a hernia. Old scars are flat with a shiny appearance, blending with client's pigmentation; new scars are raised and reddened. Atrophic lines or streaks reveal lineae albicantes (striae) that occur with tumors, obesity, ascites, and pregnancy. Engorged or dilated veins around the umbilicus are associated with circulatory obstruction of superior or inferior vena cava. Uneven respiratory movement with retractions may indicate appendicitis. Strong peristaltic movement may indicate intestinal obstruction. Marked pulsations in epigastric area may indicate an aortic aneurysm. Hypoactive or diminished bowel sounds are soft and low and widely separated so that only one or two are heard in a 2-minute interval. Hypoactive is normal the first few hours after general anesthesia. Hypoactive sounds may indicate decreased motility of the bowel, such as occurs with peritoneal irritation or paralytic ileus. Absent bowel sounds (none heard for 3–5 minutes) may signal paralytic ileus, peritonitis, or an obstruction. Hyperactive (loud, audible, gurgling sounds similar to stomach growling; sounds also called borborygmi) may occur with diarrhea or hunger. Rushed, high-pitched or tingling sounds suggest air or fluid under pressure; this may occur in the early stages of an intestinal blockage when heard in the portion of the bowel that precedes the obstruction (Kirton, 1997). A bruit over an abdominal vessel reveals turbulent blood flow suggestive of an aortic aneurysm or partial obstruction (e.g., renal or femoral stenosis). Dullness over the stomach or intestines may indicate a mass or tumor; ascites (excessive fluid accumulation in the abdominal cavity) or full intestines. Tenderness and increased skin temperature may indicate inflammation. Large masses may be due to tumors, feces, or enlarged organs.

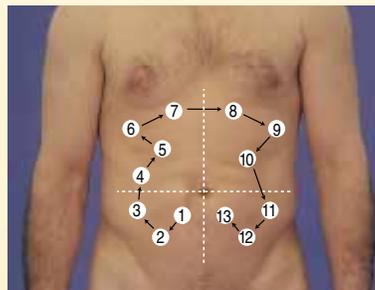


Figure 27-54 Directional Pattern of Abdominal Percussion

TABLE 27-18
Assessment of Female External Genitalia and Anus: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>Female External Genitalia and Anus: Inspect and Palpate</p> <p>Place client in lithotomy position with knees flexed perpendicular to bed. Instruct client to relax thighs to allow each leg to abduct to side. The client's head may be elevated for comfort. Place drape over client's torso and thighs to expose external genitalia. Don gloves.</p> <ol style="list-style-type: none"> 1. Inspect the mons pubis and vulva. Touch the thigh before advancing to the perineum (extremely sensitive and tender). <ol style="list-style-type: none"> a. Observe skin coloration and condition of mons pubis and vulva. b. Separate the labia majora with thumb and index finger of dominant hand. Note color, lesions, or trauma. c. Palpate the labium between thumb and index finger of dominant hand for swelling, induration, pain, or discharge from a Bartholin gland. <i>Skin over the mons pubis is clear except for nevi and hair distribution. The labia majora and minora are symmetrical, with a smooth to wrinkled, unbroken, slightly pigmented skin surface, free from ecchymosis, excoriation, nodules, swelling, rash, and lesions. Sebaceous cysts (nontender, yellow-colored nodules less than 1 cm) may be present.</i> 2. Inspect the clitoris using the dominant thumb and index finger: separate the labia minora laterally to expose the prepuce of the clitoris. Note the size and condition. <i>Approximately 2 cm long and 0.5 cm in diameter; free from lesions.</i> 3. Using dominant thumb and index finger, separate the labia minora laterally to expose the urethral meatus to inspect the shape, color, and size. Avoid touching the meatus because touching it may cause pain and urethral spasm. <i>Midline, slit-like opening, free of discharge, swelling, or redness; about the size of a pea.</i> 4. Keeping the labia minora retracted laterally, inspect the vaginal introitus: instruct the client to bear down while you note patency and bulging. <i>Introitus mucosa is pink and moist with a clear to white discharge that contains white clumps of epithelial cells. Free of foul odor and bulging.</i> 5. Inspect the perineum and anus. Note texture and color of perineum and color and shape of anus. <i>Perineum is smooth, intact, and slightly darkened. The anus is dark pink to brown and puckered, usually with skin tags.</i> 	<p>If client has difficulty assuming the lithotomy position, place in a left lateral or Sims' position with buttocks near the edge of bed with right knee flexed.</p> <ol style="list-style-type: none"> 1. Ecchymosis over mons pubis or labia may be due to blunt accidental trauma or intentional abuse. Rashes over the mons pubis or labia have multiple origins (e.g., contact dermatitis or infestations). Labial swelling may be due to a hematoma, Bartholin's cyst, or obstruction of lymphatic system. Broken areas of the skin may be due to ulcerations or abrasions secondary to infections or trauma (see the display on common abnormal lesions of the external female genitalia). A painless mass with pruritus or a cauliflower-like growth is suspicious of malignancy. Venous prominence (varicose veins) of the labia may be due to a congenital predisposition, prolonged standing, or pregnancy. 2. Enlarged (hypertrophy) clitoris may indicate female pseudohermaphroditism caused by androgen excess. The clitoris is the common site for a chancre lesion. 3. Discharge of any color indicates a urinary tract infection. Swelling or redness around the urethral meatus indicates a possible infection of the Skene's glands, urethral caruncle or carcinoma, or prolapse of the urethral mucosa. 4. Pale color and dryness reveal atrophy from topical steroids or aging. Foul-smelling discharge of any color may indicate vaginitis or cervicitis. External tear of the vaginal introitus may indicate trauma from sexual activity or abuse. Bulging of the anterior wall may indicate a cystocele (protrusion of the urinary bladder through the wall of the vagina) due to weakness of supporting tissues and ligaments. 5. Fissure or tear results from area trauma, abscess, or unhealed episiotomy. Venous prominence of anal area indicates external hemorrhoids (varicose dilatation of a vein of the inferior hemorrhoidal plexus covered with modified anal skin).

(From Estes, M. E. Z. [2002]. *Health assessment and physical examination*. Albany, NY: Delmar Publishers.)



RESEARCH FOCUS

Title of Study

“Something to Talk About: Sexual Risk Communication Between Young Women and Their Partners”

Author

Hutchinson, M. K.

Purpose

To describe sexual risk communication between young women and their male sexual partners, and examine its impact on women’s perceptions of sexual risks.

Methods

The study and results reported were part of a larger descriptive, retrospective study in which data were collected from young women and their male partners via telephone interviews. Participants of this study included 93 unmarried, sexually active heterosexual women between the ages of 17 and 26 years, and 82 of their male sexual partners. The sample was predominantly white; all other ethnic groups were underrepresented.

Findings

Nearly all of the women described their partners as “no risk” or “low risk,” despite the fact that nearly half never discussed their partner’s sexual risk histories. Women gave three primary reasons why sexual risk was not discussed: did not know the partner well enough/too embarrassed to ask; “knew” the partner was low risk/no need to discuss it; and did not think of it.

Implications

Nurses should adopt and promote the premise that all sexually active women are at some risk for sexually transmitted diseases (STDs), including human immunodeficiency virus (HIV). Furthermore, sexually active women should be advised to distinguish between what they think they know about their partners and what they actually know. As client advocates, nurses should help women recognize the need to protect themselves from STD/HIV.

Hutchinson, M. K. (1998). Something to talk about: Sexual risk communication between young women and their partners. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, 27(2), 127–133.

COMMON ABNORMAL LESIONS OF THE EXTERNAL MALE GENITALIA

- **Candidiasis:** multiple, discrete, flat pustules with scaling and surrounding edema that are superficial mycotic infections of moist cutaneous sites associated with diabetes mellitus, deficiencies in systemic immunity, and antibiotic therapy
- **Chancroid:** tender, ulcerated, exudative, papular lesion with an erythematous halo surrounding edema and a friable base that results from small breaks in epidermal tissue and inoculation of *Hemophilus ducreyi*
- **Tinea cruris:** erythematous plaques with scaling, papular, lesions with sharp margins caused by fungal infections of the groin

Note: Chancre, condyloma acuminatum, and herpes simplex are common abnormal lesions of the external male genitalia. These lesions are described in the display for common abnormal lesions of the external female genitalia.

THINK ABOUT IT

Examination of the Male Genitalia

What would you do if a client, who is the same age as you, had an erection during the examination? How would you feel?



NURSING CHECKLIST

Testicular Self-examination

- Ask the client if monthly TSE is performed.
- Explain to the client that monthly TSE will allow for early detection of testicular cancer.
- Review the anatomy of the scrotum by describing that the testicles are ovoid structures that feel firm and rubbery and that the epididymis, located behind the testicles, is softer and feels rope-like.
- Instruct the client to perform the examination during a warm shower using the thumb and first two fingers to gently feel each testicle and the epididymis. The testicles should move freely within the scrotum and have a smooth surface; the epididymis should be softer.
- Instruct the client to report any findings that deviate from normal such as lumps and nodules, especially if they are nonmobile.

(From Estes, M. E. Z. [2002]. *Health assessment and physical examination*. Albany, NY: Delmar Publishers.)

mortality rates. Monthly testicular self-examination (TSE) allows for early detection of testicular cancer. The nurse should teach the client during the scrotal examination about TSE (see the accompanying Teaching Checklist, “Testicular Self-Examination”).

TABLE 27-19
Assessment of Male Genitalia, Anus, and Rectum: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>Male External Genitalia and Anus: Inspect and Palpate: Place client supine, with legs spread slightly, or in standing position. Don gloves.</p> <ol style="list-style-type: none"> 1. Assess the glans penis, urethral meatus, and scrotum. <ol style="list-style-type: none"> a. Instruct uncircumcised clients to retract the foreskin. Inspect the anterior and posterior surfaces by lifting the penis. Note lesions, swelling, or inflammation (client can replace the foreskin). b. Palpate the shaft of the penis using thumb and first two fingers to assess the entire length of penis. Note pulsations, tenderness, swelling, masses, or plaques. c. Inspect the urethral meatus. Note location and color, and observe for discharge (culture any discharge). d. Inspect the scrotum by displacing the penis to one side to assess the scrotal skin. Lift up the posterior side. Note lesions, inflammation, and swelling. e. Begin scrotal palpation by gently palpating the right testicle between your thumb and first two fingers. Proceed to the epididymis, then to the spermatic cord from the epididymis, and to the external ring, noting consistency, presence of tenderness or masses. Repeat on left side. f. Teach testicular self-examination. <i>Foreskin retracts easily. Glans penis varies in size and shape. A small amount of smegma (white “cottage cheese” substance) may be present. Pulsations are present on the dorsal sides of the penis. The meatus is centrally located and pink. Scrotal skin appears rugated and thin and hugs the testicles firmly in the young male and becomes elongated and flaccid in the elderly. The left scrotal sac is lower than the right. Testicles are sensitive to pressure, firm, ovoid, smooth, and equal in size bilaterally. The epididymis should be distinguishable from the testicle, and the spermatic cord feels smooth and round.</i> 	<p>If the client has difficulty in the supine position, elevate the head of the bed.</p> <ol style="list-style-type: none"> 1. a. Uncircumcised men can develop phimosis (foreskin cannot be retracted over the glans penis). Paraphimosis occurs when retracted foreskin causes proximal constriction to glans and the penis distal to the foreskin becomes swollen and gangrenous. Priapism is a continuous and pathologic erection of the penis. b. Absent pulsations indicate vascular insufficiency associated with systemic disease, localized trauma, or disease that interrupts blood flow. See the display on common abnormal lesions of the external male genitalia. c. Meatus that opens dorsally on penis (epispadias) occurs mainly with chordee (a congenital defect that results in ventral curvature of penis). Congenital defects, epispadias, and hypospadias (congenital defect in which the meatus opens on the underside of the penis) cause displacement of the meatus. d. and e. Painless swelling that is unilateral with a hard, fixed nodule may indicate a cancerous mass. An extremely sensitive, enlarged testicle may indicate a testicular torsion (twisting). Swollen, indurated, tender epididymis indicates epididymitis (inflammation). Warm scrotal skin, tenderness, and an acute onset of swelling indicates orchitis (inflammation of the testes) that is associated with mumps. Enlarged, reddened scrotum with taut skin and nonpalpable contents is scrotal edema. A large pear-sized mass in the scrotum (hydrocele) causes the skin to stretch with a shiny, erythematous appearance from the accumulation of fluid between the two layers of the tunica vaginalis. A bluish discoloration of the scrotal mass that disappears with supine positioning is a varicocele. Undescended testicle (cryptorchidism) is usually unilateral. The testicle remains in the inguinal canal. f. Provides for early detection and treatment of testicular cancer.

(continues)

TABLE 27-19 (continued)
Assessment of Male Genitalia, Anus, and Rectum: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>2. Inspect and palpate the inguinal and femoral areas with client standing.</p> <ol style="list-style-type: none"> Instruct the client to strain down. Observe for bulges. Begin palpation on the client's right side. <ol style="list-style-type: none"> Using your right hand, invaginate (telescope) loose scrotal skin with index finger. Follow spermatic cord upward to opening of external inguinal ring. Ask client to cough or strain down. If mass is present, it will touch your finger. Repeat palpation on client's left side with your left hand. <i>Inguinal area is smooth, free from swelling or bulges.</i> <p>3. Examine the anal and rectal area with the client in a side-lying position. Spread the buttocks with your nondominant hand.</p> <ol style="list-style-type: none"> Inspect sacrococcygeal and perineal areas. Observe for excoriation, rashes, inflammation, and nodes. Palpate any nodules for tenderness. Lubricate gloved index finger of dominant hand. Instruct client to strain down while inspecting anus for hemorrhoids, fissures, excoriation, and growths. As client strains down, place pad of index finger over anus. As sphincter relaxes, insert finger pad into the anal canal, pointing toward umbilicus. Note sphincter tone, tenderness, or nodules. Insert finger further and palpate as much of rectal wall as possible in sequence (right lateral, posterior, left lateral surfaces), noting nodules, irregularities, or undue tenderness. Palpate surface of prostate gland (lateral lobes and median sulcus). Extend fingerpad above prostate gland and instruct client to strain down. Note size, shape, consistency, and mobility of prostate. Withdraw finger and wipe anal area. <i>Perineum and sacrococcygeal area is smooth, intact, and free of feces and mucus. Anal mucosa is deeply pigmented, coarse, moist, and hairless. Anal opening should be closed. Rectal sphincter has good tone, and rectal wall is smooth. Prostate gland is small (about the size of a chestnut), smooth, mobile, and median sulcus is palpable.</i> 	<p>2. Oval swelling at the pubic tubercle just above the inguinal ligament indicates an inguinal hernia (portions of the bowel or omentum protrude through the external inguinal ring). A mass medial to the femoral vessels and inferior to the inguinal ligament is indicative of a femoral hernia (portions of the bowel or omentum protrude through the femoral wall).</p> <p>3. Fissure or tear results from trauma or abscess. Venous prominence of anal area indicates external hemorrhoids. A soft, nontender, enlarged prostate may reveal benign prostatic hypertrophy that occurs with the loss of androgens (e.g., as with aging). Firm, hard, or indurated nodules on prostate may indicate acinar adenocarcinoma. A firm, tender, or fluctuant mass may reveal a prostatic abscess that has a high occurrence with diabetes mellitus clients and is caused mainly by <i>Escherichia coli</i>. A tender, warm prostate may indicate acute bacterial prostatitis associated with a bladder infection (e.g., <i>E. coli</i>).</p>

(From Estes, M. E. Z. [2002]. *Health assessment and physical examination*. Albany, NY: Delmar Publishers.)

Musculoskeletal System

The musculoskeletal system provides clients with the ability to maintain and change their position in response to both internal and external stimuli. Muscle tone and bone strength allow the client to maintain an upright and erect position. The musculoskeletal system consists of bones, joints, skeletal muscles, and supportive connective tissue (Figure 27-55).

Inspection, palpation, range of motion (ROM), and muscle testing are performed on the major skeletal muscles and joints by comparing paired muscles and joints. Table 27-20 presents the specific areas of the musculoskeletal system to be examined and the normal and key findings of this assessment. This table is not meant to be a complete examination to assess complaints or musculoskeletal disease.

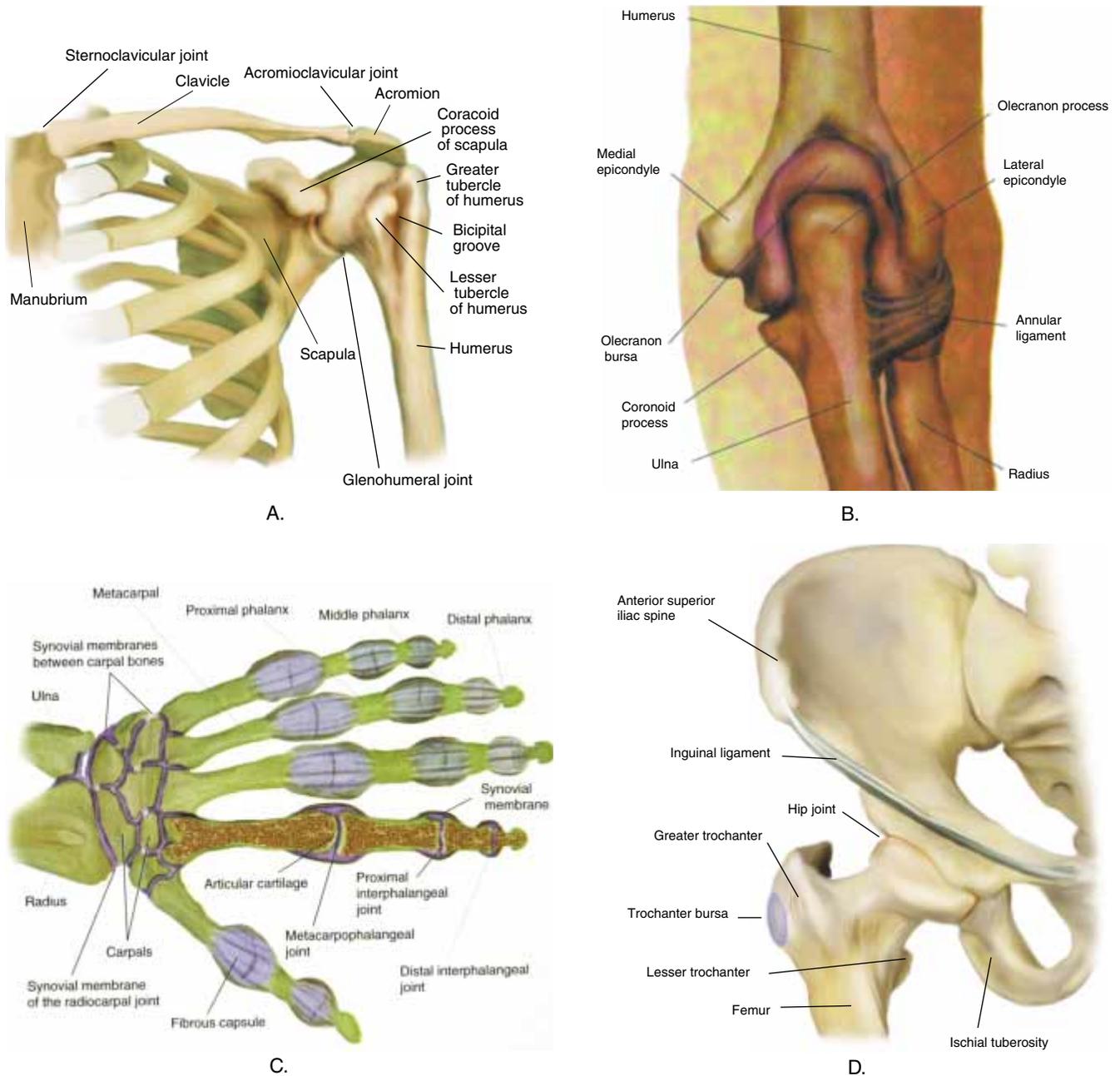


Figure 27-55 The Musculoskeletal System: A. Shoulder; B. Elbow; C. Wrist and Hand; D. Hip.

A complete musculoskeletal examination requires the full assessment of range of motion. A **goniometer** is a protractor with two movable arms (Figure 27-57) used to measure the angle of a skeletal joint during range of motion.

Skeletal muscles provide contour for the body and promote joint mobility. Muscle contour is affected by the exercise and activity patterns of the client. **Hypertrophy** refers to an increase in muscle size and shape due to an increase in muscle fiber. **Atrophy** refers to thin, flabby muscles due to a reduction in muscle size and shape. Increased muscle tone (**hypertonicity**) causes resistance with joint movement. **Hypotonicity** refers to a flabby muscle with poor tone.

Joints are normally nontender and move freely. **Arthritis** is an inflammation of the joints that causes

pain and swelling. Degenerative joint disease or **osteoarthritis** (the most common type of degenerative arthritis, in which the joints become stiff and tender to touch) causes the joints to undergo degenerative changes. ROM and activities of daily living are compromised by the loss of joint mobility. Crepitus is often palpated in joints affected by degenerative joint disease.

Neurologic System

A complete neurologic examination includes an assessment of mental status, sensation, cranial nerves, motor functioning, cerebellar function, and reflexes. See Chapter 36 for a complete discussion of cranial nerve

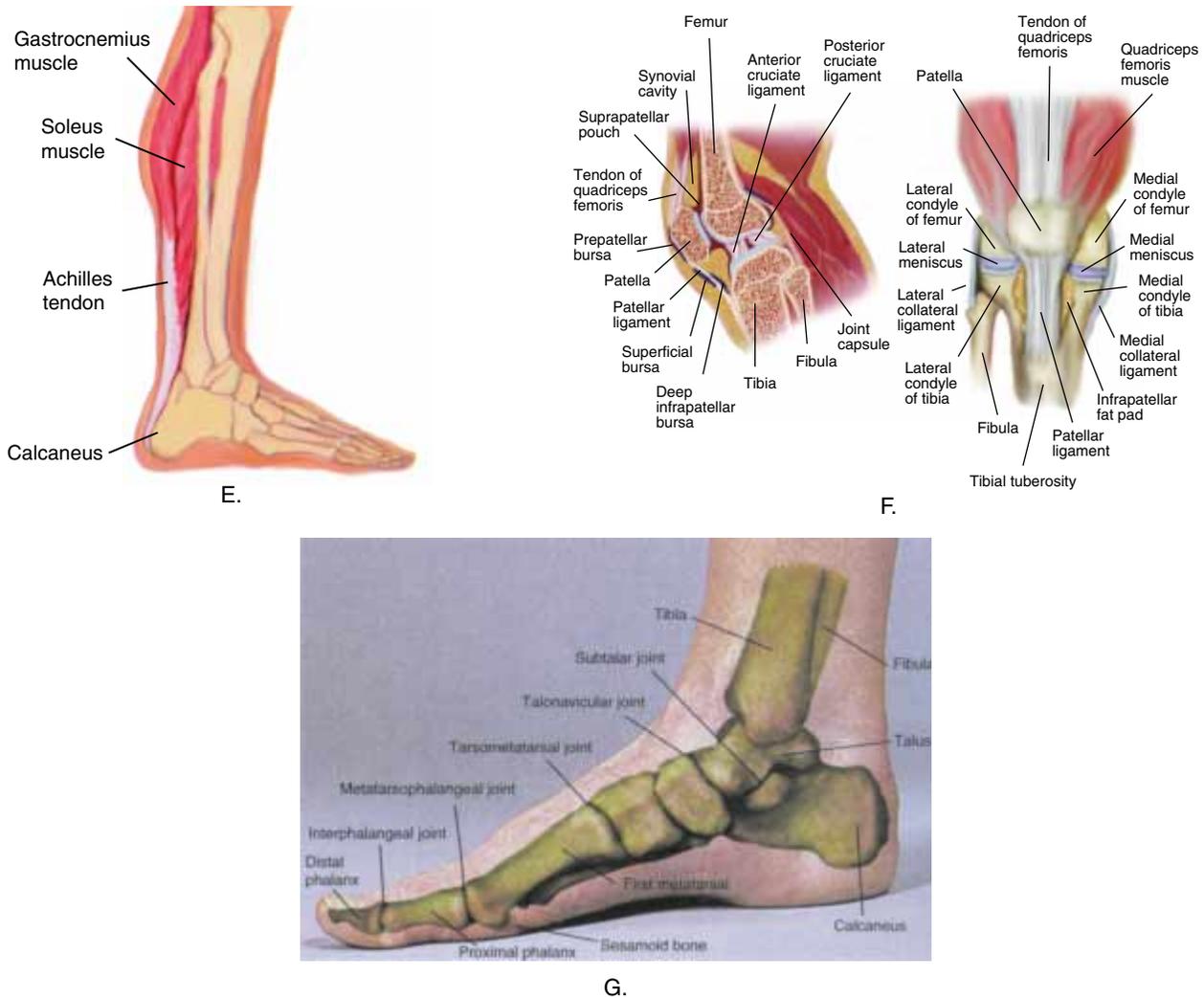


Figure 27-55 (continued) The Musculoskeletal System: E. Leg; F. Knee; G. Ankle and Foot.

TABLE 27-20
Assessment of Musculoskeletal System: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>Inspect and Palpate</p> <p>Place client in a sitting position to provide comfort.</p> <p>1. Assess the head and neck.</p> <p>a. Ask client to open mouth as you apply light pressure with fingerpads of dominant hand 2–3 inches away from the temporomandibular joint. Listen for crepitation and note any limitation of range of motion of jaw.</p> <p>b. Inspect neck, noting symmetry, deformities, and abnormal posture.</p> <p>c. Palpate cervical spine, paravertebral muscles, and trapezii for tenderness.</p> <p>d. Assess ROM of neck. <i>A click occurs when mouth opens. Lower jaw protrudes without deviating to the side and moves 1 to 2 cm with lateral movement. Head and neck are erect and straight. Alignment is straight in the cervical spine. Movements done with ease.</i></p>	<p>1. a. Tenderness, limited range of motion (ROM), and crepitus reveal temporomandibular joint dysfunction that occurs secondary to arthritis, malocclusion, dislocation, poorly fitting dentures, and myofascial dysfunction.</p> <p>b. Lateral tilting of the head and neck indicates degenerative joint disease.</p> <p>c. Aching pain and tightness of muscles may be associated with chronic postural strain, tension, or depression.</p> <p>d. Pain and limited movement may be caused by herniation of a cervical intervertebral disc, arthritis, or degenerative joint disease.</p>

(continues)

TABLE 27-20 (continued)
Assessment of Musculoskeletal System: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>2. Assess hands and wrists.</p> <p>a. Inspect for swelling, redness, nodules, deformity, or muscular atrophy.</p> <p>b. Test ROM.</p> <p>c. Assess strength of hand grasp.</p> <p>(1) Place your dominant index and middle fingers in the client's dominant hand and your nondominant index and middle fingers in the client's nondominant hand.</p> <p>(2) Instruct the client to squeeze your fingers as hard as possible.</p> <p>(3) Release grasp on client's hands.</p> <p>d. Palpate medial and lateral aspects of each interphalangeal joint between your thumb and index finger. Note tenderness, bony enlargement, swelling, or bogginess.</p> <p>e. Use your thumb to palpate the metacarpophalangeal joints, just distal to and on each side of knuckles.</p> <p>f. Palpate each wrist joint with your fingers underneath the client's hands and your thumbs on the dorsum of client's hand. <i>Move your thumbs from side to side. Fingers, hands, and wrists are straight. Joints are smooth, movement is easy, and strength is felt on grasp.</i></p> <p>3. Assess elbows.</p> <p>a. Support the client's forearm, elbow partially flexed:</p> <p>(1) Inspect and palpate each elbow, extensor surface of ulna, and olecranon process. Note tenderness, swelling, or nodules.</p> <p>(2) Palpate both sides of olecranon groove for tenderness or swelling.</p> <p>(3) Palpate the lateral epicondyle for tenderness.</p> <p>b. Assess ROM. <i>Elbows are at the same height and symmetrical in appearance. Movements should be done with ease.</i></p> <p>4. Assess shoulders.</p> <p>a. Inspect anterior shoulder and girdle for symmetry. Note swelling, atrophy, or deformity.</p> <p>b. Inspect and palpate scapulae and related muscles posteriorly.</p> <p>c. Palpate the following areas on each side and note tenderness:</p> <p>(1) Sternoclavicular joint</p> <p>(2) Acromioclavicular joint</p> <p>(3) Shoulder</p> <p>(4) Biceps groove</p> <p>(5) Greater tubercle of humerus</p> <p>d. Assess ROM. <i>Shoulders are equal in height, and movements should be done with ease.</i></p>	<p>2. a. Hard, painless nodules on the dorsolateral aspects of the distal interphalangeal joints (Heberden's nodes) are the main sign of degenerative joint disease or osteoarthritis.</p> <p>b. Flexion contracture that affects the little, ring, and middle fingers (Dupuytren's contracture) may limit full extension of the fingers. Limited movement of all fingers is associated with arthritis.</p> <p>c. Weakness of opposition of thumb and ipsilateral finger against resistance indicates median nerve disorders.</p> <p>d. Enlargement of interphalangeal distal joints is associated with degenerative joint disease. Bony enlargement with tender, swollen interphalangeal proximal joints is associated with acute rheumatoid arthritis.</p> <p>e. Painful, swollen, and boggy metacarpophalangeal joints, with ulnar deviation of deformed fingers, are associated with chronic rheumatoid arthritis.</p> <p>f. Bilateral swelling of wrist suggests rheumatoid arthritis. Round, nontender swelling near the tendon sheaths or joint capsules that is more prominent on the dorsum of the hand and wrist when flexed is a ganglia (cystic growth).</p> <p>3. Painful, asymmetrical elbow with forearm out of alignment is associated with a dislocation or subluxation of the elbow. Red, warm, swollen, and tender olecranon process indicates arthritis. A boggy, soft, or fluctuant swelling with tenderness in the grooves between the olecranon process and the epicondyles on either side indicates a synovial inflammation. Localized tenderness and pain during ROM indicate epicondylitis (inflammation of muscle tissue surrounding elbow) that results from repetitive motion (e.g., swinging a racquet, tennis elbow).</p> <p>4. Increased outward prominence of scapula is indicative of a serratus anterior muscle injury or weakness. Painful, decreased movement with swelling and asymmetry are associated with degenerative joint disease, arthritis, or injury, which may trigger bursitis (an inflammation of the bursa). Pain with swelling at the distal end of clavicle is associated with an acromioclavicular joint separation (separated shoulder). Shoulder subluxation and dislocation are common athletic injuries that result when the glenohumeral joint pops out of the socket.</p>

(continues)

TABLE 27-20 (continued)
Assessment of Musculoskeletal System: Normal and Key Findings

Area of Assessment/Normal Findings	Key Findings
<p>5. Assess feet and ankles with client in a supine position.</p> <ol style="list-style-type: none"> Inspect for swelling, calluses, corns, nodules, or deformity. Palpate anterior surface of ankle joint. Note tenderness, bogginess, or swelling. Palpate the Achilles tendon for nodules. Palpate metatarsophalangeal joints and metatarsal head in sole of each foot, compressing joint between thumb and finger for tenderness. Assess ROM. <i>Foot is in alignment with lower leg.</i> <p>6. Assess knees.</p> <ol style="list-style-type: none"> Inspect for contour, alignment, and deformity; atrophy of quadriceps muscles; and loss of normal hollows around patella. Palpate suprapatellar pouch on each side of quadriceps. Note tenderness, thickening, or bogginess. Compress suprapatellar pouch. Palpate each side of patella over joint space and near femoral epicondyles for structural abnormalities, tenderness, thickening, or edema. <i>Knees are in alignment with each other and do not protrude medially or laterally.</i> <p>7. Assess hips and spine with the client in a standing position.</p> <ol style="list-style-type: none"> Inspect for symmetry of the iliac crests and buttocks. Observe the client's posture and gait. Note position of trunk in relation to legs; foot drop; shuffling or limp; cervical, thoracic, and lumbar curves. Place client in supine position and palpate the hips (Figure 27-56). Test ROM. <i>Iliac crests and buttocks are symmetrical with each other. Stance is upright, with parallel alignment of hips and shoulders. Gait is natural, with arms swinging freely at sides and head leading the body. Spine has a cervical concavity, thoracic convexity, and lumbar concavity.</i> 	<p>5. Nontender thickening of skin on sole of foot is a callus, which is caused by pressure. Painful, conical thickening of skin over bony prominences is a corn (also caused by pressure). Painful, swollen, red, and warm first metatarsophalangeal joint usually indicates acute gouty arthritis. Ankle pain, decreased ROM, and crepitation occur with a sprain or fracture secondary to injury.</p> <p>6. Bilateral inward deviation toward midline of the knees is genu valgum (knock knees). Bilateral outward deviation away from the midline is genu varum (bow legs). Thickening, bogginess, or swelling indicates synovial effusion (excessive synovial joint fluid).</p> <p>7. Unequal iliac crests and lateral curvature of the thoracic or lumbar vertebrae is scoliosis. The chin tilted downward onto the chest, with abdominal protrusion, indicates kyphosis (excessive convexity of the thoracic spine). Excessive concavity of the lumbar spine is lordosis.</p>



Figure 27-56 Palpation of the Hips

(From Estes, M. E. Z. [2002]. *Health assessment and physical examination*. Albany, NY: Delmar Publishers.)

function. Clients with minor or intermittent neurologic symptoms may require only a screening assessment, as outlined in Table 27-21.

Mental Status

The mental status assessment should be done during the interview and health history. A complete assessment should be performed if the client exhibits any signs of neurologic deficit (see the display).

Physical Appearance and Behavior

Pertinent information relative to mental status is assessed by observing the client's posture and movements, dress and grooming, facial expressions, and

affect. The nurse should observe the client's ability to wait patiently. Note the gait and posture (relaxed, slumped, or stiff).

The client should appear relaxed but with the appropriate amount of concern regarding the assessment. The client should exhibit an erect posture, smooth gait, and symmetrical body movements.

Dress and grooming are influenced by the client's economic status, age, home situation, and cultural background. Information obtained from the health history assists the nurse in determining appropriate dress and grooming for each client. It is also helpful to ask clients directly about their grooming routines and clothing choices.

Facial expressions should be symmetric and appropriate to the content of the conversation. Facial expres-



Figure 27-57 Use of Goniometer to Measure Joint ROM

NEUROLOGIC DEFICITS REQUIRING A COMPLETE ASSESSMENT

- Known brain lesion (stroke, tumors, trauma)
- Suspected brain lesion (new seizures, headaches, behavioral changes)
- Memory deficits
- Confusion
- Vague behavioral complaints (by significant others if client unaware or denies behavioral changes)
- Aphasia
- Irritability
- Emotional lability
- Change in level of consciousness

sions may demonstrate anxiety or depression. The nurse should observe the client's verbal and nonverbal behaviors and note if the client's affect appears labile, blunted, or flat.

TABLE 27-21
Neurologic Screening Assessment

Area of Assessment	Assessment Parameter	Outcome Findings
Mental status/level of consciousness	Note general appearance, affect, speech content, memory, logic, judgment, and speech patterns during the health history. Perform the Glasgow Coma Scale (GCS) (see Chapter 36) with motor assessment component and pupil assessment.	If any abnormalities are evident, perform a full mental status assessment. If the GCS < 15, perform a full assessment of mental status. If motor assessment is abnormal or asymmetrical, perform a complete motor and sensory assessment.
Sensation	Assess pain and vibration in the hands and feet with light touch on the limbs.	If deficits are identified, perform a complete sensory assessment.
Cranial nerves (CNs)	Assess CN II, III, IV, VI: visual acuity, gross fields, funduscopy, pupillary reactions, and extraocular movements. Assess CN VII, IX, X, XII: facial expression, gross hearing, voice, and tongue.	If any abnormalities exist, perform complete assessment of all 12 CNs.
Motor system	Assess muscle tone and strength, abnormal movements, and grasps.	If deficits are noted, perform a complete motor assessment.
Cerebellar function	Observe the client's gait and ability to walk heel-to-toe and to perform shallow knee bends. Perform Romberg's test: ask the client to stand erect, feet together and arms at side, first with eyes open, then closed. The nurse should stand close to the client to catch the client in the event of a fall. Note the client's ability to maintain balance with eyes open and closed for 20 seconds with minimum swaying.	If any deficits exist, perform a complete cerebellar assessment.
Reflexes	Assess the muscle stretch reflexes and the plantar response.	If an abnormal response is elicited, perform a complete reflex examination.

Communication

Communication skills should be assessed throughout the entire interview, health history, and physical examination. The client should be able to produce spontaneous, coherent speech with an effortless flow and normal inflections, volume, pitch, articulation, rate, and rhythm. The message should make sense. Comprehension of language should be intact, and the client's ability to read and write should be commensurate with educational level.

Aphasia is an impairment of language functioning that results from injury to the cortex. Aphasia is classified as sensory (receptive), motor (expressive), or global (mixed sensory and motor). In receptive aphasia, auditory comprehension is impaired as well as the content of speech. The client is unaware of the deficits, and his ability to name people and objects is severely impaired. With expressive aphasia, speech is slow and hesitant, the client has difficulty selecting and organizing words, and writing is impaired. Phrases are repeated. Oral and written comprehension are severely impaired with global aphasia.

Level of Consciousness

Consciousness is the level of awareness of the self and the environment. Conscious behavior requires arousal, or wakefulness, and awareness, or cognition and affect. Awareness is a higher-level function of the cerebral cortex that includes judgment and thinking, which are usually assessed as part of the cognitive assessment.

The **Glasgow Coma Scale** (GCS) is an international scale used in grading neurologic responses to determine the client's level of consciousness; see Chapter 36 for a detailed discussion.

Cognitive Abilities and Mentation

Assessment of cognitive function includes testing for attention, memory, judgment, insight, spatial perception, calculation, abstraction, thought process, and thought content. See Chapter 36 for a complete discussion about assessment of these abilities.

Sensory Assessment

Sensation should be tested early in the neurologic assessment because of the detail involved and the need for client cooperation. If the client becomes fatigued, the findings may be unreliable. The assessment is divided into three sections:

- Exteroceptive sensations: superficial sensations that originate in the sensory receptors in the skin and mucous membranes (light touch, pain, heat, and cold)
- Proprioceptive sensations: deep sensations that originate in the sensory receptors in the muscles, joints, tendons, and ligaments (motion, position, and vibration sense)
- Cortical sensations: sensations that compose cerebral integration and discrimination abilities—**stereognosis**

(ability to identify objects by manipulation and touch); **graphesthesia** (ability to identify numbers, letters, or shapes drawn on the skin); two-point discrimination (a test to determine at a given site how close two points can be brought together before being felt as one); and **extinction** (ability to discriminate the points of distance when two body parts are simultaneously touched)

The sensory **dermatome map** (cutaneous area whose sensory receptors and axons feed into a single dorsal root of the spinal cord) is used to assess the major sensory nerves (Figure 27-58). The map of dermatomes is helpful in identifying the areas of pain and altered sensation. Although several dorsal roots may receive inputs from a single dermatome, the map is helpful in identifying where a neurologic lesion may exist. For example, pain localized in the posterior area of the neck would suggest a possible lesion in the third cervical spinal cord segment.

The assessment is carried out with the client's eyes closed to note the client's ability to perceive the sensation. The nurse should observe the client's reactions by watching for facial grimacing or withdrawal of the stimulated extremity. Compare the client's sensation on the corresponding areas bilaterally. The nurse should note

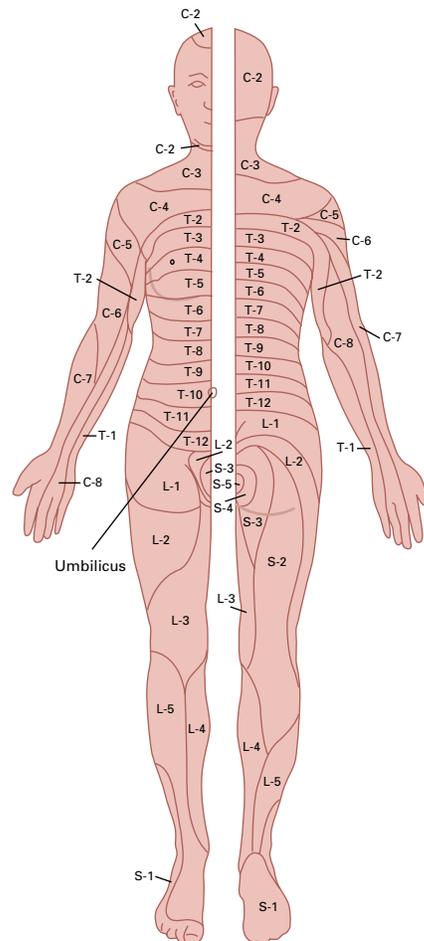


Figure 27-58 Dermatome Map

the proximal to distal sensory differences on all four extremities, evaluate whether any sensory deficits follow a dermatome distribution, and map the borders of any area exhibiting changes in sensation.

Cranial Nerves Assessment

A complete assessment of the 12 cranial nerves is necessary for a baseline assessment, if a tumor of a specific cranial nerve is suspected, or when periodic assessment is required after surgery or radiation treatments. An abbreviated cranial nerve assessment is an integral part of a neurologic screening as presented in Table 27-21.

Pupil assessment (cranial nerve III, oculomotor) is included in the screening assessment and is tested with the trochlear and abducens (cranial nerves IV and VI) because all three cranial nerves supply the muscles of the eye, as previously discussed in Table 27-13.

Motor Assessment

The assessment of the motor system involves testing for muscle size, tone, and strength under voluntary movements (see Table 27-20). Cerebellar assessment can be done either with motor testing or separately as follows.

Cerebellar Assessment

Cerebellar assessment includes observation of coordination, station or balance, and gait. Cerebellar muscular activity requires the motor coordination of various muscle groups to execute smooth, precise, and harmonious movements. Coordination is an integrated process that involves complicated neural integration of the motor and premotor cortex, basal ganglia, cerebellum, vestibular system, posterior columns, and peripheral nerves.

Coordination

Equilibratory coordination is concerned with maintenance of an upright stance and depends on the vestibular, cerebellar, and proprioceptive systems. Nonequilibratory coordination is concerned with smaller movements of the extremities and involves the cerebellar and proprioceptive mechanisms.

To test coordination the nurse should position the client comfortably with eyes open. Clients who wear glasses should be wearing their glasses before coordination is assessed. Instruct the client to first touch the index finger to the nose, then to alternate rapidly with the index finger of the opposite hand. Ask the client to close her eyes and continue to rapidly touch her nose with alternate index fingers. Tell the client to open her eyes and ask her to touch her finger to her nose and to touch the nurse's index finger, which is held about 18 inches away from the client. The test is repeated with the client using the opposite hand. Throughout testing, the nurse should observe for intention tremor or overshooting of the client's finger.

To assess rapid alternate movements of the upper extremities, ask the client to alternately pat her knees with rapid supinating and pronating of the hands. Test the lower extremities for rapid alternating movement by asking the client to rapidly extend the ankle ("tap your foot") and to place the heel just below the knee on the shin of the opposite leg and slide it down to the foot.

The client should be able to rapidly alternate touching finger to nose and moving finger from nose to the nurse's finger in a coordinated fashion. Also, the client should be able to perform alternating movements in a purposeful, rapid, coordinated manner. The client should demonstrate the ability to purposefully and smoothly run her heel down the shin.

Station and Gait

The performance of Romberg's test is described in Table 27-21. A positive Romberg sign exists if the client becomes unsteady and tends to fall with the eyes closed.

The assessment of gait begins when the client enters the room and continues throughout the examination. The nurse must consider the client's age, activity level, and degree of alertness. The tandem walk is tested by having the client walk in a straight line touching the ground heel-to-toe. The arms should be held at the side and the eyes should be open. Note the client's posture and ability to maintain balance. Posture should be upright with a narrow base and the gait smooth with arms swinging opposite the movement of the legs. Heel-to-toe walk should be in a straight line without losing balance.

Reflex Assessment

A reflex action is a specific response to an adequate stimulus that occurs without conscious control. The stimulus can occur in a joint, muscle, or skin and is transmitted through the sensory and motor pathways of the reflex arc and specific spinal cord segments. Each muscle contains a muscle spindle (small sensory unit) that controls muscle tone and detects changes in the length of the muscle fibers.

To elicit a muscle stretch reflex, the nurse should briskly tap the client's tendon with a reflex hammer, thereby stretching the muscle and tendon and lengthening the spindle. The spindle transmits the signal along the afferent neurons to the dorsal roots where it synapses. Following synapse in the cord, the anterior motor neurons trigger an impulse on efferent neurons to the endplates of the skeletal muscle, causing the reflex response.

Normal reflexes are classified into two main categories: muscle stretch (deep tendon) reflexes (DTR) and superficial (cutaneous) reflexes. When testing reflexes, clients should be relaxed and positioned so that their extremities are symmetrical. The nurse should hold the reflex hammer loosely between the thumb and index finger and strike the tendon with a brisk motion from the wrist. The reflex hammer should make contact with the correct point on the tendon in a quick, direct manner.

TABLE 27-22
Assessment of Common Deep Tendon Reflexes

Type	Assessment	Normal Reflex
<p>Biceps</p> 	<p>Flex client's arm between 45° and 90°. Place your thumb firmly on the biceps tendon just above the crease of antecubital fossa and tap thumb with reflex hammer.</p>	Flexion of arm at elbow
<p>Triceps</p> 	<p>Flex client's arm between 45° and 90°. Tap triceps tendon just above elbow.</p>	Extension of elbow
<p>Brachioradialis</p> 	<p>Flex client's arm 45° and place in lap with the arm in semipronation. Tap brachioradialis tendon on thumb side of wrist.</p>	Flexion of forearm
<p>Patellar</p> 	<p>Ask client to sit in a chair or on edge of bed with legs hanging freely or in a supine position with knee flexed. Tap patellar tendon just below the patella.</p>	Extension of leg below the knee

(continues)

TABLE 27-22 (continued)
Assessment of Common Deep Tendon Reflexes

Type	Assessment	Normal Reflex
Achilles 	Ask client to sit with feet dangling and partially dorsiflexed or in a supine position with leg flexed at knee and thigh externally rotated. Tap the Achilles tendon just above heel.	Plantar flexion of foot
Plantar (Babinski) 	Position the client's ankle firmly against the bed and slowly stroke client's sole with the handle of the reflex hammer.	Bending of the toes downward

REFLEX GRADING SCALE

Scale	Response
0	Absent
+	Present but diminished
++	Normal
+++	Mildly increased but not pathologic
++++	Markedly hyperactive; clonus may be present

Table 27-22 discusses the assessment of common DTRs: biceps, triceps, brachioradialis, patellar, Achilles, and plantar (Babinski). When testing the reflexes the nurse should observe the degree and speed of response of the muscle after the reflex hammer makes contact. Grading of reflexes is presented in the accompanying display. The reflex responses between the right and left sides should be compared. The normal response to taps in the correct area should elicit a brisk (++ or +++) contraction of the muscles involved.

Care of the Client after the Examination

A physical examination is taxing on the client, especially if the complete assessment is performed in one session.

The nurse should assess the client's needs after this process and respond appropriately. The nurse should also dispose of soiled articles in the proper container, clean and store equipment appropriate for the setting, and put all furniture back in its original place. Thanking the client for cooperating during the physical examination demonstrates concern and caring.

Home or Outpatient Setting

If the physical examination is conducted in the home environment, the nurse should acknowledge the client's need to rest before dressing. The client should be offered assistance with either toileting or dressing. If a family member is in the home, the nurse should notify that person that the assessment is completed. If the client is home alone the nurse should verify that the client is capable of caring for his or her own needs before leaving. The nurse should telephone the client within 2 hours after leaving to answer any questions about the examination.

In an outpatient setting, assess whether the client needs assistance in dressing. After the client is dressed, discuss the experience by inviting questions and comments. Listen carefully to the client's remarks and provide information regarding the assessment. The nurse should make certain that the client is capable of driving home or should secure safe transportation if needed.

Acute or Extended Care Setting

Nursing students should check with their instructors or supervisors before conducting the assessment to ascertain the amount of information that they can share with the client during and after the examination. This varies in different agencies and according to the admitting physician. It is best to secure this information before beginning the examination.

After concluding the assessment, the nurse should dispose of soiled articles and clean and store the equipment. The bed should be returned to a low position, side rails up, and call light in place. Quietly check on the client several times within the 2 to 3 hours after assessment to monitor the client's condition.

Data Documentation

Health care agencies have specific forms for recording the assessment findings. Review these forms before initiating the assessment and record the findings on the appropriate form as the data are gathered. This practice ensures accuracy in documentation of findings. Some data (e.g., vital signs) may need to be recorded on two or more forms.

THINK ABOUT IT

Physical Examination: Benefit and Implications

With the emphasis on cost containment in health care and the expanding roles of nurses as case managers for managed care companies, what do you think are the implications for accurate assessment data? Can you relate the health care implications of preventive nursing to assessment and cost controls? How does performance of thorough physical examination ensure the holistic care of the client?

Reporting information is a critical part of documentation. If findings that require immediate attention—for example, bright red blood or a change in the nature and character of a previous symptom—are detected, report the findings to the nursing supervisor and document in the medical record the actions taken.

Documentation should reflect the objective data obtained from the examination regarding the client's current condition. Avoid phrases such as the *client appears lethargic*; rather, record the GCS score. If the data identify areas in which the client is at risk, such as a 35-year-old woman with a family history of breast cancer, use the appropriate resources for prevention; for example, BSE and the American Cancer Society's guidelines for early detection of breast cancer. Likewise, abnormal findings should be addressed in planning the nursing care and client outcomes.

KEY CONCEPTS

- Baseline values establish the norm; variations from normal may indicate possible problems with the client's health status.
- The assessment of physiological functioning provides specific data regarding the client's current condition.
- Thermoregulation is the body's physiological function of heat regulation to maintain a constant internal body temperature.
- Hemodynamic regulation is the body's physiological function of blood circulation to maintain an appropriate environment in all the tissue fluids.
- The pulse is caused by the stroke volume ejection and distension of the walls of the aorta, which creates a pulse wave as it travels rapidly toward the distal ends of the arteries.
- Blood pressure is the measurement of pressure pulsations exerted against the blood vessel walls during cardiac systole and diastole. It is measured in terms of millimeters of mercury (mm Hg).
- There are several factors that cause changes in one or more of the vital signs: age, sex, exercise and metabolism, anxiety and stress, postural and diurnal variations, hormones, pain, medications, and alterations in physiological functions.
- The normal values and variations in vital signs measurement are usually based on age.
- All pieces of equipment used to measure the vital signs and perform a physical assessment should be maintained to function accurately.
- Clinical data regarding the efficacy of blood circulation to an extremity are obtained by assessing all the characteristics (rate, quality, rhythm, and volume) of the peripheral pulses.
- When assessing ventilation, ascertain the rate, depth, and rhythm of ventilatory movement.
- Before checking a blood pressure, review the client's chart for brachial artery contraindications and make sure that the client has not exercised or eaten for the past 30 minutes.
- The physical examination provides a complete picture of the client's physiological functioning; when combined with a health and psychosocial assessment it forms a database to direct decision making.
- Because the client will experience some anxieties regarding the examination it is important for the nurse to keep the client informed while performing the examination.
- The primary purpose of draping the client is to prevent unnecessary exposure during the examination; feelings of embarrassment will elicit tension and restlessness and will decrease the client's ability to cooperate.
- The physical examination is done in a sequential, head-to-toe fashion to ensure a thorough assessment of each system; when you gain proficiency in per-

forming the physical examination, you will be able to integrate assessment into routine care.

- Assessment begins from the moment you come in contact with the client; data obtained from the health history will assist in identifying areas of alteration.
- Know the agency's policies relative to performing and documenting a physical assessment.
- Use the landmarks and visualize the internal organs when assessing the thorax, heart, and abdomen.
- The order of abdominal assessment is inspection, auscultation, percussion, and palpation because palpation and percussion can alter the bowel sounds.
- Nurses play a major role by teaching breast self-examination (BSE), testicular self-examination (TSE), and by supporting clients in achieving healthier lifestyles believed to decrease the risk factors of cancer.
- If you feel uncomfortable about assessing the genitalia you need to work through your own feelings about sexuality and reproduction before you can talk comfortably with the client; work through any reluctance you may have about discussing sexual situations.
- Reporting information is a critical part of documentation; if you assess findings that require immediate attention, report the findings to your supervisor and document your action in the medical record.
- Documentation should reflect the objective data obtained from the examination regarding the client's current condition.

CRITICAL THINKING ACTIVITIES

1. Ms. Reynolds is 33 years old; her vital signs measurements are: OT-37.0°C (98.6°F), P-96/min., R-22/min., and BP 144/90. Which of these measurements are outside the normal ranges?
2. You are assigned to care for Mr. Warren, a 77-year-old client in a long-term care facility. When you enter his room to take his vital signs, you note that the fan is on high speed and blowing directly over him. He is sweating, and the bed linens are damp. What type of reading would you expect to find when you take his temperature? Why is the fan on? What type of heat loss from the skin surface is being increased: radiation, conduction, convection, or evaporation?
3. Mrs. Gray is 55 years old and had a right mastectomy 9 months ago. What implications would the mastectomy have on your assessment (vital signs and examination)?
4. What hemodynamic function is compromised when the lips and nail beds have a bluish discoloration?
5. What normal sounds should you hear when you percuss the posterior aspect of the apex of the right lung?
6. Are bronchial breath sounds upon auscultation of the lung periphery normal?

7. What type of palpating technique should you use to assess an obese client or a client with large breasts?
8. Match the adventitious breath sound in Column A with the description that best describes it in Column B.

COLUMN A

- ___ 1. Fine crackle
- ___ 2. Coarse crackle
- ___ 3. Sonorous wheeze
- ___ 4. Sibilant wheeze
- ___ 5. Pleural friction rub
- ___ 6. Stridor

COLUMN B

- a. Moist, low-pitched crackling, gurgling sound of long duration
- b. Creaking, grating sound
- c. Crowing sound
- d. Dry, high-pitched crackling, popping sound of short duration
- e. Low-pitched snoring sound
- f. High-pitched musical sound

WEB RESOURCES

American Cancer Society
www.cancer.org
 American Heart Association
www.americanheart.org
 BreastCancer.Net
www.breastcancer.net

Chapter 28

Diagnostic Testing



If the nurse is an intelligent being, and not a mere carrier of diets to and from the patient, let her exercise her intelligence in these things.

—Nightingale (in Skretkowicz, 1992)

COMPETENCIES

1. Discuss the relevant client teaching guidelines for the care of the client before, during, and after diagnostic testing.
2. Describe the common specimen collection methods.
3. Describe common invasive and noninvasive diagnostic procedures.
4. Discuss nursing interventions for the common diagnostic procedures.

KEY
TERMS

agglutination	angiography	oliguria
agglutinin	disseminated intravascular coagulation	oral cholecystography
agglutininogen	Doppler	paracentesis
Allen test	echocardiogram	Papanicolaou test
amniocentesis	electrocardiogram	phagocytosis
analyte	electroencephalogram	phlebotomist
aneurysm	electrolyte	pneumothorax
angiography	endoscopy	polyp
anions	enzyme	port-a-cath
antibody	erythrocyte	predictive value
antigens	fluoroscopy	radiofrequency ablation
arteriography	general anesthesia	radiography
ascites	hematuria	red cell indices
aspiration	hemoconcentration	regional anesthesia
atherosclerotic plaque	hemoglobin electrophoresis	sensitivity
bacteremia	hemolysis	signal-averaged electrocardiography
barium	incidence	specificity
barium enema	intravenous pyelogram	spherocytes
barium swallow	invasive	stress test
biopsy	ketone	thallium
bronchography	late potentials	thrombus
cardiac catheterization	leukocytes	thoracentesis
cations	lipoproteins	transducer
central line	local anesthesia	trocar
cholangiography	lumbar puncture	T-tube
cholinesterase	lymphangiography	type and crossmatch
computed tomography	mammography	ultrasound
conscious sedation	magnetic resonance imaging	urobilinogen
contrast medium	myelography	venipuncture
culture	necrosis	venography
cystography	noninvasive	void
cytology	occult	
digital subtraction		

With the arrival of health care reform, reimbursement practices such as managed care, and medicolegal concerns, health care is redefining the importance of history taking and physical examinations with a decreasing reliance on diagnostic tests. In the last two decades, before reform acts, health care relied heavily on the use of diagnostic testing to determine the nature of the client's condition.

Health care providers are using the findings from a thorough history and physical to determine the need for diagnostic testing. The client's history and presenting symptoms determine which diagnostic procedures are necessary to formulate a medical diagnosis and the course of treatment. The challenge of cost-effective health care pushes practitioners to rely on basic assessment and to be selective with expensive diagnostic tests. To reflect the emphasis on cost containment, the nurse's role has changed from doing for the client to teaching clients to do for themselves. The role of the nurse is to teach the client, family, and significant others about the procedures involved with diagnostic testing, the steps to be taken in preparation for the specific test, and the care

that will follow the procedure. Although the primary focus is on teaching, the nurse may assist in performing various noninvasive and invasive procedures. Nurses must be aware of the implications of diagnostic testing so as to deliver appropriate nursing care to the client.

This chapter discusses the most common diagnostic tests. The terms *test* and *procedure* are used interchangeably throughout the chapter. The term *practitioner* is used in this chapter to refer to either the physician or other authorized prescribers. Most state boards of nursing allow advanced practice registered nurses to order and perform certain diagnostic tests. See Chapter 22 for a discussion of professional responsibility.

UNDERSTANDING DIAGNOSTIC TESTING

To understand the nature of diagnostic tests, nurses need to review anatomy and physiology. Knowing the anatomical and physiological functions of the body will assist nurses in relating certain diagnostic tests to specific disease processes.

NURSING TIP

Client Assessment and Diagnostic Testing

Mr. Simon, a 57-year-old man, goes to a primary care clinic for treatment of an infected ingrown toenail that continues to bleed when pressure is released. This is his first visit in 7 years. While performing the history and physical, the nurse practitioner learns that for the past 2 months Mr. Simon has had repeated colds with fever, fatigue, weakness, and a 20-lb weight loss. He has multiple bruises on his extremities and trunk. He complains of pain when his bones and joints are moved. The nurse practitioner orders a white blood cell differential. The staff nurse cleans the toenails and applies a pressure dressing.

What did Mr. Simon's physical and history and reveal? Why did the nurse practitioner order a white blood cell differential as opposed to a white blood cell count? What are the possible medical diagnoses for Mr. Simon's ailment? Infected ingrown toenail? Anemia? Diabetes? Or could it be something else? Relate the symptoms as presented in the history and physical to the physiological functions of white blood cells.

As you gain in nursing knowledge and clinical experience, you will be exposed to a wide range of diagnostic tests. As with Mr. Simon, always ask yourself "Why is this diagnostic test being done?" Answer the question of "why" from the relational perspective of the client's symptomatology and the physiological functions of the body's organs and tissues.

NONINVASIVE AND INVASIVE DIAGNOSTIC TESTING

Diagnostic tests are either noninvasive or invasive. **Noninvasive** means the body is not entered with any type of instrument. The skin and other body tissues, organs, and cavities remain intact. **Invasive** means accessing the body's tissue, organ, or cavity through some type of instrumentation procedure.

Nursing Care of the Client

Diagnostic testing is a critical element of assessment. See Chapters 6 and 27 for a complete discussion. Assessment data are used to formulate nursing diagnoses, a plan of care, and outcome measures in collabo-

NURSING ALERT

Diagnostic Testing: Safety Measures

Use Standard Precautions whenever performing invasive and noninvasive testing to protect your health and safety, as well as that of other health care providers and the client.

ration with the client. Ongoing client assessment and evaluation of the client's expected outcomes requires the incorporation of diagnostic findings.

Preparing a Client for Diagnostic Testing

The nurse plays a key role in scheduling and preparing the client for diagnostic testing. "The emphasis of pretest is on appropriate test selection, proper patient preparation, individualized patient education, and emotional support" (Fischbach, 2000, p. 9). When tests are not scheduled correctly, the client is inconvenienced. It may also delay interventions, which places the client's health status at risk. The institution is also at risk to lose money. Table 28-1 presents a sample protocol of the nursing care to prepare a client for diagnostic testing.

The nursing care contained in the protocol provides a systemic format, based on the nursing process, to prepare the client for most diagnostic studies. During the assessment of the client, make sure the client is wearing an identification band (Figure 28-1). The identification band is a key factor to ensure client safety in all health care settings.

Other key nursing measures to ensure client safety are to establish baseline vital signs, identify known allergies, and assess the effectiveness of teaching. In the ambulatory and outpatient centers, the nurse might have only one opportunity to assess and record the vital signs; it is



Figure 28-1 Nurse and client prepare for diagnostic testing.

TABLE 28-1
Protocol: Preparing the Client for Diagnostic Testing

<i>Purpose</i>	To increase the reliability of the test by providing client teaching on why the test is being performed, what the client can expect during the test, and the outcomes and side effects of the test To decrease the client's anxiety about the test and the associated risk
<i>Level</i>	Independent
<i>Supportive Data</i>	Increasing the client's knowledge promotes cooperation, enhances the quality of the testing, decreases the time required to perform the study with an outcome of increased cost-effectiveness. Proper physical preparation prevents delays.
<i>Assessment</i>	Check to be sure the client is wearing an identification band. Review the medical record for allergies and previous adverse reactions to dyes and other contrast media, a signed consent form, and the recorded findings of diagnostic tests relative to the procedure. Assess for presence, location, and characteristics of physical and communicative limitations or preexisting conditions. Monitor the client's knowledge of why the test is being performed and what to expect during and after testing. Monitor vital signs for clients scheduled for invasive testing to establish baseline data. Assess client outcome measures relative to the practitioner's preferences for preprocedure preparations. Monitor level of hydration and weakness for clients who are NPO (nothing by mouth), especially geriatric and pediatric populations.
<i>Report to Practitioner</i>	Notify practitioner of allergy, previous adverse reactions, or suspected adverse reaction following administration of drugs. Notify practitioner of any client or family concerns you were not able to alleviate.
<i>Interventions</i>	Clarify with practitioner if regularly scheduled medications are to be administered. The NPO status is determined by the type of test. Administer cathartics or laxatives as denoted by the test's protocol; however, there must be a specific practitioner order to give children and infants a laxative. Instruct clients who are weak, especially geriatric clients, to call for assistance to bathroom. Teach relaxation techniques, such as deep breathing and imagery. Establish intravenous (IV) access if necessary for procedure.
<i>Evaluation</i>	Evaluate client's knowledge of what to expect. Evaluate client's anxiety level. Evaluate client's level of safety and comfort. Monitor that someone will accompany a child to the department where the test is to be performed and remain with the child during the tests if not at risk of harmful exposure.
<i>Client Teaching</i>	Discuss the following with the client and family as appropriate to the specific test: <ul style="list-style-type: none"> • Explain reason for test and what to expect • An estimation of how long the test will take • NPO (If oral medication to be taken, how much water to drink) • Cathartics or laxative: how much, how often • Sputum: cough deeply, do not clear throat • Urine: voided, clean-catch specimen, time to collect • No objects (jewelry or hair clips) to obscure x-ray film • Barium: taste, consistency, aftereffects (stools lightly colored for 24–72 hours, can cause obstruction/impaction) • Iodine: metallic taste, delayed allergic reaction (itching, rashes, hives, wheezing and breathing difficulties) • Positioning during the test • Positioning posttest (e.g., angiography)—immobilize limb • Post-test, encourage fluids if not contraindicated
<i>Documentation</i>	Record the following in the client's medical record: <ul style="list-style-type: none"> • Practitioner notification of allergies or suspected adverse reaction to contrast media • Presence, location, and characteristics of symptoms • Teaching and the client's response to teaching • Response to interventions (client's outcomes)

important for the nurse to confirm that these findings are *normal values* for the client. To accurately assess the client's response to anesthetic agents and the procedure, the nurse has to compare the vital signs taken during and after the procedure with the baseline data.

The client needs to know what to expect during the procedure. Teaching can increase the client's level of cooperation and should decrease the degree of anxiety. The client's family should also know what will happen during the procedure and approximately how long the procedure normally lasts.

Reference is made to Table 28-1 throughout this chapter. This protocol provides you with the direction and guidance needed to plan nursing care. Nurses must also know the institution's protocols and procedures because these are not standardized in all practice settings.

Care of the Client During Diagnostic Testing

Although the care of the client needs to be individualized for a specific procedure, general guidelines for client care during a procedure are given in Table 28-2. Protocols are used to assist the nurse with client care.

Standard Precautions are initiated when exposure to body fluids presents a threat to the safety of the caregiver. Protective barriers, such as gloves and a gown, should be used during invasive procedures. The nurse is responsible for labeling any specimen with the client's name, room number (hospitalized clients), date, time, and source of the specimen. Some specimens may need to be taken immediately to the laboratory or placed on ice (e.g., arterial blood gases).

In order to promote the client's comfort and cooperation during diagnostic tests, nurses must consider the management of procedural pain. Although not all procedures are painful, advances in diagnostic and therapeutic studies have placed clients at risk for painful procedures. Clients who are repeatedly subjected to painful procedures without adequate analgesia become anxious and anticipate pain; if pain is experienced during one procedure, the client is reluctant to return for the same procedure or other tests. "Unrelieved procedural pain also can have adverse physiologic effects, even if the pain is temporary" (Pasero, 1998, p. 18).

Recognizing that diagnostic procedures are performed in various settings, intravenous conscious sedation (conscious sedation) is often used to manage pain during diagnostic testing.

Conscious sedation is a minimally depressed level of consciousness during which the client retains the ability to maintain a continuously patent airway and respond appropriately to physical stimulation or verbal commands (Fischbach, 2000). The nurse managing conscious sedation is usually functioning in an expanded role that requires additional education and demonstrated ability beyond basic education.

DIAGNOSTIC PROCEDURES THAT MAY REQUIRE ANALGESIA OR SEDATION

- Bone marrow aspiration or biopsy
- Cardioversion
- Endoscopy
- Lumbar puncture
- Paracentesis
- Placement of catheters, lines, and tubing
- Radiologic procedures (CT and MRI)
- Thoracentesis
- Tissue biopsies
- Venipuncture

Adapted from Pasero, C. L. (1998). Procedural pain management. *American Journal of Nursing*, 98(7), 19–20.

See the accompanying display for some procedures that may require analgesia or sedation.

Ongoing assessment of the client's status is required during the procedure. Always assess the patency of the client's airway, which may be compromised by the client's position, anesthesia, or the procedure itself. During an invasive procedure the nurse needs to monitor for signs and symptoms of accidental perforation of an organ (e.g., sudden changes in vital signs).

The nurse has additional responsibilities:

- Preparing the room (e.g., adequate lighting).
- Gathering and charging for supplies used during the procedure
- Testing the equipment to ensure it is functional and safe
- Securing proper containers for specimen collection

Practitioners usually have *preference cards* within the diagnostic testing area that specify the type of equipment to be used, the position to place the client, and the type of sedation or anesthesia.

Care of the Client After Diagnostic Testing

Nursing care postprocedure is directed toward restoring the client's prediagnostic level of functioning (Table 28-3). Nursing assessment and interventions are based mainly on the nature of the test and whether or not the client received anesthesia. Anesthesia can be administered in one of three ways:

- **Local anesthesia**—client loses sensation to a localized body part—spraying the back of the throat with lidocaine to decrease the gag reflex
- **Regional anesthesia**—client loses sensation in an area of the body—laparoscope for a tubal sterilization
- **General anesthesia**—client loses all sensation and consciousness—major surgical procedures

TABLE 28-2
Protocol: Care of the Client During Diagnostic Testing

<i>Purpose</i>	To increase cooperation and participation by allaying the client's anxiety and to provide the maximum level of safety and comfort during a procedure
<i>Level</i>	Interdependent
<i>Supportive Data</i>	Increasing the client's participation and comfort encourages relaxation of muscles to facilitate instrumentation. Proper preparation of the client ensures efficient use of time during the test and reliable results.
<i>Assessment</i>	Check the client's identification band to ensure the correct client. Review the medical record for allergies. Assess the preprocedure sedatives administered to the client before the administration of anesthesia during the procedure. Assess airway maintenance and gag reflex if a local anesthetic is sprayed into the client's throat. Assess vital signs throughout the procedure and compare with baseline data. Assess the client's ability to maintain and tolerate the prescribed position. Assess the client's comfort level to ensure the effectiveness of the anesthetic agent. Assess for related symptoms indicating complications specific to the procedure (e.g., accidental perforation of an organ).
<i>Report to Practitioner</i>	Notify the practitioner if the client has any concerns or questions that you were not able to resolve. Notify the practitioner if the client has family members present and where they are waiting during the procedure. Notify the practitioner when the client is positioned properly and the anesthetic agent has been administered to the client.
<i>Interventions</i>	Institute Standard Precautions or appropriate aseptic technique for the specific test. Report to all personnel involved with the test any known client allergies. Place client in the correct position, drape, and monitor to ensure that breathing is not compromised. Remain with the client during the administration of anesthesia. If the procedure requires the administration of a dye, ensure the client is not allergic to the dye; if the client has not received the dye before, perform the skin allergy test according to the drug manufacturer's instructions that accompany the medication. Maintain the client's airway and keep resuscitative equipment available. Assist the client to relax during insertion of the instrument by telling the client to breathe through the mouth and to concentrate on relaxing the involved muscles. Explain what the practitioner is doing so that the client will know what to expect. Label and handle the specimen according to the type of materials obtained and the testing to be done. Report to the practitioner any symptoms of complications. Secure client transport from the diagnostic area. Post-test in the diagnostic area: <ol style="list-style-type: none"> 1. Assist client to a comfortable, safe position. 2. Provide oral hygiene and water to clients who were NPO for the test if they are alert and able to swallow. 3. Remain with the client awaiting transport to another area.
<i>Evaluation</i>	Evaluate client's ventilatory status and tolerance to the procedure. Evaluate client's need for assistance. Evaluate client's understanding of what was performed during the procedure. Evaluate client's understanding of findings identified during the procedure. Evaluate client's knowledge of what to expect after the procedure.

(continues)

TABLE 28-2 (continued)
Protocol: Care of the Client During Diagnostic Testing

<i>Client Teaching</i>	<p>Discuss the following with the client and family as appropriate to the specific test:</p> <ul style="list-style-type: none"> • Explain what occurred during the procedure. • Answer questions and concerns of the client or family member. • Explain what to expect during the immediate recovery phase. • Explain what to report to the nurse during the immediate recovery phase.
<i>Documentation</i>	<p>Record in the client's medical record:</p> <ul style="list-style-type: none"> • Who performed the procedure • Reason for the procedure • Type of anesthesia, dye, or other medications administered • Type of specimen obtained and where it was delivered • Vital signs and other assessment data, such as client's tolerance of the procedure or pain/discomfort level • Any symptoms of complications • Who transported the client to another area (designate the names of persons who provided transport and place of destination)

See Chapter 30 for additional discussion of anesthesia.

The client is monitored closely for signs of respiratory distress and bleeding. Some diagnostic procedures require that the vital signs be measured every 15 minutes for the first hour, then gradually decreased in frequency until the client is stable (alert and vital signs within the client's normal range).

Some diagnostic tests require the use of medications that are excreted through the kidneys; the nurse monitors the client's intake and output for 24 hours. The client is taught how to monitor intake and output. Instruct the client to report **hematuria** (presence of blood in the urine). Clients receiving radioactive iodine must have their urine collected and properly discarded in a special container, according to agency policy for handling radioactive medical wastes.

When clients are discharged after diagnostic tests, they should receive written instructions. Most agencies have discharge forms for the nurse to document teaching regarding medications, dietary and activity restrictions, and signs and symptoms to be reported immediately to the practitioner. Clients may also need to have follow-up appointments made for them.

LABORATORY TESTS

Common laboratory studies are usually simple measurements to determine how much or how many **analytes**, (a substance dissolved in a solution, also called a solute) are present in a specimen. Laboratory tests are ordered by practitioners to:

- Detect and quantify the risk of future disease
- Establish and exclude diagnoses
- Assess the severity of the disease process and determine the prognosis
- Guide the selection of interventions

- Monitor the progress of the disorder
- Monitor the effectiveness of the treatment

Nurses are often the first to view results of laboratory studies and they need to know the terminology regarding laboratory tests: purpose, process, procedure, and normal test values. The clinical value of a test is related to (Fischbach, 2000):

1. **Specificity**—the ability of a test to correctly identify those individuals who do not have the disease
2. **Sensitivity**—the ability of a test to correctly identify those individuals who have the disease
3. **Incidence**—the prevalence of a disease in a population or community. the predictive value of the same test can be different when applied to people of differing ages, genders, and geographic locations.
4. **Predictive value**—the ability of screening test results to correctly identify the disease state—a true-positive correctly identifies persons who actually have the disease, whereas a true-negative correctly identifies persons who do not actually have the disease.

Laboratory test results are based on *normal range values*. Le Système International d'Unités (SI), the International System of Units, is an international normal range reference established for reporting laboratory results (Pagana & Pagana, 1999). For example, the SI reference range for reporting red blood cell count for a woman is 4.0 to $5.2 \times 10^{12}/L$, the conventional range would appear as 4,000,000 to 5,200,000/ mm^3 of blood.

Specimen Collection

The scheduling and sequencing of laboratory tests is an important function of the nurse. All tests requiring **venipuncture** (the puncturing of a vein with a needle to aspirate blood) are grouped together so that the client

TABLE 28-3
Protocol: Care of the Client After Diagnostic Testing

<i>Purpose</i>	To restore the client's prediagnostic level of functioning by providing care and teaching relative to what the client can expect after a test and the outcomes or side effects of the test
<i>Level</i>	Interdependent
<i>Supportive Data</i>	Increasing the client's participation and knowledge of expected outcome measures after a diagnostic test Proper postprocedure care and client teaching alerts the client to what signs and symptoms need to be reported to the practitioner.
<i>Assessment</i>	Check the identification band and call the client by name. Assess the client closely for signs of airway distress, adverse reactions to anesthesia or other medications, and other signs that may indicate accidental perforation of an organ. Assess body area(s) where a biopsy was performed for bleeding. Assess the client's color and skin temperature. Assess vascular access lines or other invasive monitoring devices. Assess the client's ability to expel air if air was instilled during a gastrointestinal test. Assess the client's knowledge of what to expect during the recovery phase.
<i>Report to Practitioner</i>	Notify the practitioner of any signs of respiratory distress bleeding or changes in vital signs; adverse reactions to anesthetic, sedative, or dye; and other signs of complications. Notify the practitioner regarding client or family concerns or questions that you are not able to answer. Notify the practitioner when any results are obtained from the diagnostic test. Notify the practitioner when the client is fully alert and recovered for an order to discharge.
<i>Interventions</i>	Implement the practitioner's orders regarding the postprocedure care of the client. Institute Standard Precautions or surgical asepsis as appropriate to the client's care needs. Position the client for comfort and accessibility to perform nursing measures. Monitor vital signs according the frequency required for the specific test. Observe the insertion site for a hematoma or blood loss; replace pressure dressing, as needed. Monitor the client's urinary output and drainage from other devices. Enforce activity restrictions appropriate to the test. Schedule client appointments as directed by the practitioner.
<i>Evaluation</i>	Evaluate the client's respiratory status to any anesthetic agents. Evaluate the client's tolerance of oral liquids. Evaluate the client's understanding of procedural findings or the time frame that written results should be reported to the practitioner. Evaluate the client's knowledge of what to expect after discharge.
<i>Client Teaching</i>	Based on client assessment and evaluation of knowledge, teach the client or family about the following: <ul style="list-style-type: none"> • Dietary or activity restrictions • Signs and symptoms that should be reported immediately to the practitioner • Medications
<i>Documentation</i>	Record in the client's medical record on the appropriate forms: <ul style="list-style-type: none"> • Assessment data, nursing interventions, and achievement of client expected outcomes • Client or family teaching and demonstrated level of understanding • Written instructions given to the client or family members

is subjected to only one venipuncture. Fasting laboratory and radiologic studies are scheduled on the same day so that the client has to fast for only one day. Appropriate scheduling increases the client's comfort level and satisfaction.

“Communication errors account for more incorrect results than do technical errors” (Fischbach, 2000, p. 13). Accuracy in laboratory testing requires that:

- The practitioner's order is transcribed onto the correct requisition form.
- All information requested should be written onto the form (e.g., the client's full name and medical number).
- Pertinent data that could influence the test's results, such as medication taken, must be included.
- Collection of the specimen from the correct client is confirmed by the identification band.
- Laboratory results are placed on the correct client's medical record.

The risk for errors increases when clients have the same last name. Always check the full name of the client and the medical record number before placing the laboratory results report onto a chart.

NURSING ALERT

Documentation

Document on the laboratory requisition slip and in your nurses' notes any difficulty you experience while collecting the specimen. Such problems may be indicative of adverse effects that clients may experience due to the nature of the test and are conditions that must be reported and treated immediately.

Point of care testing (POCT) is a common practice in critical care settings and is proving to be a cost-effective, quality intervention for both clients and agencies. With advances in POCT technology over the past two decades, critical care nurses can perform a blood analysis and within seconds to minutes have a measurement upon which to change or implement an intervention. Schallom (1999) suggests that nurses be involved in the implementation and evaluation process of POCT since accuracy of the test is contingent on correct calibration and correct usage by the test performer. The following advantages are inherent in POCT (McConnell, 1999; Schallom, 1999):

- Prompt client diagnosis, treatment, and monitoring by decreasing turnaround time (TAT)
- Decreasing the risk for error by eliminating many of the steps in conventional laboratory testing
- Decreasing prolonged hospital stays and avoiding unnecessary hospitalizations by facilitating appropriate triage from emergency departments and prehospital settings

- Decreasing delays or cancellations of surgical procedures due to unavailable laboratory results, and the actual time the client spends in surgery;
- Minimizing blood loss due to phlebotomy since POCT devices usually require only a few microliters or drops of blood versus 25 to 125 microliters per day for the critically ill client due to laboratory testing

Studies regarding POCT's clinical and financial value have revealed positive results: improved overall day-stay unit operations and client services; and earlier therapeutic decision-making time that required blood test results for emergency room clients (McConnell, 1999). Although studies have proven positive results in settings where the client's condition is acute and unstable, critical care applications may be quite different from that on a general medical/surgical unit. Studies will need to document the usefulness of POCT as a quality intervention in nonacute care settings.

Venipuncture

Venipuncture can be performed by various members of the health care team. Laboratories employ a **phlebotomist** (an individual who performs venipuncture) to collect blood specimens; however, it is the responsibility of a nurse to know *how* to perform a venipuncture. Nurses routinely perform venipuncture in the home, long-term care settings, and hospital critical care units.

Venipuncture can either be performed by using a sterile needle and syringe or a vacuum tube holder with a sterile two-sided needle. Test tubes are used to collect blood specimens. Test tubes have different colored stoppers to indicate the type of additive in the test tube. Collecting tubes are universally color coded as follows:

- Red—no additive
- Lavender—EDTA (ethylenediaminetetraacetic acid)
- Light blue—sodium citrate
- Green—sodium heparin
- Gray—potassium oxalate
- Black—sodium oxalate

Noe and Rock (1994) address three sources of venipuncture variability that can cause inaccurate results. **Hemoconcentration** is the reduced volume of plasma water and the increased concentration of blood cells, plasma proteins, and protein-bound constituents. It occurs with increased capillary hydrostatic pressure that causes water to shift from the intravascular into the interstitial space.

Hemoconcentration can be caused from prolonged standing or a prolonged time of application of a tourniquet during venipuncture. Alterations in the circulating blood volume can also cause hemoconcentration, such as occurs with dehydrated and burned clients.

Hemolysis is the breakdown of red blood cells and the release of hemoglobin. Hemolysis occurs with the rapid

NURSING ALERT

Preventing Hemoconcentration

Keep to a minimum both the length of time a client stands before venipuncture and the length of time of tourniquet application during venipuncture. These actions lower the risk of hemoconcentration and increase the rate of accuracy in laboratory tests.

flow of blood through small-bore needles and exposure to large negative pressures. A negative pressure exists inside the collecting test tubes and syringe. To minimize the possibility of hemolysis use a large-bore needle, moderate flow rates, and moderate negative pressures.

NURSING ALERT

Contraindications to Conducting Laboratory Tests

Health care providers with weeping dermatitis or other exudative lesions should avoid handling all invasive equipment, because the pathogens from these conditions can contaminate the equipment and spread infection to clients.

The third source of variability occurs when a blood specimen is drawn from a site above an intravenous infusion. The specimen is contaminated with intravenous solutions. Blood should be drawn from the client's other arm or below the infusion site.

Venipuncture is an invasive procedure. Health care providers performing venipuncture are at risk for the transmission of blood-borne organisms, such as human immunodeficiency virus (HIV) and hepatitis. HIV is the causative agent for acquired immunodeficiency syndrome (AIDS).

THINK ABOUT IT

Determining Needle Gauge

The gauge of the needle should be appropriate to the size of the vessel to prevent hemolysis.

Correct selection and preparation of equipment and vein provides for a safe and efficient venipuncture (Procedure 28-1). Review of the client's health history and physical assessment data will assist in identifying special client considerations. If the client has a bleeding

PROCEDURE 28-1

Venipuncture

Equipment

- | | |
|---|--|
| <ul style="list-style-type: none"> ■ Sterile packages of 70% isopropanol (antiseptic) and povidone-iodine (topical anti-infectant) ■ Sterile needle and syringe or vacutainer system (20- or 21-gauge needle for cubital vein puncture on an adult) | <ul style="list-style-type: none"> ■ Sterile 2 × 2 cotton gauze and povidone-iodine ■ Tourniquet ■ Nonsterile gloves ■ Bandage or sterile adhesive bandage ■ Collecting tubes |
|---|--|

Action

1. Check identification band.
2. Wash hands.
3. Explain procedure to client.
4. Place client in a sitting or supine position; lower side rail.
5. Prepare supplies:
 - Open sterile packages.
 - Label specimen tubes with the client's data.
6. Position arm straight. If possible place extremity in dependent position.
7. Apply the tourniquet 6 to 10 cm above the elbow. Tourniquet should only obstruct venous blood flow, not arterial. Check for a distal pulse.

Rationale

1. Ensures correct client.
2. Decreases transmission of microorganisms.
3. Reduces anxiety; promotes cooperation.
4. Promotes client comfort; provides access to the site.
5. Promotes efficiency; ensures accuracy of specimen collection regarding the client's identifying data, date and time of collection.
6. Provides access to vein. Increases venous dilation and visibility.
7. Restricted arterial blood flow prevents venous filling.

(continues)

PROCEDURE 28-1

Venipuncture (continued)

Action

8. Select a dilated vein (Figure 28-2). If a vein is not visible, instruct client to open and close a fist; or stroke extremity from proximal to distal, tap lightly over a vein, apply warmth.

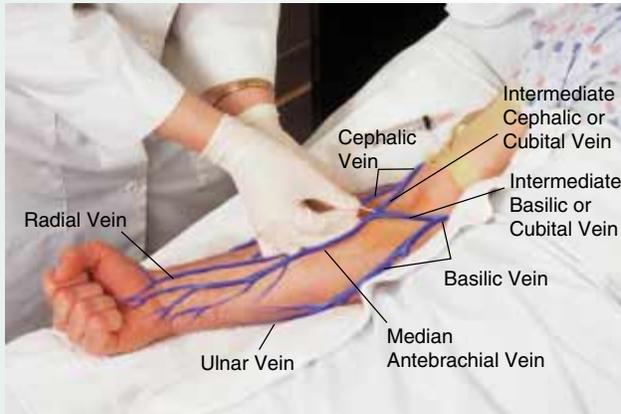


Figure 28-2 Nurse selects site for venipuncture and holds skin taut over site with needle held at 30° angle.

Rationale

8. Commonly used veins are the basilic or median cubital. Alternate sites are lower arm veins (cephalic or median antebrachial) and hand veins (basilic). Methods to increase venous dilation.

9. Palpate the vein for size and pliancy; be sure it is well seated.
 10. Release the tourniquet.
 11. Cleanse puncture site with isopropanol, let dry and cleanse with povidone-iodine, let dry or wipe with sterile gauze, do not touch site after cleansing. If the client is allergic to iodine, only use isopropanol and cleanse skin for 30 seconds.
 12. Place equipment in easy reach and position yourself to access the puncture site.
 13. Reapply the tourniquet (time should not exceed 3 minutes).
 14. Don gloves.
 15. Perform venipuncture:
 - Remove cap from 20- or 21-gauge needle.
 - With nondominant hand, stabilize the vein by holding the skin taut over the puncture site (apply downward tension on the forearm with your thumb).
 - With dominant hand, hold the needle bevel facing upward at an approximate 30° angle to the arm (see Figure 28-2).
 - Puncture the skin into the straightest part of vein with a steady, moderately fast movement. (When the vein is entered you will feel
9. Locates a well dilated vein; vein does not roll.
 10. Prevents hemoconcentration.
 11. Povidone-iodine reduces bacteria on the skin's surface; it must dry to be effective.
 12. Promotes efficiency.
 13. Restricts blood flow, distends vein.
 14. Decreases exposure to blood-borne organisms.
 15.
 - Large-bore needle prevents hemolysis.
 - Prevents the vein from rolling when the needle is pushed against the outer wall of the vein.
 - Provides for a downward movement toward vein.
 - Decreases risk of going through the vein, decreases discomfort.

(continues)

PROCEDURE 28-1

Venipuncture (continued)

Action	Rationale
<p>a slight give and can see blood at the needle's hub.)</p> <ul style="list-style-type: none"> Apply moderate negative pressure by puncturing the vacuum tube or by gently retracting the syringe plunger. (When first performing a venipuncture, use a syringe. It takes greater dexterity to puncture the vacuum tube with a two-sided needle; if you apply too much pressure you will go through the vein.) 	
16. Remove the tourniquet once blood is flowing into the tube or syringe; collect the specimen(s).	16. Prevents hemolysis.
17. Remove the needle and immediately apply pressure to site for 2 to 3 minutes or 5 to 10 minutes if client is taking anticoagulant medication. Keep the arm straight.	17. Decreases bleeding. Bending the arm can reopen the puncture site.
18. Have the client maintain pressure on the puncture site. <ul style="list-style-type: none"> <i>Note:</i> Green stoppers contain sodium heparin (anticoagulant); they must be mixed promptly after collection. 	18. Facilitates clotting. <ul style="list-style-type: none"> Prevents coagulation of blood in test tube.
19. Apply a sterile bandage or adhesive bandage to puncture site.	19. Facilitates clotting.
20. If using a needle and syringe, transfer the blood into test tube under moderate pressure.	20. Prevents hemolysis.
21. Dispose the needle or needle/syringe into a sharps container.	21. Prevents needle stick.
22. Remove gloves; wash hands.	22. Decreases transmission of microorganisms.

disorder or is taking anticoagulant therapy, apply pressure to the puncture site for 3 to 5 minutes after the removal of the needle.

Nursing Process Highlight

INTERVENTION

Clients with a depressed white blood cell count are susceptible to infection. Whenever you have to puncture the skin of a client with a depressed white blood cell count, cleanse the puncture site for 2 to 3 minutes.

Arterial Puncture

Assessment of arterial blood gases (ABG) reveals the ability of the lungs to exchange gases by measuring the partial pressures of oxygen (PO_2), carbon dioxide (PCO_2), and evaluates the pH of arterial blood. Blood gases are ordered to evaluate:

- Oxygenation
- Ventilation and the effectiveness of respiratory therapy
- Acid-base level of the blood

Arterial blood samples are drawn from a peripheral artery (e.g., radial or femoral) or from an arterial line. The arterial blood sample is collected in a 5-ml heparinized syringe. The syringe is then rotated to mix the blood with the heparin to prevent clotting. The

THINK ABOUT IT

Diagnostic Testing and Confidentiality

Mr. Takahashi comes to the Ambulatory Surgery Clinic for his preoperative diagnostic testing. You overheard the staff saying that Mr. Takahashi has had a history of hepatitis. Your instructor gathers all the student nurses and says “Who needs the experience of performing a venipuncture?” Two of your classmates indicate to the instructor that they have not had the opportunity to perform this procedure. Should you say anything to the instructor? Would you share with your classmates Mr. Takahashi’s history? If you said something, would this be a breach of client confidentiality?

blood sample is placed on ice to reduce the rate of oxygen metabolism.

In some agencies it is within the scope of nursing practice to perform radial artery puncture; however, femoral artery puncture is usually performed only by an advanced practitioner. An increased risk of hemorrhage exists with a femoral puncture. Although it is not common practice for student nurses to draw ABG samples, students often have to assist with the procedure and care for the client after the procedure.

Arterial punctures should not be performed:

- If the client is hyperthermic
- Immediately after breathing and suctioning treatments
- If there have been changes on ventilator settings

NURSING ALERT

Arterial Blood Gases

Arterial blood gases should not be drawn within 20 minutes after any respiratory treatment; *ensures accurate determination of the client’s actual blood gases.*

Arterial samples are also contraindicated in the following conditions:

- Anticoagulant therapy
- Clotting disorders
- Symptomatic peripheral vascular disease
- Negative Allen test

An **Allen test** is performed to measure the collateral circulation to the radial artery. See Chapter 27 for the Allen test procedure.

Regardless of who performs the arterial puncture, the nurse is responsible for assessing the client for symptoms of bleeding or occlusion postpuncture. Direct pressure must be applied to the puncture site until all bleeding has stopped, a minimum of 5 minutes. Ensure

NURSING ALERT

Postarterial Puncture

Instruct the client to notify you immediately if any pain or numbness occurs in the arm or leg after arterial puncture, symptoms indicate impaired circulation.

that all bleeding has stopped before releasing the pressure. Symptoms of impaired circulation include:

- Numbness and tingling
- Bluish color
- Absence of a peripheral pulse

Capillary Puncture

Skin punctures are performed when small quantities of capillary blood are needed for analysis or when the client has poor veins. Capillary puncture is also commonly performed for blood glucose analysis, discussed later in this chapter.

The common sites for capillary punctures are the:

- Heel—most common site for neonates and infants
- Fingertip—the inner aspect of palmar fingertip used most commonly in children and adults
- Earlobe—when the client is in shock or the extremities are edematous

To perform a skin puncture, assemble the equipment, prepare the client, and select the appropriate site (Procedure 28-2). Figure 28-3 shows a capillary puncture of a fingertip.

Central Lines

Blood samples can be collected from central lines. A **central line** refers to a venous catheter inserted into the superior vena cava through the subclavian, internal, or external jugular vein. Central lines are used to treat alterations in fluid or electrolytes. The client’s nursing diagnoses may include the following: *Deficient Fluid Volume related to nausea and/or vomiting or Imbalanced Nutrition, Less than Body Requirement related to anorexia.*

A central line is inserted when a peripheral route cannot be obtained, for treatment, and to withdraw blood for analysis.

Nurses need to know the type and location of the central line catheter. There are various types of central lines. Central lines can have either one or more lumens inside the catheter. For example, a central venous catheter has either one or two lumens, whereas a Hickman multilumen catheter, may have either two or three catheters contained in one sheath (Figure 28-4).

It is standard practice to mark each lumen of a multilumen catheter with the name of the infusion (e.g., fluid or medication). Lumens are marked to prevent the mixing of medications. Lumens without continuous

PROCEDURE 28-2

Skin Puncture

Equipment

- Antiseptic—70% isopropanol or povidone-iodine
- Sterile 2 × 2 gauze
- Sterile lancet
- Hand towel or absorbent pad
- Microhematocrit tubes or micropipette (collection tubes)
- Nonsterile gloves

Action

1. Wash hands.
2. Check client's identification band.
3. Explain procedure to client.
4. Prepare supplies:
 - Open sterile packages.
 - Label specimen collection tubes.
 - Place in easy reach.
5. Don gloves.
6. Select site:
 - Lateral aspect of the fingertips in adults/children
7. Place the hand or heel in a dependent position; apply warm compresses if fingers or heel are cool to touch.
8. Place hand towel or absorbent pad under the extremity.
9. Cleanse puncture site with an antiseptic and allow to dry; use 70% isopropanol if client is allergic to iodine.
10. With nondominant hand apply light pressure by gently squeezing the area above/around the puncture site. Do not touch puncture site.
11. With the sterile lancet at a 90° angle to the skin, use a quick stab to puncture the skin (about 2 mm deep) (Figure 28-3).

Rationale

1. Decreases transmission of microorganisms.
2. Ensures correct client.
3. Allays anxiety and encourages cooperation.
4. Ensures efficiency.
5. Decreases the health care provider's exposure to blood-borne organisms.
6. Avoids damage to nerve endings and calloused areas of the skin.
7. Increases the blood supply to the puncture site.
8. Prevents soiling the bed linen.
9. Reduces skin surface bacteria; povidone-iodine must dry to be effective.
10. Increases blood supply to puncture site; maintains asepsis.
11. Provides a blood sample with minimal discomfort to the client.

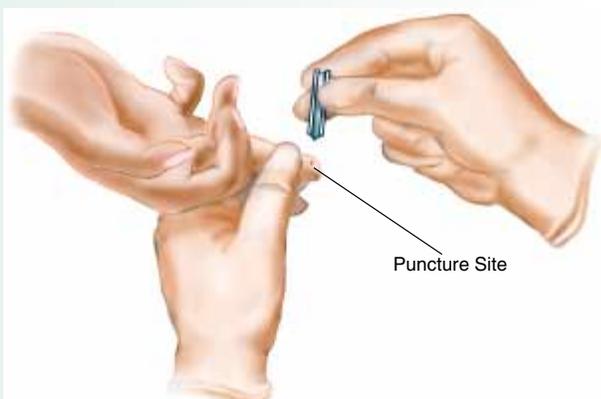


Figure 28-3 Capillary Puncture of Fingertip

(continues)

PROCEDURE 28-2

Skin Puncture (continued)

Action	Rationale
12. Wipe off the first drop of blood with a sterile 2 × 2 gauze; allow the blood to flow freely.	12. Pressure at the puncture site can cause hemolysis.
13. Collect the blood into the tube(s). If a platelet count is to be collected, obtain this specimen first.	13. Allows blood collection; avoids aggregation of platelets at the puncture site.
14. Apply pressure to the puncture site with a sterile 2 × 2 gauze gauze.	14. Controls bleeding.
15. Place contaminated articles into a sharps container.	15. Reduces risk for needle stick.
16. Remove gloves; wash hands.	16. Reduces transmission of microorganisms.
17. Position client for comfort with call light in reach.	17. Provides for comfort and communication.



Figure 28-4 Hickman Catheter®. (Photo provided by Bard Access Systems. Hickman is a registered trademark of Bard Access Systems.)

NURSING ALERT

Central Line

Clients in the home environment usually have a central line in place for prolonged therapy. Because one of the primary complications of central venous catheter insertion is infection, the nurse must be alert for signs of infections (e.g., fever) exhibited by the client.

infusion of fluids are capped with an infusion plug and flushed with a heparin solution every 8 hours according to agency protocol. Heparin prevents obstruction of the catheter lumen with a blood clot. The first sample of blood drawn from the central line cannot be used for diagnostic testing; it must be discarded. The amount of discard volume is directly related to the dead space (catheter size). The agency's protocol should indicate the volume to discard relative to the type and size of catheter.

The nursing care of central lines requires strict sterile technique. See Chapter 30 for a discussion of sterile technique. The practitioner has to write an order to allow a blood sample to be obtained from a central line. Refer to the Nursing Checklist for how to draw a blood sample from a central line.

Implanted Port

Some clients have a **port-a-cath** (a port that has been implanted under the skin) over the third or fourth rib.

NURSING CHECKLIST

Obtaining a Blood Sample From a Central Line

- Gather equipment (the sizes of the needle and syringe to obtain the blood sample are determined by the amount of blood needed for the test and the type and size of central line catheter).
- Check the client's identification band.
- Wash hands and don gloves to prevent exposure to blood-borne organisms.
- Select a port that is not used routinely for an infusion.
- Cleanse the port of the lumen with an antiseptic.
- Insert the needle into the port and aspirate the discard volume according to agency protocol; dispose of the syringe containing the discard blood into a sharps container.
- Access the port and withdraw the blood sample.
- Apply the same principles used in venipuncture to prevent the hemoconcentration and hemolysis of blood when withdrawing the sample.
- Transfer the sample into the correct collection tubes and discard the contaminated needle and syringe into the sharps container.
- Instill the required heparin solution to prevent the lumen from clotting.
- Transport specimen to the laboratory.
- Remove gloves, wash hands.

The port has a catheter that is inserted into the superior vena cava or right atrium through the subclavian or internal jugular vein. The implanted port is used for the same purpose as the central lines.

Blood can be withdrawn for sampling by accessing the port using strict sterile technique. Accessing a port should only be performed by a nurse with proper education. Students are not usually taught how to access an implanted port.

Urine Collection

The kidneys are responsible for maintaining homeostasis of the body's buffering systems and the volume, and ionic and osmotic composition of its fluid compartments; refer to Chapter 37 for a complete discussion of the composition of fluid compartments. "Although the results of kidney functions are reflected in analyses of blood, the mechanisms by which normalcy of body fluids is preserved can be understood only through studies of urine" (Kirschbaum, Sica, & Anderson, 1999, p. 597).

Urine can be collected for various studies. The type of testing determines the method of collection. The different methods of urine collection are:

- Random collection (routine analysis)
- Timed collection
- Collection from a closed urinary drainage system
- Clean-voided specimen

The urine from a closed urinary drainage system is a sterile specimen. Client teaching depends on the client's age and the method of collection. Initiate the protocol for preparing the client for testing (see Table 28-1). The method of collection should be written on the laboratory requisition.

NURSING ALERT

Urine Collection

As with blood, all urine collection requires the use of Standard Precautions to prevent the transmission of microorganisms among nurses, clients and other health care providers.

Random Collection

The practitioner usually writes the order for a UA (routine urine analysis), which is also called a random collection. It can be collected at any time using a clean cup. The urine does not have to be collected in a sterile container. Instruct the client to urinate into the specimen cup or into a clean bedpan or urinal. Wearing gloves, transfer the urine into a clean container. Seal the lid tightly, label, and place in a biohazard bag for transport to the laboratory. Submit the specimen immediately to the laboratory to prevent the growth of bacteria or changes in the urine's analytes (substances).



NURSING TIP

Urine Collection in the Home

Instruct clients in the home to place the urine container in a Zip Lock bag and refrigerate until it is delivered to a laboratory; this prevents the growth of bacteria and promotes accuracy of results.

Timed Collection

Timed collection is done over a 24-hour period. The urine is collected in a plastic gallon container that contains preservative(s), some of which are caustic. The laboratory usually adds the preservatives to the container. If the analyte to be studied is light sensitive, a dark plastic container is necessary.

Provide the client with specific instructions. The client is told to **void** (the process of urine evacuation) and discard the specimen at the beginning of the collection. The 24-hour collection begins with the first discarded voiding. For example, if the client is instructed to void at 1000 hours (24-hour clock time frame), discard the urine, save all other voided specimens until 1000 hours the following day. The client can void throughout the test into a clean container, then pour the urine into the collection bottle. Toilet tissue should not be dropped into the container used to catch the urine.

The collection container should be refrigerated or kept on ice throughout the 24 hours. This retards bacterial growth and stabilizes the analytes. The last urine collection, 1000 hours, should be a complete, forced voiding at the exact timed period. Seal the labeled container tightly and take immediately to the lab.

Collection from a Closed Drainage System

A sterile specimen can be collected from a client with an indwelling Foley catheter with a closed drainage system. A sterile specimen is used to culture the urine. *The urine specimen should not be obtained from the drainage bag.* The analytes in the urine drainage bag change; this will cause inaccurate results. Bacteria grow quickly in the drainage bag.

The catheter's closed drainage tubing has an aspiration port that is used for a sterile specimen collection (Procedure 28-3).

Clean-Voided Specimen

Clean-voided (clean-catch, or midstream) specimen collection is done to secure a specimen uncontaminated by skin flora. A clean-voided specimen should be obtained on first voiding in the morning. Most adult clients are capable of following instructions to perform this test.

PROCEDURE 28-3

Urine Collection—Closed Drainage System

Equipment

- Rubber band or catheter clamp
- Tape and sign
- Examination gloves
- Sterile specimen container and label
- Sterile packages of 70% isopropanol (anti-infective) or povidone-iodine (antiseptic)
- Sterile 10-ml syringe with 23- or 25-gauge needle

Action

1. Check client's identification band.
2. Gather equipment.
3. Explain procedure to client.
4. Manipulate the drainage tubing so that the urine in the tubing goes into the bag.
5. Clamp the drainage tubing below the aspiration port; leave clamped 10 to 15 minutes.
6. Tape a sign over the client's bed that the Foley catheter's drainage tubing is temporarily clamped for a specimen.
7. Wash hands, don gloves.
8. Provide for privacy.
9. Cleanse the aspiration port with an anti-infective or antiseptic solution; let dry.
10. Remove all air from the needle and syringe.
11. Insert needle into aspiration port at a 45° angle, aspirate 10 ml, from port, remove needle.
12. Transfer urine into sterile labeled container, secure lid on container, and place container in a biohazard bag.
13. Place needle and syringe unit into sharps container, *never recap a contaminated needle*.
14. Remove the notice from above the bed.
15. Transport specimen to laboratory.
16. Remove and dispose of gloves, wash hands.

Rationale

1. Ensures accuracy.
2. Promotes efficiency.
3. Allays anxiety, increases participation.
4. Facilitates urine to flow into the drainage bag; provides a fresh urine sample.
5. Traps fresh urine in the tubing above the level of the aspiration port.
6. Communicates to other personnel that the drainage tube is clamped.
7. Decreases transmission of microorganisms.
8. Decreases embarrassment.
9. Inhibits growth and reproduction of microorganisms; povidone-iodine must dry to be effective antiseptic.
10. Allow for withdrawal of the correction amount of urine.
11. Prevents accidental puncture of the catheter wall on distant side of port; provides sufficient urine for analysis.
12. Prevents contamination of sterile specimen, ensures client accuracy, prevents spillage.
13. Prevents accidental needle sticks.
14. Clamp is no longer in place.
15. Prevents growth of bacteria or changes in the urine's analytes.
16. Decreases transmission of microorganisms.

Different aseptic techniques are used for women and men. Poor technique in cleaning the perineum can contaminate the specimen. Instruct the female client to cleanse from the front to the back (Procedure 28-4).

Instruct the male client to perform the same procedure except for the cleansing of the perineal area; men should cleanse from the tip of the penis downward. The Nursing Checklist describes the procedure for obtaining a clean-voided specimen from a man.

PROCEDURE 28-4

Urine Collection—Clean Catch, Female

Equipment

- Examination gloves
- Sterile collection container and lid, label
- Sterile midstream kit
- 3 antiseptic towelettes or 3 cotton balls saturated with an antiseptic solution

Action

1. Gather equipment.
2. Check client's identification band.
3. Wash hands and don gloves.
4. Provide for privacy.
5. Instruct the female client:
 - To sit with legs separated on the toilet.
 - Open the sterile container, placing the lid up on a firm surface in easy reach.
 - Using thumb and forefinger separate the labia.
 - With the labia separated, using a downward stroke, cleanse one side of the labia with the towelette, discard the towelette, repeat procedure on the other side with the second towelette, make sure the labia stay separated throughout the procedure (Figure 28-5).

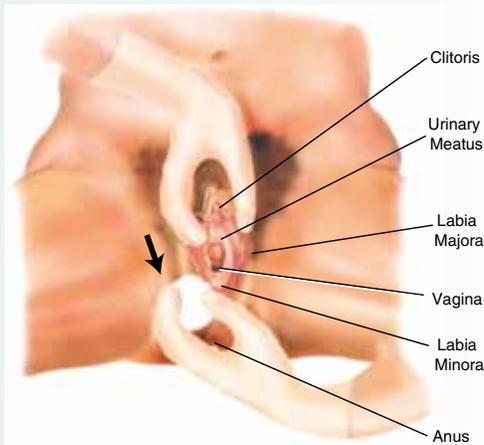


Figure 28-5 Cleansing Labia

Rationale

1. Promotes efficiency.
2. Ensures accuracy.
3. Decreases transmission of microorganisms.
4. Decreases embarrassment.
5. Allays anxiety, increases participation.
 - Comfortable position, provides access to cleansing the labia.
 - Prevents the inside of the container's lid from touching a soiled surface; prevents contamination of specimen.
 - Provides access for cleansing the labia.
 - Prevents contamination of clean area.
6. Begin to urinate into the toilet, place the collection cup under the stream of urine after a good flow of urine has been started. Fill the container half-way with urine.
6. Initial flow of urine is *not* collected, can contain bacteria.
6. Place sterile lid back onto the container, close tightly, label and transport to laboratory.
6. Prevents contamination of sterile specimen, prevents spillage, ensures client accuracy.
7. Remove and dispose of gloves; wash hands.
7. Decreases transmission of microorganisms.

✓ NURSING CHECKLIST

Clean-Voided Specimen, Male

- Check the client's identification band.
- Instruct the client on the procedure.
- Wash hands and don gloves if the client needs assistance with the procedure.
- If uncircumcised, retract the foreskin, hold retracted.
- Cleanse the head of the penis with a towelette using a circular motion. Cleanse the meatus and glans beginning with the urethral opening and make one complete circle around the penis, moving down the glans shaft.
- Discard the towelette.
- Repeat the procedure until all three towelettes have been used.

THINK ABOUT IT

Overcoming Embarrassment

You are cleansing the genitals of a client to obtain a clean catch urine sample. How would you feel about performing this type of procedure if the client were a man? A woman? What methods would you use to maintain your professional role while still respecting and caring for the client? How would you maintain your nurse-client relationship without becoming too personal? Or without depersonalizing the client so that he or she becomes uncomfortable?

When obtaining a clean-voided specimen from infants and small children, secure assistance. Follow the Nursing Checklist.

Stool Collection

Explain to the client why the stool specimen is being collected. Instruct the client to defecate into a clean bedpan or container, discarding tissue into the toilet. Stools can be collected for either a one-time defecation or over 24, 48, or 72 hours. If a specimen is needed over a pro-

NURSING ALERT

Stool from a Client with Hepatitis

When collecting a stool specimen from a client with hepatitis, write on the lab requisition form that the client has hepatitis. This increases the laboratory personnel's awareness to be extra careful when handling the specimen.

✓ NURSING CHECKLIST

Clean-Voided Specimen, Infant and Child

- Check the identification band.
- Explain the procedure to family member present with infant or child. If the child can cooperate, tell child what to do before having someone hold him or her in position.
- Wash hands and don gloves.
- Place in a supine position with hips externally rotated.
- Have parent or assistant flex and abduct the knees, hold the knees throughout the procedure.
- Cleanse the perineal area as you would for an adult.
- Place a sterile collection bag over the perineum or penis and scrotum, apply a diaper.
- Remove the collection bag immediately after voiding.
- Transfer the urine into the labeled collection container, close lid tightly, place in biohazard bag for immediate transport to the laboratory.

longed period of time, all stools must be placed into a container and refrigerated. Once collected, label the container with the client's name, date, time, and the test to be performed on the specimen. All stool specimens are placed in a biohazard bag before transport to the laboratory.

Hematologic System

Understanding the hematologic system requires a knowledge of the blood's composition and its functions. Table 28-4 discusses the origin, normal range values, and the major function for each of the three types of cells found in blood:

- Red blood cells (**erythrocytes**)
- White blood cells (**leukocytes**)
- Platelets

Forty to 45% of the blood's volume is composed of blood cells; the remaining blood volume is plasma as shown in Figure 28-6. Plasma is part of the body's extracellular fluid system, consisting of water and analytes. Blood proteins form the largest portion of the plasma analytes. The average plasma volume for a normal adult is 3 L.

Red Blood Cells

Red blood cells (RBCs), in embryonic life, are produced first in the yolk sac until the middle trimester; then the liver becomes the main organ of RBC production. RBC

TABLE 28-4
Types of Blood Cells

Cell	Origin	Range SI Units*	Major Function
Erythrocytes	Bone marrow	F: $4.0\text{--}5.2 \times 10^{12}/\text{L}$ M: $4.5\text{--}5.9 \times 10^{12}/\text{L}$	Transport hemoglobin
Leukocytes	Granulocytes Monocytes Bone Marrow Lymphocytes Plasma cells Lymph tissue	$4.5\text{--}11.0 \times 10^9/\text{L}$	The body's protective system
Platelets	Bone Marrow from megakaryocytes	$150\text{--}300 \times 10^9/\text{L}$	Vascular repair

*Data for normal range SI units from Noe, D., & Rock, R. (1994). *Laboratory medicine*. Baltimore: Williams & Wilkins.

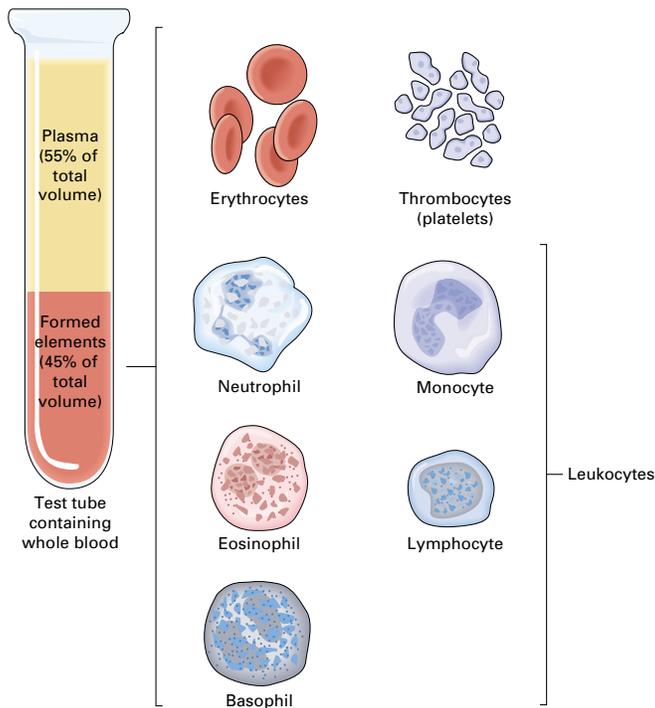


Figure 28-6 Blood Cells

production becomes the exclusive function of the bone marrow by the end of gestation, after birth, and throughout life. RBC bone marrow site production changes with age:

- From birth to age 5—all bone marrow
- Five to 20 years—the shaft of the long bones (tibia and femur)
- After 20 years—the membranous bones (ilia, ribs, sternum, and vertebrae). As part of the normal aging process, the production of RBCs decreases with age.

Functions of the RBCs include:

- Transporting oxygen carrying hemoglobin
- Transporting carbon dioxide in the form of sodium bicarbonate
- Being an acid-base buffer for whole blood

White Blood Cells

There are six types of white blood cells (WBCs, leukocytes) found in the blood.

- Neutrophils
- Basophils
- Lymphocytes
- Eosinophils
- Monocytes
- Plasma cells

The polymorphonuclear cells, neutrophils, eosinophils, and basophils have a granular appearance, hence the name granulocytes or polys. The granulocytes and monocytes are responsible for **phagocytosis** (process by which certain cells engulf and dispose of foreign bodies). The lymphocytes and plasma cells function mainly as the body's immune system.

The WBCs are formed and stored in the bone marrow until needed by the body. Table 28-5 presents laboratory studies for a complete blood count with SI values and when each analyte is either increased or decreased in clinical situations.

Red Cell Indices

Red cell indices measure the size and hemoglobin content of the RBCs. The RBC indices are:

- Mean red cell hemoglobin (MCH)
- Mean red cell hemoglobin concentration (MCHC)
- Mean red cell volume (MCV)

The indices are diagnostic in determining the type of anemia. For example, an elevated MCHC means that

TABLE 28-5
Complete Blood Count with Clinical Significance

Analyte	SI Range	Increased	Decreased
Red blood cell count	F: $4.0\text{--}5.2 \times 10^{12}/\text{L}$ M: $4.5\text{--}5.9 \times 10^{12}/\text{L}$	Dehydration, induced hypoxia, polycythemia	Anemias, hypothyroidism, leukemias
Hemoglobin (Hb): Whole blood Fetal Plasma	F: 120–150 g/L, M: 139–163 g/L 0–75mg/L < 0.01	Chronic obstructive lung disease, polycythemia, high altitudes burns, shock	Anemia, severe hemorrhage
Hematocrit (Hct)	F: 0.36–0.46 M: 0.41–0.53	Dehydration, polycythemia	Leukemia, hemorrhage
Mean red cell Hb	26–34 pg/RBC	Macrocytosis	Microcytic hypochromic anemia
Mean red cell Hb concentration	310–370 g/L	Spherocytosis	Chronic iron deficiency anemia
Mean red cell volume	80–100 fl	Aplastic anemia, cirrhosis, folic acid & vitamin B ₁₂	Chronic iron deficiency, thalassemias, chronic anemia
White blood cell (WBC): Total count	$4.5\text{--}11.0 \times 10^9/\text{L}$	Acute leukemia, infections, surgery, trauma	Acute chronic leukemias, aplastic anemia, agranulocytosis
WBC Differential	% of total WBC		
Band Neutrophils	0–0.06%	Severe bacterial disease	
Segmented neutrophils	0.31–0.76%	Diabetic acidosis, infarctions, inflammatory diseases, malignancies	
Lymphocytes	0.14–0.44%	Chronic lymphocytic leukemia	Lupus erythematosus, Hodgkin's disease
Monocytes	0.02–0.11%	Chronic inflammatory diseases	
Eosinophils	0–0.04%	Allergies, parasites	
Basophils	0–0.02%	Myelofibrosis	

Data for normal range SI units from Noe, D., & Rock, R. [1994]. *Laboratory medicine*. Baltimore: Williams & Wilkins.

spherocytes (smaller, thicker red cells) are present; this occurs in acquired hemolytic anemia.

Platelets

Platelets are fragments of a seventh type of WBC found in the bone marrow, the megakaryocytes. Platelets maintain hemostasis and blood coagulation by being the active mechanism of the blood in vascular repair. The active factors necessary for blood to coagulate are found in the cytoplasm of platelets. Blood coagulation is a

comprehensive, sequential process of the body's response to injury.

The blood coagulation flow chart (Figure 28-7) reviews the key elements of vascular constriction and coagulation. Prothrombin (factor II) is a plasma protein, formed in the liver, and requires vitamin K for synthesis. It is activated when blood vessels are damaged. Prothrombin activator causes the conversion of prothrombin into thrombin, which then causes fibrinogen to form threads. This whole process takes 10 to 15 seconds.

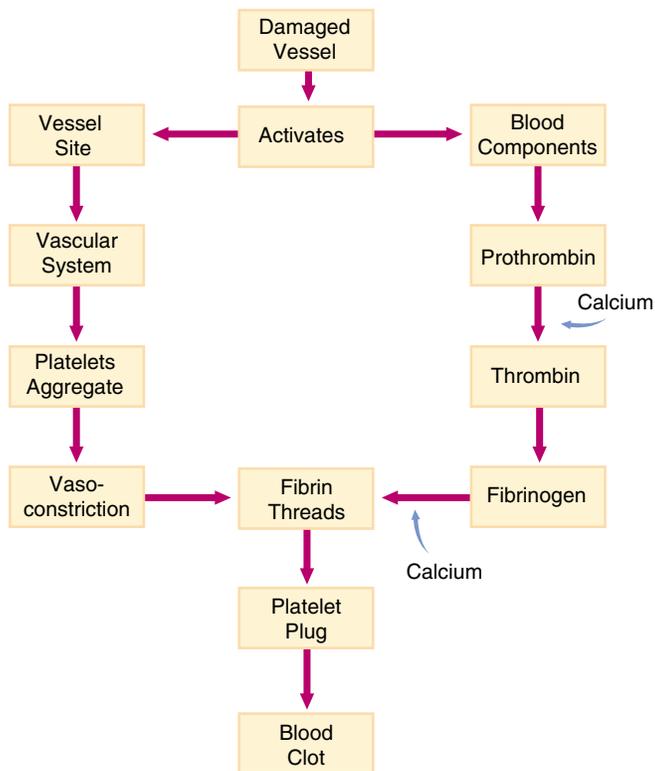


Figure 28-7 Blood Coagulation Flow Chart

Prothrombin activator is the governing element in blood coagulation. Prothrombin time (PT) measures the defects in this extrinsic clotting mechanism, specifically fibrinogen (factor I), prothrombin (factor II), and factors V, VII, and X (Pagana & Pagana, 1999).

NURSING ALERT

Drug Effect on Prothrombin Time

Be sure to list the drugs the client is taking on the laboratory requisition for the PT test; some drugs affect the PT.

Drugs can either increase or decrease the PT. Common drugs that increase the PT include salicylates, steroids, sulfonamides, oral anticoagulants, antibiotics, quinidine, Dilantin, Aldomet, Tagamet, cathartics, and alcohol. Other drugs can decrease the PT: digitalis, oral contraceptives, corticosteroids, chloral hydrate, barbiturates, vitamin K, Placidyl, Doriden, griseofulvin, Alupent, and rifampin.

Partial thromboplastin (PTT) or activated partial thromboplastin time (aPTT) measures the intrinsic clotting mechanism factors (I, II, V, X, XI, XII). There are five primary screening tests to diagnose suspected coagulation disorders (Pagana & Pagana, 1999; Fischbach, 2000):

1. Platelet count, size, and shape
2. Bleeding time—the ability of platelets to function normally and the ability of capillaries to constrict their walls, prolonged with deficiencies in platelets and other clotting factors
3. PTT—measures the ability of the blood to clot, prolonged with any intrinsic factor deficiencies such as hemophilia A (factor VIII) and hemophilia B (factor X)
4. PT—measures the total quantity of prothrombin in the blood, monitors the effectiveness of coumarin therapy, prolonged with deficiencies in the extrinsic factors and vitamin K
5. Fibrinogen level—investigates abnormal PT and APTT and to screen for **disseminated intravascular coagulation (DIC)** (an acquired hemorrhagic syndrome characterized by uncontrolled formation and deposition of thrombi) and fibrin-fibrinogenolysis; levels increase with acute inflammatory reactions, trauma, coronary heart disease and cigarette smoking and decrease in liver disease, DIC, cancer, primary fibrinolysis and congenital hypofibrinogenemia.

Thrombin time (TT) measures the fibrinogen portion of the hemostatic mechanism; it is infrequently used today to evaluate the fibrinogen-to-fibrin reaction. Direct measurements of fibrinogen level and the increasing use of other tests have decreased the usefulness of TT (Pagana & Pagana, 1998).

Sickle Cell Test

Sickle cell test (hemoglobin S) is used to identify the sickle cell trait and sickle cell disease. A negative result, which is normal, indicates the absence of hemoglobin S. The presence of sickle cells causes a positive result, thus requiring hemoglobin electrophoresis to determine the presence of the genetically transmitted deficit. Figure 28-8 shows the difference in the shape between a normal RBC and a sickle-shaped RBC.

Hemoglobin electrophoresis refers to a laboratory test that uses an electromagnetic field (an anode [+], and a cathode [-], which are separated by cellulose acetate or starch gel) to identify various types of hemolytic anemia.

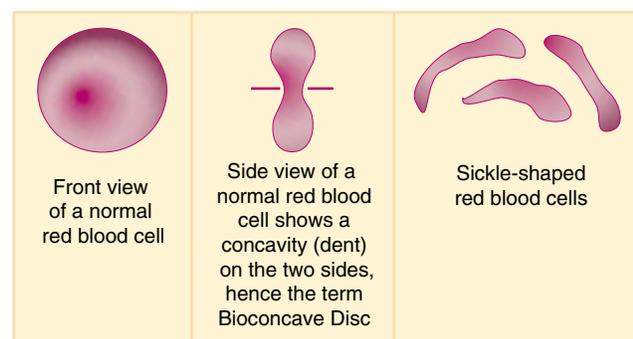


Figure 28-8 Differences in shape are apparent in a normal red blood cell (biconcave disc) and a sickle-shaped red blood cell (crescent-shaped).

Electrophoresis distinguishes between genetically transmitted homozygous and heterozygous hemoglobin S, which is responsible for sickle cell anemia. For example, if both genes carry hemoglobin S, it is called homozygous and the client has sickle cell disease; however, if only one gene has the abnormal hemoglobin S and the other gene has the normal hemoglobin A, the client is heterozygous, having the sickle cell trait. Electrophoresis is also used to identify fetal hemoglobin and distinguishes between thalassemia minor and major.

Sickle cell anemia is a blood disorder with multiple, recurring symptoms that not only causes the client pain from the clumping of RBCs in the joints but has widespread effects on other systems. Figure 28-9 demonstrates the pathologic changes in the body and the resulting effects of sickle cell anemia.

Other common laboratory tests that measure hematologic functions are presented in Table 28-6.

Type and Crossmatch

A **type and crossmatch** is a laboratory test that identifies the client's blood type and determines the compatibility of blood between a potential donor and recipient (client). There are four basic blood types: A, B, AB, and O that are determined by the presence or absence of A or B antigens as seen in Figure 28-10. **Antigens** are substances, usually proteins, that cause the formation of and react specifically with antibodies. **Antibodies** are immunoglobulins produced by the body in response to bacteria, viruses, or other antigenic substances. Type A and type B are antigens that are classified as **agglutinogens**, which are substances that cause **agglutination** (clumping of RBCs). **Agglutinins** are specific kinds of antibodies whose interaction with antigens is manifested as agglutination.

Blood types are also designated as either positive or negative, depending on the presence or absence of the

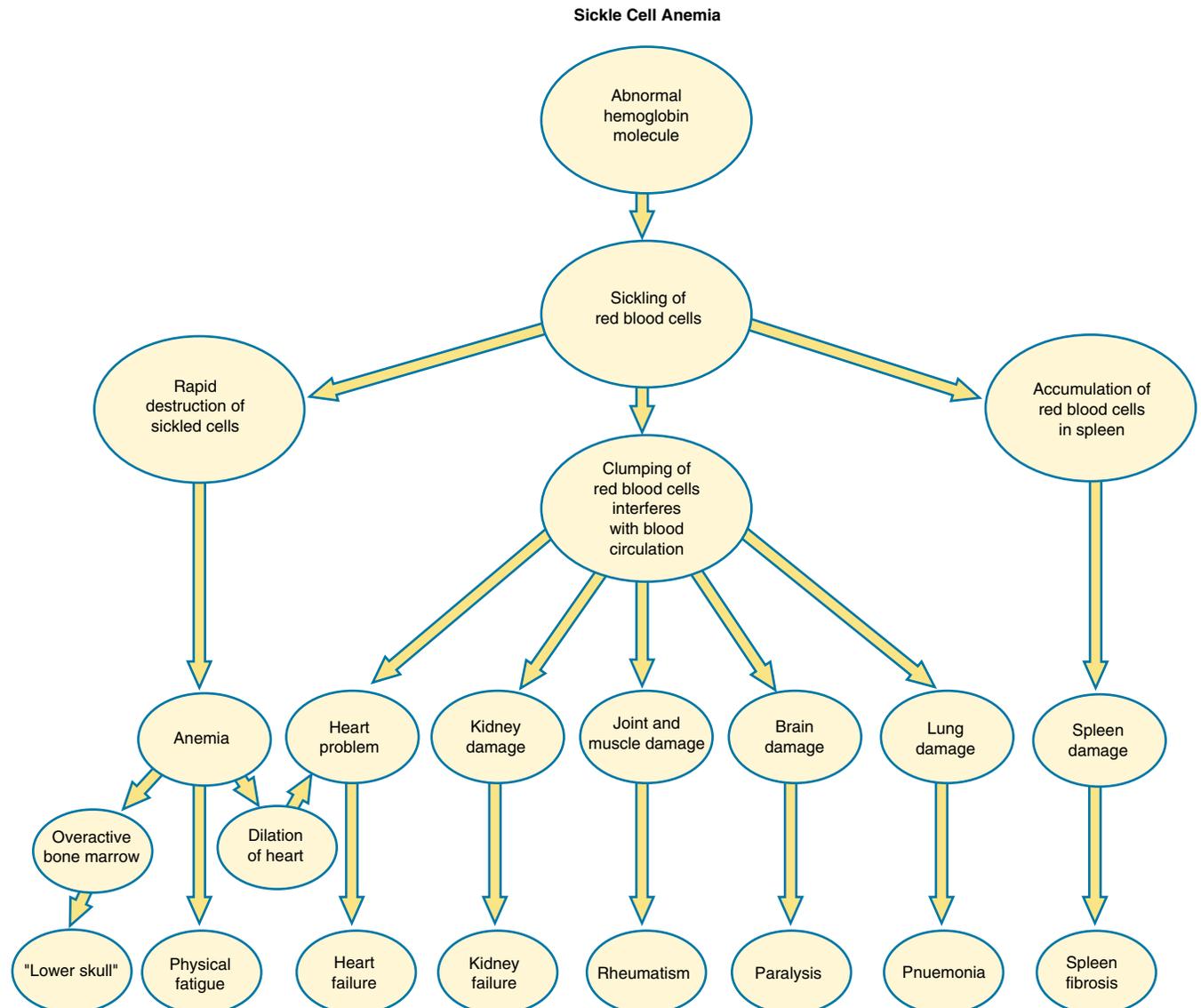


Figure 28-9 Sick cell anemia: the clumping of red blood cells with their resulting effects on the body are shown.

TABLE 28-6
Hematologic Function Studies

Test/Normal Range	Diagnostic Value
Erythrocyte sedimentation rate (ESR or sed rate) Westergren: F: < 50 yr 0–25 mm/h > 50 yr 0–30 mm/h M: < 50 yr 0–15 mm/h > 50 yr 0–20 mm/h	Alterations in the plasma proteins cause aggregation of the RBCs with an elevated ESR: moderately, with inflammatory diseases; high, with multiple myeloma, macroglobulinemias, hyperfibrinogenemias.
Haptoglobin 0.10–0.30 g/L 12–35 μ mol/L	Haptoglobins bind with free hemoglobin released from the destruction of RBCs, conserving iron, <i>decreased</i> in any condition causing hemolysis of RBCs: hemolytic anemias (sickle cell anemia, hereditary spherocytosis, erythroblastosis fetalis), thalassemia, liver disease, transfusion reactions, systemic lupus erythematosus, prosthetic heart valve implants; <i>increased</i> with acute and chronic infections, inflammation, malignancies, steroid therapy, rheumatoid arthritis, ulcerative colitis, peptic ulcer, oral contraception, pregnancy.
Glucose-6-phosphate dehydrogenase (G6PD) (red blood cell) F: 7.4–9.4 IU/g hemoglobin Whites 6.5–9.3 IU/g hemoglobin African-Americans M: 7.4–9.4 IU/g hemoglobin Whites 6.6–10.8 IU/g hemoglobin African-Americans	G6PD is an enzyme in RBCs that metabolizes glucose. The test measures enzyme deficiencies that are hereditary, sex-linked conditions carried on the female X chromosome, which causes hemolytic anemia. Clinical disease traits are found in males.
Osmotic fragility 0.30%–0.45% saline < 0.30% saline > 0.50% saline	Test measures the fragility of RBCs to aid in the diagnosis of hereditary spherocytosis. <i>Increased</i> in hereditary spherocytosis, spherocytosis resulting from autoimmune hemolytic anemia, severe burns, chemical poisoning, erythroblastosis fetalis, transfusion reactions, prosthetic heart valve transplantation. <i>Decreased</i> in sickle cell and iron deficiency anemia, polycythemia vera, hemoglobin C disease, thalassemia major, liver disease, obstructive jaundice, or splenectomy
Reticulocyte count (results reported in % of total erythrocytes) Adults 0.5–2.0% Children 0.5–2.0% Infants 0.5–3.5% Newborns 2.5–6.0%	Used to differentiate between hypoproliferative and hyperproliferative anemias; to assess blood loss and bone marrow response to therapy. <i>Increased</i> in hemolytic and sickle cell anemia; hereditary spherocytosis; treatment of anemias from iron, vitamin B ₁₂ , and folic acid deficiencies. <i>Decreased</i> in aplastic, iron deficiency and untreated pernicious anemias; chronic infection; radiation therapy

Rh factor. Rh factor refers to an antigen found on the RBC. Rh positive means the antigen is present; Rh negative means the antigen is absent.

When factoring the four basic blood types with either Rh positive or Rh negative factor there are eight possible combinations (see accompanying box). An individual's blood type is determined by heredity.

Crossmatch determines the compatibility of the donor's blood with that of the recipient. In the laboratory, a sample of the recipient's blood is mixed with the blood of a possible donor. If the blood sample is compatible, the mixed sample does not agglutinate. For example, blood type A negative means that the person's blood

BASIC BLOOD TYPES

- A positive
- B positive
- AB positive
- O positive
- A negative
- B negative
- AB negative
- O negative

contains the A antigen but does not contain the anti-Rh agglutinins. The first time the person is exposed to A-positive blood, either through a transfusion or by giving birth to an Rh-positive child, agglutination does not occur because the body has no antibodies against the

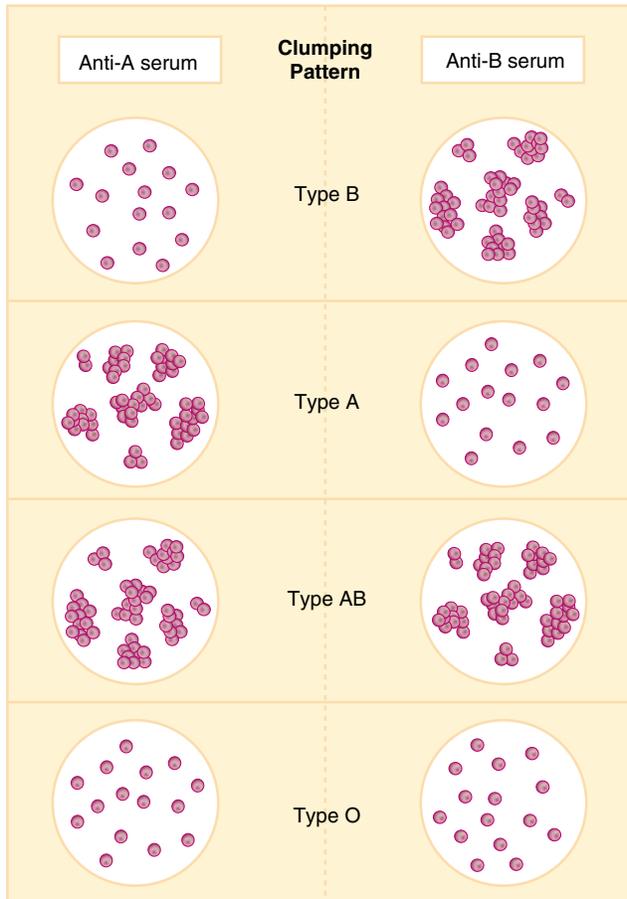


Figure 28-10 Blood Types

antigen. However, once the body has had time to build up antibodies (agglutinins), agglutination will occur.

Blood Chemistry

Blood chemistry analytes can be ordered separately or as profile groups (panels) that consist of 4 to 20 biochemical tests performed on a few milliliters of serum with an instrument called a sequential multiple analyzer (SMA). The studies are referred to as SMA panels based on the number of analytes being tested; refer to accompanying display.

Blood Glucose

Glucose is a simple sugar formed from the digestion of carbohydrates and used by the cells for energy. Insulin is needed to transport glucose into the cells.

Glucose measurement is performed by either skin puncture or venipuncture, fasting blood sugar (FBS) or nonfasting (usually 2-hours postprandial). The normal fasting value is 70 to 115 mg/dl and less than 120 mg/dl postprandial. The 2-hour postprandial blood sugar is drawn 2 hours after the client eats a meal. This test is used to screen for diabetes mellitus; if the results are abnormal, the practitioner may order a glucose tolerance test.

SMA PANELS

SMA-4	Red blood cells White blood cells	Hemoglobin Hematocrit
SMA-6	Sodium Potassium Chloride	Bicarbonate Glucose Blood urea nitrogen
SMA-12	Total protein Albumin Calcium Blood urea nitrogen Inorganic phosphate Cholesterol	Glucose Uric acid Creatinine Total bilirubin Alkaline phosphatase Aspartate aminotransferase (AST)
SMA-20	Glucose Blood urea nitrogen Creatinine Uric acid Sodium Potassium Chloride Bicarbonate Calcium Phosphorus	Bilirubin, direct Bilirubin, indirect Lactic dehydrogenase AST Alanine aminotransferase (ALT) Alkaline phosphate Albumin Total protein Cholesterol Triglycerides

Data from Jaffe, M. S., & McVon, B. F. (1997). *Laboratory and diagnostic test handbook*. Philadelphia: F. A. Davis Company.

A glucose tolerance test is the most accurate test for diagnosing hypoglycemia and hyperglycemia (diabetes mellitus). The client is asked to fast until the test begins. The test is conducted as follows:

- Initial blood and urine specimens are obtained.
- An oral loading dose of glucose is administered.
- Blood and urine specimens are obtained at 30 minutes, 1 hour, 2 hours, 3 hours, and sometimes 4 hours after loading dose.

Figure 28-11 is a graphic presentation of the results of a glucose tolerance test, showing results that indicate hyperglycemia, normal glucose, and hypoglycemia.

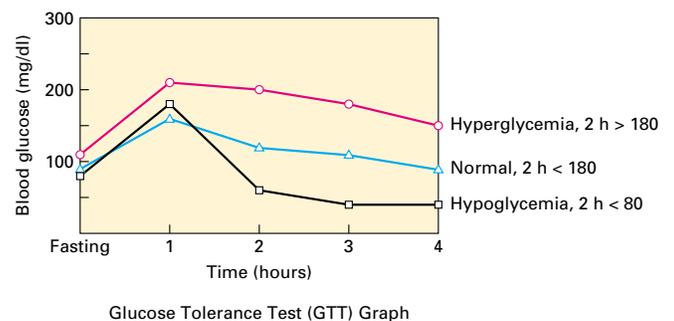


Figure 28-11 Glucose Tolerance Test (GTT) Graph



Title of Study

“Diurnal Variation in Fasting Plasma Glucose: Implications for Diagnosis of Diabetes in Patients Examined in the Afternoon”

Authors

Troisi, R. J., Cowie, C. C., & Harris, M. I.

Purpose

To document diurnal variation in fasting plasma glucose levels in adults not known to have diabetes, and to examine the applicability to afternoon-examined clients based on the diagnostic criteria for diabetes.

Methods

Participants were selected from the U.S. population-based Third National Health and Nutrition Examination Survey (1988–1994). All participants were 20 years of age or older who had no previously diagnosed diabetes. The participants were randomly assigned to morning or afternoon examinations, and fasted prior to blood sampling.

Findings

The two groups did not differ in age, body mass index, waist-to-hip ratio, physical activity index, and other factors. The mean fasting plasma glucose levels were higher in the morning group than in the afternoon group.

Implications

The results of this study indicate that, if current diabetes diagnostic criteria are applied to clients seen in the afternoon, approximately half of all cases of undiagnosed diabetes in these clients will be missed.

Troisi, R. J., Cowie, C. C., & Harris, M. I. (2000). Diurnal variation in fasting plasma glucose: Implications for diagnosis of diabetes in patients examined in the afternoon. *Journal of the American Medical Association*, 284(24), 3157–3159.

Glucose results reveal deficits in either the digestion of carbohydrates or glucose metabolism (e.g., diabetes mellitus). Drugs, especially diuretics and steroids, can cause physiological changes resulting in elevated blood glucose values. Clients receiving intravenous fluids with a high glucose content need to have their glucose levels monitored for hyperglycemia.

Serum Electrolytes

An **electrolyte** is an element or compound that, when dissolved in water or another solvent, separates into ions and provides for cellular reactions. Some electrolytes act on the cell membrane allowing for the transmission of electrochemical impulses in nerve and muscle fibers. Other electrolytes determine the activity of different enzymatically catalyzed reactions that are necessary for cellular metabolism.

Cations are ions that have a positive charge: sodium (Na^+), potassium (K^+), calcium (Ca^{++}), and magnesium (Mg^{++}). **Anions** are ions that have a negative charge: chloride (Cl^-) and phosphate (HPO_4^{--}).

The routine electrolyte laboratory tests are presented in Table 28-7. These tests measure the serum concentration of sodium, potassium, calcium, chloride, magnesium, and phosphate. See Chapter 37 for a detailed discussion of the intracellular and extracellular functions of electrolytes.

Blood Enzymes

Enzymes are globular proteins produced in the body that catalyze chemical reactions within the cells by promoting the oxidative reactions and synthesis of various chemicals, such as lipids, glycogen, and adenosine triphosphate (ATP). Enzyme tests play a key role in diagnosing the degree of tissue damage mainly to the myocardium and, to a lesser degree, to the brain.

Elevations in plasma levels of intracellular enzymes occur during myocardial **necrosis** (tissue death as the result of disease or injury). Enzymes are released into the bloodstream in proportion to the degree of cellular damage. Table 28-7 discusses the common alterations of electrolytes and their clinical significance.

Enzymes are not used as single diagnostic values in determining a diagnosis but are viewed in relation to other diagnostic studies. The results from several diagnostic procedures will assist the practitioner in determining the cause of clinical symptoms.

Creatine phosphokinase (CPK) is an enzyme used to convert creatine to phosphocreatine and adenosine diphosphate (ADP) to ATP. ATP provides energy to the cells to carry on metabolism. CPK levels indicate the degree of normal tissue catabolism. Elevated values of CPK reflect the damage that has occurred in tissue with a high CPK content. For example, the myocardium has a high CPK content; when the client has a myocardial infarction, CPK is elevated because the heart's tissue has been damaged, requiring ATP to repair the damaged myocardium.

Creatine phosphokinase has three isoenzymes of differing molecular structure that are present in different tissue (Table 28-8). The isoenzymes provides clinical data to the practitioner in diagnosing the site and extent of tissue injury.

Aspartate aminotransferase (AST) is one of two enzymes that catalyze the transfer of the nitrogenous por-

TABLE 28-7
Routine Serum Electrolytes

Electrolyte/Normal Range*	Clinical Significance
Sodium 135–148 mEq/L, adult 138–144 mEq/L, children 133–144 mEq/L, newborns	<i>Increased:</i> excessive intake of sodium without water; salt water drowning; high solute concentration (tube feeding, IV, hyperalimentation) without fluid correction; diarrhea; diabetes insipidus; primary aldosteronism; renal failure. <i>Decreased:</i> excessive intake of water without sodium (oral, IV therapy, tap water enemas); heart failure, cirrhosis; nephrosis and massive diuretic therapy.
Potassium (serum) 3.5–5.0 mEq/L, adult 3.4–4.7 mEq/L, children 3.7–5.9 mEq/L, newborns	<i>Increased:</i> high potassium intake (oral, IV therapy, rapid infusion of aged blood); renal disease; drugs (adrenal steroids, potassium-conserving diuretics, potassium penicillin, chemotherapeutic agents); Addison's disease; burns and other massive tissue trauma; metabolic and respiratory acidosis. <i>Decreased:</i> drugs (diuretics, digitalis); metabolic alkalosis; primary aldosteronism; Cushing's disease; vomiting and gastric suction.
Calcium Total 8.4–10.5 mg/dl Ionized 1.13–1.32 mmol/L	<i>Increased:</i> hyperparathyroidism; bone catabolism (multiple myeloma, leukemia, bone tumors); immobility. <i>Decreased:</i> renal failure; sprue; pancreatitis; Crohn's disease; hyperphosphatemia; drugs (aminoglycosides, antacids containing aluminum, caffeine, cisplatin, corticosteroids, loop diuretics, mithracin, phosphate).
Chloride 96–109 mEq/L, adult 98–105 mEq/L, children 94–112 mEq/L, newborn	<i>Increased:</i> hyperparathyroidism; drugs (ammonium chloride, ion exchange resin, phenylbutazone); metabolic acidosis; respiratory acidosis; dehydration. <i>Decreased:</i> prolonged vomiting and gastric suction; diarrhea; diuretics (ethacrynic acid and furosemide).
Magnesium 1.3–2.0 mEq/L, adult 1.6–2.6 mEq/L, children 1.4–2.9 mEq/L, newborn	<i>Increased:</i> chronic renal failure, drugs (magnesium sulfate, antacids, enemas containing magnesium, sedatives); acute adrenal cortical insufficiency. <i>Decreased:</i> chronic diarrhea and alcoholism, nontropical sprue, steatorrhea, hereditary malabsorption, starvation, bowel resection, diuretics (mannitol, urea, glucose); hypoparathyroidism.
Phosphate 2.7–4.5 mg/dl, adult 4.5–5.5 mg/dl, children 4.5–6.7 mg/dl, newborn	<i>Increased:</i> renal insufficiency; intake, IV solutions and enemas; blood transfusion; muscle necrosis; hypoparathyroidism. <i>Decreased:</i> alcohol withdrawal; hyperventilation; diabetic ketoacidosis; phosphate-binding antacids.

*Data for normal ranges from Noe, D., & Rock, R. [1994]. *Laboratory medicine*. Baltimore: Williams & Wilkins.

TABLE 28-8
CPK Isoenzymes

Isoenzyme	Normal Range*	Tissue Source
CPK ₁ (BB)	0 IU/l	Primarily in brain/indicative of cerebrovascular accident
CPK ₂ (MB)	0–7 IU/l	Exclusively in myocardium/indicative of myocardial infarction
CPK ₃	5–70 IU/l	Found in skeleton and myocardium/skeletal muscle disorders

*Data for normal range values from Noe, D., & Rock, R. [1994]. *Laboratory medicine*. Baltimore: Williams & Wilkins.

tion of an amino acid to an acid residue. It is an intracellular enzyme found mainly in the liver, heart, skeletal muscles, kidney, pancreas, and RBCs. The normal range is:

- Adults/children 4–36 IU/L
- Newborns 4 times as high as those of adults.

Blood for AST is drawn to determine:

- A recent myocardial infarction (together with the CPK and lactic dehydrogenase levels)
- Acute hepatic disease
- The client's progress and prognosis in cardiac and hepatic diseases

Certain drugs may increase the AST (see the accompanying box). Remember to note drugs on the laboratory

DRUGS THAT CAN ELEVATE ASPARTATE AMINOTRANSFERASE (AST)

- Antibiotics
- Contraceptives
- Cortisone
- Digitalis
- Flurazepam
- Guanthidine
- Indomethacin
- Isoniazid
- Mithramycin
- Narcotics
- Pyridoxine
- Rifampin
- Salicylate
- Theophylline
- Vitamin A

requisition when a client is taking a drug that can influence the results of testing.

Lactic dehydrogenase (LDH), a cellular enzyme that contributes to carbohydrate metabolism, catalyzes the reversible conversion of muscle pyruvic acid into lactic acid. The diagnostic value of serum LDH is limited because it is present in almost all body tissue; however, through electrophoresis, five isoenzymes can be related to specific tissue (Table 28-9).

The percent of isoenzymes changes with tissue damage. For example, in an acute myocardial infarction the LDH₁ becomes greater than LDH₂ 12 to 48 hours postinfarction.

α -Hydroxybutyrate dehydrogenase (HBD) is the total LDH forced to act on α -ketobutyric acid rather than lactic or pyruvic acid. It is a serum measurement used when the assay of isoenzymes of LDH is not available in the laboratory. Once a myocardial infarction has been diagnosed, the HBD has clinical significance by indicating the duration of tissue injury. HBD will remain elevated up to 2 weeks after infarction.

TABLE 28-9
LDH Isoenzymes

Isoenzyme	Range of % of Total LDH	Tissue Source
LDH ₁	17–33	Primarily in heart, kidneys, RBCs
LDH ₂	27–37	Primarily in heart, kidneys, RBCs
LDH ₃	18–25	Primarily in lungs, to a lesser extent in pancreas, thyroid, adrenal glands, lymph nodes
LDH ₄	3–8	Liver and skeletal tissue
LDH ₅	0–5	Liver and skeletal tissue

(Data for normal range values taken from Noe, D., & Rock, R. [1994]. *Laboratory medicine*. Baltimore: Williams & Wilkins.)

Alkaline phosphatase (a zinc-dependent enzyme) influences bone calcification and lipid and metabolite transport. The normal plasma range is 30 to 120 IU/L. Alkaline phosphatase is used to detect:

- Osteoblastic activity
- Hepatic tumors or abscess
- Impaired zinc status
- The response of vitamin D in the treatment of deficiency-induced rickets

Certain drugs can cause a mild to moderate elevation in the alkaline phosphatase (see the accompanying box).

DRUGS THAT CAN ELEVATE ALKALINE PHOSPHATASE

- Allopurinol
- Antibiotics
- Ergosterol
- Estrogen
- Isoniazid
- Methyldopa
- Methyltestosterone
- Oral contraceptives
- Phenothiazine tranquilizers
- Procainamide
- Propranolol
- Sulfonamides
- Tolbutamide

Acid phosphatase is an enzyme found primarily in the adult male prostate gland. It is used clinically to distinguish between encapsulated and metastatic carcinoma of the prostate gland. If the cancer cells are contained within a capsule, the acid phosphatase levels remain normal (0.2 to 0.8 IU/L).

Glucose-6-phosphate dehydrogenase is a RBC enzyme. The normal range and the clinical significance were shown in Table 28-6.

The main proteolytic enzymes for digestion are contained in the pancreatic juices (trypsin, chymotrypsin, and carboxypeptidase). The common laboratory tests for measuring the digestive enzymes are presented in Table 28-10.

NURSING ALERT

Blood Enzyme Tests

Client must be fasting 1 to 2 hours before having a serum amylase drawn. If the client has eaten and received a narcotic at the same time, the serum results could be invalidated.

Cholinesterase is an enzyme, manufactured in liver, that is responsible for the breakdown of acetylcholine and other choline esters. The normal range for cholinesterase in adults and children is 8 to 18 IU/L. It is elevated in diabetes, hyperthyroidism, and nephrotic syndrome. Decreases in cholinesterase can result from

TABLE 28-10
Digestive Enzymes

Enzymes	Reference Range	Clinical Significance
Alanine aminotransferase	0–30 IU/L	Hepatocellular damage
Aldolase	0–8 IU/L	Anemia (hemolytic and megaloblastic); granulocytic leukemia; metastatic carcinoma; skeletal muscle tissue damage
Amylase	Total: 40–220 IU/L	Pancreatitis
Aspartate aminotransferase	0–35 IU/L	Hepatitis; infectious mononucleosis; cirrhosis
Lipase	0–1 Cherry-Crandell U/L	Acute pancreatitis
5'-Nucleotidase	0–17 U/L	Biliary cirrhosis; extrahepatic obstruction; hepatic carcinoma

(Data for normal range values taken from Noe D., & Rock, R. [1994]. *Laboratory medicine*. Baltimore: Williams & Wilkins.)

severe anemias and infections, exposure to some insecticides, liver disease, malnutrition, shock, and uremia (Cavanaugh, 1999).

Blood Lipids

Coronary heart disease (CHD) is the number one killer of both men and women in the United States. According to the National Center for Health Statistics (NCHS), some 7 million Americans suffer from CHD and more than 500,000 Americans die of heart attacks each year caused by CHD (NCHS, 1999). The National Cholesterol Education Program (NCEP) and the American Heart Association have published guidelines and recommendations regarding the need to improve laboratory detection of hypercholesterolemia and treatment. Total blood cholesterol is the most common measurement of blood cholesterol. Cholesterol is measured in milligrams per deciliter of blood (mg/dl). Blood cholesterol for adults is classified by levels.

Exogenous cholesterol is present in the diet and absorbed into the gastrointestinal tract. Endogenous cholesterol is formed in the liver and other cells in the body. As much as 80% of cholesterol is converted into cholic acid to form bile salts. Cholesterol is also needed:

- Throughout the body for the formation of membranes
- By the adrenal glands to form adrenocortical hormones
- By the ovaries to form progesterone and estrogen
- By the testes to form testosterone
- By the skin to provide a water-soluble barrier

Cholesterol and other fats cannot dissolve in the blood; they have to be transported to and from the cells by special carriers called **lipoproteins** (blood lipids bound to protein). The types of lipoproteins are described below, but the ones to be most concerned about are low-density lipoprotein (LDL) and high-density lipoprotein (HDL).

- Chylomicrons—mainly ingested triglycerides
- Very low-density lipoproteins (VLDLs)—mainly endogenous triglycerides
- Low-density lipoproteins (LDLs)—moderate amounts of phospholipids with 50% cholesterol
- High-density lipoproteins (HDLs)—50% protein

LDL is the major cholesterol carrier in the blood. When too much LDL circulates in the blood, it can slowly build up in the walls of the arteries feeding the heart and brain. The build up of LDL and other substances causes the formation of **atherosclerotic plaque**, a thick, hard deposit that can clog the arteries in the heart and brain. A **thrombus** (a blood clot) can develop around the plaque that blocks the flow of blood to part of the heart muscle and causes a myocardial infarction (MI). If the thrombus blocks the flow of blood to part of the brain, it results in a cerebrovascular accident (CVA). High levels of LDL cholesterol (more than 130 mg/dl) increase the risk for CHD; this type of cholesterol is often called bad cholesterol.

HDL accounts for one-third to one-fourth of blood cholesterol and carries the cholesterol away from the arteries and back to the liver, where it is removed from the blood. HDL removes excess cholesterol from atherosclerotic plaques, slowing their growth. HDL is known as good cholesterol because a high level of HDL seems to decrease the risk of CHD.

Triglycerides are the chemical form in which most fat exists in food as well as in the body; they account for more than 90% of dietary intake and comprise 95% of fat stored in tissues (Fischbach, 2000). Triglycerides are insoluble in water and are the main plasma glycerol ester. An increase in triglyceride levels can be detected by plasma measurements; this test evaluates suspected atherosclerosis and measures the body's ability to metabolize fat.

Table 28-11 shows the relationship of lipids to a client being at risk for CHD. The practitioner must examine all of the lipid levels together. For instance, a client whose total cholesterol, LDL cholesterol, and triglycerides are all slightly elevated and whose HDL is slightly decreased is at a greater risk for CHD than

TABLE 28-11
Relationship of Lipids to Coronary Heart Disease Risk

Lipid	Desirable Level	Borderline CHD Risk	High CHD Risk
Cholesterol	< 200 mg/dl	200–239 mg/dl	> 240 mg/dl
LDL Cholesterol	< 130 mg/dl	130–159 mg/dl	> 160 mg/dl
HDL Cholesterol	> 40 mg/dl	35–40 mg/dl	< 35 mg/dl
Triglyceride	< 250 mg/dl	250–500 mg/dl	> 500 mg/dl

(Data from Fischbach, F. [2000]. *A manual of laboratory and diagnostic tests* [6th ed.]. Philadelphia: Lippincott.)

someone whose cholesterol is elevated but whose HDL is also high.

The nurse must prepare clients for the lipid level testing by teaching them to:

- Eat a regular diet 3 to 7 days before the test
- Fast 12 to 14 hours before the test
- Refrain from vigorous exercise 24 hours before the test
- Refrain from caffeine and nicotine 24 hours before the test
- Per practitioner order, withhold drugs 24 hours before the test (many drugs affect the serum triglycerides level)
- Be aware that repeat tests may be necessary to confirm elevated levels because results can vary 15% or more from day to day.

Diurnal variation causes triglycerides to be lowest in the morning and highest around noon (Fischbach, 2000).

Several factors can affect the test results. The client's position, such as lying down, causes a redistribution between vascular and extravascular compartments. For instance, after 5 minutes in a recumbent position, total plasma cholesterol may be significantly reduced (10–15% decrease after 20 minutes). Recent trauma and severe infections may decrease the cholesterol level by 10% to 30%. Because pregnancy increases the HDL, LDL, VLDL levels 20% to 30%, postpone testing 3 to 4 months postdelivery.

Therapeutic Drug Monitoring

Therapeutic drug monitoring is performed when a quantitative relationship exists between the drug concentration and drug response or toxicity is known. For a drug concentration to be significant:

- It must be determined in a blood sample drawn after the drug has been completely absorbed from the oral or intramuscular route.
- It has had an opportunity to be distributed to its site of action.
- Its steady state has been reached (e.g., four to five half-lives must have passed).

For instance, with digoxin (a cardiac medication, administered on a daily schedule) the absorption and distribution phases may take 6 to 12 hours to complete. For a meaningful interpretation, the blood specimen should be drawn at least midway through the elimination phase (6 hours before the next dose). If the specimen is drawn just before the next dose, one obtains a trough concentration, whereas a specimen drawn 6 to 12 hours after dosing yields a peak concentration. For digoxin, the swing between peak and trough would be expected to be minimal because the drug is given at intervals that are less than the drug's terminal half-life (42 ± 19 hours). Generally, such sampling is most significant after steady state has been reached (about 8 days for digoxin). Trough and peak sampling help the practitioner to determine the dose rate, keeping the drug level below toxic value.

Arterial Blood Gases

Blood gas results are reported in millimeters of mercury (Hg). Normal ABG ranges are:

- PO_2 75–100 mm Hg
- PCO_2 35–45 mm Hg
- pH 7.35–7.45

The clinical interpretation of gases studies the relationship between the gasses. For example, a low PO_2 combined with a high PCO_2 may indicate bronchiole obstruction or that the alveoli are filled with fluid. In both situations, there is an impairment of gaseous exchange. See Chapter 32 for a complete discussion.

Urine Tests

The primary function of the kidneys to rid the body of waste products and to maintain homeostasis through regulation of the acid-base balance, fluid and electrolyte balance, and arterial blood pressure. Urine leaves the kidneys through the ureters. Peristaltic waves move the waste products through the ureters to the bladder. Normally, the bladder stores 200 to 400 ml of urine; however, its capacity is greater.

NORMAL URINE VALUES

• pH	4.6–8.0	Adults and children
	5.0–7.0	Newborns
• Color	Amber-yellow	
• Specific gravity	1.010–1.025	
• Protein:		
Qualitative	None	
Quantitative	10–100 mg/24h	
• Glucose	None	
• Ketones	None	
• Blood	0–2 RBCs	

(Data from Noe D., & Rock, R. [1994]. *Laboratory medicine*. Baltimore: Williams & Wilkins.)

Urinalysis (UA) is an essential part of an examination for both diagnostic and preventive purposes. UAs are easy to collect and can be a valuable screening procedure. The kidneys have the ability to regulate sodium and urine concentration and dilution in accordance with the needs of the individual. The main urine constituents are water, urea, uric acid, creatinine, ammonia, sulfates, sodium, potassium, chloride, calcium, magnesium, and phosphate. Other kidney filtrates found in the urine include hormones, vitamins, and medications. The urine may also contain other constituents indicative of disease such as RBCs and WBCs, casts, crystals, mucus, bacteria, protein, glucose, and ketones. See the accompanying box for normal values.

Although laboratories provide a wide range of urine tests, some types of tablet, tapes, and dipstick tests for UA can be performed outside the laboratory setting. Kerr, Marshall, and Sinclair (1999) conducted a study to determine if there was a difference in the urine results obtained by the emergency department physician as compared with the results obtained by a trained laboratory technician. On comparison, the results were similar for both dipstick and microscopic components of urinalysis: red blood cell urinalysis and microscopy, leukocyte esterase, and nitrite testing; however, emergency physicians were not able to consistently perform UA for microscopic white cells and bacteria, and testing for proteinuria.

Urine pH

The pH is governed by the hydrogen ion concentration of the urine. Disorders such as diabetes mellitus, dehydration, diarrhea, emphysema, and starvation make the urine acidic. Chronic renal failure, renal tubular acidosis, urinary tract infections, and salicylate poisoning cause the urine to be alkaline.

Specific Gravity

Specific gravity measures the number of solutes in a solution. Urea and uric acid (the byproducts of nitrogen

metabolism) have the greatest influence on the specific gravity of urine. A urinometer and cylinder are used to measure the specific gravity (Figure 28-12). The urinometer has a specific gravity scale and a weighted mercury bulb. A fresh urine specimen is poured into the cylinder. The nurse inserts and twirls the urinometer into the cylinder. The depth of the urinometer is determined by the concentration of dissolved analytes. When the urinometer stops spinning, the nurse reads the urinometer at eye level.

The specific gravity increases with conditions that increase the loss of fluids from the body, such as diabetes mellitus, gastrointestinal fluid losses, third-space fluid accumulation, and fear or anxiety. Decreases in the specific gravity result from renal disease. When the amount of urine increases and the specific gravity decreases there is an absence of the antidiuretic hormone (ADH), usually triggered by diabetes insipidus (a disorder of the posterior pituitary gland).

Urine Glucose

When the blood levels of glucose exceed the renal threshold (180 mg/dl), glucose spills into the urine. Multiple agents are available for measuring the glucose content of urine. These agents are not as accurate a test method as blood glucose levels.

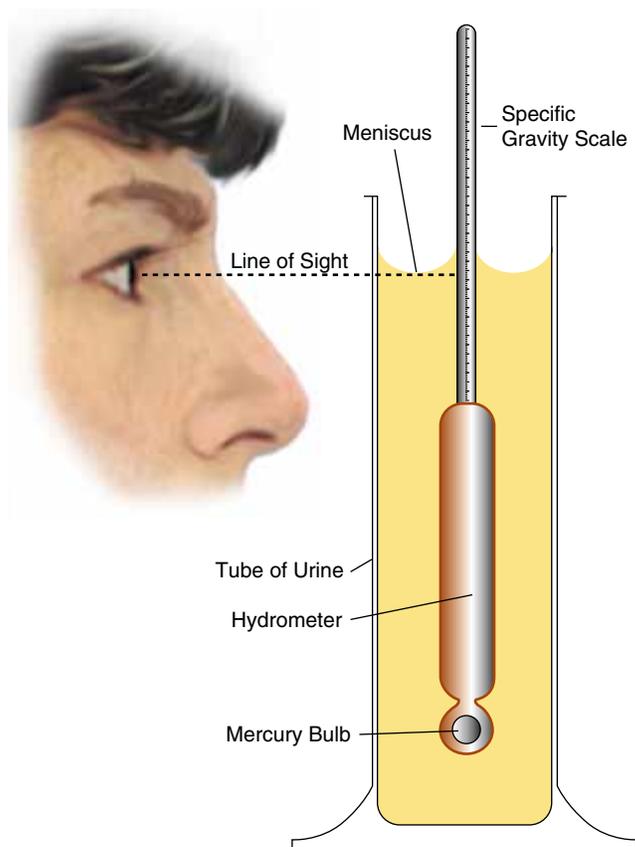


Figure 28-12 Urinometer

Some of the reducing agents can measure other products, such as protein and blood, along with the glucose (Clinitest and Clinistix). Each product has specific step-by-step instructions for performing the test and reading the results. Teach the client how to perform these urine tests.

Urine Ketones

Ketones are products of fatty acid metabolism and are completely metabolized by the liver under normal conditions. The most common cause of ketonuria is diabetes. However, with strenuous exercise, starvation, and sustained febrile and hypoxic conditions an increase in fatty acid metabolism causes ketoacidosis, resulting in ketone bodies in the urine.

Urine Cells and Casts

Normally the urine is free from blood cells and casts. When the renal system is impaired as in renal damage or failure, nephritis, and stones and infections in the urinary tract, the following can occur:

- Bleeding with resulting RBCs in the urine
- Accumulation of epithelial cells with cast formation
- WBCs, which indicate infections

Stool Tests

Stool analysis is used to determine the various constituents of the stool for diagnostic purposes such as diseases of the gastrointestinal tract, the liver, and the pancreas. Normal constituents of the stool are urobilinogen, porphyrins, sodium, chloride, potassium, and small amounts of nitrogen and lipids. The most frequent tests ordered on feces include leukocytes, blood, fat, ova and parasites, and pathogens.

Urobilinogen

Urobilinogen is derived from the normal bacterial action of intestinal flora on bilirubin. It is increased with severe hemolysis of RBCs and decreased with most biliary obstructions.

Occult Blood

When blood is invisible on inspection it is said to be **occult**; it is blood that can only be detected through a microscope or by chemical means. In the gastrointestinal tract, the digestive process acts on blood, making it occult. Random sampling for occult blood is done to diagnose gastrointestinal bleeding, ulcers, and malignant tumors. Colorectal cancer is a leading cause of cancer deaths in the United States. Most colorectal cancers begin as a **polyp**, a small abnormal growth of tissue, in the wall of the colon. As the polyp grows, it may cause bleeding from the rectum, blood in the stool, or a

change in the shape of the stool. Screening for colorectal cancer begins with fecal occult blood testing. Cancer screening guidelines recommend annual fecal occult blood testing for adults aged 50 years and older (Mandelson, LaCroix, Anderson, Nadel, & Lee, 1999). Any person age 50 years or older but asymptomatic are considered average risk for colorectal cancer. The risk factors increase when one or more of the following exist:

- Close relative(s) who have had colorectal cancer or an adenomatous polyp
- Family history of familial adenomatous polyposis
- Family history of hereditary nonpolyposis colorectal cancer
- History of adenomatous polyps
- History of colorectal cancer
- Inflammatory bowel disease

See the accompanying box for the complete set of guidelines for colorectal screening as developed by the

GUIDELINES FOR COLORECTAL SCREENING

Risk Category	Recommendations
Average	Fecal occult blood screening yearly, starting at 50 years of age Flexible sigmoidoscopy every 5 years or colonoscopy every 10 years or double-contrast barium enema every 5 to 10 years
Increased Risk	Same as above, but screening is initiated when the client is 40 years of age Genetic counseling/testing In a gene carrier, flexible sigmoidoscopy every 12 months, beginning at puberty Genetic counseling/testing Examination of the entire colon every 1 to 2 years, starting when the client is 20 to 30 years old Examination of the entire colon yearly after the client is 40 years old Colonoscopy 3 years after initial examination, with subsequent examinations, depending on the types of polyps detected Complete examination 1 year after colon surgery; if normal, reexamination of colon in 3 years; if still normal, reexamination in 5 years Surveillance colonoscopy every 1 to 2 years, beginning after 8 years of disease in the client with pancolitis and after 15 years in the client with left colon involvement only

From Johnson, B. A. (1999). Flexible sigmoidoscopy for colorectal cancer. *American Family Physician*, Jan 15., 1999.

American Cancer Society, the American College of Gastroenterology, and the American Society of Gastrointestinal Endoscopists. See Table 28-12 for the diagnostic procedures: colonoscopy and proctosigmoidoscopy.

When the practitioner is using occult blood to confirm suspicions of a gastrointestinal disorder, the client is placed on a 3-day diet free of meat, poultry, and fish to decrease the possibility of a false-positive result. Common drugs that can cause a positive test for occult blood are salicylate, steroids and indomethacin.

Parasites

The gastrointestinal tract can harbor parasites and their eggs (ova). Some of these parasites are harmless, whereas others cause clinical symptoms. With the exception of pinworms (which can enter the body through both the oral and anal routes), all other common parasites gain portal entry through the mouth by ingesting contaminated water or food. Roundworm, hookworm, whipworm, tapeworm, *Trichinella spiralis*, and *Entamoeba histolytica* are common parasites found in the United States.

Culture and Sensitivity Tests

Culture refers to the growing of microorganisms to identify the pathogen. Culture and sensitivity (C&S) tests are performed to identify both the nature of the invading organisms and their susceptibility to commonly used antibiotics. Sensitivity allows the practitioner to select the appropriate antibiotic therapy. All C&S specimens should be taken immediately to the laboratory.

NURSING ALERT

Cultures

All culture tests should be performed before initiating antibiotic therapy so as to identify the type of pathogen and its sensitivity to specific antibiotics.

Blood Culture

Bacteremia is bacteria in the blood. The blood culture should be obtained while the client is experiencing chills and fever. A series of three venipuncture collections are performed using strict sterile technique; change the needle after the specimen is collected before injecting the blood sample into the test tube.

Swab (Throat) Culture

The throat normally colonizes many organisms. Throat cultures serve to isolate and identify such pathogens as β -hemolytic streptococci; *Staphylococcus aureus*; meningococci; gonococci; *Bordetella pertussis*; and *Corynebacterium diphtheria*. A throat swab is commonly done to identify streptococcal infections, which, if untreated, can cause rheumatic fever or glomerulonephritis.

To obtain a throat swab, use a wooden blade to depress the tongue and swab the white patches, exudate, or ulcerations of the throat with a sterile applicator. Avoid touching other parts of the mouth with the swab. Once obtained, place the applicator in a sterile container.

Sputum Culture

Sputum tests are done for culture, smear, and cytology. Sputum is created by the mucous glands and goblet cells of the tracheobronchial tree and is raised by coughing. Sputum is sterile until it reaches the throat and mouth where it comes in contact with normal flora. Sputum can be obtained by tracheobronchial suctioning and transtracheal aspiration, producing a more accurate identification of pulmonary organisms.

A sputum smear will identify the same organism found in a culture plus eosinophils, epithelial cells, and other substances. Smears are helpful in diagnosing asthma (eosinophils) and fungal infection. The specimen needs to be refrigerated if it cannot be taken immediately to the laboratory.

Sputum can also be examined for **cytology** (the study of cells). It is performed to diagnose cancer of the lungs. The specimen should be collected early in the morning after a deep cough.

Urine Culture

Urinary C&S tests are performed whenever a urinary tract infection is suspected. Organisms enter the urinary system by one of two ways:

1. Ascending urinary tract infections are associated with *Escherichia coli* and *Candida albicans* from the rectum, vagina and catheterization.
2. Descending sources are caused from *Staphylococcus* and *Streptococcus* entering the urinary system from the blood.

Stool Culture

Stool C&S is performed to identify bacterial infections. If the client has diarrhea, a rectal swab can be taken as a specimen; fecal material must be visible on the swab for the laboratory to perform the test.

Wound Culture

Clinical specimens taken from abscesses or infected wounds reveal a variety of aerobic and anaerobic microorganisms. "Because anaerobic microorganisms are the preponderant microflora in humans and are

consistently present in the upper respiratory, gastrointestinal, and genitourinary tracts, they are also likely to invade other parts of the body to cause severe, and sometimes fatal, infections” (Fischbach, 2000, p. 554). Pathogens are likely to be present in the following wound specimens: pus, necrotic tissue, debrided material, postoperative wound drainage, lower-extremity ulcers, and pressure ulcers. Use standard precautions when obtaining a wound culture. Most wounds require some form of preparation prior to culturing a wound (see Procedure 35-1, Culturing a Wound).

Bone Marrow

Bone marrow specimens are examined by either culture or smear for identification of microorganisms. Smear slides are prepared at the client’s bedside by the nurse.

Papanicolaou Test

Papanicolaou test (smear method of examining stained exfoliative cells), commonly called a Pap smear, is done to evaluate the cell maturity, metabolic activity, and morphologic variations of the cervical tissue. Papanicolaou testing can also be used for tissue specimens from other organs, such as bronchial aspirations and gastric secretions.

Cervical Pap smear testing is recommended every 2 to 3 years after the onset of sexual activity. Annual testing is indicated for women:

- Over 40 years of age
- With a family history of cervical cancer
- With a previous positive test

To increase the accuracy of a cervical specimen, the client should be told to avoid intercourse, douches, and vaginal creams for 24 hours before the test. The vaginal speculum should not be lubricated. This test should not be performed if the client is menstruating because the specimen will be unsuitable for cytologic study.

RADIOLOGIC STUDIES

Radiography (the study of x-rays or gamma ray-exposed film through the action of ionizing radiation) is used by the practitioner to study internal organ structure. **Fluoroscopy** (the immediate, serial images of the body’s structure and function) is used to demonstrate the motion of organs when used with **contrast medium** (a radiopaque substance that facilitates roentgen imaging of the body’s internal structures). X-rays are valuable to the practitioner in either formulating a diagnosis (e.g., pneumonia) or as a tool to determine if other studies are necessary (e.g., lung lesion requiring biopsy to differentiate between a benign or malignant tumor).

Certain radiologic tests will require a contrast medium that could interfere with other diagnostic studies. Barium and iodine are commonly used contrast media. Laboratory blood samples measuring the thyroid function should be drawn before an intravenous pyelogram (IVP) where radioactive iodine dye is administered. If the client needs both an IVP and barium enema, the IVP is done first because the barium is likely to decrease the visualization of the kidneys.

Precautions need to be taken to ensure client safety. It is essential during history taking that the client is questioned about the possibility of pregnancy, asthma, and allergic reactions to contrast media (iodine) as well as to other foods and drugs. If the client has never received iodine, this should be noted on the requisition.

NURSING ALERT

Contrast Media

Carefully monitor clients who are scheduled for dye injection studies when they have a history of allergies to any foods or drugs (particularly fish or iodine) because this condition may predispose them to allergic reactions to contrast media.

Chest X-Ray

The most common radiologic study is the noninvasive, non-contrasted chest x-ray. The best results are obtained when the films are taken in the radiology department; however, a portable chest x-ray can be performed at the bedside.

Radiographic projection positions of chest x-ray films are taken from various views (Figure 28-13). Multiple views of the chest are necessary for the practitioner to assess the entire lung field. To prepare the client for a chest x-ray, remove metal objects (jewelry) and all clothing from the waist up and replace with a gown. Metal will appear on the x-ray film thereby obscuring visualization of parts of the chest. Pregnant women are draped with a metal apron to protect the fetus.

Chest films can indicate the following alterations and diseases:

- Lesions (tumors, cysts, masses) in the lung tissue, chest wall, bony thorax or heart
- Inflammation of lung tissue (pneumonia, atelectasis, abscesses, tuberculosis); pleura (pleuritis); and pericardium (pericarditis)
- Fluid accumulation in the lung tissue (pulmonary edema, hemothorax); pleura (pleural effusion); and pericardium (pericardial effusion)
- Bone deformities and fractures of the rib and sternum
- Air accumulation in the lungs (chronic obstructive pulmonary disease, emphysema), and pleura (pneumothorax)
- Diaphragmatic hernia

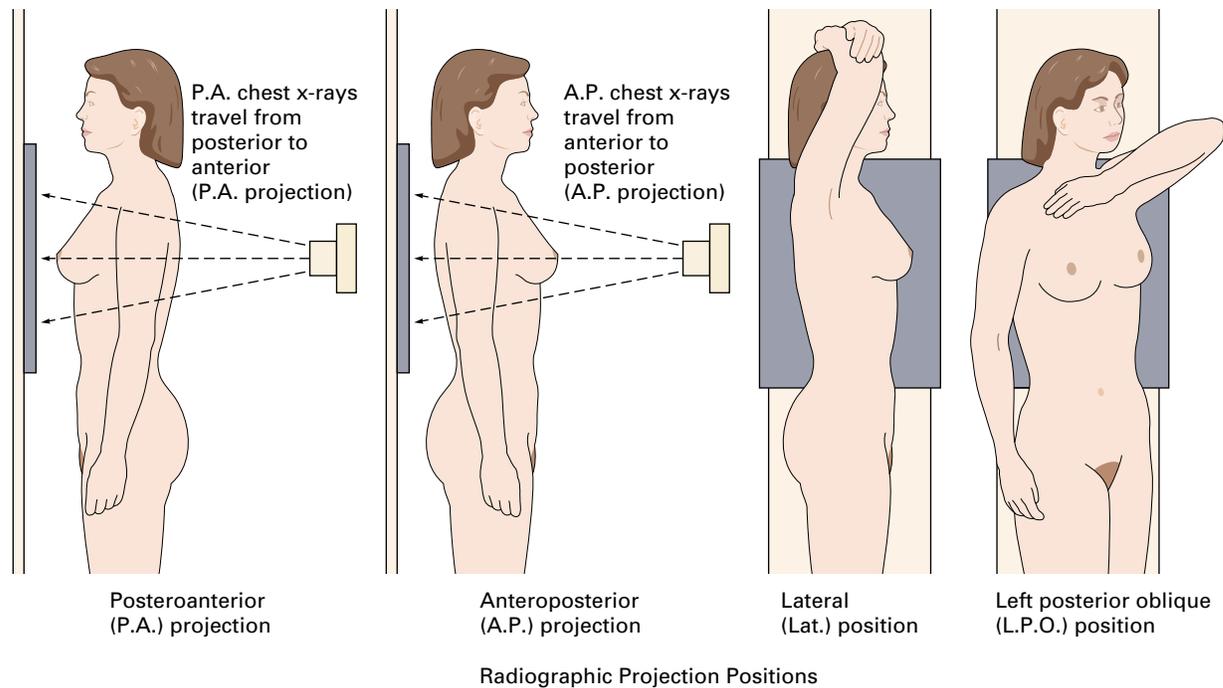


Figure 28-13 Radiographic Projection Positions

RESEARCH FOCUS

Title of Study

“Financial Impact of Elimination of Routine Chest Radiographs in a Pediatric Intensive Care Unit”

Authors

Price, M. B., Grant, M. J., & Welkie, K.

Purpose

To determine the change in chest radiograph use if each chest radiograph requires a separate order and clinical indications.

Methods

A prospective, nonrandomized, controlled design with an intervention study was conducted in a pediatric intensive care unit (PICU) at a children’s hospital. The study comprised 3,727 PICU clients treated between 1992 and 1996. The study’s interventions were a change in ordering practice: no standing orders for routine daily morning chest radiographs; each radiograph required a written order and clinical indication for ordering the chest radiograph. During a 29-month control phase when routine daily chest radiographs were obtained for all intubated clients, 1.026 chest radiographs per client day were performed. After the intervention, the ratio dropped to 0.653 chest radiographs per client day, a decrease of 36.4% and a cost savings of \$45,476.

Findings

The study results demonstrated the outcome of an evaluation and subsequent change in radiology ordering practice; the change resulted in decreased variability in ordering practice, fewer chest radiographs per client, and a cost savings to the clients and payors.

Implications

This study is the beginning effort to validate the need for diagnostic testing versus standing orders for routine testing. Other routine tests need to be studied regarding outcome measures that include client safety and health promotion.

Price, M. B., Grant, M. J., & Welkie, K. (1999). Financial impact of elimination of routine chest radiographs in a pediatric intensive care unit. *Critical Care Medicine*, 27(8), 1588–1593.

Kidney-Ureter-Bladder

A kidney-ureter-bladder, also known as a KUB (x-ray of the abdomen), is used to visualize the kidney, ureter, and bladder and sometimes the gallbladder, liver, and spleen. The results can reveal congenital abnormalities, enlarged organs, lesions, and obstructions.

Mammography

Mammography (a low-dose radiographic study of breast tissue) is used to reveal congenital abnormalities and lesions. The American Cancer Society (1997) recommends a baseline mammogram by age 40, followed by a mammogram every 2 years until age 50, and every year after age 50.

Skeletal X-Rays

Skeletal x-rays are taken of any bony processes to reveal congenital abnormalities, fractures, joint and spine abnormalities, and degeneration (arthritis).

Computed Tomography

Computed tomography (CT) is the radiologic scanning of the body with x-ray beams and radiation detectors that transmit data to a computer that transcribes the data into quantitative measurement and multidimensional images of the internal structures. Figure 28-14 demonstrates the directions of sagittal, transverse, and coronal planes taken during CT scanning.

This procedure requires the client's written consent. Because the client will be positioned on the scanning table and told to remain motionless, the client's cooperation is essential during the scanning. Prepare the client with an explanation and pictures of what to expect. Figure 28-15 shows the direction of CT scan waves. A simple drawing of this figure can be used in client teaching to increase understanding of the test. Assess the client's ability to relax and review imagery relaxation. See Chapter 14 for a discussion of relaxation techniques. Sedation can be administered with an order from the practitioner.

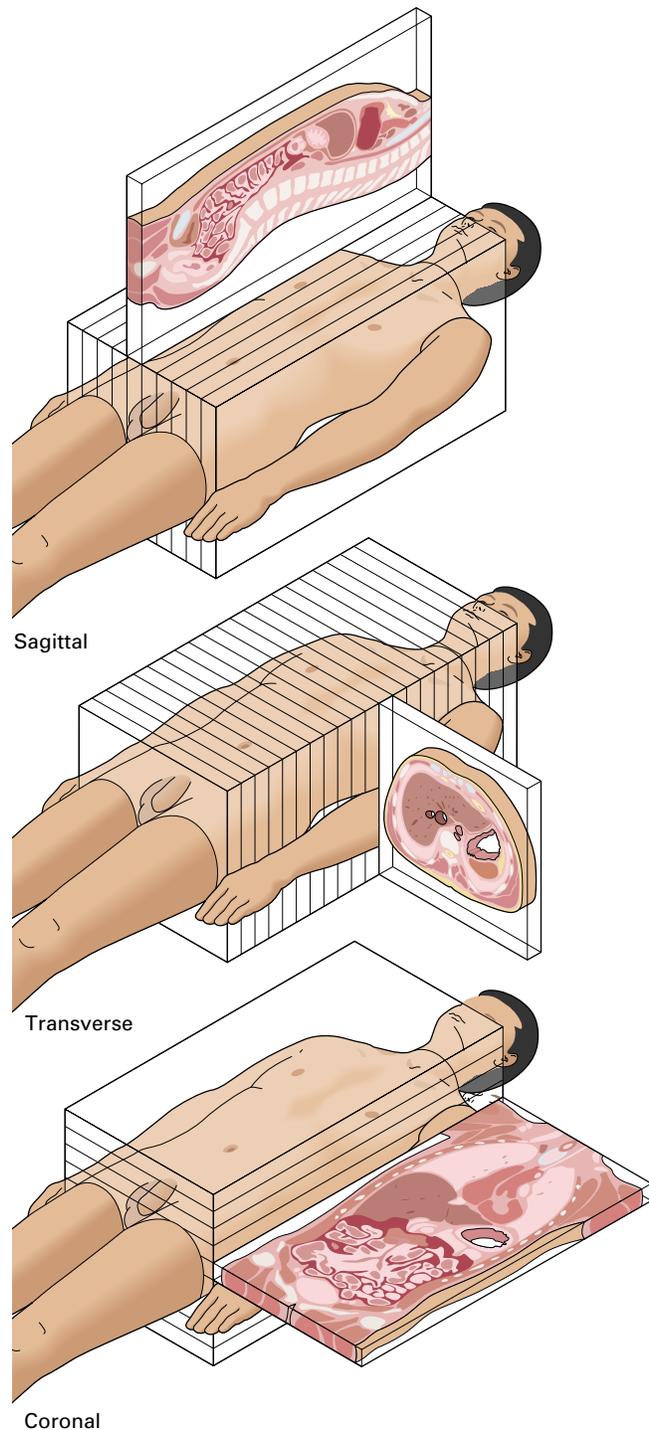


Figure 28-14 Computed Tomography (CT)

Clients who will receive a contrast medium need to be kept NPO 2 to 4 hours before the test. The client should void before the test unless the pelvic area is to be studied. A full bladder enhances visualization of the pelvic area.

Barium Studies

Barium (a chalky white contrast medium) is an oral preparation that allows for roentgenographic visualization of the internal structures of the digestive tract. The results of

NURSING ALERT

Computed Tomography

Because of the use of contrast media during CT to improve the images yielded by the equipment, the nurse must observe the client after the procedure for indicators of allergic dye reactions such as: respiratory distress, urticaria, hives, nausea, vomiting, decreased production of urine (oliguria) and decreased blood pressure.

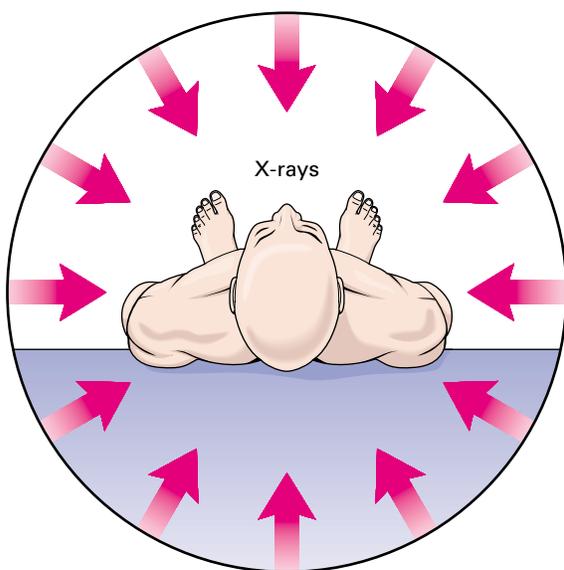


Figure 28-15 Direction of Computed Tomography Scan Rays

barium studies can reveal: congenital abnormalities; lesions; spasm, reflux, stricture, and obstruction; inflammation and ulceration; varices; and fistula. General client preparation for barium studies should include:

- Placing the client on NPO status after midnight
- Administering a laxative the evening before and enemas the morning of the test
- Forcing fluid postprocedure
- Follow-up 2 to 3 days postprocedure to ensure the client has had a normal brown stool

Postprocedure barium will be expelled in the stool, making it milky white. Fluids are forced to help with the excretion of barium. If the barium is not completely excreted, it can cause an intestinal obstruction.

Barium Swallow

Barium swallow (also called esophography) is a fluoroscopic visualization of the esophagus following the ingestion of barium sulfate. Implement the nursing care discussed above for client having a barium study.

Upper Gastrointestinal Study

Upper gastrointestinal (UGI) study is a fluoroscopic visualization of the stomach and small bowel following the ingestion of barium sulfate. In addition to the general preparation of the client for a barium study, also instruct the client:

- Not to smoke 24 hours before the procedure (smoking causes an increased production of gastric juices)
- That during the procedure (which will last approximately 2 hours) pictures will be taken at 30-minute intervals with the client in different positions

Barium Enema

Barium enema (a rectal infusion of barium sulfate) is the roentgenographic study of the lower intestinal tract. The colon should be free of all fecal material to allow for maximum visualization. Instruct the client:

- To eat a low residue diet 2 days prior to the test
- That during the procedure various positions will need to be assumed on the table to facilitate movement of the barium in the intestines
- The test will take about 1 hour.
- The postprocedure cleansing enemas will be given to help remove the barium

NURSING ALERT

Enema

Clients with severe abdominal pain, ulcerative colitis, or a history of a megacolon should have a written order before enemas can be administered because these conditions would normally prohibit the use of standard bowel preparation procedures such as administration of laxatives and cleansing enemas.

Angiography

Angiography allows visualization of the vascular structures through the use of fluoroscopy with a contrast medium. It is performed in radiology or diagnostic studies departments. The test reveals the blood flow to the heart, lungs, brain, kidneys, and lower extremities. It is also useful in diagnosing an **aneurysm** (weakness in the wall of a blood vessel).

Arteriography

Arteriography is the radiographic study of the vascular system following the injection of a radiopaque dye through a catheter. The practitioner uses fluoroscopy to thread the catheter through a peripheral artery into the area to be studied, such as the aorta or the cerebral, coronary, pulmonary, renal, iliac, femoral, or popliteal arteries. The client is placed on a cardiac monitor. Dye is injected in a vascular catheter with a rapid sequence of films to visualize the vasculature.

Cardiac Catheterization

Cardiac catheterization is a radiographic study with the use of a contrast medium injected into a vascular catheter that is threaded into the heart and coronary or pulmonary vessels. The client is placed in a supine position and connected to a cardiac monitor.

The peripheral site, either the groin or brachial area, is prepped and injected with xylocaine. A catheter is inserted and threaded:

- Right-sided catheterization—into the right atrium, ventricle and pulmonary artery
- Left-sided catheterization—into the aorta to the coronary arteries or the left ventricle

The study includes pressure measurements, blood gas sampling, and viewing the integrity of the heart's valves. Postcatheterization the nurse should:

- Place the client on telemetry.
- Apply manual pressure (for 30 minutes or longer) when the catheter sheath is removed, then apply a pressure dressing.
- Keep the client on bed rest with the involved extremity straight and immobile.
- Monitor and record vital signs to include the presence, quality, and character of peripheral pulses; and the color, temperature and tactile sensation of the involved extremity.
- Encourage oral fluids and record intake and output.
- Instruct the client to report any warm, tickling sensations at the puncture site that would indicate bleeding.
- Monitor for procedural complications: bleeding or hematoma formation at the site; allergic reactions; and cardiovascular, pulmonary, and neurologic changes.

Digital Subtraction Angiography

Digital subtraction angiography is a computerized imaging of the vasculature with visualization on a monitor screen after the intravenous injection of iodine through a catheter. The results reveal the presence of vascular malformations (stenosis, occlusion, obstruction, ulceration, plaques, and aneurysms), lesions, and emboli.

Lymphangiography

Lymphangiography is a radiographic study of the lymphatic system after a catheter injection of an oil-based dye. A lymphatic vessel is first identified with an intradermal injection of a blue dye into either the foot or hand depending on the area to be studied. The results reveal the presence of a lymphoma, metastatic disease, and the degree of edema in lymphatic tissue.

Venography

Venography is a radiographic study of the venous system of the lower extremities after the injection of an iodine contrast agent. A venogram reveals both the presence and degree of trauma or disease (e.g., incompetent valves) to a vein, soft tissue compression, and the presence of thrombi.

Dye Injection Studies

Iodine is a common dye used in radiographic studies. Iodine injection might cause the client to experience temporary symptoms of shortness of breath, nausea, and a warm, hot flushed sensation. Most dye injection studies are invasive, requiring written consent. General guidelines for a client receiving a dye injection study should include:

- Preprocedure—NPO 6 to 12 hours before testing.
- Postprocedure—drink 2500 ml of water daily to encourage dye excretion. Notify the practitioner of decreased urinary output, bleeding, and signs of infection.

Test findings can reveal congenital abnormalities, lesions, inflammation, stones, obstruction, and organ-specific disorders.

Cholangiography

Cholangiography is the roentgenographic procedure visualizing the integrity of the biliary system by a radiopaque contrast medium. There are three methods of performing a cholangiogram: intravenous, percutaneous, and direct injection into a **T-tube** (an artificial drain placed in common bile duct during surgery). The client is placed NPO 8 to 12 hours before the test with a cleansing enema the evening before.

Intravenous Cholangiography

Intravenous Cholograffin (contrast agent) is administered with photographs taken every 15 to 30 minutes until the common bile ducts are visualized. If the gallbladder has not been removed, a fatty meal is given the evening before. The x-ray films are taken to show the contraction of the dye in the gallbladder.

Percutaneous Cholangiography

The percutaneous method for performing a cholangiogram requires the contrast agent to be injected directly into the liver tissue. A venous catheter or long needle is inserted into the liver tissue during fluoroscopy. For this method, the client must have a normal prothrombin time and platelet count before the procedure.

Postprocedure the client is placed on bed rest. Assess the insertion site for bleeding. Clients are at risk for bile peritonitis. Instruct the client to report immediately to the practitioner if any of the following symptoms occur: abdominal pain, distension and rigidity; chills and fever; and nausea or vomiting.

T-Tube Cholangiography

T-tube cholangiography requires the instillation of iodine to visualize the patency of the hepatic and common bile ducts. The client is at risk for bile peritonitis.

Oral Cholecystography

Oral cholecystography is the visualization of the gallbladder and presence of stones through the administration of radiopaque iodine tablets. The evening before the test the client eats a fatty meal and takes the iodine tablets 5 minutes apart with 8 ounces of water. The number of tablets administered is based on weight.

Cystography

Cystography is a radiographic study that uses an aqueous iodine contrast agent instilled into the bladder through a urinary catheter. It is used to visualize the bladder, urethra, and ureteral openings. Postprocedure, instruct the client on how to monitor urinary output and to notify the practitioner of bleeding, decreased output, and signs of infection.

Intravenous Pyelogram

An **intravenous pyelogram (IVP)** is a series of x-ray films of the kidneys, ureters, and bladder following the administration of an intravenous iodine preparation. The test may reveal organ specific disorders such as hydronephrosis, polycystic disease, chronic pyelonephritis, and acute renal failure.

Bronchography

Bronchography is a radiographic study of the trachea and bronchi following the injection of a contrast agent through a catheter. Before the insertion of the catheter, the client is given a local anesthetic agent to sedate the gag and swallow reflex. The test may reveal bronchiectasis.

NURSING ALERT

Gag and Swallow Reflexes

The client is maintained on an NPO status until the return of the gag and swallowing reflexes; prevents aspiration.

Myelography

Myelography is the study of the spinal cord and its surrounding subarachnoid spaces through the use of radiography and Pantopaque (contrast agent). *Strict aseptic technique is used throughout the procedure.* This test is performed in the radiology department with the client on a tilt table.

To inject the Pantopaque dye, the practitioner has to access the subarachnoid space by performing a posterior lumbar puncture. The procedure for performing a lumbar puncture is presented later in this chapter.

The practitioner inserts a needle with a stylet between the vertebrae to access the subarachnoid

space. The stylet is removed and a pressure reading is taken of the cerebrospinal fluid (CSF). If the CSF pressure is elevated, the test is stopped. Otherwise the dye is injected. The table is tilted into various up and down positions. Changing position allows the dye to flow within the subarachnoid space. X-ray films are taken to reveal compression or herniated intervertebral discs and tumors.

ULTRASONOGRAPHY

Ultrasound (echogram) is a noninvasive study that uses high-frequency sound waves to visualize deep body structures. This test should be scheduled before any studies using a contrast medium or air to ensure accuracy because an ultrasound *does not* require any contrast medium. The client is instructed to lie still during the procedure.

Ultrasound is used to evaluate the brain, thyroid gland, heart, vascular structure, abdominal aorta, spleen, liver, gallbladder, pancreas, and pelvis. An ultrasound is commonly done during pregnancy to evaluate the size of the fetus and placenta; a full bladder is needed to ensure visualization. Instruct the mother to drink 6 to 8 glasses of water and to avoid urination before testing.

A coupling agent (lubricant) is placed on the surface of the body area to be studied to increase the contact between the skin and the **transducer** (instrument that converts electrical energy to sound waves). The transducer emits waves that travel through the body tissue and are reflected back to the transducer and recorded. The varying density of body tissues deflects the waves into a differentiated pattern on an oscilloscope. Photographs can be taken of the sound wave pattern on the oscilloscope.

Echocardiograms

An **echocardiogram** is an ultrasonographic procedure used to reveal abnormal structure or motion of the heart wall and thrombi. This test is also used after **radiofrequency ablation** (the delivery of low-voltage, high-frequency alternating electrical current to cauterize the abnormal myocardial tissue) to identify the potential complications of pericardial effusion.

Doppler Ultrasonography

Doppler (a hand-held transducer) transmits high-frequency sound waves to the artery or vein being studied. The sound waves strike the moving RBCs and are reflected back to the transducer, which amplifies the sound and produces a graphic recording. Doppler ultrasonography reveals blood clots and peripheral vascular disease.

MAGNETIC RESONANCE IMAGING

Magnetic resonance imaging (MRI) is an imaging technique that uses radiowaves and a strong magnetic field to make continuous cross-sectional images of the body. The client is instructed to wear earphones to decrease the discomfort from the machine's clanging sound. A noniodine intravenous paramagnetic contrast agent may be used during the study. The study reveals lesions and changes in the body's organs, tissues, vascular, and skeletal structures.

RADIOACTIVE STUDIES

Radionuclide imaging (nuclear scanning) uses radionuclides (or radiopharmaceuticals) to image the morphologic and functional changes in the body's structure. A scintigraphic scanner is placed over the area of study to detect the radiation emission and to produce a visual image of the structure on film. Radiopharmaceutical agents are administered by various routes with consideration given to time delays of absorption. The results reveal congenital abnormalities, lesions, skeletal changes, infections, and gland and organ enlargement.

ELECTRODIAGNOSTIC STUDIES

These diagnostic tests use devices to measure the electrical activity of the heart, brain, and skeletal muscles. Electrical sensors (electrodes) are placed at certain anatomic points to measure the tone, velocity, and direction of the impulses. The impulses are then transmitted to an oscilloscope or printed on graphic paper.

Electrocardiography

An **electrocardiogram (ECG or EKG)** is a graphic recording of the heart's electrical activity. The client may be asked not to smoke or drink caffeinated beverages 24 hours before the test. Nicotine and caffeine can affect the heart rate.

Electrodes are applied to the chest wall and extremities. A lubricating gel applied to the electrodes increases the conduction of electrical activity between the skin and electrode. The client is instructed to lie still during the pain-free test. The test can reveal abnormal transmission of impulses and electrical position of the heart's axis.

A portable cardiac monitor (Holter monitor) is a device that records the heart's electrical activity. It produces a continuous recording over a specified period of time (e.g., 24 hours). The portable unit allows the client to ambulate and perform regular activities. Clients are

instructed to maintain a log of activities that occur when they feel their heart beating faster or irregularly. The practitioner reviews the ECG tracing in relation to the client's log to determine if certain activities, such as walking, are associated with abnormal transmission of impulses.

Signal-Averaged Electrocardiography

Signal-averaged electrocardiography (SAECG) is a surface ECG that amplifies **late potentials** (the electrical activity that occurs after normal depolarization of the ventricles). The test requires a specialized ECG machine and small computer to detect the late potentials. It is performed on clients who have had a myocardial infarction. The test reveals the client's risk for ventricular tachycardia.

Stress Test

A **stress test** measures the client's cardiovascular response to exercise tolerance. It demonstrates the ability of the myocardium to respond to increased oxygen requirements (the result of exercise) by increasing the blood flow to the coronary arteries.

The client is connected to an ECG machine and asked to walk on a treadmill. Continuous ECG recordings are made of the client's heart response (rate, electrical activity, and cardiac recovery time) to frequent changes in the treadmill's speed and slope. The test is stopped immediately if the client experiences any symptoms of decreased cardiac output (chest pain, dyspnea, fatigue, or ischemic changes on the ECG monitor).

Thallium Test

Thallium (a radionuclide that is the physiological analogue of potassium) is normally absorbed into normal myocardial tissue from the circulating blood. During the test, thallium is administered intravenously to detect damaged myocardial tissue (necrotic or ischemic). Because thallium is not absorbed by the damaged tissue, the degree of heart damage can be estimated.

There are two types of thallium tests: resting imaging or stress imaging. Resting imaging is performed a few hours after myocardial infarction. The thallium is injected and an ECG tracing is performed. Stress imaging (thallium stress test) is performed while the client is on the treadmill with ECG monitoring. At peak stress the intravenous thallium is injected; scanning is done 3 to 5 minutes postinjection. The test is stopped immediately if the client becomes symptomatic for ischemia.

Electroencephalography

An **electroencephalogram (EEG)** is the graphic recording of the brain's electrical activity. The procedure is painless and takes about an hour. The test is performed

in a quiet, nonstimulating environment. It can reveal the presence and type of seizure disorder and intracranial lesion. The absence of brain's electrical activity is used to confirm death.

During the procedure, electrodes are placed on the client's scalp. The electrodes transmit the impulses from the brain to an EEG machine. The machine amplifies the brain's impulses and makes a recording of the waves on strips of paper.

ENDOSCOPY

Endoscopy is the visualization of a body organ or cavity through a scope. The procedure is performed with an endoscope (a metal or fiberoptic tube) being inserted directly into the body structure to be studied (see Figure 28-16). A light at the end of the scope allows the practitioner to assess for lesions and structural problems. The endoscope has an opening at the distant tip that allows the practitioner to administer an anesthetic agent, lavage, suction, and biopsy tissue. Common endoscopic procedures are presented in Table 28-12.

THINK ABOUT IT

Participating in Diagnostic Testing

A client comes to an outpatient clinic for a laparoscopy to retrieve an egg for in vitro fertilization. You are to assist the practitioner with this procedure. How would you handle this situation if your own religious beliefs were in conflict with the procedure being performed? Would it make any difference if the client had had an abortion as a teenager?

General client preparation and positioning depend on the structure being studied as discussed in Table 28-12. As with all invasive procedures, the client needs to sign a consent form and the nurse needs to establish baseline vital signs before administering sedative agents.

Postprocedure the nurse monitors the vital signs, observes for bleeding, and assesses for procedural risks (e.g., return of the gag and swallowing reflexes following an esophagogastroduodenoscopy with local anesthesia).

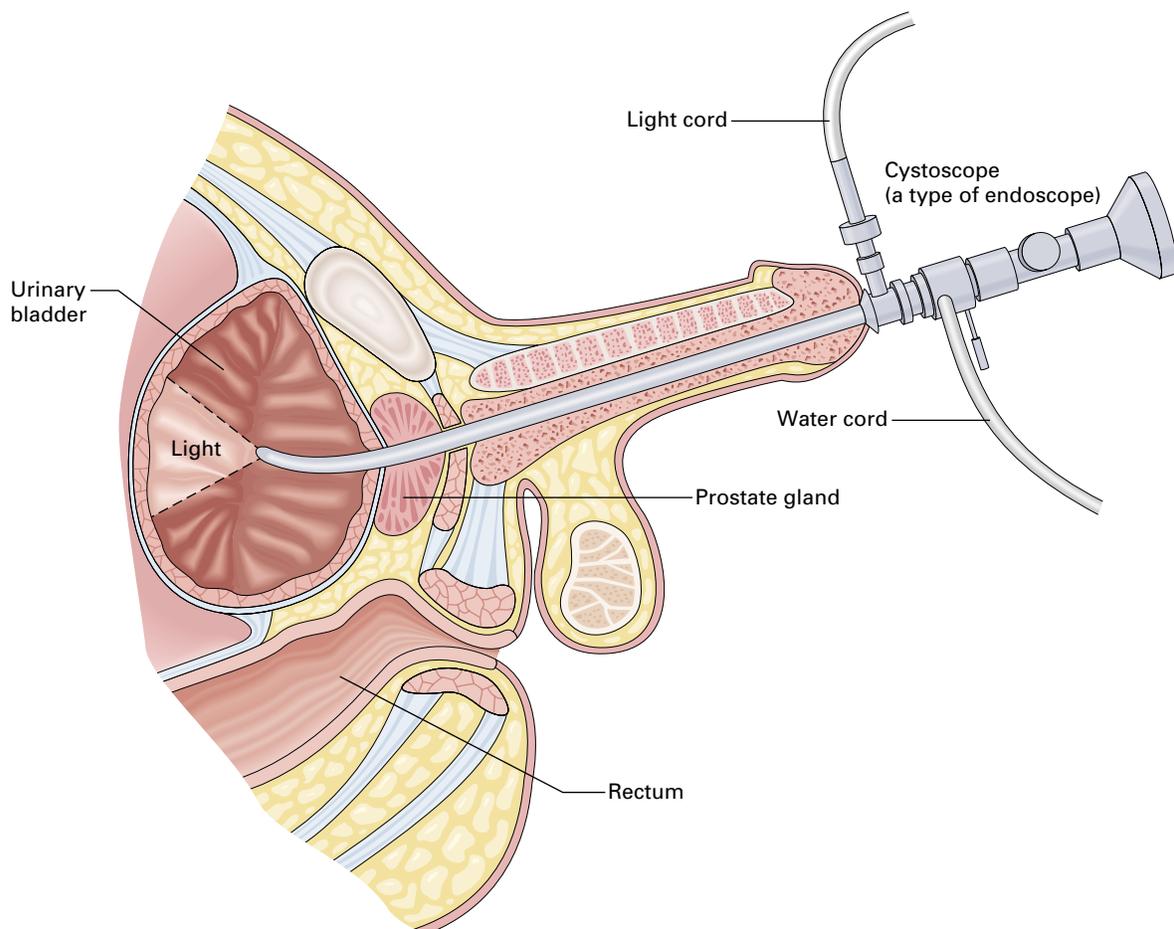


Figure 28-16 Cystoscopy

TABLE 28-12
Endoscopic Procedures

Procedure/Area Studied	Preparation/Position	Clinical Significance
Arthroscopy—examine joint structures, primarily the knee	Instruct client to fast after midnight; test is usually performed under local anesthesia, may be done under spinal or general anesthesia if surgery is necessary. Position the joint for accessibility.	Diagnose a torn meniscus, patellar, condylar, and synovial disorders; perform surgery. Also used to monitor the progression of a disease or effectiveness of therapy.
Bronchoscopy—examine the bronchus and bronchial tree	Instruct client to fast 6–12 hours before the test; test is usually done under local anesthesia. Position client supine or sitting upright.	Identify the origin of bleeding, lesions, or obstruction; collect a specimen for bacteriologic and cytologic examination (diagnosis abnormal cells); remove foreign bodies, lesions, mucus plugs, or excessive secretions.
Colonoscopy—examine the large intestine	Instruct client to maintain a clear liquid diet for 48 hours before the test, take the prescribed laxative the evening before the examination; place client on left side with knees flexed and drape.	Identify origin of bleeding or lesions; evaluate inflammatory and ulcerative bowel disease and recurrence of polyps or malignant lesions.
Colposcopy—examine the cervix and vagina following a positive Pap smear	No restriction on food or liquids. Place client in lithotomy position.	Evaluate abnormal cytology or grossly suspicious lesions and to perform a biopsy or take photographs of suspicious lesions.
Cystoscopy (see cystourethroscopy)		
Cystourethroscopy—uses two instruments: a cystoscope to examine the bladder and ureter openings, urethroscope to examine the bladder neck and the urethra	Food and fluids are restricted only if the client is to receive general anesthesia; regional anesthesia is usually given. Place client in a lithotomy position.	Identify bladder lesions and urethral strictures, ulcers, inflammation, and an enlarged prostate gland.
Esophagogastroduodenoscopy (EGD)—examine the esophagus, stomach, and upper duodenum	Instruct client to fast 6–12 hours before the test. An intravenous tranquilizer may be given, then a local anesthetic is sprayed into the back of the throat to decrease the gag reflex (swallowing will seem difficult). Place client in a sitting position.	Identify diverticula, varices, Mallory-Weiss syndrome, esophageal rings and hiatal hernia, and esophageal and gastric stenoses. When combined with histologic and cytologic tests may indicate acute or chronic ulcers, benign or malignant tumors, and inflammatory disease.
Laparoscopy—examine the peritoneal cavity: pelvis and abdomen	Instruct client to fast 8 hours before the surgery; the test is performed either with a local or general anesthetic agent. Place the client in a lithotomy position; catheterize the client to ensure the bladder is empty (avoids puncture of the bladder during the test with the laparoscope).	Used to detect cysts; adhesions; fibroids; and infections of the uterus, fallopian, tubes and ovaries; ectopic pregnancies; liver lacerations and cirrhosis. May also be used for lysis of adhesions, ovarian biopsy, tubal sterilization, foreign body removal, and fulguration of endometriotic implants.
Proctosigmoidoscopy—three steps: 1. Digital examination to dilate the anal sphincters to detect obstruction that might hinder passage of the endoscope 2. A sigmoidoscope to examine the distal sigmoid colon and rectum. 3. A proctoscope to examine the lower rectum and anal canal	Instruct client according to physician orders relative to dietary restrictions and bowel preparation (these are usually based on physician preference). If the client has rectal inflammation a local anesthetic agent is applied to decrease discomfort. Secure the client to a tilting table that rotates into horizontal and vertical positions.	Identify internal hemorrhoids, hypertrophic anal papillae, polyps, fissures, fistulae, and rectal and anal abscesses.

ASPIRATION/BIOPSY

Aspiration is performed to withdraw fluid that has abnormally collected or to obtain a specimen. Aseptic technique and Standard Precautions are used during aspiration. Aspiration diagnostic studies are invasive; implement the protocols for diagnostic tests. A local anesthetic is administered in the area being studied to decrease the client's discomfort when the skin is pierced by the needle.

A stylet needle with an outer, hollow-bore needle is used to pierce the skin. Once the needle is in place, the stylet is withdrawn, leaving only the outer needle to aspirate the fluid. A tissue **biopsy** (excision of a small amount of tissue) can be obtained during aspiration or with other diagnostic tests (e.g., bronchoscopy). A biopsy can be taken from most of the body's tissue.

Amniocentesis

Amniocentesis is the withdrawal of amniotic fluid to obtain a sample for specimen examination. The amniotic fluid increases during pregnancy from 50 ml at the end of the first trimester to an average of 1000 ml near term. This test is indicated when:

- Maternal age exceeds 35
- A spontaneous abortion occurred with a previous pregnancy
- There is a family history of genetic, chromosomal, or neural tube defects

The amniocentesis is performed when the amniotic fluid volume reaches 150 ml, usually after the 16th week of pregnancy.

There are no restrictions on fluids or food. The procedure usually lasts 10 to 15 minutes. Instruct the mother to void to prevent the risk of puncturing a full bladder. Position the client supine and assesses the fetal heart tones.

The abdomen is prepped and injected with lidocaine hydrochloride (a local anesthetic agent). The practitioner withdraws 10 to 20 ml amniotic fluid by transabdominal needle aspiration. Postprocedure the nurse monitors the client's vital signs, fetal heart tones, and assesses for signs of labor. Instruct the client to notify the practitioner of any signs of labor or infection.

Bone Marrow Aspiration/Biopsy

The sternum and iliac crest are the common sites for bone marrow puncture. During a bone marrow puncture a fluid specimen (aspiration) or a core of marrow cells (biopsy) can be obtained. Both tests are commonly done concurrently to obtain the best marrow specimen. The test can reveal anemias or cancer, such as leukemia, multiple myeloma, or Hodgkin's disease, or the client's response to chemotherapy.

There are no restrictions on fluids or food before the puncture. The nurse should explain the procedure to elicit the client's support during the procedure. The client must lay perfectly still throughout the procedure. The client is usually fearful; allay the client's fear with relaxation methods or sedation. Infants and small children are restrained by holding them throughout the procedure.

Client positioning is determined by the site to be used, supine (sternum) or side-lying (iliac crest). The site is prepped for puncture to decrease the skin's normal flora. Explain to the client that pressure may be experienced as the specimen is withdrawn. The client should not move when the specimen is being withdrawn; a sudden movement may dislodge the needle.

Postprocedure the client should be on bed rest for an hour. The nurse monitors vital signs to assess for bleeding (rapid pulse rate, low blood pressure). Instruct the client to report to the practitioner any bleeding or signs of inflammation.

Paracentesis

Paracentesis is the aspiration of fluid from the abdominal cavity. This test can either be diagnostic, therapeutic, or both. For instance, with end-stage liver or renal disease there is **ascites** (an accumulation of fluid in the abdomen). Pressure caused from the ascites can interfere with breathing and gastrointestinal functioning. Aspiration in this instance is therapeutic. If a culture specimen is taken, it is also diagnostic.

Have the client void and obtain a body weight before the procedure. Place the client in a high Fowler's position in a chair or sitting on the side of the bed. The skin is prepped, anesthetized, and punctured with a **trocár** (a large-bored abdominal paracentesis needle). The trocar is held perpendicular to the abdominal wall and advanced into the peritoneal cavity. When fluid appears, the trocar is removed, leaving the inner catheter in place to drain the fluid. Observe the client for pressure changes that can result from the rapid removal of fluid.

Postprocedure apply a sterile dressing to the puncture site. Monitor the client for changes in vital signs and electrolytes. Instruct the client to record the color, amount, and consistency of drainage on the dressing after discharge.

Thoracentesis

Thoracentesis is the aspiration of fluids from the pleural cavity. The pleural cavity normally contains a small amount of fluid to lubricate the lining between the lungs and pleura. Infection, inflammation, and trauma may cause an increased production of fluid, which can impair ventilation.

Position the client with arms crossed and resting on a bedside table to allow access to the rib cage (Figure 28-17). Instruct the client not to cough during insertion

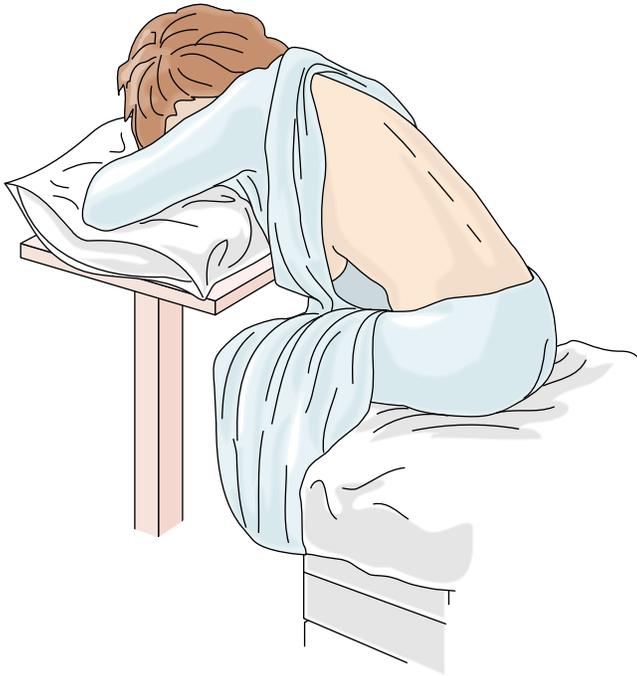


Figure 28-17 Client Position for Thoracentesis

of the needle. The practitioner selects, preps, and anesthetizes the puncture site. The needle is usually inserted into the intercostal space at the location of maximum dullness to percussion. Posteriorly, the site should be above the ninth rib, and laterally, above the seventh rib.

During the procedure, monitor the client for symptoms of a **pneumothorax** (collection of air or gas in the pleural space causing the lungs to collapse), such as dyspnea, pallor, tachycardia, vertigo, and chest pain. Postprocedure observe for cardiopulmonary changes and a mediastinum shift as assessed by vital signs and bloody sputum.

Cerebrospinal Fluid Aspiration

Lumbar puncture (“spinal tap”) is the aspiration of CSF from the subarachnoid space. The specimen is examined for organisms, blood, and tumor cells. A spinal tap is also performed:

- To obtain a pressure measurement when blockage is suspected
- During a myelogram, as discussed earlier
- To instill medications (anesthesia, antibiotics, or chemotherapy)

A spinal tap is contraindicated in clients with increased intracranial pressure, hemorrhagic diathesis, and an infection at the proposed puncture site.

Place the client in a lateral recumbent position with the craniospinal axis parallel to the floor and flat of the back perpendicular to the procedure table. Have the client assume a flexed knee-chest position to bow the

back. This position separates the vertebrae. Most clients will require assistance in maintaining this position throughout the procedure. To assist, the nurse stands facing the client with one hand across the client’s posterior shoulder blades and the other hand over the buttocks.

The practitioner selects, preps, and anesthetizes the puncture site (usually interspace L3-L4, L4-L5, or L5-S1). The needle and stylet are inserted into the mid-sagittal space and advanced through the longitudinal subarachnoid space (Figure 28-18).

Once in the subarachnoid space, the stylet is removed, leaving the needle in place. An initial CSF pressure reading is taken:

- A three-way stopcock with a manometer (calibrated column) is securely connected to the spinal needle.
- The stopcock is opened toward the manometer to allow the CSF to rise in the column. Under normal conditions, the CSF will fluctuate in the column with respirations.
- When the CSF stabilizes, a pressure reading is taken.

If the pressure reading is greater than 200 mm H₂O or falls quickly, only 1 or 2 ml CSF is obtained for analysis. If the pressure is less than 200 mm H₂O, an adequate specimen sampling is withdrawn slowly.

NURSING ALERT

Taking the Pressure Reading

The client should be relaxed and quiet during the initial pressure reading; *straining increases the CSF*.

After the pressure reading is taken, the stopcock is turned to allow the CSF to slowly flow into a sterile test tube. A sterile cap is placed on the test tube, and the

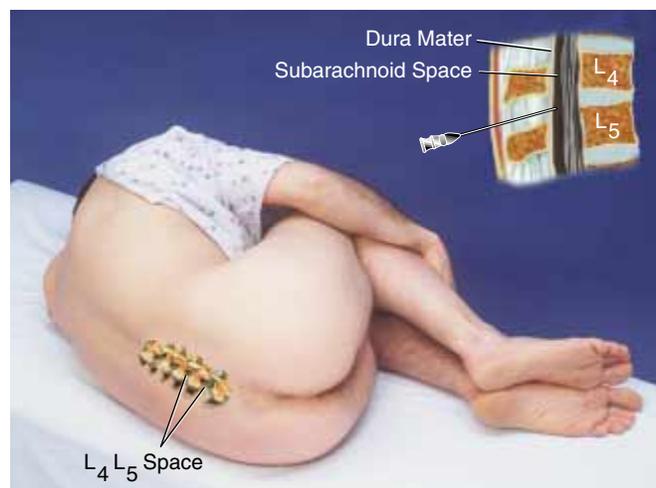


Figure 28-18 Lumbar puncture: position of client and insertion of the needle into the subarachnoid space are shown.

sample is transported to the laboratory for analysis. Rapid withdrawal of CSF can cause a transient postural headache. Throughout the procedure, monitor the client's cardiorespiratory status.

Postprocedure, pressure is applied and then a sterile bandage. Assess the bandage for leakage of CSF and the client's neurologic and cardiorespiratory status. A postural headache is the most common complication of a lumbar puncture; using a small-bore spinal needle minimizes the chances of a headache.

KEY CONCEPTS

- Most invasive procedures require the client's written consent and a thorough understanding of the reasons the test is being performed. Nurses explain the purpose of the diagnostic test and the reasons it has been ordered.
 - Nurses prepare clients for diagnostic testing by ensuring client understanding and compliance to preprocedural requirements.
 - Clients, families, and significant others need to be involved in the testing process; advise them of the estimated time the procedure requires.
 - Nurses teach the client how to perform relaxation and imagery techniques to cope with the discomfort and anxiety experienced during procedures.
 - After a procedure, the nurse provides care and teaches the client what to expect following a diagnostic test and the outcomes or side effects of the test.
 - Specimen collection methods include punctures such as venipuncture, arterial puncture, capillary puncture, catheter insertion, and bone marrow aspiration. Specimens collected by noninvasive methods include urine, stool, sputum, throat tissue, and cervical tissue.
 - Invasive procedures include endoscopy, angiography, aspiration, biopsy, and other procedures in which body cavities are punctured.
 - Noninvasive procedures include radiography, fluoroscopy, mammography, computed tomography, radioisotope scanning, ultrasonography, magnetic resonance imaging, and electrodiagnostic studies.
 - The role of the nurse in diagnostic procedures is to facilitate the scheduling of diagnostic test, perform client teaching, perform or assist with procedures, and assess the client for adverse responses to the procedures.
 - Nurses should schedule diagnostic procedures to promote client comfort and cost containment.
 - Standard Precautions are used when obtaining a specimen for diagnostic examination or assisting with an invasive procedure
 - Before the procedure the nurse is responsible for obtaining baseline vital signs and assessing the client's preparation for testing.
- Nurses may assist the practitioner in performing invasive procedures.
 - After the procedure the nurse assesses the client for secondary procedural complications and provides any necessary nursing interventions.

CRITICAL THINKING ACTIVITIES

1. In reference to the nursing tip about Mr. Simon, what did his history and physical reveal? Why did the nurse practitioner order a white blood cell differential as opposed to a white blood cell count? What do you think Mr. Simon's medical diagnosis will be: an infected ingrown toenail, anemia, diabetes, or something else? Relate the symptoms as presented in the history and physical to the physiological functions of white blood cells.
2. With invasive procedures the body is entered with some type of instrumentation; there is a puncture site. If you fall down and a nail pierces your leg, you have a puncture site. What are you at risk for immediately after the incidence and 48 to 72 hours postinjury? Can you relate the body's physiological response to an invasive procedure to a puncture injury?
3. Explain how the three sources of venipuncture variability can cause inaccurate laboratory results.
4. What is a normal prothrombin time (PT)? PT is a comparative test that measures the client's PT to the control time. Both the PT and control time results are reported. One example of the use of a PT is to measure the effectiveness of prescribed anticoagulant therapy. In this case, the therapeutic range is 2 to 2.5 times the control time, which is 12 to 14 seconds. If the control time is 12 seconds, what would you expect the client's PT to be?
5. If your blood type is AB positive, what are the possible blood types of your parents? Can you receive Rh-negative blood? Explain your answer.
6. What are the physiological effects of acetylcholine on the nervous system? Why should the practitioner be notified about a decreased level of cholinesterase for a client scheduled to receive succinylcholine for either major surgery or electroconvulsive therapy?
7. Which client is more at risk for coronary heart disease? Mrs. Smith, a 59-year-old who is postmenopausal with a cholesterol of 185 mg/dl, LDL of 131 mg/dl, HDL of 25 mg/dl, and triglycerides of 250 mg/dl. Mr. Jones, a 55-year-old who smokes occasionally with a cholesterol of 220 mg/dl, LDL of 157 mg/dl, HDL of 37 mg/dl, and triglycerides of 249 mg/dl.
8. You are counseling Maria Rodriguez regarding the symptoms and risk factors of large radiation exposures. She is receiving radiation therapy for breast cancer. Where in her medical record should the potential risk factors be addressed?

9. What specific teaching should be done for a client undergoing arteriography? Evaluate the need for teaching based on the procedure. Refer to the protocol on preparing the client for diagnostic testing for appropriate teaching interventions.
10. Plan the postprocedural care for a cardiac catheterization client using the protocol for care of the client after diagnostic testing.
11. Relate the laboratory and diagnostic tests to the functional health patterns. Consider the special diagnostic teaching needs for each of the functional health patterns.
12. Select interventions, based on the functional health pattern(s) affecting the results, when planning nursing care for your assigned clients.

WEB RESOURCES

- American Cancer Society
www.cancer.org
- American Radiological Nurses Association
www.rsna.org
- BreastCancer.Net
www.breastcancer.net/
- Center Health Care Technologies
www-bio.llnl.gov
- FDA Center for Devices and Radiological Health
www.fda.gov/cdrh

Chapter 29

Medication Administration



Words are the most potent drug that mankind uses.

—Kipling (in Edlin & Golanty, 1988)

COMPETENCIES

1. Define the key terms and abbreviations frequently used in medication administration.
2. Describe the influence of drug standards and legislation on medication administration.
3. Discuss the nurse's legal responsibilities in preparation and administration of medications.
4. Explain the principles of pharmacokinetics, including absorption, distribution, and metabolism, and excretion of drugs.
5. Describe the factors that can affect a drug's action.
6. Identify the responsibilities of the nurse for each type of medication order.
7. Differentiate between allergic reaction, side effects, toxic effect, and idiosyncratic reaction to medications.
8. Correctly calculate appropriate dosage for medications as prescribed.
9. Discuss principles of safe medication administration including the five rights of medication administration.
10. Correctly explain procedures for the different methods of medication administration including the choice of route and site.
11. Discuss potential liabilities for the nurse administering medications.
12. Develop teaching guidelines for clients regarding medication in the home.

KEY
TERMS

absorption	excretion	phlebitis
addiction	half-life	plateau
adverse reaction	idiosyncratic reaction	prn orders
aspiration	infiltration	trough
bioavailability	intra dermal (ID)	side effects
buccal	intramuscular (IM)	stat order
dependence	intravenous (IV)	stock supply
dissolution	metabolism	subcutaneous (SC/SQ)
distribution	onset of action	sublingual
drug allergy	parenteral	therapeutic range
drug incompatibility	patency	toxic effect
drug tolerance	peak plasma levels	trough
duration	pharmacognosy	unit-dose form
enteral instillation	pharmacokinetics	Z-track technique

Alteration in health related to acute or chronic conditions lead clients to seek relief of their symptoms through various treatment options. One modality frequently used to help alleviate symptoms and restore health is a medication regime. Medications are substances prescribed by the client's health care practitioner to help in the treatment, relief, or cure of the cause of the client's health alteration or in the prevention of an alteration.

Medication management requires the collaborative efforts of many health care providers. Medications may be prescribed by a physician, dentist, or other authorized prescriber such as advanced practice registered nurses as determined by individual state licensing bodies. Pharmacists are licensed to prepare and dispense medications. Nurses are responsible for administering medications. Dietitians are often involved in identifying possible food and drug interactions.

Nurses play an essential role in the administration of, education about, and evaluation of the effectiveness of prescribed medications. The nurse's role changes with the setting of the client. In the home or community setting, referred to as primary care, clients take their own medication as prescribed by the health care practitioner. Nurses are responsible for educating the client about his or her medications and its possible side effects as well as for evaluating the outcome of the prescribed therapy in restoring and maintaining the client's health. In the acute care setting, nurses spend a great deal of time administering medications and evaluating their effectiveness. Nurses are responsible for teaching clients how to take their medications safely when they are discharged.

Medication administration requires specialized knowledge, judgment, and nursing skill based on the principles of pharmacology. The focus of this chapter is to assist the student in applying knowledge of pharmacology and in acquiring skills in the safe administration of medications. The nursing process is used to direct nursing decisions relative to safe drug administration and to ensure compliance with standards of practice.

DRUG STANDARDS AND LEGISLATION

A drug is a chemical substance intended for use in the diagnosis, treatment, cure, mitigation, or prevention of a disease. When a drug is given to a client, there is an intended specific effect. An assumption made by nurses before administration of any medication is that the drug will be safe for the client to consume if the dose, frequency, and route are within the therapeutic range for that drug. This assumption is implied in accord with standards that are set to ensure drug uniformity in strength, purity, efficacy, safety, and **bioavailability** (readiness to produce a drug effect).

Standards

Standards have been developed to ensure drug uniformity so that effects are predictable. The *United States Pharmacopeia* and *National Formulary* (USP and NF) are books of drug standards for usage in the United States. The USP and NF list drugs that have been recognized as being in compliance with legal standards of purity, quality, and strength.

The USP has been providing standards for pharmaceutical preparations since its first edition in 1820. The NF was published in 1898 by the American Pharmaceutical Association to provide a listing of drugs that complied with established standards. The *British Pharmacopoeia* is the Canadian complement to the USP, and the *Canadian Formulary* provides a listing of drugs commonly used in Canada.

Federal Legislation

The Pure Food and Drug Act of 1906 designated the USP and the NF as the official references to establish drug standards. It also gave the federal government the authority to enforce these standards.

The federal Food, Drug, and Cosmetic Act of 1938 empowered the Food and Drug Administration (FDA) to

test all new drugs for toxicity before granting a pharmaceutical company approval to market a drug. The federal Food, Drug, and Cosmetic Act of 1938 was amended in 1952 to distinguish prescription (legend) drugs from nonprescription (over-the-counter) drugs and to regulate the dispensing of prescriptions. Testing for drug effectiveness materialized with the Kefauver-Harris Act of 1962 (Lehne, 1994).

The Harrison Narcotic Act of 1914 classified habit-forming drugs as narcotics and began regulating these substances. This law and other drug abuse laws have been replaced with the Comprehensive Drug Abuse Prevention and Control Act (Controlled Substance Act) of 1970. This act defines a *drug-dependent person* in terms of physical and psychological dependence and provides for strict regulation of narcotics and other controlled drugs such as barbiturates through the establishment of five categories of scheduled drugs (see the accompanying display on controlled substances). Any controlled substance must be recorded by the dispensing pharmacist. The Drug Enforcement Administration (DEA) employs pharmacists to inspect all types of records, including prescriptions, to detect the illicit distribution of these substances.

State and Local Legislation

Within an individual state, the nurse's functions and responsibilities are defined by the state nurse practice act. The wording of a state's practice act may be general so that it gives the nurse a broad range of responsibilities, or it may be very specific in the limitations it sets. The nurse is responsible for knowing the boundaries set by the state practice act in the particular state of practice. A health care institution may develop policies that are more restrictive than the nurse practice act but cannot expand the scope of practice outlined by the state legislation. The primary intent of all state practice acts is to protect the public by defining required education and skill levels of all state-licensed nurses.

State and local regulations of medications must conform with federal legislation. States, however, have the

power to enforce additional regulations that impose stricter control of substances. For example, the Controlled Substance Act has codeine in antitussives as a schedule V drug, but an individual state that identifies abuse of antitussives with codeine may place this drug in the schedule II category, which is more restrictive.

Health Care Institution Regulations

All health care institutions are required to meet minimum standards set by federal, state, and local agencies. In addition to these standards, most institutions have established specific policies that regulate administration of medication within the institution. Institutional policies are typically more restrictive and more specific than federal and state regulations. Health care institutions are trying to prevent problems stemming from medication administration. For example, institutional policies may set the times for medication administration (for example, medications ordered for every eight hours are given at 0600 [6 AM], 1400 [2 PM], and 2200 [10 PM] or may mandate discontinuation of medications unless reordered by the health care provider (for example, antibiotics must be reordered every five days).

PHARMACOKINETICS

For a drug to achieve a therapeutic effect, it must proceed from the point of entry into the body to the tissue with which it will react. The effectiveness is further affected by the dosage of the drug and the amount of time the drug spends in the body before it is excreted.

Pharmacokinetics refers to the study of the absorption, distribution, metabolism, and excretion of drugs to determine the relationship between the dose of a drug and the drug's concentration in biological fluids. The knowledge of pharmacokinetics is used by health care providers in medication management.

The physician, when ordering a drug, is concerned mainly with dose and route to produce the most therapeutic effects; physicians, pharmacists, and nurses are all involved in identifying appropriate times for drug administration and for avoiding interactions with other substances that could alter the drug's actions. Physicians and nurses monitor the client's response to the drug's action. Drug actions are dependent on four properties: absorption, distribution, metabolism, and excretion.

Absorption

The degree and rate of **absorption**, or passage of a drug from the site of administration into the bloodstream, depend on several factors: the drug's physicochemical effects, its dosage form, its route of administration, its interactions with other substances in the digestive system, and various client characteristics such as age. Oral preparations, such as tablets and capsules, must first disintegrate into smaller particles for gastric juices to

CONTROLLED SUBSTANCES

- Schedule C-I: High abuse potential, no current accepted medical use (e.g., heroin, marijuana, and LSD)
- Schedule C-II: High abuse potential for severe dependence (e.g., narcotics, amphetamines, dronabinol, and some barbiturates)
- Schedule C-III: Less abuse potential than schedule II drugs for moderate dependence (e.g., nonbarbiturate sedatives, nonamphetamine stimulants, and limited amounts of certain narcotics)
- Schedule C-IV: Lower abuse potential than schedule III drugs for limited dependence (e.g., sedatives, antianxiety agents, and nonnarcotic analgesics)
- Schedule C-V: Limited abuse potential (e.g., codeine used as antitussive and antidiarrheals)

dissolve and prepare the drug for absorption in the small intestines. **Dissolution** is the rate at which a drug becomes a solution. After ingestion, a pill, capsule, or caplet must disintegrate before it can be dissolved and then absorbed by the body for therapeutic use. The more rapid the rate of dissolution, the more quickly the drug can be absorbed. Oral drugs in liquid form are more readily absorbed by the gastrointestinal tract than are tablets. Figure 29-1 shows the process of absorption of solid drugs.

Drugs administered intramuscularly are absorbed through the muscle into the bloodstream. Suppositories are absorbed through the mucous membranes into the blood. Intravenous drugs are immediately bioavailable because of their direct injection into the blood to produce a drug effect.

Blood flow to the absorption site is a major factor in drug absorption. A rich blood supply facilitates absorption, whereas a poor blood supply will slow absorption. **Sublingual** (under the tongue) medications, such as Nitrostat (for angina), are absorbed more quickly than are medications such as insulin that are injected into subcutaneous tissue. A person in shock, which results in poor peripheral circulation, may not absorb intramuscular medications as well as a person with normal circulation. Circulation is enhanced by exercise, so a diabetic who has exercised hard may experience low blood sugar (hypoglycemia) because of more rapid absorption of the insulin from increased peripheral circulation.

The solubility of the drug is also a factor in absorption. To be absorbed, the drug must be in a liquid form. The more soluble the drug, the faster it will be absorbed. Because cells have a fatty acid layer, drugs that are more lipid in content are absorbed more rapidly. Chemicals and minerals that are insoluble in the gastrointestinal tract, such as barium salts, are not absorbed. When given parenterally, drugs with an oily base such as streptomycin (anti-infective) are absorbed more slowly than are drugs dissolved in a water base.

The pH of the drug is another factor in absorption. A drug that is acidic (such as aspirin) can be more easily absorbed in an acidic environment such as gastric content. A drug that is more basic in composition is not

absorbed in the stomach but passes on to the small intestine, where it is absorbed.

Drugs that are highly concentrated (such as epinephrine) tend to be absorbed more quickly than do drugs that are lower in concentrations. Less well researched is the effect ethnicity and culture have on the therapeutic effects of medications. Some studies have identified differences in required drug levels as well as response to medications (such as antihypertensive drugs and the African-American client). Drugs do not have the same effect in all people. Diet is a factor as well as adherence to herbal and homeopathic remedies (for example, the herb ginseng can act as an accelerant or inhibitor of certain medications). Health care providers need to be aware of and sensitive to these cultural variations that may affect clients in their care (Kudzma, 1999).

Another factor affecting absorption is the ingestion of food before taking oral medications. Interactions of some medications with food change the chemical structure of the drug, thereby affecting absorption. For example, tetracycline (an anti-infective) should not be taken with dairy products. Clients taking warfarin (an anticoagulant) should avoid or limit their intake of food high in vitamin K, which is an antidote for warfarin. Some medications, when given together, interact with each other to impair absorption.

The administration time of dosages needs to be regulated to ensure adequate absorption of drugs. For example, it may be best to take certain medications a half-hour before meals. The nurse needs to use this knowledge to be sure prescribed medications are administered properly.

Distribution

Distribution refers to the movement of drugs from the blood into various body fluids and tissues. The rate at which the drug reaches the specific site of action is affected by blood flow, cell membrane permeability, and the protein-binding capacity of the medication.

How fast the drug reaches the organs and tissues depends on the cardiac output (blood flow) of the person. When conditions exist that decrease blood flow (as in cardiogenic shock) or when circulation to the tissue is poor (as in peripheral vascular disease from atherosclerosis) the distribution of the drug will be slowed. When conditions exist that increase blood flow (such as strenuous exercise) distribution will be facilitated.

To be distributed to the tissue, the drug must cross the cell membrane. Some membranes act as a barrier for distribution of medications. The blood brain barrier, for example, allows only fat-soluble medications to pass through (for example alcohol, general anesthetics, penicillin G).

Once the drug enters the circulation, it may become attached to proteins, mostly albumin. This protein binding decreases the amount of free drug available to reach the site of action. This is because the protein-drug molecule is trapped in the blood flow because it is too large to diffuse through the cell membrane. While medications vary in the extent to which they bind with proteins, most drugs have some protein binding properties. Some diseases (such as malnutrition or liver disease) cause a decrease in circulating

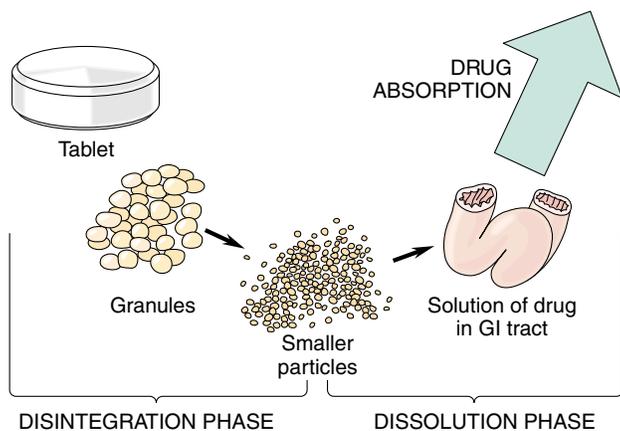


Figure 29-1 Phases of Solid Drug Absorption

albumin which results in more free drug. This can result in increased distribution of the drug (enhanced pharmacological effect) and toxicity if not carefully monitored.

The body composition also affects the distribution of medications. Many drugs are prescribed based on body weight. An increase in body fat (in an obese person for example) causes longer drug duration because of slower distribution. The less a person weighs the higher the concentration of medication in the circulation which results in a more powerful drug effect. This needs to be monitored very closely in the elderly who have changes in body composition naturally related to aging and often lose weight due to a decreased appetite.

Metabolism

After the medication is absorbed and distributed, the body eliminates the drugs. The process of **metabolism** (also known as biotransformation) refers to the physical and chemical processing of the drug. In metabolism, the drug is inactivated and changed into a water-soluble compound that can be excreted by the body. The liver is the primary source of biotransformation. The rate of metabolism is determined by the presence of enzymes in the liver cells that detoxify the drugs. Diseases that affect the liver (such as cirrhosis) affect the body's ability to biotransform medications. Other conditions that affect metabolism are blood flow to the liver, the presence of other substances that affect liver function, and age. If drug metabolism is inhibited, there will be a buildup of the medication, causing a cumulative effect. This will be exhibited as prolonged response to a normal dose of medication. If metabolism is enhanced (as in high blood flow states), the medications will be inactivated faster than expected, resulting in a shorter response to medications.

Excretion

Excretion is the process in which drugs are eliminated from the body. Excretion occurs primarily through hepatic biotransformation and renal excretion. "Drug excretion refers to the movement of a drug or its metabolites from the tissues back into circulation and from the circulation into the organs of excretion" (Springhouse, 1997, p. 7).

Factors that affect the kidneys' ability to excrete drugs include maturity of the kidneys, circulation, and disease. As kidney function decreases, there can be an accumulation of drugs, which can result in toxicity. If the kidneys are not functioning normally, a decreased dosage of medications may be needed. Adequate fluid intake aids in the elimination of drugs in a healthy individual. Other organs, such as exocrine glands, the skin, the gastrointestinal tract, and the lungs contribute to the elimination of some drugs.

DRUG NOMENCLATURE

A drug may be used as an aid in the diagnosis, treatment, or prevention of disease; or in other abnormal

SAMPLE TRADE AND GENERIC DRUG NAMES

Trade Name	Generic Name
Bayer	Aspirin
Benadryl	Diphenhydramine hydrochloride
Robitussin	Guiafenesin
Zovirax	Acyclovir

conditions for the relief of pain or suffering; or to improve any physiological or pathologic condition. The terms *drug*, *medication*, and *medicine* are often used interchangeably by health care providers and laypersons.

Drugs can be identified by their chemical, generic, official, or trade names. The *chemical name* is a precise description of the drug's composition (chemical formula). The *nonproprietary*, or *generic, name* in the United States is the name assigned by the United States Adopted Names Council to the manufacturer who first develops the drug. When the drug is approved, it is given an *official name* that may be the same as the nonproprietary name (Lehne, 1994). Drugs with a proven therapeutic value are listed in the USP and NF by their official names. When pharmaceutical companies market the drug, they assign a *proprietary name*, also called a *trade*, or *brand, name*; therefore, one generic drug may have several trade names based on the number of companies marketing the drug. For example, ibuprofen is a generic name; common trade names for this drug are Advil, Excedrin IB, Motrin, and Nuprin. See the accompanying display for additional examples of trade and generic drug names.

DRUG ACTION

Drug action refers to a drug's ability to combine with a cellular drug receptor. Depending on the location of different cellular receptors affected by a given drug, a drug can have a local effect, systemic effect, or both local and systemic effects. For example, when diphenhydramine hydrochloride (Benadryl) cream is applied to the skin, it elicits only a local effect; however, when this drug is administered in a tablet or injectable form, it causes both systemic and local effects.

Pharmacology

Pharmacology is the study of the effects of drugs on living organisms. This section discusses the pharmacologic activities of drug action as it relates to medication management, drug classification, drug preparation, and routes of administration.

Medication Management

The purpose of medication management is to produce the desired drug action by maintaining a constant drug level. Drug action is based on the half-life of a drug.

A drug's **half-life** refers to the time it takes the body to eliminate half of the blood concentration level of the original drug dose. For example, if a drug has a half-life of 6 hours, 50% of the drug's original dose is present in the blood 6 hours after administration; in 12 hours after administration, 25% of the original drug is present. Because of a drug's half-life, repeated doses are often required to maintain the drug level over a 24-hour interval.

The nurse should understand other terms used to describe drug action: onset, peak plasma level, trough, duration, and plateau. **Onset of action** is the time it takes the body to respond to a drug after administration. Onset is affected by route of administration and pharmacokinetic factors already discussed. A **peak plasma level** is the highest blood concentration of a single drug dose before the elimination rate equals the rate of absorption. Once the peak plasma level is achieved, the blood concentration level will decrease steadily unless another drug dose is given. **Trough** is the lowest blood serum concentration of a drug in a person's system. This is measured immediately before the next scheduled dose. Trough levels help adjust dosage to prevent toxicity or drug buildup. **Duration** is the time a drug remains in the system in a concentration great enough to have a therapeutic effect. Table 29-1 defines the common terms associated with the medical management of medication administration. If a series of scheduled drug doses are administered, the blood concentration level is maintained; maintenance of a certain level is called a **plateau**.

Classification

Drugs are commonly classified by the body system that they interact with (e.g., cardiovascular) or in accord with the drug's approved therapeutic usage (e.g., antihypertensive). Drugs with multiple therapeutic uses are usually classified in accordance with their most common usage.

TABLE 29-1
Common Terms Associated
with Medical Management

Half-life	The time it takes the body to eliminate half the blood concentration level of the original drug dose
Onset	The time it takes the body to respond after medication administration
Peak plasma level	The time it takes for a drug to reach the highest blood concentration after a plasma level single dose before elimination rate equals the rate of absorption
Trough	The lowest blood serum concentration immediately before the next scheduled dosage
Duration	The time a drug remains in the system in a therapeutic concentration
Plateau	Blood concentration level maintained after a series of scheduled drug doses is administered

Preparation and Route

Drugs are available in many forms for administration by a specific route (see Drug Preparations). The route refers to how the drug is absorbed: oral, buccal, sublingual, rectal, parenteral (hypodermic routes), topical, and inhalation.

Drugs prepared for administration by one route should not be substituted by other drug forms. For example, when a client has difficulty swallowing a large tablet or capsule, *the nurse should not administer an oral solution or elixir of the same drug without first consulting the physician because a liquid may be more easily and completely absorbed, producing a higher blood level than a tablet.*

The nurse should be aware of the various drug forms and how they are administered. Certain drug preparations require special consideration regarding administration. For example:

- Chewable tablets are designed to be chewed before swallowing because chewing enhances gastric absorption.
- Buccal and sublingual medications must be allowed to dissolve completely before the client can drink or eat.
- Suspensions and emulsions should be administered immediately after shaking and pouring from the bottle.

Oral Route

Most drugs are administered by the oral route because it is the safest, most convenient, and least expensive method. The disadvantage of the oral route is that it is slower acting than the other routes, such as injectables. Drugs may not be given orally to clients with gastrointestinal intolerance or those on NPO (nothing by mouth) status. Oral drugs should be given with caution to clients who have difficulty swallowing, such as a patient who has had a cerebrovascular accident (stroke). Oral administration is also precluded by unconsciousness.

When small amounts of drugs are required, the **buccal** (cheek) or sublingual route is used. Drugs administered through these routes act quickly because of the oral mucosa's thin epithelium and large vascular system, which allows the drug to quickly be absorbed by the blood.

Certain oral drugs are prepared for sublingual or buccal administration to prevent their destruction or transformation in the stomach or small intestines. Buccal drugs are designed to be placed in the buccal pocket (superior-posterior aspect of the internal cheek next to the molars) for absorption by the mucous membrane of the mouth. Sublingual medications are designed to dissolve quickly when placed under the tongue. For example erythrityl tetranitrate (an anti-anginal) can be given either sublingually or buccally as prescribed, whereas isoproterenol hydrochloride (a bronchodilator) and nitroglycerin (an anti-anginal) are given sublingually, and methyltestosterone (an androgen) is given only buccally.

Parenteral Route

By definition, **parenteral** means introduction of a medication by any route other than the oral-gastrointestinal

DRUG PREPARATIONS

Oral Solids

- Tablets: compressed or molded substances, to be swallowed whole, chewed before swallowing, or placed in the buccal pocket or under the tongue (sublingual)
- Capsules: substances encased in either a hard or a soft soluble container or gelatin shell that dissolves in the stomach
- Caplets: gelatin-coated tablets that dissolve in the stomach
- Powder and granules: finely ground substances
- Troches, lozenges, and pastilles: similar preparations of drugs designed to dissolve in the mouth
- Enteric-coated: coated tablets that dissolve in the intestines
- Time-release capsules: encased substances that are further enclosed in smaller casings that deliver a drug dose over an extended period of time
- Sustained-release: compounded substances designed to release a drug slowly to maintain a steady blood medication level

Topical

- Liniments: substances mixed with an alcohol, oil, or soapy emollient that is applied to the skin
- Ointments: semisolid substances for topical use
- Pastes: semisolid substances, thicker than an ointment, absorbed slowly through the skin
- Transdermal patches: contain medication that is absorbed through the skin over an extended period of time
- Suppositories: gelatin substances designed to dissolve when inserted in the rectum, urethra, or vagina

Inhalants

- Inhalations: drugs or dilution of drugs administered by the nasal or oral respiratory route for a local or systemic effect

Solutions

- Solutions: contain one or more soluble chemical substances dissolved in water
- Enemas: aqueous solutions for rectal instillation
- Douches: aqueous solutions that function as a cleansing or antiseptic agent that may be dispensed in the form of a powder with directions for dissolving in a specific quantity of warm water
- Suspensions: particle or powder substances that must be dissolved in a liquid (shaken vigorously) before administration
- Emulsion: a two-phase system in which one liquid is dispersed in the form of small droplets throughout another liquid
- Syrups: substances dissolved in a sugar liquid
- Gargles: aqueous solutions
- Mouthwashes: aqueous solutions that may contain alcohol, glycerin, and synthetic sweeteners and surface-active flavoring and coloring agents
- Nasal solutions: aqueous solutions in the form of drops or sprays
- Optic (eye) and otic (ear) solutions: aqueous solutions that are instilled as drops
- Elixirs: nonaqueous solutions that contain water varying alcohol content, and glycerin or other sweeteners

route. However, medical usage of this term refers to injecting medication into body tissue. Sterile technique is always used for any medication injection. The four routes that nurses commonly use to administer parenteral medications are:

- **Intradermal (ID)** is an injection into the dermis.
- **Subcutaneous (SC or SQ)** is an injection into the subcutaneous tissue.
- **Intramuscular (IM)** is an injection into the muscle.
- **Intravenous (IV)** is an injection into a vein.

Other parenteral routes, such as intrathecal or intraspinal, intracardiac, intrapleural, intra-arterial, and intra-articular, are used by physicians and in some cases by advanced practice registered nurses for medication administration.

Topical Route

Most topical drugs are given to deliver a drug at, or immediately beneath, the point of application. Although a large number of topical drugs are applied to the skin, other topical drugs include eye, nose and throat, ear, rectal, and vaginal preparations. Drugs directly applied to the skin are absorbed through the epidermal layer into the dermis, where they create local effects or are absorbed into the bloodstream. Drug action varies with the vascularity of the skin, usually requiring several applications over a 24-hour period to cause the desired therapeutic effect.

Transdermal patches, another type of topical preparation, are used to deliver medications such as nitroglycerin (anti-anginal) and certain supplemental hormone replacements for absorption by the blood to produce systemic effects. An adhesive disk secures the

medication ointment to the skin. The frequency for changing the patch varies with the specific drug. The medication can last from 24 hours to 7 days.

Some topical drugs, such as eye and nasal drops and vaginal and rectal suppositories, can be applied directly to the mucous membranes. These drugs are absorbed quickly into the bloodstream, and, depending on the drug's dose (strength and quantity), may cause systemic effects.

The client may complain of a burning sensation when the nurse instills eye or nasal drops because the cornea of the eye and nasal mucous membranes are often sensitive to medications. Eyedrops should never be applied onto the sensitive cornea.

Inhalants

Inhalants such as oxygen and most general anesthetics deliver gaseous or volatile substances that are almost immediately absorbed into the systemic circulation. The inhalants are delivered into the alveoli of the lungs, which promote fast absorption owing to:

- The permeability of the alveolar and vascular epithelia
- An abundant blood flow
- A very large surface area for absorption

Oropharyngeal hand-held inhalers deliver topical drugs to the respiratory tract to create local and systemic effects. There are three types of inhaler: metered-dose inhaler or nebulizer, turbo-inhaler, and nasal inhaler. They are explained later in this chapter.

Intraocular Route

Intraocular medications are administered by applying a clear, flexible, elliptical-shaped disk similar to a contact lens to the conjunctival sac. This provides continuous treatment of diseases such as open-angle glaucoma. Pilocarpine, a medication to treat glaucoma, can be administered in this manner. The disk can remain in the patient's eye for up to a week. This route increases compliance and decreases the number of times a client must administer medication.

Drug Interaction

Drug interaction refers to the effect one drug can have on another. Drug interactions may occur when one drug is administered in combination with a second drug or when a short time interval exists between the administration of two different drugs. Drugs can be combined deliberately to produce a positive effect, as when hydrochlorothiazide (a potassium-depleting diuretic) is combined with spironolactone (a potassium-sparing diuretic) to maintain a normal blood level of potassium. A positive drug combination can also occur when one drug, such as a preoperative medication, is deliberately given to potentiate the action of another drug.

Not all drug combinations are therapeutic. Some drug combinations can interfere with the absorption,

effect, or excretion of other drugs. For example, calcium products and magnesium-containing antacids can cause inadequate absorption of tetracycline (antibiotic) in the digestive tract.

Side Effects and Adverse Reactions

Drug effects other than those that are therapeutically intended and expected are called **adverse reactions**. A nontherapeutic effect may be mild and predictable (**side effect**) or unexpected and potentially hazardous (adverse effect). There are several types of adverse reactions: drug allergy, drug tolerance, toxic effect, and idiosyncratic reactions.

Drug allergy (hypersensitivity) is an antigen-antibody immune reaction that occurs when an individual who has been previously exposed to a drug has developed antibodies against the drug. The type of reaction may be mild (skin rash, urticaria, headache, nausea, or vomiting) or severe (anaphylaxis). Drug reactions are often manifested in the skin because of its abundant blood supply.

Anaphylaxis is an immediate, life-threatening reaction to a drug, such as penicillin, characterized by respiratory distress, sudden severe bronchospasm, and cardiovascular collapse. If emergency measures (administration of epinephrine, bronchodilators, and antihistamines) are not instituted immediately, anaphylaxis can be fatal.

Drug tolerance occurs when the body becomes so accustomed to a specific drug that larger doses are needed to produce the desired therapeutic effect. For example, cancer clients with severe pain may require larger and larger doses of morphine (narcotic analgesic) to control the pain as the body builds up a tolerance to the morphine.

A **toxic effect** occurs when the body cannot metabolize a drug, causing the drug to accumulate in the blood. Toxic reactions can result after prolonged intake of high doses of medication or after only one dose.

An **idiosyncratic reaction** is a highly unpredictable response that may be manifested by overresponse, underresponse, or an atypical response. For example, 1 of 40,000 clients will develop aplastic anemia after receiving chloramphenicol (antibiotic) (Springhouse, 1997).

Food and Drug Interactions

Medication management requires avoidance of possible food and drug interactions. There are three primary types of food and drug interaction:

1. Certain drugs may interfere with the absorption, excretion, or use in the body of one or more nutrients.
2. Certain foods may increase or decrease the absorption of a drug into the body.
3. Certain foods may alter the chemical actions of drugs, preventing their therapeutic effect on the body.

COMMON FOOD AND DRUG INTERACTIONS

Drug Effects on Nutritional Status

- Abuse of antacids can lead to phosphate depletion, which can cause a vitamin D deficiency, resulting in osteomalacia, or softening of the bones due to loss of calcium.
- Excessive use of diuretics may result in the loss of electrolytes, especially potassium, that places clients with cardiac conditions at a higher risk for serious rhythm problems. Potassium loss is greatest in clients taking digitalis as well as diuretics, making the heart more sensitive to the drug.
- Prolonged use of oral contraceptives by women may cause folacin and vitamin C deficiencies if their diets are inadequate in these nutrients.
- Hydralazine (antihypertensive drug) can deplete the body's supply of vitamin B₆.

Food Effects on Drug Absorption

- Calcium in milk and milk products may decrease the absorption of certain antibiotics such as tetracycline.
- Certain liquids such as soda pop or high-acid fruit or vegetable juices can cause an increase in the stomach acidity that can dissolve some drugs before they reach the intestine. Because most drugs are absorbed in the intestines, this interaction will decrease the amount of drug that can be absorbed into the body.
- Certain foods such as fatty foods can increase the rate of absorption of some drugs; (e.g., griseofulvin, an antifungal).

Food Effects on Drug Utilization

- The effects of anticoagulants can be decreased by certain foods in the liver such as green leafy vegetables that contain vitamin K, which is used by the body to promote blood clotting.
- Aged or fermented foods such as aged cheese, chicken livers, and other foods can decrease the metabolism in the body of monoamine oxidase inhibitors that are used to treat depression and high blood pressure.
- Long-term use of licorice and licorice-flavored candy or drugs can counteract the effect of high blood pressure medication.

Most interaction problems occur with the use of diuretics, oral antibiotics, and anticoagulant and antihypertensive drugs (see the accompanying display on common food and drug interactions). Clients on sodium-restricted diets should be advised to consult with a pharmacist regarding the sodium content in prescription and over-the-counter drugs. Some drugs can contain almost one-half the total daily allowance of

sodium. Alcohol is also considered a drug. Small amounts of alcohol interact with many drugs, such as antibiotics, antihistamines, anticoagulants, and sleeping pills. Food and drug interactions can vary depending on the dose and the form in which the drug is taken and the client's age, sex, body weight, nutritional status, and specific medical condition.

FACTORS INFLUENCING DRUG ACTION

Individual client characteristics such as genetic factors, age, height and weight, and physical and mental conditions can influence the action of drugs on the body. Sometimes mistaken for drug allergies, genetic factors can interfere with drug metabolism and produce an abnormal sensitivity to certain drugs.

The nurse should consider age-related factors that can influence drug action and dosing. For example, neonates and infants have underdeveloped gastrointestinal systems, muscle mass, and metabolic enzyme systems and inadequate renal function; elderly clients often experience decreased hepatic or renal function and diminished muscle mass.

The physician often correlates the client's age, height, and weight when determining the dosage for many drugs. The nurse should make sure that this information is accurately recorded in the client's medical record. The amount of body fat may also alter drug distribution because some drugs such as digoxin (inotropic) are poorly distributed to fatty tissues.

The client's physical condition can also alter the effects of drugs. For example, in an edematous client the drug must be distributed to a larger volume of body fluids than for a nonedematous client; therefore, the edematous client may require a larger drug dose to produce the drug action, whereas a dehydrated client would require a smaller dosage. Diseases that affect liver and renal functions can alter the metabolism and elimination of most drugs.

PROFESSIONAL ROLES IN MEDICATION ADMINISTRATION

The health care practitioner determines the therapeutic drug plan and conveys the plan to others by initiating orders or a prescription. In health care settings (long-term care facilities and hospitals), medication orders are written on a health care practitioner's order form. Health care practitioners can also write medication orders on legal prescription pads or through the computer terminal. When allowed by organizational policy, the health care practitioner may also give medication orders via telephone or as a verbal order.

If the health care practitioner gives a medication order orally, either directly or over the telephone, the nurse enters the information on the medical record. This information includes the name of the health care practitioner who ordered the medication, the name of the medication, the dosage, the frequency, the route of administration, and the nurse's name. Most institutions require the health care practitioner to confirm oral orders within 24 hours; the nurse is responsible for ensuring that the verbal order is clear. It often helps for the nurse to repeat the order to the health care practitioner to make sure it was interpreted as intended. See Chapter 26 for a complete discussion of written and verbal orders and the role of the nurse in transcribing orders.

The pharmacist processes the health care practitioner's orders, clarifies any entries that are unclear, and prepares the medications for administration. The pharmacist is responsible for filling prescriptions and for making sure they are valid entries. Pharmacists also assess medication plans monitoring for incompatibilities and, at times, recommending the best time to administer a medication to obtain therapeutic benefit such as Lovastatin (cholesterol lowering drug) which is most effective if taken in the evening. The pharmacist participates in calculating the appropriate dosage of certain medications such as anti-infective drugs (e.g., gentamycin). These dosages are based on the patient's body weight and kidney function and may be adjusted during the course of therapy by the pharmacist with the health care practitioner's consent. Nurses frequently consult with pharmacists in determining compatibility if intravenous medications are to be administered simultaneously. Pharmacists also answer medication-related questions for both nurses and patients.

Nurses spend a great deal of time with their patients and have specific knowledge and skills that qualify them to administer medication and to evaluate a medication's effectiveness. Nurses understand why particular medications are ordered for clients and what physiological changes may result from the medication that cause a therapeutic effect. Because of their knowledge, skills, and frequent client contact, nurses can readily assess changes in a client's condition and can determine whether it is appropriate to administer a medication on the basis of the client's condition.

Nurses are responsible for teaching patients to self-administer medications such as insulin and for assessing the patient's ability to self-administer correctly. Before discharge, nurses teach clients about the medications they will be taking at home and how to assess for side effects and adverse reactions. Using the nursing process, nurses help clients incorporate their medication regimen into their plan of care.

When a client is admitted to an inpatient health care facility, the drug order form is stamped with the

COMMON ABBREVIATIONS USED IN MEDICATION ORDERS

Abbreviation	Meaning
a.c.	before meals
ad lib	freely, as desired
b.i.d.	two times a day
̄	with
cap	capsule
DC	discontinue
elix	elixir
h	hour
hrly	hourly
h.s.	at bedtime
ID	intra dermal
IM	intramuscular
IV	intravenous
IVPB	intravenous piggyback
OD	right eye
od	every day
OS	left eye
OU	each eye
p.c.	after meals
PO	by mouth
per	by
prn	as needed
q	every
qd	every day
q2h	every 2 hours
q.i.d.	four times a day
qod	every other day
qs	sufficient quantity
SC or SQ	subcutaneous
stat	immediately
supp	suppository
susp	suspension
tab	tablet
t.i.d.	three times a day
Tr or tinct	tincture

client's name, room number, age, and weight. The client's weight is used by the pharmacist in compounding and dispensing drugs.

Most agencies have policies relative to medication administration, such as stop dates for certain types of drugs, regularly scheduled times to administer medications as specified in the drug order, and a listing of abbreviations officially accepted for use in the agency. The agency's medical records department maintains the official listing of abbreviations adopted by the medical staff; only abbreviations from the official list can be used in any part of the client's medical record. See the accompanying display for a list of common abbreviations used in medication orders.



NURSING TIP

Therapeutic Levels

Some medications require monitoring of blood levels to determine their effectiveness. When reviewing these laboratory values, notice if the levels are higher (toxic) or lower (subtherapeutic) than the recommended therapeutic range for that medication. Adjustments in the medication dose by the health care practitioner may be warranted to reach the recommended therapeutic level.

Types of Medication Orders

The health care practitioner prescribes medications in different ways, depending on their purpose. Medications can be prescribed as stat, single-dose, standing, and prn orders.

Stat Orders

When the health care practitioner writes orders, the nurse should read all of the orders to determine if any stat orders have been prescribed. A **stat order** is an order for a single dose of medication to be given immediately. Stat drugs are often prescribed in emergency situations to modify a serious physiological response; a stat dose of nitroglycerin may be ordered for a client experiencing chest pain. The nurse should assess and document the client's response to all stat medications.

Single-dose Orders

Single-dose orders are one-time medications or may require the administration of drops or tablets over a short period of time. The nurse should administer single-dose orders only once, either at a time specified by the health care practitioner or at the earliest convenient time. These drugs are often prescribed in preparation for a diagnostic or therapeutic procedure; for example, radiopaque tablets may be administered in preparation for a gallbladder test, or a one-time order may be given for a preoperative medication.

Standing Orders

Standing orders are also referred to as *scheduled orders* because they are administered routinely as specified until the order is canceled by another order. The standing orders stay in effect until the health care

practitioner discontinues or modifies the dosage or frequency with another order or until a prescribed number of days has elapsed as determined by agency policy. The purpose of a standing medication order is to maintain the desired blood level of the medication.

Agency policy determines the actual times for administering medications for a 24-hour time interval. For example, t.i.d. drugs may be administered at 0800, 1400, and 2000 or at 0900, 1500, and 2100. Medications ordered qd may have a specified time identified in the order, such as Isophane (NPH) Insulin 10 U SC qd at 0600, or they may be given at the agency's designated time, for example, Lanoxin 0.25 mg PO qd 0900.

When the order specifies the number of days or the number of dosages of the drug the client is to receive, the order has an automatic stop date to discontinue the drug. For example, the order may read tetracycline 250 mg PO q6h for 5 days. The nurse should execute this order by administering 250 mg tetracycline orally every 6 hours for 5 days for a total of 20 doses. Day one begins with the administration of the drug and the time the first dose is given. If the first dose of tetracycline is given on a Tuesday at 1200, then every 6 hours, the last dose will be given on Sunday at 0600. Although the medication is given over 6 consecutive days, it totals 20 doses as ordered. Most agencies have an automatic stop date to discontinue certain medications, such as 5 or 7 days for antibiotics and 48 or 72 hours for narcotics.

prn Orders

A drug may be ordered on a prn (as needed) basis as circumstances indicate. The drug is administered when, in the nurse's judgment, the client's condition requires it. Before administering a prn medication, the nurse must thoroughly assess the client, using both objective and subjective data in determining the appropriateness of administering the medication. This type of order is commonly written for analgesics, antiemetics, and laxatives.

The order written by the health care practitioner indicates how frequently a prn medication can be given. A nurse cannot administer a prn medication more frequently than the order indicates without consulting with the health care practitioner for a change in that order. Examples of prn orders are meperidine (a narcotic analgesic) 75 mg IM q3–4 hours prn incisional pain and Tylenol 650 mg q4 hours prn headache. When the prn medication has been administered, the nurse documents the assessment and the time of administration. In addition, the nurse is responsible for monitoring the effectiveness of the medication and documenting the effect in the client's medical record. The nurse administers the pain medication on the basis of the assessment of the client's pain and as specified in the order.

Parts of the Drug Order

All orders should be written clearly and legibly, and the drug order should contain seven parts:

1. The name of the client
2. The date and time when the order is written
3. The name of the drug to be administered
4. The dosage
5. The route by which it is to be administered and special directives about its administration
6. The time of administration and frequency
7. The signature of the person writing the order, such as the physician or advanced practice registered nurse

Drug prescriptions written in settings other than acute care facilities may also specify whether the generic or trade name of the drug is to be dispensed, the quantity to be dispensed, and how many times the prescription can be refilled.

SYSTEMS OF WEIGHT AND MEASURE

Medication administration requires the nurse to have a knowledge of weight and volume measurement systems. In North America there are three systems of measurement used in medication management: metric, apothecary, and household.

Metric System

The metric system of weights and measures was adopted by the USP in 1890 and the British Pharmacopoeia in 1914 to the exclusion of all other systems except for equivalent dosages. The Council on Pharmacy and Chemistry of the American Medical Association adopted the metric system exclusively in 1944. Resistance to changing established customs interfered with the exclusive adoption of the metric system. Today, the metric system is used in every major country of the world and is used almost exclusively in the U.S. medical practice (*Remington's Pharmaceutical Sciences*, 1990).

The metric, or decimal, system is a simple system of measurement based on units of 10. The basic units can be multiplied or divided by 10 to form secondary units. The decimal point is moved to the right for calculating multiples, and the decimal point is moved to the left for division.

The basic units of measurement in the metric system are the meter (linear), the liter (volume), and the gram (mass). The metric system uses prefixes derived from Latin to designate subdivisions of the basic units and prefixes derived from Greek to designate multiples of the basic units (see the accompanying display). When the metric system is used, a zero is always placed in front of the decimal for values less than 1 (e.g., 0.5) to prevent error.

METRIC SYSTEM PREFIXES

Latin Prefixes—Subdivisions of the Basic Unit

deci (1/10, or 0.1)
centi (1/100, or 0.01)
milli (1/1000, or 0.001)

Greek Prefixes—Multiples of the Basic Unit

deka (10)
hecto (100)
kilo (1000)

Apothecary System

The apothecary system, which originated in England, is based on the weight of one grain of wheat. Therefore, the basic unit of weight is the grain (gr), and the basic unit of volume is the minim (the approximate volume of water that weighs a grain). The grain is expressed in fractions such as morphine gr 1/4. The minim (*m*) is the smallest unit of volume, followed in ascending order by the fluid dram (*D*), fluid ounce (*Z*), pint (pt), quart (qt), and gallon (gal).

Household System

The household system of measurement is similar to the apothecary system of liquid measures and is the least accurate of the three systems. The units of liquid measure are drop (gtt), teaspoon (tsp), tablespoon (Tbsp), cup, and glass. Household units are often used to inform clients of the size of a liquid dose.

The USP recognizes the use of the teaspoon as the ordinary practice for household medication administration and states that the teaspoon may be regarded as representing 5 ml (American Hospital Formulary Service, 1996). Household spoons are not appropriate when accurate measurement of a liquid dose is required; therefore, the USP recommends that a calibrated oral syringe or dropper be used for accurate measurement of liquid drug doses.

APPROXIMATE DOSE EQUIVALENTS

The conversion of metric doses with the apothecary and household systems are *approximate dose equivalents* (see the accompanying display). The approximate dose equivalents represent the quantities usually ordered by health care practitioners when using either the metric or apothecary system of weights and volumes for drug doses (American Hospital Formulary Service, 1996). If the prepared dosage form is prescribed in the metric system, the pharmacist may dispense the corresponding approxi-

mate equivalent in the apothecary system and vice versa. For example, if the health care practitioner prescribes morphine gr 1/4, the pharmacist may dispense morphine 15 mg. The USP and NF reference *exact equivalents* that must be used to calculate quantities in pharmaceutical formularies and prescription compounding.

Converting Units of Weight and Volume

The nurse has to apply the knowledge of measurement systems and their conversions when the health care practitioner prescribes a drug dosage in one system and the pharmacy dispenses the equivalent dose in another. Given the above example of morphine, if the health care practitioner orders morphine gr 1/4 and the pharmacist dispenses morphine 15 mg, the nurse is responsible for ensuring the correct dose. The nurse knows that 1 grain equals 60 milligrams; to convert the ordered dose to milligrams, the nurse should use the following calculation:

$$\begin{aligned} 1 \text{ gr} &= 60 \text{ mg} \\ x &= 1/4 \text{ gr} \times 60 \text{ mg/gr} \\ &\text{(the grains cancel out)} \\ x &= 60/4 \text{ mg} \\ x &= 15 \text{ mg} \end{aligned}$$

Measurement Conversions within the Metric System

Because the metric system is based on units of 10, dose equivalents within the system are computed by simple arithmetic, either dividing or multiplying. For example, to change milligrams to grams (1,000 mg equals 1 g) or milliliters to liters (1,000 ml equals 1 L), divide the number by 1000:

$$\begin{aligned} 250 \text{ mg} &= x \text{ g} \\ &\text{(move the decimal point three places to the left)} \\ x &= 0.25 \text{ g} \\ &\text{or} \\ 500 \text{ ml} &= x \text{ L} \\ &\text{(move the decimal point three places to the left)} \\ x &= 0.5 \text{ L} \end{aligned}$$

To convert grams to milligrams or liters to milliliters, the nurse multiplies the number by 1000:

$$\begin{aligned} 0.005 \text{ g} &= x \text{ mg} \\ &\text{(move the decimal point three places to the right)} \\ x &= 5 \text{ mg} \\ &\text{or} \\ 0.725 \text{ L} &= x \text{ ml} \\ &\text{(move the decimal point three places to the right)} \\ x &= 725 \text{ ml} \end{aligned}$$

The nurse may need to convert the volumes of liters and milliliters for enemas and irrigating solutions such as for bladder and wound irrigations. Intravenous solutions are sterile, prepackaged solutions dispensed in volumes as ordered by the health care practitioner, such as 50 ml, 100 ml, 250 ml, 500 ml, and 1,000 ml (1 liter).

APPROXIMATE METRIC SYSTEM EQUIVALENTS

Liquid Measure (Volume)

Metric	Apothecary	Household
5 ml	= 1 fluid dram	= 1 teaspoonful
10 ml	= 2 fluid drams	= 1 dessertspoonful
15 ml	= 4 fluid drams	= 1 tablespoonful
30 ml	= 1 fluid ounce	= 1 ounce
60 ml	= 2 fluid ounces	= 1 wineglassful
120 ml	= 4 fluid ounces	= 1 teacupful
240 ml	= 8 fluid ounces	= 1 tumblerful
500 ml	= 1 pint	= 1 pint
1000 ml	= 1 quart	= 1 quart
4000 ml	= 1 gallon	= 1 gallon

Weight

Metric	Apothecary
1 mg	= 1/60 grain
4 mg	= 1/15 grain
10 mg	= 1/6 grain
15 mg	= 1/4 grain
30 mg	= 1/2 grain
60 mg	= 1 grain
1 g	= 15 grains
4 g	= 1 dram
30 g	= 1 ounce
500 g	= 1.1 pound
1000 g (1 kg)	= 2.2 pounds

Measurement Conversions between Systems

When converting grains to milligrams, the nurse must multiply by 60. For example, if the physician orders nitroglycerin (anti-anginal) 1/150 gr PO for chest pain, the dispensed dose will be 0.4 mg:

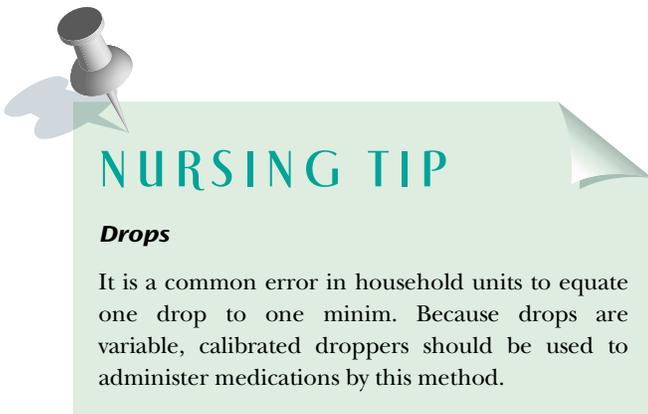
$$\begin{aligned} 1 \text{ gr} &= 60 \text{ mg} \\ x &= 1/150 \text{ gr} \times 60 \text{ mg/gr} \\ &\text{(the grains cancel out)} \\ x &= 1/150 \times 60/1 \text{ mg} \\ x &= 60/150 \text{ mg} \\ &\text{(divide 60 by 150)} \\ x &= 0.4 \text{ mg} \end{aligned}$$

The nurse converts between pounds and kilograms (2.2 lb = 1 kg) by dividing or multiplying by 2.2. For example, if the ordered dose is 10 mg/kg and the client weighs 150 lb:

$$\frac{150 \text{ lb}}{2.2 \text{ lb/kg}} \times \frac{10 \text{ mg/kg}}{x}$$

$$\begin{aligned} &\text{(the lb and kg cancel out)} \\ x &= 68.2 \times 10 \text{ mg} \\ x &= 682 \text{ mg} \end{aligned}$$

In clinical settings, household measures are used for bedside recording of intake so that the client or family member can record the volume ingested by the client. Agencies have a legend on their intake form with the approximate conversions from household to metric volume measures based on the type of containers used in that specific agency. See Chapter 37 for the procedure for measuring intake and output. Home health nurses often have to convert a liquid dose to an approximate household unit.



NURSING TIP

Drops

It is a common error in household units to equate one drop to one minim. Because drops are variable, calibrated droppers should be used to administer medications by this method.

Drug Dose Calculations

Several formulas may be used by the nurse when calculating drug doses. One formula uses ratios based on the *dose on hand* and the *dose desired*. For example, cephalexin (anti-infective cephalosporin) 500 mg PO q.i.d. (dose desired) is ordered by the health care practitioner; the dose on hand is 250 mg/5 ml. The formula is as follows:

$$\frac{250 \text{ mg (dose on hand)}}{5 \text{ ml (dose on hand)}} = \frac{500 \text{ mg (dose desired)}}{x \text{ (dose desired)}}$$

(cross-multiply)

$$250 x = 5 \times 500$$

$$x = \frac{5 \times 500}{250}$$

$$x = 10 \text{ ml}$$

The ratio formula can be used in calculating dosages. For example, the health care practitioner orders heparin (anticoagulant) 10,000 units SC; the dose on hand is 40,000 units/ml:

$$\frac{40,000 \text{ units}}{1 \text{ ml}} = \frac{10,000 \text{ units}}{x}$$

(units cancel out)

$$40,000 x = 10,000$$

$$x = \frac{10,000}{40,000}$$

$$x = \frac{1}{4}$$

$$x = 0.25 \text{ ml}$$

Pediatric Dosages

“Children are sometimes more susceptible than adults to certain drugs” (*Remington’s Pharmaceutical Sciences*, 1990, p. 91). Several rules have been devised to calculate infants’ and childrens’ dosages such as *Young’s Rule*, *Clark’s Rule*, and *Fried’s Rule*, but these rules give only approximate dosages. Even when pediatric drug dosages are calculated on body surface area, weight, and age of the child, they are based on a proportion of the usual adult dose (approximate). Regardless of the method used in calculating pediatric drug dosages, the nurse should realize that dosages are approximate and often need adjustment based on the child’s response.

The body surface area method of determining pediatric doses is based on the body surface area of an adult weighing 150 lb. The body surface area of an adult weighing 150 lb. is 1.73 square meters. The approximate child dose is calculated as follows:

$$\frac{\text{Body surface area of child}}{\text{Body surface area of adult}} \times \text{adult dose} \\ = \text{approximate child dose}$$

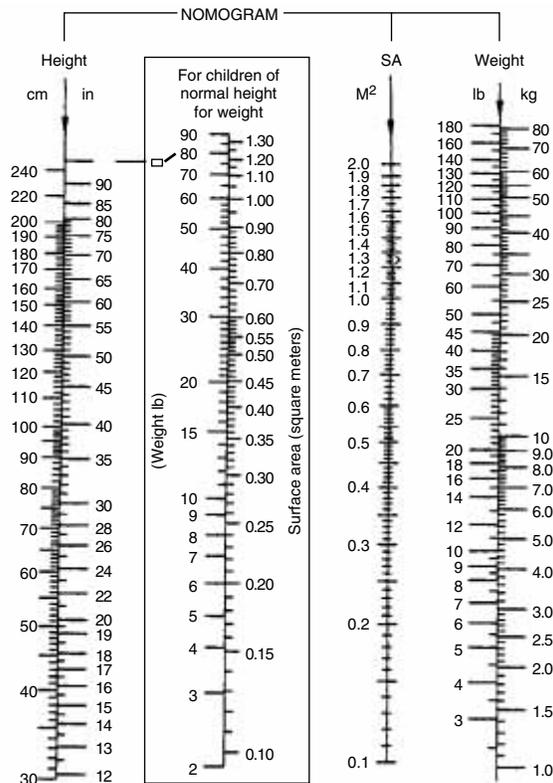
$$\frac{\text{Body surface area of child (m}^2\text{)}}{1.73 \text{ m}^2} \times \text{adult dose} \\ = \text{approximate child dose}$$

Nomograms based on height and weight are used to compute the body surface area (Figure 29-2). A straight line is drawn from the client’s height in the left column to the client’s weight in the right column. The point at which this line intersects the body surface area column (designated SA) indicates the body surface area. Nomograms are used primarily in calculating pediatric drug dosages; however, they are also used when calculating some adult drug dosages such as aminoglycosides and antineoplastic agents.

SAFE DRUG ADMINISTRATION

Nurses must administer numerous drugs daily in a safe and efficient manner. The nurse should administer drugs in accord with nursing standards of practice and agency policy. The safe storage and maintenance of an adequate supply of drugs are other responsibilities of the nurse.

The nurse documents the actual administration of medications on the medication administration record, or MAR. The MAR is a medical record form that contains the drug’s name, dose, route, and frequency of administration. Drug data are entered either by the nurse when transcribing the order (handwritten onto the form) or by the pharmacist when dispensing the order (a computer-generated pharmacy MAR form is shown in Figure 29-3).



Directions for use: (1) Determine client height. (2) Determine client weight. (3) Draw a straight line to connect the height and weight. Where the line intersects on the SA line is the derived body surface area (m²).

Figure 29-2 Nomogram for Estimating Body Surface Area. Reprinted with permission from Behrman, R.E., Kliegman, R., & Arvin, A. M. (Eds.). (1996). *Nelson textbook of pediatrics* (15th ed.). Philadelphia: Saunders

Guidelines for Medication Administration

To protect the client from medication errors, nurses have traditionally used as a guideline the “five rights” of drug administration (see the accompanying display).

Right Drug

Before administering any medication the nurse compares the medications listed on the MAR, other recording forms, or computer orders against the health care practitioner’s order. When administering a medication, the nurse should check the label written on the container against the MAR at least three times before giving the drug. The nurse should:

1. Check the label when removing the drug container from the client’s medication drawer.
2. Check the drug when removing it from the container.
3. Check the drug before returning it to the client’s medication drawer.

Some medications come in a unit-dose prepackaged form. The nurse should check the medication a third

time even though there would be no container to return to the drawer. This third check should be done at the bedside before opening the unit-dose medication.

The nurse should give only medications that the nurse has prepared and checked. The nurse who administers the medication is the responsible party should an error occur. If a client questions a medication to be administered, the nurse should never ignore the question. Clients are active participants in their care and usually know when a medication is different from that usually taken. The nurse should withhold this medication until the order can be rechecked. Frequently, the medication order has changed, but the client question can stop an error before it occurs.

If the client refuses a medication, it should be discarded rather than returned to the original container. Unit-dose medications that have not been opened can be saved.

FIVE RIGHTS OF DRUG ADMINISTRATION

1. Right drug
2. Right dose
3. Right client
4. Right route
5. Right time

Right Dose

The unit-dose system was implemented to help decrease medication errors. However, there are times when medications on hand are in a larger volume or strength than needed. Careful calculation is especially important when the health care practitioner orders a unit of measurement different from what is supplied by the pharmacy.

The nurse must know how to reduce the risk of error by correctly calculating doses and having them double-checked before administration. Policy in some agencies, for instance, mandates that two nurses check insulin dosages to ensure accuracy. After calculations have been completed, the nurse should prepare the medication using appropriate measurement devices such as graduated measuring cups, syringes, and droppers.

To prepare scored or crushed medications, the nurse should make sure scored tablets are broken evenly. This practice will prevent overdosage or underdosage of a medication. If the medication has to be crushed with a mortar and pestle, the nurse should thoroughly cleanse the pestle after each use. Cleansing the pestle will avoid mixing of different medications and will prevent the client from receiving minute amounts of a medication that may cause serious adverse effects.

Right Client

The nurse should correctly identify the client by asking the client to state his or her full name and checking the client’s

PHARMACY MAR

START	STOP	MEDICATION	SCHEDULED TIMES	OK'D BY	0001 HRS. to 1200 HRS.	1201 HRS. to 2400 HRS.
08/31/xx 1800 SCH		PROCAN SR 500 MG TAB-SR 500 MG Q6H PO	0600 1200 1800 2400	JD	0600 GP 1200 GP	1800 MS 2400 JD
09/03/xx 0900 SCH		DIGOXIN (LANOXIN) 0.125 MG TAB 1 TAB QOD PO ODD DAYS-SEPT.	0900	JD	0900 GP	
09/03/xx 0900 SCH		FUROSEMIDE (LASIX) 40 MG TAB 1 TAB QD PO	0900	JD	0900 GP	
09/03/xx 0845 SCH		REGLAN 10 MG TAB 10 MG AC&HS PO GIVE ONE NOW!	0730 1130 1630 2100	JD	0730 GP 1130 GP	1630 MS 2100 MS
09/04/xx 0900 SCH		K-LYTE 25 MEQ EFFERVESCENT 1 EFF. TAB BID PO DISSOLVE AS DIR. START 9-4	0900 1700	JD	0900 GP	1700 GP
09/03/xx 1507 PRN		NITROGLYCERIN 1/50 GR 0.4 MG TAB-SL 1 TABLET PRN* SL PRN CHEST PAIN		JD		
09/03/xx 1700 PRN		DARVOCET-N 100* 1 TAB Q4-6H PO PRN MILD-MODERATE PAIN		JD		
09/03/xx 2100 PRN		MEPERIDINE* (DEMOROL) 50 MG Q4H INJ PRN SEVERE PAIN IM W PHENERGAN		JD		2200 (H) MS
09/03/xx 2100 PRN		PROMETHAZINE (PHENERGAN) 50 MG Q4H INJ PRN SEVERE PAIN IM W DEMEROL		JD		2200 (H) MS

Gluteus A. Right B. Left	Thigh H. Right I. Left	Nurse's Signature	Initial	Allergies: NKA	Patient: Patient, John D.
Ventro Gluteal C. Right D. Left E. Abdomen	J. Right K. Left	7-3 G. Pickar, R.N.	GP	Diagnosis: CHF	Patient #: 3-81512-3
		3-11 M. Smith, R.N.	MS		Admitted: 08/31/xx
		11-7 J. Doe, R.N.	JD		Physician: J. Physician, MD
					Room: PCU-14 PCU

Figure 29-3 Computerized Pharmacy Medication Administration Record

identification armband (Figure 29-4). Never identify a client solely by calling the person's name because some clients may be confused and will answer to any name. Identification bracelets that become blurred or are missing for any reason should be replaced. The nurse needs to obtain a new identification band for the client. Verify the identification by asking the client to state his or her full name before placing the new band on the client's arm.

Right Route

The route of the medication is specified in the written order. The nurse should consult the health care practitioner whenever a route is not identified in the prescription, when the route indicated differs from the recommended one, or when the nurse questions the choice of route prescribed. For example, the nurse should not substitute an oral medication for an intramuscular medication simply because the oral medication is available and the intramuscular one is not.



Figure 29-4 Check a client's identification band before administering medication.

Injecting a medication designed to be administered orally can cause adverse reactions such as a sterile abscess at the injection site. Medications for parenteral injections should be prepared from medications designed for this purpose. Manufacturers of medications label medications that can be used for parenteral injections as “for parenteral use only.”

Right Time

Medications are generally ordered on a schedule. Nurses are responsible for knowing why a medication is ordered on a certain schedule and for following that schedule as closely as possible. A drug should not be given more than a half-hour before or after the scheduled time (according to organizational policy) without first checking with the health care practitioner. To maintain the drug’s effect, the nurse has to give the medication in a timely manner. Some medications must be given at a certain time for proper therapeutic effect; for example, insulin should be given at a set time before meals. These types of drugs should be administered as ordered. See the Nursing Checklist for guidelines that ensure the safe administration of medications.

In the home health and community care settings, such as a retirement home, the nurse has different responsibilities regarding drug safety (Figure 29-5). The nurse should promote drug safety measures that are appropriate to the environment and inherent risk factors (see the accompanying display).

Documentation of Drug Administration

A critical element of drug administration is documentation. The standard is “if it was not documented it was not done.” Many drug errors can be avoided with appropriate documentation. The nurse responsible for administering the medication must initial the medication on the MAR near the time the drug is scheduled. Usually there is a space available for a full signature on the record. The nurse should document that a drug has been given after the client has taken the drug.



Figure 29-5 A pill box correlated to the days of the month can help the client follow her medication regimen.



NURSING CHECKLIST

Guidelines for Safe Administration of Medications

- Never administer medications that are prepared by another nurse. You are responsible for a medication error if you administer a medication that was inaccurately prepared by another nurse.
- Nurses should listen carefully to the client who questions the addition or deletion of a medication. Most clients are aware of their prescribed medications. If a client questions the drug or dose you are preparing to administer, recheck the order.
- If a medication is withheld, indicate the exact reason why in the client’s record. Legally you are accountable for giving ordered medications to the client; however, circumstances may prevent you from giving a medication as ordered. Medications may be held for some diagnostic tests, or the client receiving antihypertensive medications may have a blood pressure that is lower than normal. If you gave the antihypertensive, the blood pressure would decrease, causing further hypotension.
- *Do not leave medications at the client’s bedside for any reason.* The client may forget to take the medication, medications can accumulate, and the client could take two or more of the same medication, causing an overdose, or another client who is confused could take the medicine.
- Initial the MAR only for those medications you actually have administered. This practice ensures accurate charting by clearly indicating which actions you have performed.
- Advise clients not to take medications belonging to others and not to offer their medications to others. Medications are ordered for each client on the basis of the history, physical examination, and effectiveness of the medication.

If the client refuses to take a medication once it has been prepared, the nurse must indicate that a dose was missed. In some hospitals, a circle is placed around the time the medication was scheduled to be given. The nurse should write in the record why the dose was missed and notify the health care practitioner. The client may have refused because the tablet was too large. The medication may be supplied as a liquid so an alternate form of the medication can be given; the nurse must request that the health care practitioner change the order to a liquid. Clients do have the right to refuse medications. However, if clients understand the actions of the medication, they may be willing to take the

DRUG SAFETY CONSIDERATIONS IN HOME HEALTH AND COMMUNITY CARE SETTINGS

- Help the client remove outdated prescriptions and over-the-counter drugs from medication cabinets. The chemical composition may change over time, causing a different drug action. Over-the-counter drugs may interact with prescription drugs, either by decreasing or potentiating the effects of the prescription medication.
- Encourage the client or caregivers to maintain drug refills to decrease the risk of missing scheduled medications.
- Use a mechanism such as a paper clock, reminder calendar, or pill box to help the client or caregiver remember to take or administer prescribed medications as scheduled.

medication. Clients who are scheduled for various diagnostic tests or treatments at the time the medication is to be administered will need to have the medication times rescheduled.

Drug Supply and Storage

Drugs are dispensed by the pharmacy to nursing units through various methods to accommodate the agency's medication system. Once the pharmacy delivers the drugs to a nursing unit, the nurse is responsible for their safe storage.

Scheduled drugs for each client are usually dispensed in a **unit-dose form**. Unit dose is a system of packaging and labeling each dose of medication by pharmacy, often to supply a 24-hour time period. The pharmacy usually delivers the drugs and stores the drugs in the designated area for each client. Unit-dose drugs are usually stored in a medication cart that contains individual drawers for each client's medication supply or in the medication room in a separate, organized container for each client. The unit-dose system has made it easier for nurses to administer the correct dose, thereby reducing the number of medication errors.

The nurse, usually at the beginning of each shift, checks the medications in each client's drawer. Some medication carts are locked, and the nurse keeps the key. Medication drawers should be removed only one at a time from the cart when the nurse is preparing the medication for administration. The client's drawer should never be left unattended on top of the cart. Drugs should not be removed from one client's supply for administration to another client.

Certain drugs are **stock supplied** (dispensed and labeled in large quantities) and stored in the medication room or other area on the nursing unit. Stock supplies are kept together in a secured area.

Certain intravenous fluids and medications must be stored in the medication refrigerator to preserve the integrity of the drug. The Public Health Department and accrediting agencies mandate that only drugs can be stored in the medication refrigerator.

Narcotics and Controlled Substances

Health care agencies have forms to record the supply on hand and the administration of narcotics and controlled substances in accord with federal regulations. These forms usually require the recording of the following information for each drug administered:

- Name of the client receiving the drug
- Amount of the drug used
- Time the drug was administered
- Name of the prescribing health care practitioner
- Name of the nurse administering the drug

Nursing practice usually requires that nurses count the narcotics and controlled substances at specified intervals. For example, at the change of shifts, one nurse who is going off duty counts the drugs with a nurse coming on duty. Each drug used must be accounted for on the narcotic record. When the narcotic count does not check, the nurse must report the discrepancy immediately. Narcotics and controlled substances are kept in a double-locked drawer, box, room, or medication-dispensing cart. The law requires these safety precautions in the use of narcotics and controlled substances to aid in the control of drug misuse. If for any reason a narcotic has to be discarded, a second person should act as a witness and that person should also sign the narcotic sheet.

Drug Abuse

Federal, state, and local rules regulate the appropriate use of drugs. Despite these rules, some people use drugs for purposes other than their proper use, seriously jeopardizing their health. Misuse of drugs also creates problems for family members and the community as a whole.

"The American Medical Association and the World Health Organization have both recognized addiction as an illness, not a lack of willpower" (Dossey, Keegan, & Guzzetta, 2000, p. 514). **Addiction** is defined as a physiological or psychological dependence on a substance, such as alcohol or morphine, or a behavior such as eating, gambling, working, or engaging in sexual intercourse. The rest of this discussion focuses only on substance abuse.

Nursing practice requires the nurse to be knowledgeable about the addictive process in order to assess and care for clients with drug toxicity or overdose and withdrawal. Continual or periodic use of drugs may lead to **dependence** (reliance on or need to take a drug). The term *chemical dependence* is often used as a more inclusive term than *drug dependence* because it includes problems with *all mind-altering substances that have the potential of creating dependence* (Crosby & Bissell, 1989).

Addiction implies more than a physical dependence alone, and it does not refer exclusively to illicit drugs. Illicit drugs are substances sold illegally, such as cocaine, PCP (angel dust), hallucinogenic agents (LSD and peyote), and cannabinoids (marijuana and hashish). There are two types of drug dependence that can occur separately or together:

- **Physiological dependence:** the biochemical changes in body tissues that occur when the tissue depends on a substance for normal functioning; cessation of the substance causes physical withdrawal symptoms.
- **Psychological dependence:** the emotional reliance on a substance to maintain a sense of well-being; the degree of psychological dependence can vary from a mild desire to an intense craving or compulsion for the substance.

Although there are many types of addictions to various substances, alcohol addiction is the most prevalent one in the United States, afflicting at least 11 million people (Dossey et al., 2000). The nurse should be able to identify the characteristics of substance abuse (see the accompanying display) and work together with other health team members in planning the care for clients experiencing the disorder.

COMMON CHARACTERISTICS OF ALCOHOLISM

- Denial that there is a drinking problem
- Rationalization
- Restlessness, impulsiveness, anxiety
- Selfishness, self-centeredness, lack of consideration
- Irritability, anger, rage
- Physical cruelty; child, spouse, or elder abuse
- Depression, isolation, self-destruction
- Low self-esteem, shame, guilt, remorse, loneliness
- Susceptibility to disease

(From Dossey, B. M., Keegan, L., & Guzzetta, C. E. [2000]. *Holistic nursing: A handbook for practice* [3rd ed.]. Gaithersburg, MD: Aspen)

Nurses and other health care providers (physicians, dentists, and pharmacists) are at risk for substance abuse because of their access to drugs such as benzodiazepines (Valium, Librium), sedative hypnotics (Nembutal, Placidyl), amphetamines (Dexedrine, Benzedrine), and narcotics (meperidine, morphine). The actual incidence of chemical dependence among nurses and other health care professionals is difficult to document; however, it is estimated that 6% to 16% of registered nurses in the United States are chemically dependent (Crosby & Bissell, 1989). The difficulty of obtaining factual data for the number of chemically addicted nurses is often related to the reluctance of professionals to report one another.

Although it may be uncomfortable to report an addicted colleague, nurses have a moral responsibility to report the situation to the appropriate authority. Nurses who are addicted may display suspicious behaviors such as insisting on carrying the narcotic keys and volunteering to administer all of the narcotics during the shift (see the accompanying display for other behavioral characteristics).

CHARACTERISTICS OF DRUG-ADDICTED NURSES IN THE WORKPLACE

- Exhibit extreme and rapid mood swings
- Always wear long sleeves
- Sign out more controlled drugs than anyone else
- Report frequent spills and breakage of controlled drugs
- Commit multiple medication errors
- Practice illogical or sloppy charting
- Are frequently absent from work
- Come to work early and stay late
- Frequently use sick leave

In 1983, Florida was the first state to enact a “diversion” law as an alternative to disciplinary proceedings against substance abusers. Florida’s diversion program is called the Intervention Project for Nurses and has served as a model for other states to create similar programs such as impaired nurse programs. These programs provide support, confidentiality, and stringent on-the-job monitoring and allow the nurse to maintain licensure as long as the nurse complies with the program. An impaired nurse program is a welcomed alternative for nurses with addictive behaviors and has increased the reporting of nurses with addiction problems. (Contact your state board of nursing office to inquire about alternative programs to disciplinary measures.)

More recently, some hospitals have taken a proactive role in combating the problem of drug abuse among nurses with the use of a computer-controlled dispensing system (Figure 29-6). With this system, the likelihood of



Figure 29-6 Computer-controlled Dispensing System

the nurse's abusing narcotics is markedly decreased. The nurse enters a private security code. The system will provide the nurse with a printout of the medications given to the client and will charge the client. This dispensing system eliminates stock supplies of narcotics and controlled drugs, decreasing the nurse's access to these drugs.

MEDICATION COMPLIANCE

Medication compliance can be associated with the client's understanding of why a medication was ordered and how a medication can decrease the likelihood of getting a disease or how it can lessen the effects of an existing disease. When clients do not consistently take their prescribed medications, or when they adjust the scheduling or dose of the medication, they are *noncompliant*.

THINK ABOUT IT

Chemical Dependence

Addicted health care practitioners are rehabilitated, whereas addicted nurses are punished! If you were practicing in a state where the only action from the state board of nursing were license suspension or revocation, would you report a fellow nurse? If you did not, what could happen to the clients under the nurse's care, and what would be the legal implications for you? Likewise, if you were addicted, what would be the implications for your continued nursing practice?

There are several reasons why clients choose not to take ordered medications. If a hypertensive client is asymptomatic (without distress), it may be difficult for the client to understand the need to take prescribed medications. If medications are taken, the dose may be altered at the discretion of the client. Medications are costly, and the client may be on a fixed income or unemployed. If the medication does not provide prompt relief, the client may consider the medication useless and discontinue it. The medication may be discontinued if the client experiences undesirable side effects, such as dizziness, impotence, or weight gain.

Compliance can be enhanced if the client is given information on the medication to take home when discharged from the hospital. If the client is elderly, large-type print or illustrations should be used. Caregivers should be included when educating the client. Scheduling the medications around certain activities of daily living may serve as a reminder to the client that the medication must be taken. Providing the client with a telephone number and a name of a nurse to call if questions arise can ensure compliance.

The nurse in the community has an opportunity to see how medications are arranged in the client's home.

Outdated medications must be discarded. After consulting with the client and caregiver, the nurse can make suggestions that may improve compliance.

Nurses have to remember that many elderly clients take a multitude of drugs. Some drugs actually cancel each other out when taken together, thus eliminating the therapeutic response. A client taking BuSpar and digoxin may experience digoxin toxicity. BuSpar may displace the serum binding of digoxin and increase the toxic levels of that drug (Shannon & Wilson, 1995). Nurses must sort through the medications with the client and report back to the health care practitioner the drugs taken in addition to those ordered by that health care practitioner.

LEGAL ASPECTS OF ADMINISTERING MEDICATIONS

Clients are awarded settlements in malpractice suits when nurses are negligent in their practice. Negligence exists any time the nurse fails to do something that a reasonable nurse would do under similar circumstances or does something that a reasonable nurse would not do. Malpractice is any professional misconduct or unreasonable lack of skill in professional duties. See Chapter 23 for related information on legal issues.

Medication Errors

Nurses have learned the "five rights" as a guideline to safe administration of medications. If the nurse gives the wrong medicine to the wrong person, an error has been made. If the nurse has the right medicine but wrong dose or wrong route, a medication error has been made. If the nurse gives the medication at the wrong time, an error has been made. Nurses must inform the health care practitioner of the error made. If an antidote must be given, the health care practitioner needs accurate information to make appropriate care decisions.

Medication errors must be reported in a timely manner. Knowing the actions and the side effects of drugs will help the nurse assess the client's response and health status. Incident reports are required in some agencies to document medication errors. A report of a medication error must include the name of the medication, the dose given, the route, the time the medication was administered, the specific error that occurred, the time the health care practitioner was contacted about the error, and what countermeasures were taken.

Sometimes nurses discover errors made by other nurses. These must also be documented.

Questioning the Medication Order

The nurse is responsible and held accountable for questioning any medication order if, in the nurse's judg-

ment, the order is unclear or in error. The nature of the error may be in any part of the drug order, and the nurse should seek clarification from the health care practitioner. A drug error has serious legal implications if the nurse involved could have been expected, on the basis of knowledge and experience, to have noted the error.

If the health care practitioner disregards the nurse's query, another line of authority must be pursued by the nurse to prevent a drug error. The medication in question should not be administered until the order has been clarified. The nurse should withhold any drug when the client's health may be jeopardized. Notify the health care practitioner of the need to withhold the medication and the reason withholding it is necessary. Document the reason for withholding the drug (such as withholding a dose of an antihypertensive medication due for a patient who is currently experiencing hypotension) on the medication administration record (MAR) and the nurse's notes.

When the nurse is not able to read or understand the order, the prescriber should be contacted for clarification. The nurse should not *guess* what the person who wrote the order is trying to communicate; the only safe nursing action is to validate the order with the health care practitioner.

ASSESSMENT

Drug administration is based on assessment data obtained by reviewing the client's medical history, eliciting a drug history, performing a physical examination, and obtaining and interpreting relevant laboratory results. Assessment is an ongoing process and requires the knowledge, skills, and abilities of a licensed professional.

THINK ABOUT IT

Medication Error

While monitoring a client who has an order for Solu-Cortef (anti-inflammatory drug) intravenously, you notice that Solu-Medrol (anti-inflammatory drug) is in the client's room. You recheck the order to make sure that the original order was for Solu-Cortef and that the order was not changed. What should your next action be? How do you feel about the nurse who made the medication error but did not recognize it?

Medical History

The client's medical history is obtained by the nurse when conducting the interview assessment and by reviewing the client's medical record. The nurse should identify all chronic diseases and disorders and correlate

these data with the drugs prescribed by the health care practitioner. Because the client may have more than one health care practitioner, the admitting health care practitioner might not be aware of all the drugs the client is taking, including over-the-counter medications. It is the nurse's responsibility to gather this information and document it on the client's chart.

Preexisting conditions such as liver and kidney dysfunction may require drug alteration because they prolong drug action, thereby increasing the potential for toxicity. The nurse needs to elicit this type of information during the medical history so that these clients can be closely monitored for signs of adverse reactions to drugs.

Drug History

A drug history is obtained on admission to a health care facility. The drug history should contain specific questions about the client's background: allergies, prescription and over-the-counter drugs, medical history, biographical data, lifestyle and beliefs, and sensory and cognitive status. See Chapter 16 for a complete discussion of taking a health history. If the client is unable to answer the questions, the nurse should contact a family member to obtain the data. Drug history data are used by nurses in determining the client's plan of care and learning needs.

Allergies

The nurse should inquire about all food and drug allergies. If the client has had an allergic reaction to a drug, the nurse should have the client describe the details of the reaction: name of the drug; dosage, route, and number of times the drug was taken before the reaction; onset of the reaction; and manifestations of the reaction. The nurse should question the client about possible contributing factors to the allergic reaction, such as concurrent use of stimulants (tobacco, alcohol, or illegal drugs) or significant changes in nutritional status.

The nurse should also ask about allergies to foods because drugs may contain the same elements or nutrients that cause allergic reactions to some foods. For example, clients who are allergic to shellfish may also experience a reaction to drugs containing iodine. Vaccines are commonly derived from chick embryos and would be contraindicated in clients with allergies to eggs.

Allergies to food and drugs, including over-the-counter drugs, should be noted in the client's record, in the admission note, on the medication administration record, and on the history and physical examination forms. The pharmacy should be notified of any drug or food allergies. In hospitals, clients wear allergy alert bands that list all medications to which the person is allergic. Nurses in all settings should discuss the use of medical alert bracelets by clients with allergies. These

bracelets would inform health care providers of allergies should the person not be able to speak for himself or herself.

Prescription Drugs

The nurse should have the client identify all current prescription drugs and describe:

- Why the drug was prescribed and by whom
- The drug's dosage, route, and frequency
- The client's knowledge of the drug's action: side and adverse effects, when to notify the health care practitioner, and special administration considerations such as with or without foods

If the client is receiving any drug that requires monitoring before administration such as insulin (antidiabetic hormone), the nurse needs to make sure the client is checking blood sugar and that the results are within normal limits.

Over-the-Counter Drugs

Clients usually have to be questioned separately about nonprescription drugs because they often fail to identify these drugs when asked to list all the medications they take routinely. For example, the nurse must determine if the client takes aspirin, antacids, or laxatives routinely. The client should describe the dosage, route, and frequency of these drugs. Because many drugs are available in topical form, the nurse should also inquire about the use of creams, ointments, patches, or sprays. Clients admitted to inpatient facilities should be asked if they have any over-the-counter drugs with them.

The nurse should explain to the client in a sensitive manner why these questions are necessary in order to allay any anxieties that might arise from this nature of questioning. Depending on the dosage and frequency, nonprescription drugs may have a profound effect on the client's treatment.

Biographical Data

The client's biographical data, including age, education, occupation, and insurance coverage, may influence the nursing care plan and teaching plan. These data are also used by the nurse when helping a client develop a drug regimen that complements the client's daily routine.

Lifestyle and Beliefs

The client's lifestyle and beliefs affect attitudes toward health, use of the health care system, and daily activity patterns. These factors often determine the client's dietary habits and nontherapeutic use of drugs such as tobacco, alcohol, and illegal drugs.

Sensory and Cognitive Status

The nurse should assess for and inquire about sensory deficits such as vision or hearing impairments, weakness or paralysis, or loss of sensation in one or more extremities. These deficits may impair a client's ability to comply with a prescribed drug plan, administer a subcutaneous injection, break a scored tablet, or open a medication container.

The nurse should assess the client's cognitive abilities throughout the drug history interview by noting whether the client is alert and oriented and interacts appropriately. Clients who are not able to express their thoughts coherently or who exhibit impaired memory function will require special consideration by the nurse when planning the client's care and teaching plan. See Chapter 36 for a complete discussion of sensory and cognitive impairments.

Physical Examination

The nurse conducts a physical assessment to identify those body systems that may be affected by a particular drug the client is currently taking or will be taking. The nurse assesses the client's condition before administering any drug to establish the client's baseline, or normal, health status. For example, the nurse assesses the client's apical pulse before administering Lanoxin (inotropic) so that the heart rate after receiving the drug can be compared with the baseline measurement.

Diagnostic and Laboratory Data

Common laboratory values, such as electrolytes, blood urea nitrogen, creatinine, glucose, complete blood count, and a white blood cell count, are usually monitored over a period of time to identify trends and to measure the body's response to medications. Laboratory results are evaluated on the basis of the client's clinical condition, physical assessment, and drug therapies. See Chapter 28 for a complete discussion of laboratory testing.

NURSING DIAGNOSIS

The nurse analyzes the assessment data to determine the client's ability to self-administer medications and to identify any potential or actual drug-related problems. Once the nurse identifies the actual or potential problems, relevant nursing diagnoses can be formulated. The common nursing diagnoses specifically related to medication administration are:

- *Deficient Knowledge*
- *Ineffective Therapeutic Regimen Management*
- *Ineffective Health Maintenance*
- *Impaired Physical Mobility*
- *Disturbed Sensory Perception*
- *Impaired Swallowing*

The addictive client may have a different set of nursing diagnoses, such as:

- *Imbalanced Nutrition*
- *Impaired Verbal Communication*
- *Interrupted Family Processes*
- *Impaired Social Interaction*
- *Social Isolation*
- *Spiritual Distress*
- *Readiness for Enhanced Spiritual Well-Being*
- *Ineffective Coping*

Selecting the most appropriate nursing diagnosis will identify the client's teaching needs.

PLANNING

Nurses need to carefully plan nursing care activities to ensure safe administration of medications. Reviewing scheduled diagnostic tests, laboratory results, and the overall plan of care helps to ensure that clients receive medications at the appropriate time and that medications that should not be given are withheld until their administration can be clarified with the health care practitioner. For example, digoxin might be withheld if the lab test indicates an above-normal level. Medication administration is a good time for nurses to incorporate client teaching. Adequate planning provides for questions and discussion by the client and demonstration of skills learned (as in self-administration of insulin injections). Planning ahead ensures that enough time is allocated for the client to accomplish all the desired tasks in a timely manner.

OUTCOME IDENTIFICATION

The nurse develops goals and plans the care on the basis of the nursing diagnosis. Inherent in the plan of care is client teaching based on medications prescribed. Nursing interventions are identified and incorporated into the plan of care to promote the attainment of goals and to assist the client in achieving expected outcomes. For example, the client with deficient knowledge related to a newly prescribed drug, insulin, may have the following expected outcomes:

- Client will correctly state the actions of insulin in the body before self-administering insulin.
- Client will prepare the correct dose of insulin in a syringe three times before discharge.
- Client will state the reasons for rotating the injection sites and demonstrate by self-administering insulin to three different sites before discharge.
- Client will correctly identify the onset of action, peak plasma level, and half-life of the insulin preparation prescribed before self-administering insulin.

- Client will correctly perform glucometer testing to ensure a normal range of blood sugar before administering the insulin injection.
- Client will correctly describe the signs of hyperglycemia and hypoglycemia and the appropriate actions to take before discharge.

Most clients admitted to a hospital or a long-term care facility have one or more nursing diagnoses related to alterations that precipitated the admission. Inherent in their nursing care plans are expected outcomes related to medication administration. For example, the nursing diagnosis *Ineffective breathing pattern* related to decreased energy may have as a client outcome, demonstrates correct use of a metered-dose inhaler. See the sample Nursing Care Plan at the end of this chapter for additional examples of client expected outcomes related to medication administration.

IMPLEMENTATION

The primary nursing interventions related to medication management are assessment, administration, and teaching. The nurse should use the time spent with the client during medication administration to assess the client's knowledge and response to the drug's action.

The administration of medication requires the implementation of safety guidelines, following the five rights. Medications are administered in accordance with set procedures based on the prescribed route. This section presents procedures and guidelines for medication administration by the following routes: oral, including sublingual, buccal, and enteral; parenteral; site-specific topical applications; and inhalation.

Once the teaching plan has been developed, the nurse should initiate discharge teaching of drug therapy. Assessment data, especially the client's history, help the nurse in determining who should be included in the teaching session. For example, an elderly client living alone is physically capable of self-administering but may have short-term memory loss. In this situation the nurse should obtain the client's permission to include a family member, neighbor, or friend in the teaching session.

Drug teaching usually occurs in two phases. The first phase involves a formal teaching session. The nurse explains the drug's action, route, side and adverse effects, and the specific signs of a drug reaction that require physician notification. Clients often need assistance in developing a drug schedule that promotes compliance and complements their lifestyle. Self-administration may require the nurse to teach the client specific procedural techniques, such as subcutaneous injection.

The second phase of client teaching is ongoing, occurring whenever the nurse administers a drug. The nurse should assess and reinforce the client's knowledge of drugs at each interaction. If the client is being taught self-administration, the drug teaching plan should

Nursing Process Highlight

Implementation: Client Teaching

The American Nurses Association and various governing bodies support written medication information for clients that is “scientifically accurate, unbiased in content and tone, sufficiently specific and comprehensive, presented in an understandable and legible format, timely, up to date, and useful.” Written medication information should:

- Be appropriate to client literacy levels
- Reflect print size appropriate to client’s visual abilities
- Give straightforward instructions
- Include brand and trade names
- Prominently display drug warnings
- Outline indications for use, contraindications, and precautions
- List possible adverse reactions and risks, storage, and use

(From American Nurses Association. [1997, March/April]. *The American Nurse*, 29 [2], 11)

identify the dates for teaching, and expected outcomes should identify a date for client achievement of targeted goals.

Administer Oral Drugs

Oral administration of drugs is the most common route; however, there are potential risk factors that the nurse must consider. Before administering oral drugs, the nurse should assess the client’s ability to take the medication as prescribed. This assessment includes the client’s gag reflex, state of consciousness, and presence of nausea and vomiting.



Figure 29-7 Check the client’s mouth to ensure that medications have been swallowed.

The nurse should protect the client against aspiration when administering any form of oral drug. **Aspiration** refers to the inhalation of regurgitated gastric contents into the pulmonary system. If a client has a weak gag reflex or difficulty swallowing water, medication can be inhaled during medication administration. To prevent aspiration, the nurse confirms the client’s gag reflex and ability to swallow. When administering an oral drug, the nurse prepares the medication, correctly identifies the client, and provides some form of liquid. See Procedure 29-1 for administering an oral medication. The nurse should remain with the client until *all* of the medications have been swallowed. If there is doubt that the client has swallowed the pill, the nurse should don a nonsterile glove and visually inspect the client’s mouth with a tongue depressor (Figure 29-7).

Sublingual and Buccal Drug Administration

Sublingual and buccal drugs are types of oral medications. Certain drugs are given by these routes to prevent their destruction or transformation in the stomach or small intestines. The nurse should assess the integrity of

PROCEDURE 29-1

Administering an Oral Medication

Equipment

- | | |
|--|--|
| <ul style="list-style-type: none"> ■ Medication administration record (MAR) ■ Medication cart or tray ■ Glass of water or juice | <ul style="list-style-type: none"> ■ Medication cup ■ Medication properly labeled ■ Straw |
|--|--|

Action

1. Assess the client for potential problems (e.g., absence of a gag reflex).
2. Check the MAR against the health care practitioner’s written orders.

Rationale

1. Decreases the risk of aspiration.
2. Ensures accuracy in the administration of the medication.

(continues)

PROCEDURE 29-1

Administering an Oral Medication (continued)

Action	Rationale
<ol style="list-style-type: none"> 3. Check for drug allergies. 4. Wash your hands. 5. Prepare the medications for <i>one client at a time</i>: <ul style="list-style-type: none"> • Select the correct medication and double-check against MAR. • Calculate the medication dose, if necessary. Double-check calculations for accuracy. • Avoid touching the drug while pouring in cup. If unit-dose is available leave drug in the wrapper until at the bedside. • Prepare liquids by placing the label side of the medicine bottle against the palm of your hand and pouring the liquid at eye level (Figure 29-8). Liquids should be measured at fluid level at the surface or the meniscus not the edges. • Recheck medications prepared with MAR. • Check MAR to make sure all medications to be administered have been prepared. • Place on the tray or medication cart. 6. Check client's armband before administering the medications. 7. Identify the drug for the client and its therapeutic purpose. 8. Perform any assessment required before the administration (such as apical pulse rate before administration of digoxin.) 9. Assist client to a sitting position. 	<ol style="list-style-type: none"> 3. Decreases risk of allergic reactions such as hives, urticaria, or anaphylactic shock. 4. Decreases transmission of microorganisms. 5. Ensures that the right client receives the right medications. <ul style="list-style-type: none"> • Increases accuracy and reduces chance of error. • Determines the correct amount of medication to be given. • Decreases possibility of contaminating the medication and helps ensure accuracy. • Prevents soiling and maintains legibility of the label. Ensures accurate measurement. 6. Ensures right dose, route, and time. 7. Promotes efficiency and decreases risk of error. 8. Prevents spillage. 6. Ensures right client. 7. Encourages client cooperation and increases client awareness of what to expect from the medication. 8. Provides data to determine if the medication should be given. 9. Prevents aspiration and promotes swallowing of the medication.



Figure 29-8 Measure oral medications at eye level to ensure accurate measurement.

(continues)

PROCEDURE 29-1

Administering an Oral Medication (continued)

Action

10. Offer liquids before and during ingestion; encourage the patient to drink 5–6 oz of water.
 - If the client is unable to hold the medication cup, assist the client by using the medication cup to introduce the pills to the person's mouth one at a time.
 - If a medication falls on the floor, discard the pill and start over.
11. Remain with the client until all medications have been swallowed.
12. Wash your hands.
13. Record the administered medications on the MAR.
14. Observe the client for side effects or adverse reactions.

Rationale

10. Facilitates downward movement of the medication in digestive system and helps absorption.
 - Prevents contamination of the medication; single-pill administration assists swallowing and helps prevent aspiration.
 - Medication that falls on floor is contaminated.
11. Ensures that all medications have been taken.
12. Decreases the transmission of microorganisms.
13. Provides documentation of the administration.
14. Assess for potential problems related to the medications administered.

the mucous membranes by inspecting underneath the client's tongue and in the buccal cavity. If the membranes are excoriated or painful, the nurse should withhold the medication and notify the health care practitioner. Some buccal drugs may irritate the mucosa, requiring the nurse to use alternate sides of the mouth to prevent irritation of the mucosa.

Sublingual and buccal administration of drugs (Figure 29-9) requires the nurse to use Standard Precautions because the nurse's hand may come into contact with oral secretions. See the Nursing Checklist for administering sublingual and buccal drugs. Drugs given by these routes are quickly absorbed by the mucosa's thin epithelium and the abundant blood supply.

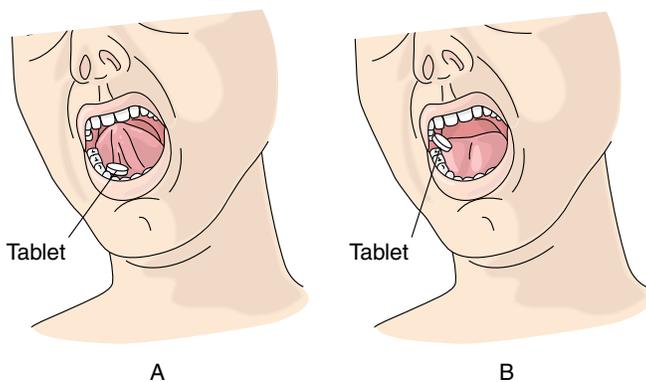


Figure 29-9 A. Sublingual Administration of a Tablet; B. Buccal Administration of a Tablet.

Enteral Instillation of Drugs

Enteral instillation refers to the delivery of drugs through a gastrointestinal tube. Enteral tubes provide a means of direct instillation of medications into the gastrointestinal system of clients who cannot ingest it orally. See Chapter 38 for a complete discussion of the purpose, insertion, and nursing care of clients with enteral tubes. Once the tube's position has been radiographically verified, the nurse may administer drugs or nutrients as prescribed.

There are several types of enteral tubes. A *nasogastric tube* (NG) is a soft rubber or plastic tube that is inserted through a nostril and into the stomach. The *gastrostomy tube* is surgically inserted into the stomach through the creation of an artificial fistula. The physician uses an endoscope to insert a *percutaneous endoscopic gastrostomy* (PEG) tube into the stomach.

The nurse should assess the client for the presence of bowel sounds and check the tube for **patency** (openness) and placement before administering a medication. The instillation of drugs is contraindicated when the tube is obstructed or improperly placed, when the client is vomiting, or if bowel sounds are absent.

The nurse prepares the medication for instillation as prescribed by the health care practitioner once the patency and placement of the tube have been determined. It is preferable to instill liquid medications into tubes, especially PEG tubes that have a small lumen. Tablets can clog the tube unless they are finely crushed. When the health care practitioner orders a drug in the



NURSING CHECKLIST

Administering Sublingual and Buccal Drugs

- Follow the five rights of safe drug administration.
- Wash your hands and don nonsterile gloves.
- Assess the client's knowledge of the drug and its action.
- Explain the procedure to the client, and allow the client time to ask questions.
- Offer the client a sip of water and explain to the client that liquids cannot be taken until the tablet is completely dissolved.
- To give a drug sublingually, ask the client to open the mouth and lift the tongue; place the drug under the client's tongue. Give the client the following instructions:
 - Keep the medication under the tongue until it dissolves completely to ensure absorption.
 - Avoid chewing the tablet or touching the tablet with the tongue to prevent accidental swallowing.
 - Do not smoke before the drug has completely dissolved because nicotine has a vasoconstriction effect that slows absorption.
- To give a drug buccally, instruct the client to open the mouth wide, and place the tablet between the client's cheek and teeth. Give the client the following instructions:
 - Keep the medication in place until it dissolves completely to ensure absorption.
 - Do not drink liquids for an hour because some tablets take up to an hour to dissolve.
 - Do not smoke before the drug has completely dissolved because nicotine has a vasoconstriction effect that slows absorption.
- Remove gloves and dispose in a proper receptacle; wash hands.
- Document the medication administration on the MAR. When the client is receiving repeated doses of a buccal medication, the nurse should indicate the site, such as right buccal cavity, to prevent irritation of the same site.

tablet or capsule form, the nurse should crush the tablet into minute particles and dissolve the crushed tablet in 15 to 30 ml of warm water before instillation. Some tablets cannot be crushed without altering their therapeutic effect. The nurse should check with the pharmacist if unsure. The instillation of cold solution may cause abdominal cramps. Capsules are prepared for administration by opening the capsule and emptying the con-



NURSING CHECKLIST

Verifying Placement of an Enteral Tube

- The nurse checks the patency and placement of a nasogastric tube before adding any water or medications by performing the following actions:
- Wash hands and don nonsterile gloves.
 - Unclamp the tube.
 - Create a 20-ml air space in a 50- or 60-ml syringe.
 - Attach the syringe to the free end of the tube.
 - Place the stethoscope on the left upper quadrant, 3 inches (7.5 cm) below the sternum.
 - Gently instill 20 ml of air into the tube while simultaneously listening for a gastric bubble. (The gastric bubble is the “swish” sound heard as the air moves into the stomach.)
 - When sound is heard, draw back on the piston of the syringe. (The appearance of gastric contents in the syringe may imply the tube is in the stomach.)

If the nurse fails to hear the swish sound and aspirates gastric contents, the tube may have risen into the client's esophagus. *Do not administer the medication until placement in the stomach is verified.* If allowed by policy, advance the tube into the stomach and check its placement by instilling air and aspirating or by obtaining a physician's order to confirm the tube's placement with an X-ray.

NURSING ALERT

Risk for Aspiration

Clients, especially those with an NG tube, are at risk for aspiration from esophageal reflux. Position the client as directed in the nursing checklist to minimize the risk of esophageal reflux and aspiration.

tents into a liquid. When the drug is prepared, the nurse is ready to instill the medication (see the Nursing Checklist for instilling drugs into enteral tubes).

The nurse should question the health care practitioner if oily medications and enteric-coated or sustained-release tablets are ordered because these drug forms should not be given through a tube. Oily preparations may cling to the sides of the tube and resist mixing with the irrigating solution. Crushing enteric-coated or sustained-release tablets destroys their intended effect. Do not crush buccal or sublingual tablets. Never attempt to give whole or undissolved medications through an enteral tube. See the accompanying display for special considerations.



NURSING CHECKLIST

Instilling Drugs into Enteral Tubes

- Wash hands and don nonsterile gloves.
- Place the client in a high or semi-Fowler's position, as the client's condition allows; for an NG tube, unpin the tube from the client's gown to allow manipulation of the tube's free end. Place a linen saver over the bed linens to prevent soilage during administration of the medication.
- Attach the syringe to the free end of the tube, pour 30 ml of medication into the syringe barrel, and open the clamp; for NG tube instillation, hold the NG tube at the client's nose level.
- Hold the syringe barrel at a slight angle and allow the medication to flow at a steady, slow rate; add more medication before the syringe empties to prevent air from entering the stomach. If necessary, adjust the height of the NG tube to achieve a steady flow rate. Never push medications into the tube.
- Observe the client while instilling the medication. If the client experiences any discomfort, slow the rate by lowering the height of the syringe.
- As the syringe barrel begins to empty with the last of the medication, slowly add 30 to 50 ml of room-temperature water into the syringe to clear the medication from the sides and distal end of the tube to prevent clogging.
- Before the syringe empties of water, clamp the tube, and detach and dispose of the syringe.
- Position the client as appropriate; clients with an NG tube should be placed on the right side with the head of the bed slightly elevated for at least 30 minutes after the instillation.
- Clean area, remove and dispose of gloves in the proper receptacle, and wash hands.
- Document the instillation of the medication on the MAR and record on the intake and output sheet the total amount of fluid instilled

SPECIAL CONSIDERATIONS FOR ENTERAL TUBE MANAGEMENT

- When a client is receiving intermittent tube feedings, schedule the medications to prevent the two solutions from being given together.
- An adult client should not receive more than 400 ml of liquid at one time. If the administration of feedings and medication coincide, give the medication first to ensure that the client receives the prescribed dosage on time; the feeding may not be given in its entirety.
- When the client is receiving a continuous feeding, stop the feeding and aspirate the gastric contents. If the gastric contents are greater than 150 ml, withhold the medication and notify the health care practitioner.
- Never put tablets into tube feeding bags.
- For clients who have an NG tube for decompression (removal) of gastric contents, turn off the suction for 20 to 30 minutes after the instillation of the medication to allow time for the gastric contents to be emptied into the intestines, where most drugs are absorbed.
- For clients who have a nasogastric tube, never use the pigtail air vent for irrigation or administration of fluids.

enteral medications the nurse must have knowledge of the special equipment, use manual dexterity and sterile technique, and follow Standard Precautions. An injection is an invasive procedure because it breaks the skin barrier. As such, it must be performed using proper aseptic technique to prevent risk of infection.

Equipment

Nurses use special equipment such as syringes, needles, ampules, and vials when administering parenteral medications.

Syringes

A syringe has three basic parts: the hub, which connects with the needle; the barrel, or outside part, which contains measurement calibrations; and the plunger, which fits inside the barrel and has a rubber tip (Figure 29-10). The nurse must ensure that the hub, inside of the barrel, and shaft and rubber plunger tip are kept sterile. When handling the syringe, the nurse should touch only the outside of the barrel and the plunger's handle.

Most syringes are disposable, made of plastic, and individually packaged for sterility. There are several types of syringes, such as the hypodermic, insulin, and tuberculin syringes (Figure 29-11A–C). When a medication is incompatible with plastic, it is usually prefilled in a single-dose glass syringe. Syringes are often prepackaged with the commonly used needle size and gauge and are referred to as *disposable plastic syringes* (Figure 29-11D).

Administer Parenteral Drugs

Parenteral medications are given through a route other than the alimentary canal; these routes are intradermal, subcutaneous, intramuscular, or intravenous. The angle of injection and the depth of penetration will indicate the type of injection. Many clients have broadly classified the parenteral route into one category: "injections" or "shots." The nurse should provide the client with an explanation of the various routes used when administering parenteral drugs. To prepare and administer par-

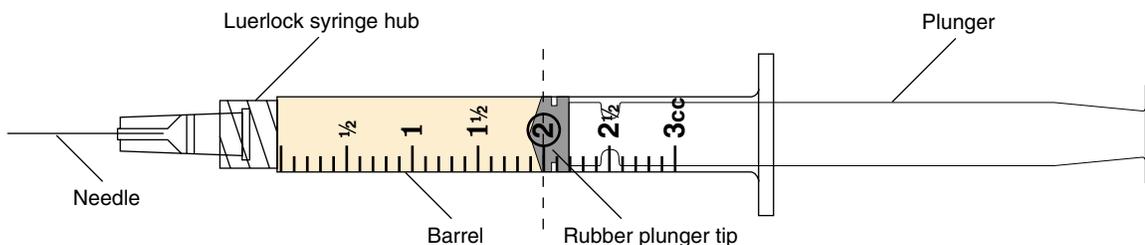


Figure 29-10 The Parts of a Syringe

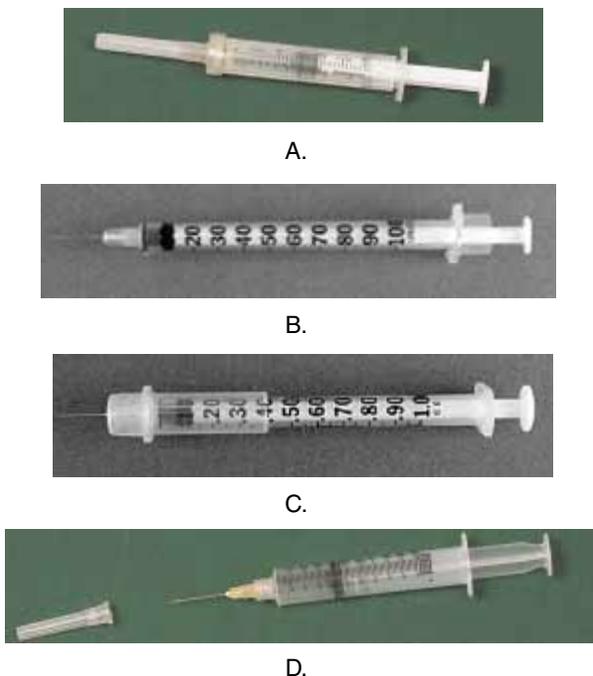


Figure 29-11 Types of Syringes. A. Hypodermic B. Standard U-100 Insulin. (Courtesy of Becton Dickinson and Company) C. 1-ml Tuberculin (Courtesy of Becton Dickinson and Company) D. Disposable Plastic

The *hypodermic syringe* comes in 2-, 2.5-, and 3-ml sizes. The measurement calibrations (scales) are usually printed in milliliters and minims. Most syringes are marked in cubic centimeters (cc), and most drugs are ordered in milliliters; these are equivalent measurements (1 cc = 1 ml). The hypodermic syringe is used most often when a medication is ordered in milliliters. When the order is written in minims, it is safer to prepare the drug in a tuberculin syringe.

The *insulin syringe* is designed specially for use with the ordered dose of insulin. For example, if the health care practitioner writes the order for 30 units of U-100 insulin, the nurse will use an insulin syringe that is calibrated on the 100-unit scale. Insulin syringes are calibrated on the U-100 (100-unit) scale, which is based on 100 units of insulin contained in 1 ml of solution. Insulin syringes come in sizes that hold 0.5 ml (50 units) to 1.0 ml (100 units). Insulin syringes that hold 0.5 ml are the easiest to read and are therefore used for low dosages.

There are other sizes of insulin syringes that complement the ordered dose, such as U-30 and U-50, although these dosages are seldom prescribed. The nurse should always compare the size of insulin syringe and the dose indicated on the insulin bottle with the health care practitioner's order; all three unit doses must be the same.

The *tuberculin syringe* is a narrow syringe, calibrated in tenths and hundredths of a milliliter (up to 1 ml) on one scale and in sixteenths of a minim (up to 1 minim) on the other scale. Originally this syringe was designed to administer the tuberculin drug, but it is commonly used today to administer small or precise doses, such as pediatric dosages. The tuberculin syringe should be used for doses 0.5 ml or less.

Prefilled single-dose syringes should not be confused with a unit dose. The nurse must be careful to check the prescribed dose against that in the prefilled syringe and discard excess medication. For example, if the health care practitioner orders diazepam (Valium) 5 mg IM as a preoperative sedative and the prefilled single-dose contains 10 mg/2 ml, the nurse must calculate dosage (5 mg/1 ml) and destroy 1 ml from the syringe before administration.

Needles

Most needles are disposable, made of stainless steel, and individually packaged for sterility. Reusable needles are seldom used, except in certain areas such as surgery and special procedure rooms; reusable needles require frequent inspection to ensure that the needle is sharp, and resterilization is necessary between uses.

The needle has three basic parts: the hub, which fits onto the syringe; the cannula, or shaft, which is attached to the hub; and the bevel, which is the slanted part at the tip of the shaft. Needles come in various sizes, from 1/4 inch to 5 inches, and with gauges that range from 28 to 14 (Figure 29-12).



Figure 29-12 Various Lengths and Gauges of Needles. Gauge from left to right: 18, 20, 22, 25.

The *gauge* of the needle refers to the diameter of the shaft; the larger the gauge number, the smaller the diameter of the shaft. Large-gauge needles produce less trauma to the body's tissue; however, the nurse has to consider the viscosity of a solution when selecting the gauge.

The *shaft of the needle* determines its length. The nurse selects the length of the needle on the basis of the client's muscle development and weight and the type of injection, such as intradermal versus intramuscular.

The needle may have a short or long *bevel*. The length of bevel selected is based on the type of injection. Long bevels are sharp and produce less pain when injected into the subcutaneous or muscle tissues; however, a short-bevel needle must be used for intradermal and intravenous injections to prevent occlusion of the bevel either by the tissue or by a blood vessel wall.

When the nurse removes a needle from its sterile wrapper, the hub of the needle should be immediately attached to the hub of the syringe to prevent contamination. Likewise, the protective cover should remain on the needle's shaft until the nurse is ready to use the needle.

After an injection, the nurse should not recap the needle; used needles should be disposed of in the proper receptacles, such as a sharps container, to prevent needle sticks. See Chapters 31 and 37 for details on how to prevent needlestick injuries. Most agencies have sharps con-

tainers in all client care areas. Chapter 37 provides a complete discussion of the needle-less system.

Ampules and Vials

Drugs for parenteral injections are sterile preparations. Drugs that deteriorate in solution are dispensed as tablets or powders and dissolved in a solution immediately before injection. Drugs that remain stable in a solution are dispensed in ampules and vials in an aqueous or oily solution or suspension.

Ampules are glass containers of single-dose drugs (Figure 29-13). The glass container has a constriction in the stem to facilitate opening the ampule. See Procedure 29-2 for removing a drug from an ampule. Because many drugs are irritating to the subcutaneous



Figure 29-13 Ampules

PROCEDURE 29-2

Withdrawing Medication from an Ampule

Equipment

- | | |
|--|---|
| <ul style="list-style-type: none"> ■ Medical administration record (MAR) ■ Sterile syringe and needle ■ Extra needle of proper gauge and length in accord with site | <ul style="list-style-type: none"> ■ Ampule of prescribed medication ■ Sterile gauze or alcohol swab ■ Filter needle |
|--|---|

Action

1. Wash your hands.
2. Hold the ampule and quickly and lightly tap the top chamber until all fluid flows into the bottom chamber.
3. Place a sterile gauze or alcohol wipe around the neck of the ampule (Figure 29-14).
4. Firmly grasp the neck of the ampule and quickly snap the top off away from your body. Place the ampule on a flat surface.
5. Withdraw the medication from the ampule, maintaining sterile technique.
 - Check connection of needle to syringe by turning barrel to right while holding needle guard.

Rationale

1. Decreases transmission of microorganisms.
2. Moves the fluid trapped above the neck of the ampule to the lower chamber of the ampule.
3. Contains the glass fragments and shields the nurse's fingers from the broken ampule.
4. Directs shattered glass fragments away from the nurse's face and fingers. Prevents spillage of medication.
5. Prevents the transmission of microorganisms.
 - Ensures an airtight system.

(continues)

PROCEDURE 29-2

Withdrawing Medication from an Ampule (continued)

Action

Figure 29-14 Snap open the ampule while holding a wipe or gauze around the neck of the ampule, to protect against glass fragments.

- Use a filter needle if recommended.
- Remove needle guard, and hold syringe in dominant hand.
- With nondominant hand grasp ampule and turn upside down, or stabilize ampule on a flat surface.
- Insert the needle into the center of the ampule; do not allow the needle tip or shaft to touch the rim of the ampule.
- Keep needle tip below level of meniscus (Figure 29-15).

Rationale

- Filters out fine glass particles.
- Promotes dexterity.
- Provides access to medication.
- Prevents contamination of needle tip or shaft.
- Prevents air from entering syringe and fluid from leaking out while the ampule is inverted.



A



B

Figure 29-15 A. Invert ampule and draw fluid into the syringe. B. Remove filter needle and replace with injection needle.

(continues)

PROCEDURE 29-2

Withdrawing Medication from an Ampule (continued)

Action

- Aspirate the medication by gently pulling on the plunger.
 - If air bubbles are aspirated, remove the needle from the ampule. Hold syringe with needle pointing up and tap sides of the syringe. Draw back slightly on plunger, and gently push the plunger upward to eject air. Reinsert the needle in the middle of the ampule and continue to withdraw the medication.
6. Remove excess air from the syringe and check the dosage of medication in the syringe. Recap.
 7. Discard any unused portion of the medication, and dispose of the ampule top in a suitable container after comparing with MAR.
 8. Change needle and properly discard used needle. Secure needle to syringe by turning the barrel to right while holding the needle guard.
 9. Wash hands.

Rationale

- Allows medication to enter the syringe.
 - Prevents loss of medication from the ampule caused from air pressure. Moves air bubbles above the fluid level in the syringe. Pulls medication from needle so only air is ejected from the syringe.
6. Allows for accurate measurement of medication dose. Prevents contamination of the needle and protects the nurse against inadvertent needlesticks.
 7. Sterility of a medication is lost in an open ampule.
 8. Reduces the risk that the drug will cause irritation to subcutaneous tissue.
 9. Prevents spread of microorganisms.



NURSING TIP

Expiration Dates

Manufacturers are required by law to put the expiration date on all drugs. The nurse should check the expiration date to ensure that the drug is current. Outdated drugs should be returned to the pharmacy for proper disposal.



Figure 29-16 Vials

tissue, the nurse should change the needle on the syringe after withdrawing a drug from an ampule.

The nurse should consider the use of a needle filter when withdrawing medication from an ampule or vial. Beyea and Nicoll (1996) suggest that the last few drops of the drug be left in an ampule or vial; some studies have found foreign substances, such as glass and rubber, in the containers that could be drawn into the syringe.

Glass, single- or multiple-dose rubber-capped drug containers are called vials (Figure 29-16). The vial is usu-

ally covered with a soft metal cap that can be easily removed. See Procedure 29-3 for removing a drug from a vial. The nurse should change the needle on the syringe after withdrawing a drug from a vial. Inserting the needle through the rubber cap of the vial can dull the needle or remove the needle coating that helps it glide through the skin (Beyea & Nicoll, 1996).

Compatible medications can be mixed in the same syringe. Refer to compatibility charts or check with the pharmacist to determine if the medications can be mixed. If medications are going to be mixed, care must be exercised not to contaminate one medication with the other in their respective vials. See Procedure 29-4 for mixing insulins in one syringe. The nurse must calculate and measure carefully to be sure the final dose is accurate.

PROCEDURE 29-3

Withdrawing Medication from a Vial

Equipment

- | | |
|--|----------------------|
| ■ Medication administration record (MAR) | ■ Vial of medication |
| ■ Sterile syringe and needle | ■ Sterile needle |
| ■ Alcohol swab | |

Action

1. Wash your hands.
2. Prepare the vial.
 - Open the alcohol wipe.
 - New vial, remove metal cap from vial of medicine and cleanse the rubber top of the vial.
 - Used vial, cleanse the rubber top of the vial.
3. Prepare syringe.
 - Choose a syringe of appropriate size to accommodate the volume of medication to be withdrawn.
 - Grasp needle and turn barrel of syringe to the right.
 - Remove the needle cap and pull back on plunger to fill syringe with an amount of air equal to amount of solution to be withdrawn from the vial.
4. Insert the needle into the center of the upright vial and inject air into the vial.
5. Invert vial; keep the vial at eye level and the needle's bevel below the fluid level, and remove the exact amount of medicine while touching only the syringe barrel and plunger tip (Figure 29-17).

Rationale

1. Reduces transmission of microorganisms.
2. Provides access to vial. Removes surface contamination. (*Note:* Manufacturers do not ensure sterility of rubber top.)
3. Ensures a closed system.
 - Ensures withdrawing all the medication at one time.
 - Displaces the solution with air to prevent the formation of a vacuum in the sealed vial.
4. Creates positive pressure inside vial to allow accurate withdrawal of medicine.
5. Prevents contamination of the plunger, barrel, and medicine.



Figure 29-17 Invert the vial, and keep the needle below the fluid level.

(continues)

PROCEDURE 29-3

Withdrawing Medication from a Vial (continued)

*Action**Rationale*

- | | |
|--|---|
| <ol style="list-style-type: none"> 6. Expel air from the syringe while needle remains within the inverted vial by tapping the side of the syringe with your finger. 7. Check the amount of medicine in the syringe. 8. Turn vial upright and remove the needle. 9. Replace the needle cap. Open the sterile package of the new needle. Remove used needle, and dispose in the sharps container. 10. Attach the new needle to the syringe by turning the barrel to the right. 11. Compare the medication in the syringe with the prescribed dosage. | <ol style="list-style-type: none"> 6. Removes air bubbles created by the dead space in the needle's hub; allows for accurate measurement of the solution. 7. Ensures accurate dose. 8. Prevents the leakage of solution from the vial. 9. Prevents needlestick. 10. Provides a sharp needle for injection that decreases the client's discomfort. 11. Complies with safety standards for ensuring the correct dosage. |
|--|---|

PROCEDURE 29-4

Mixing Insulins in One Syringe

Equipment

- | | |
|---|--|
| <ul style="list-style-type: none"> ■ Medication administration record (MAR) ■ Insulin vials | <ul style="list-style-type: none"> ■ Alcohol swabs ■ Insulin syringe |
|---|--|

*Action**Rationale*

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Check with the client and the chart for known allergies or medical conditions that would contraindicate the use of the drug. 2. Gather necessary equipment. 3. Check the MAR against written health care orders. 4. Wash your hands. 5. Follow the five rights of medication administration. Check the client's identification band. 6. Remove caps from insulin vials (if not already off). 7. Slowly rotate each bottle of insulin. Never shake. Make sure suspensions are thoroughly mixed. (Cloudy insulin such as NPH should be completely mixed.) 8. Clean the rubber stoppers of the vials with an alcohol swab. | <ol style="list-style-type: none"> 1. Prevents occurrence of adverse reactions. 2. Promotes efficiency. 3. Ensures accuracy in identification of medication. 4. Reduces transmission of microorganisms. 5. Ensures correct client. 6. Permits access to solution. 7. Ensures complete mixture of suspension. Make sure there are no crystals on the bottom of the vial. 8. Helps remove surface contaminants. |
|---|---|

(continues)

PROCEDURE 29-4

Mixing Insulins in One Syringe (continued)

Action

9. Remove cap from the needle. Draw air into the syringe equal to the dose of insulin to be given. Insert needle into vial of the suspension, being careful not to touch the needle to the medication in the vial. Inject the air into the vial and remove the needle. Do not withdraw any insulin yet.
10. Fill syringe with air equal to dose of regular insulin. Insert needle into bottle and inject air into vial. Invert bottle and pull plunger down to withdraw the appropriate dose of insulin.
11. With needle in the bottle, hold it up to the light and look for air bubbles. To remove air bubbles, tap or flick the syringe with your finger to cause air to rise. Push plunger to push air and some insulin back into the vial. Pull back to get the appropriate dose of insulin free of air. Remove the needle.
12. Insert needle into the vial of longer-acting insulin; be sure the tip of the needle is below the surface of the fluid level. Invert the bottle, and slowly draw back to dose of insulin required. Remove needle.
 - Have another nurse check the prescribed dose.
13. Store insulin vials according to your agency policy.
14. Wash your hands.

Rationale

9. Injected air will displace the insulin to be removed.
10. Injected air displaces insulin and facilitates withdrawal. Inverting the vial allows the air to rise and the solution to settle on the bottom of the vial.
11. Air displace the medication in the syringe and can cause errors in dosage. Air bubbles must be removed to ensure that an accurate dose of insulin is in the syringe.
12. Drawing back slowly helps prevent air from being drawn into the syringe.
 - Ensures accuracy.
14. Reduces transmission of microorganisms.

Angle of Injection

The angle of insertion depends on the type of injection. Figure 29-18 illustrates the angle of insertion for each type of parenteral injection.

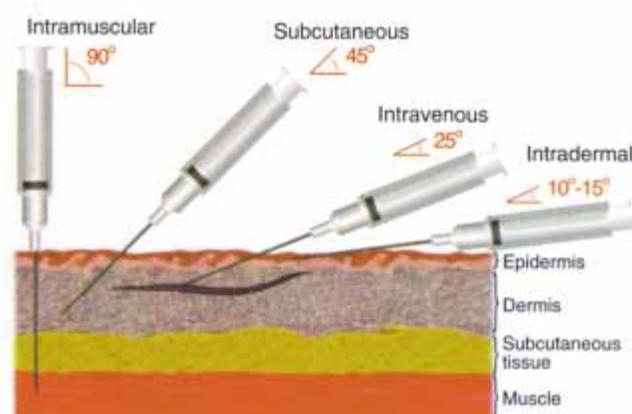


Figure 29-18 Angles of Insertion for Parenteral Injections.

Intradermal Injection

Intradermal (ID) or intracutaneous injections are typically used to diagnose tuberculosis, identify allergens, and administer local anesthetics. The site below the epidermis is the location for administering ID injections; drugs are absorbed slowly from this site. The sites commonly used for ID injection are the inner aspect of the forearm (if it is not highly pigmented or covered with hair), upper chest, and upper back beneath the scapula (Figure 29-19). Only small amounts of water-soluble medication should be used for subcutaneous injections.

The drug's dosage for an ID injection is usually contained in a small quantity of solution (0.01 to 0.1 ml). A 1-ml tuberculin syringe with a short bevel, 25 to 27 gauge, 3/8- to 1/2-inch needle is used to provide accurate measurement. If repeated doses are ordered, the site should be rotated. ID injections are administered into the epidermis layer by angling the needle 10° to 15° to the skin. See Procedure 29-5 for administering intradermal injections.

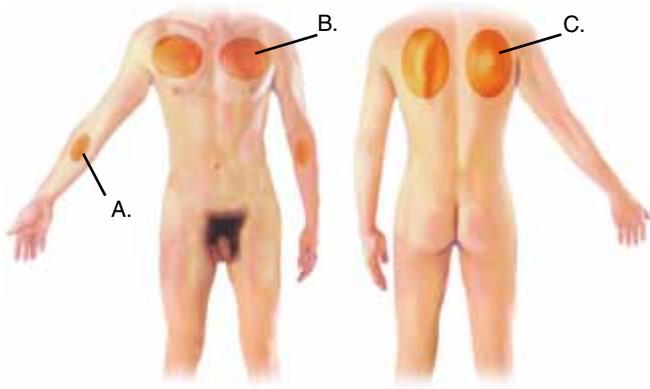


Figure 29-19 Intradermal Injection Sites: A. Inner Aspect of the Forearm; B. Upper Chest; C. Upper Back

Subcutaneous Injection

Subcutaneous (SC or SQ) injections are commonly used in the administration of medications such as insulin and heparin because these drugs are absorbed slowly, to produce a sustained effect. SC injections place the medication into the subcutaneous tissue, between the dermis and the muscle. Clients who administer frequent subcutaneous injections should rotate sites regularly. An administration chart can help them keep track of the sites used. The amount of medication given varies but should not exceed 1.0 ml; if repeated drug doses are given, rotate the sites. Subcutaneous tissues are sensitive to irritating medications. Hard painful lumps can develop beneath the skin if the sites are not rotated.

PROCEDURE 29-5

Administering an Intradermal Injection

Equipment

- | | |
|--|---|
| <ul style="list-style-type: none"> ■ Medication administration record (MAR) ■ Sterile tuberculin syringe and short bevel, 25 to 27 gauge, $\frac{3}{8}$- to $\frac{1}{2}$-inch needle. | <ul style="list-style-type: none"> ■ Medication ■ Alcohol swab and sterile 2 × 2 gauze pad ■ Disposable gloves |
|--|---|

Action

1. Check with the client and the chart for any known allergies.
2. Wash hands.
3. Follow the five rights.
4. Prepare the medication from an ampule or vial; refer to Procedure 29-2 or 29-3 as appropriate. Take the medication to the client's room and place on a clean surface.
5. Check the client's identification armband.
6. Explain the procedure to the client.
7. Place the client in a comfortable position; provide for privacy.
8. Wash hands and don nonsterile gloves.
9. Select and clean the site.
 - Assess the client's skin for bruises, redness, or broken tissue.
 - Select an appropriate site using appropriate anatomic landmarks.
 - Cleanse the site with an alcohol wipe using a firm circular motion; cleanse from inside to outside; allow alcohol to dry.

Rationale

1. Prevents the occurrence of hypersensitivity reactions such as hives, urticaria, or anaphylactic shock.
2. Reduces transmission of microorganisms.
3. Promotes client safety.
5. Accurately identifies the client.
6. Reduces the client's anxiety and enhances cooperation.
7. Promotes comfort. Promotes absorption of the medication. Decreases anxiety.
8. Decreases contact with blood and body fluids.
9. Promotes absorption of the drug; reduces trauma to the body's tissue.
 - Aids in the removal of microorganisms on the skin.

(continues)

PROCEDURE 29-5

Administering an Intradermal Injection (continued)

Action

10. Prepare the syringe for injection.
 - Remove the needle guard.
 - Express any air bubbles from the syringe.
 - Check the amount of solution in the syringe.
11. Inject the medication.
 - Hold the syringe in dominant hand.
 - With nondominant hand, grasp the client's dorsal forearm and gently pull the skin taut on ventral forearm (Figure 29-20).



Figure 29-20 Spread the skin taut for an intradermal injection.

- Place the needle close to the skin, bevel side up. Insert the needle at a 10° to 15° angle until resistance is felt, and advance the needle approximately 3 mm below the skin surface; the needle's tip should be visible under the skin.
 - Administer the medication slowly; observe the development of a bleb (large flaccid vesicle that resembles a mosquito bite). If none appears, withdraw the needle slightly.
 - Withdraw the needle.
 - Pat area gently with a dry 2 × 2 sterile gauze pad.
 - Do not massage the area after removing the needle.
12. Discard the needle and syringe in a sharps container.
 13. Remove gloves, dispose of in appropriate receptacle, and wash hands.
 14. Observe for signs of an allergic reaction.
 15. Draw a circle around the perimeter of the bleb with a ball point pen.
 16. Document medication and site of injection on the MAR.

Rationale

10. Ensures correct dosage of medication in the syringe.
 - Taut skin facilitates needle insertion.
- Ensures that medication is injected into the intradermal tissue; initial resistance indicates the needle's tip is in the subcutaneous region.
- Indicates that the medication was injected into the dermis.
- Prevents spreading the medication beyond the point of injection.

 12. Prevents needlesticks.
 13. Reduces the spread of microorganisms.
 14. Ensures client safety.
 15. Allows for easy recognition and observation of the injection site.
 16. Provides a written description of the injection site and states the time the medication was administered.

Common sites for SC injections are the abdomen, the lateral and anterior aspects of the upper arm or thigh, the scapular area on the back, and upper ventrodorsal gluteal areas (Figure 29-21). The nurse should select a sterile 0.5- to 3-ml syringe with a 25- to 29-gauge, 3/8- to 1/2-inch needle. The medication is administered by angling the needle 45° or 90° to the skin. The client's body weight will influence the angle used for injection. As a general rule, to reach subcutaneous tissue, if you can grasp 2 inches of tissue between two fingers, insert the needle at a 90° angle. If only 1 inch of tissue can be grasped between the fingers, use a 45° angle to administer the medication.

The length of the needle may also vary with body weight. Normally for SC injections, a 25-gauge, 5/8-inch needle is used. A child will require a short needle, and an obese person may require a longer needle to ensure placing the medication in the subcutaneous tissue. The length of the needle should be approximately half the

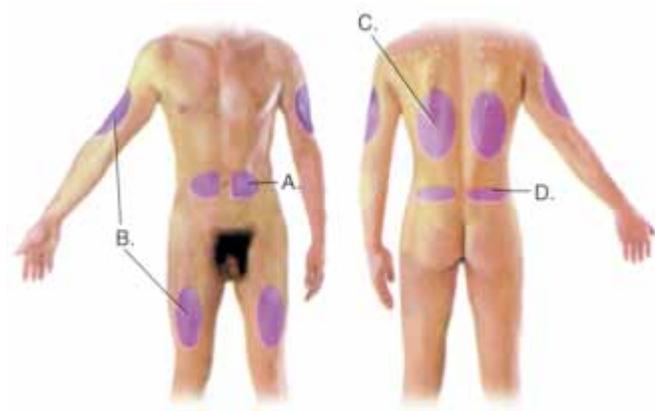


Figure 29-21 Subcutaneous Injection Sites: A. Abdomen; B. Lateral and Anterior Aspects of Upper Arm and Thigh; C. Scapular Area on Back; D. Upper Ventrodorsal Gluteal Area.

width of the pinched skinfold. See Procedure 29-6 for the technique used in administering an SC injection.

NURSING ALERT

Aspirating the Syringe

Do not aspirate on the plunger when giving heparin; *doing so may cause tissue damage.*

Intramuscular Injection

Intramuscular (IM) injections are used to promote rapid drug absorption and to provide an alternate route when the drug is irritating to subcutaneous tissue. The IM route enhances the absorption rate because there

PROCEDURE 29-6

Administering a Subcutaneous Injection

Equipment

- Medication administration record (MAR)
- Sterile syringe and 5/8-inch needle
- Disposable gloves
- 2 alcohol swabs
- Medication as prescribed

Action

1. Check with client and the chart for any known allergies.
2. Wash your hands.
3. Follow the five rights.
4. Prepare the medication from an ampule or vial; refer to Procedure 29-2 or 29-3 as appropriate. Take medication to the client's room and place on a clean surface.
5. Check the client's identification armband.
6. Explain the procedure to the client.
7. Place the client in a comfortable position; provide for privacy.
8. Don nonsterile gloves.

Rationale

1. Prevents the occurrence of hypersensitivity reactions such as hives, urticaria, or anaphylactic shock.
2. Reduces transmission of microorganisms.
3. Promotes client safety.
5. Accurately identifies the client.
6. Reduces the client's anxiety and enhances cooperation.
7. Promotes relaxation of the muscles, decreasing discomfort from the injection.
8. Decreases contact with blood and body fluids.

(continues)

PROCEDURE 29-6

Administering a Subcutaneous Injection (continued)

<i>Action</i>	<i>Rationale</i>
<p>9. Select and clean the site.</p> <ul style="list-style-type: none"> • Assess the client's skin for bruises, redness, hard tissue, or broken skin. • Cleanse the site with an alcohol swab; cleanse from inside outward. 	<p>9. Promotes absorption of drug when injected into healthy tissue.</p> <ul style="list-style-type: none"> • Removes the surface microorganisms.
<p>10. Prepare for the injection.</p> <ul style="list-style-type: none"> • Remove the needle guard and express any air bubbles from the syringe; check the dosage in the syringe. • With dominant hand, hold the syringe like a dart between your thumb and forefingers. • Pinch the subcutaneous tissue between the thumb and forefinger with the nondominant hand. If the client has substantial subcutaneous tissue, spread the tissue taut. 	<ul style="list-style-type: none"> • Prevents the injection of air into the subcutaneous tissue. • Decreases risk for accidental contamination of the needle. • Ensures insertion of the needle into the subcutaneous tissue.
<p>11. Administer the injection.</p> <ul style="list-style-type: none"> • Insert the needle quickly at a 45° or 90° angle. • Release the subcutaneous tissue and grasp the barrel of the syringe with nondominant hand. • With dominant hand, aspirate by pulling back on the plunger gently, except when administering an anticoagulant injection. • If blood appears, remove needle and discard in a sharps container. • Inject medication slowly if there is no blood present. • Remove the needle quickly and lightly massage area with alcohol swab; do not massage the injection site after the administration of an anticoagulant. • Do not recap the needle; discard the needle in a sharps container. 	<ul style="list-style-type: none"> • Quick insertion decreases the client's anxiety and the amount of discomfort. • Indicates needle has entered a blood vessel. • Prevents the injection of medication into the blood, which causes a faster absorption rate that may be dangerous to the client. • Promotes dispersment of medication in the tissues and facilitates absorption. • Prevents needlesticks.
<p>12. Position client for comfort.</p>	
<p>13. Remove gloves and wash hands.</p>	<p>13. Reduces the spread of microorganisms.</p>
<p>14. Record on the MAR the route, site, and time of injection.</p>	<p>14. Provides documentation that the medication was administered.</p>
<p>15. Observe the client for any side or adverse effects and assess the effectiveness of the medication at the appropriate time.</p>	<p>15. Alerts the nurse to hypersensitivity reactions; the peak plasma level is dependent on the drug's half-life.</p>

are more blood vessels in the muscles than in subcutaneous tissue; however, the absorption rate may be affected by the client's circulatory status.

Since the 1920s over 90 research studies related to IM injections have been reported in the literature (Beyea & Nicoll, 1995). Researchers have studied the medication volume and appropriate size of the syringe and needle for administering an IM injection to a particular site. "Research on the maximum volume to be drawn up for a single injection is still inconclusive" (Beyea & Nicoll, 1996, p. 34). The nurse should determine the maximum volume to inject on the basis of the site and the client's muscle development:

- 4 ml for a large muscle (gluteus medius) in a well-developed adult
- 1 to 2 ml for less developed muscles in children, elderly, and thin clients
- 0.5 to 1.0 ml for the deltoid muscle

When more than 4 ml is ordered, the medication can be divided into two different sites.

There are four common sites for administering IM injections (see the accompanying display). Injection sites are identified by using appropriate anatomic landmarks (Figure 29-22).

COMMON INTRAMUSCULAR INJECTION SITES AND MUSCLES

Site	Muscle
Dorsogluteal	Gluteus maximus
Ventrogluteal	Gluteus medius
Anterolateral aspect of thigh	Vastus lateralis
Upper arm	Deltoid

The primary site for administering an IM injection in clients over 7 months old is the ventrogluteal (VG) site. The gluteus medius is a well-developed muscle, free of major nerves and large blood vessels. Research shows that injuries—including fibrosis, nerve damage, abscess, tissue necrosis, muscle contraction, gangrene, and pain—have been associated with all the common sites (dorsogluteal, deltoid, and vastus lateralis, for example) *except* the VG site (Beyea & Nicoll, 1996, p. 35).

The nurse should avoid using the deltoid and dorsogluteal sites in infants and children. There is a risk of striking the sciatic nerve when using the dorsogluteal site. The deltoid muscle is not well developed in infants and children.

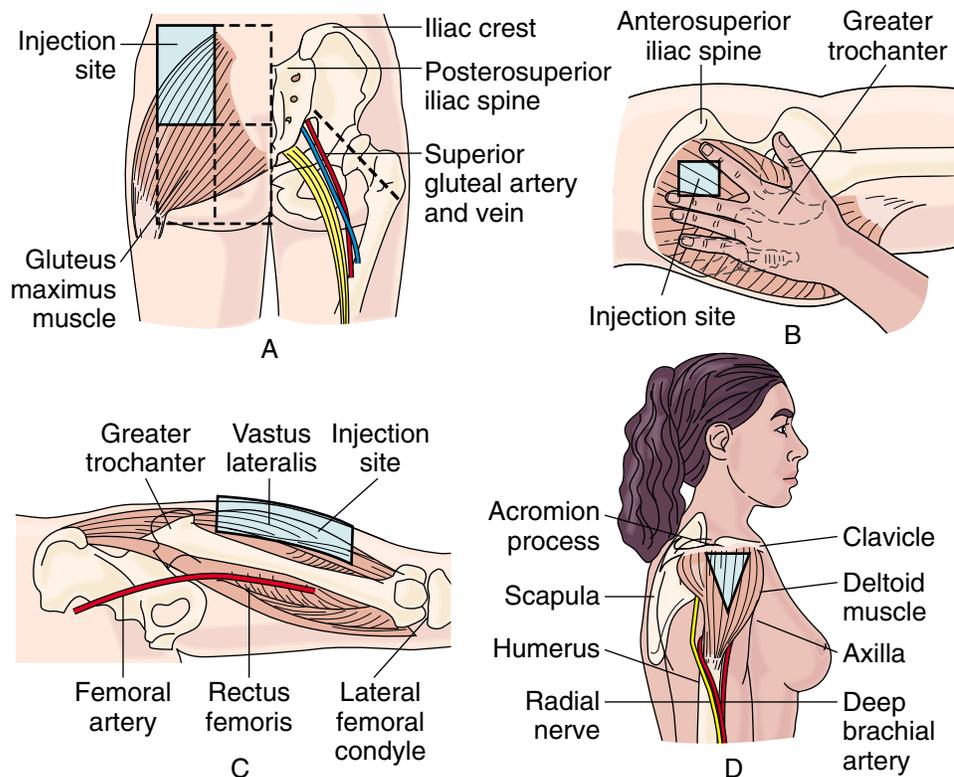


Figure 29-22 Intramuscular Injection Sites. A. Dorsogluteal: Place hand on iliac crest and locate the posterosuperior iliac spine. Draw an imaginary line between the trochanter and the iliac spine; the injection site is the outer quadrant. B. Ventrogluteal: Place palm of left hand on right greater trochanter so that index finger points toward anterosuperior iliac spine; spread first and middle fingers to form a V; injection site is the middle of the V. C. Vastus lateralis: Identify greater trochanter; place hand at lateral femoral condyle; injection site is middle third of anterior lateral aspect. D. Deltoid: Locate the lateral side of the humerus from two to three fingerwidths below the acromion process in adults or one fingerwidth below the acromion process in children.

The nurse will need to decide on the gauge and length of the needle on the basis of the consistency of the solution, the site, and how far the needle must be injected to reach the muscle. A 21- to 23-gauge needle will accommodate the consistency of most drugs and will minimize tissue injury and subcutaneous leakage. The needle's length is determined by the site:

- 1 ½-inch needle, VG site for average-sized adults
- 1-inch needle, VG site for children
- 1-inch needle, deltoid or vastus lateralis

An obese client usually requires a 2-inch needle to ensure that the needle will reach a large muscle such as the gluteal muscle. For example, for a client weighing 100 pounds, use a needle 1 to 1 ½ inches long; usually

for a child use only a 1-inch needle. It is important to consider the size of the client when determining the needle length; some children are large, and some adults are small. The nurse should administer an IM injection at a 90° angle. See Procedure 29-7 for administering an intramuscular injection.

Z-Track Injection

The *Z-track* (zigzag) *technique* refers to a method used in administering IM injections (see Procedure 29-7). This technique was traditionally used when administering imferon, an iron preparation, which can cause permanent discoloration in the subcutaneous tissue. Today, the technique is used commonly when administering ventrogluteal and dorsogluteal injections.

PROCEDURE 29-7

Administering an Intramuscular Injection

Equipment

- | | |
|--|----------------------------|
| ■ Medication administration report (MAR) | ■ Medication as prescribed |
| ■ Sterile 3-ml syringe and long bevel, 20 to 22 gauge, 1- to 2-inch needle (average-sized, adult client receiving a drug in an aqueous solution) | ■ Alcohol swab |
| | ■ Nonsterile gloves |
| | ■ Sterile 2 × 2 gauze pad |

Action

1. Check with client and the chart for any known allergies.
2. Wash hands.
3. Follow the five rights.
4. Prepare the medication from an ampule or vial; refer to Procedure 29-2 or 29-3 as appropriate.
 - Add 0.1 to 0.2 ml of air to the syringe.
 - Take medication to the client's room and place on a clean surface.
5. Check the client's identification armband.
6. Explain the procedure to the client; provide for privacy.
7. Place the client in an appropriate position to expose the site.
 - Deltoid: sitting position.
 - Ventrogluteal:
 - Side-lying: flex the knee, pivot the leg forward from the hip about 20° so it can rest on the bed.
 - Supine: flex the knee on the injection side.
 - Prone: point toes inward toward each other to internally rotate the femur.

Rationale

1. Prevents the occurrence of hypersensitivity reactions.
2. Reduces the transmission of microorganisms.
3. Promotes client safety.
 - Ensures that all the medication is expelled from the needle's shaft.
5. Accurately identifies the client.
6. Reduces the client's anxiety and enhances cooperation.
7. Provides access to the site, promotes relaxation of muscles, and decreases the discomfort from the injection.

(continues)

PROCEDURE 29-7

Administering an Intramuscular Injection (continued)

<i>Action</i>	<i>Rationale</i>
<p>8. Don nonsterile gloves.</p> <p>9. Select and clean the site.</p> <ul style="list-style-type: none"> • Assess the client's skin for redness, scarring, breaks in the skin, and palpate for lumps or nodules. • Select site using the anatomic landmarks. • Cleanse the area with an alcohol swab, cleanse from inside outward using friction; wait 30 seconds to allow to dry. <p>10. Prepare for the injection.</p> <ul style="list-style-type: none"> • Remove the needle cap by pulling it straight off, and expel any air bubbles from the syringe. • Pull the skin down or to one side (Z-track technique) with nondominant hand. <p>11. Administer the injection.</p> <ul style="list-style-type: none"> • Deltoid: quickly insert the needle with a dart-like motion at a 90° angle (Figure 29-23). 	<p>8. Decreases contact with blood and body fluids.</p> <p>9. Avoids potential problems that may decrease the rate of the drug's absorption.</p> <ul style="list-style-type: none"> • Avoids tissue containing large nerves and blood vessels. • Removes the surface microorganisms and prevents the introduction of alcohol into subcutaneous tissue to avoid irritation. • Maintains the sterility of the needle; ensures the correct dosage in the syringe. • Decreases the risk of medication's leaking into needle track and the subcutaneous tissue; reduces complications and discomfort. <p>11. Ensures that the needle is injected into the muscle.</p>



Figure 29-23 Administering Intramuscular Injection into the Deltoid Muscle

- Ventrogluteal: quickly insert the needle using a dartlike motion and steady pressure at a 90° angle to the iliac crest in the middle of the V (Figure 29-24).
- Aspirate by pulling back on the plunger, and observe for blood.
- If blood appears, remove the needle and discard.

(continues)

PROCEDURE 29-7

Administering an Intramuscular Injection (continued)

Action

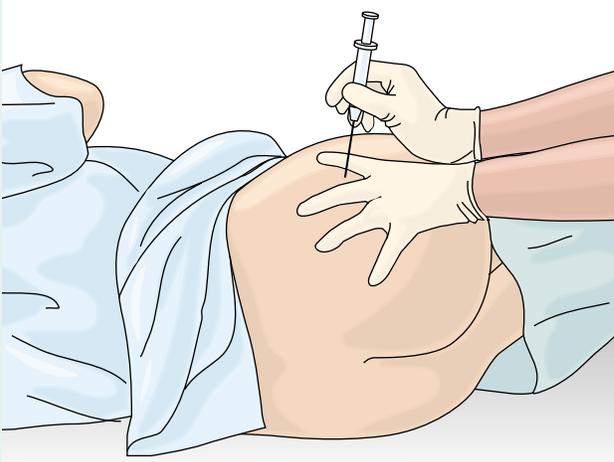


Figure 29-24 Administering Intramuscular Injection into the Ventrogluteal Site

- | | |
|---|--|
| <ul style="list-style-type: none"> • If blood does not appear, inject the medication slowly, about 10 sec/ml. • Wait 10 seconds after the medication has been injected, then smoothly withdraw the needle at the same angle of insertion. • Apply gentle pressure at the site with a dry, sterile 2 × 2 gauze; do not massage the injection site. Swab using gentle pressure. • Discard the needle and syringe in a sharps container; do not recap the needle. <ol style="list-style-type: none"> 12. Position client for comfort; encourage client receiving ventrogluteal injections to perform leg exercises (flexion and extension). 13. Remove gloves, wash hands. 14. Record on the MAR the dosage, route, site, and time. 15. Inspect the injection site within 2 to 4 hours and evaluate the client's response to the medication. | <div style="text-align: center;"><i>Rationale</i></div> <hr/> <ul style="list-style-type: none"> • Promotes comfort and allows time for the tissues to expand and begin absorbing the medication. • Allows the medication to diffuse through the muscle. • Decreases tissue irritation. • Prevents needlesticks. <ol style="list-style-type: none"> 12. Promotes the absorption of the medication. 13. Prevents transmission of microorganisms. 14. Provides documentation that the medication was administered. 15. Alerts the nurse to hypersensitivity reactions; the peak plasma level is dependent on the drug's half-life. |
|---|--|

When administering a Z-track injection, the nurse should place the client in the prone position (Figure 29-25A); then pull the skin to one side (Figure 29-25B), insert the needle at a 90° angle and administer the medication (Figure 29-25C). Spreading the skin, a common method formerly used for IM injections, increases the risk

that medication will leak into the needle track and the subcutaneous tissue; this risk is virtually eliminated using the Z-track technique, making it the technique of choice (Beyea & Nicoll, 1996). The nurse waits 10 seconds and withdraws the needle at the same angle of insertion; the site should not be massaged because massaging could cause tissue irritation.



NURSING TIP

Air Bubble in Syringe

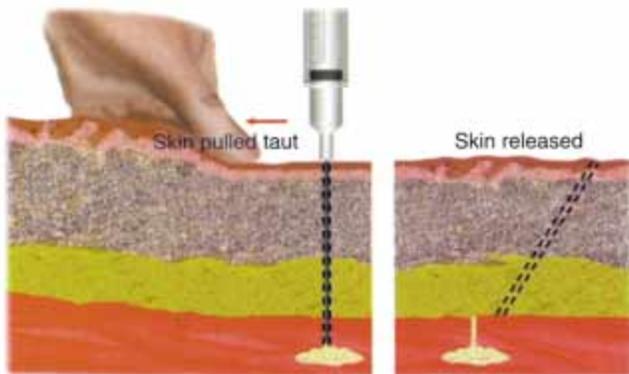
The nurse should not draw an air bubble when using a plastic disposable syringe, as doing so can dramatically affect the medication dosage (Beyea & Nicoll, 1996).



A.



B.



C.

Figure 29-25 Administering Intramuscular Injection Using Z-Track Technique. A. Client lies prone with buttocks exposed. B. Grasp and pull the muscle laterally before injecting medication. C. Pulling skin taut and then releasing it after the needle is withdrawn seals the site.

Table 29-2 summarizes the basics of intradermal, subcutaneous, and intramuscular injections.

Intravenous Injections

The intravenous (IV) route is used when a rapid drug effect is desired or when the medication is irritating to tissue. IV administration provides immediate release of medication into the bloodstream; consequently, it can be dangerous. IV medications are administered by one of the following methods:

- Intravenous fluid container
- Volume-control administration set
- Intermittent infusion by piggyback or partial fill
- Intravenous push (IVP or bolus)

See Chapter 37 for a discussion of other IV delivery systems.

Adding Drugs to an Intravenous Fluid Container

When administering IV medications, regardless of the method used, the nurse should assess the patency of the infusion system and the condition of the injection site for signs of complications such as **infiltration** (swelling and discomfort at the IV site) and **phlebitis** (inflammation of a vein). See Chapter 37 for a complete discussion of these IV complications. Some IV medications or solutions with high or low pH or high osmolarity are irritating to veins and can cause phlebitis.

Before administering any IV medication, the nurse should note the client's allergies, drug or solution incompatibilities, the amount and type of diluent needed to mix the medication, and the client's general condition to establish a baseline for administering medication.

Examples of drugs that can be added to an IV fluid container that is infusing are potassium chloride, an electrolyte, and Solu-B, a vitamin (Figure 29-26). The nurse should check for drug compatibilities of drug additives before injecting a medication into an infusion bag. **Drug incompatibilities** cause an undesired chemical or physical reaction between a drug and a solution, between two drugs, or between a drug and the container or tubing. For example, diazepam (Valium) and chlorthalidone hydrochloride (Librium) must not come into contact with a saline solution; insulin should not be added to an infusion bag because the insulin adheres to the inside of the solution bag.

Adding Drugs to a Volume-Control Administration Set

A volume-control set is used to administer small volumes of IV solution (Figure 29-27). These devices have various names as determined by the manufacturer, such as

TABLE 29-2
Summary of Intradermal, Subcutaneous, and Intramuscular Injections

Type of Injection	Purpose	Site	Needle Size	Maximum Dose	Angle of Insertion
Intradermal	Injects medication below the epidermis; drugs are absorbed slowly; typically used for diagnosis of tuberculosis and allergens	Inner aspect of forearm; upper chest; upperback	Syringe with short bevel; 25- to 27-gauge; 3/8 to 1/2-inch	0.01 to 0.1 ml	10°–15° 
Subcutaneous	Injects medication between dermis and muscle; absorbed slowly; typically used for insulin and anticoagulants	Abdomen; lateral and anterior aspects of upper arm and thigh; scapular area on back; ventrogluteal area	25-gauge, 5/8-inch needle (varies by size of person)	0.5–1.0 ml	45° or 90° 
Intramuscular	Used to promote rapid drug absorption and to provide an alternate route when drug is irritating to SC tissue	Ventrogluteal; dorsogluteal; anterolateral aspect of thigh (vastus lateralis); upper arm (deltoid)	The gauge and length of needle are selected on the basis of medication volume and viscosity and client's body size	Well-developed adult: 4 ml in a large muscle; infant and small child: 0.5–1.0ml; children and elderly: 1–2 ml; deltoid muscle: 0.5–1 ml	90° 



Figure 29-26 Adding a Medication to an Intravenous Fluid Container

Soluset, Metriset, VoluTrol, or Buretrol. To administer a drug by this method, the nurse should:

- Withdraw the prescribed amount of medication into a syringe that is to be injected into the volume-control set.

- Cleanse the injection port of a partially filled volume-control set with an alcohol swab.
- Inject the prepared medication into the port of the volume-control set (Figure 29-28).
- Gently mix the solution in the volume-control chamber.

After injecting the medication into the volume-control chamber, the nurse should check the infusion rate and adjust as necessary to the prescribed rate of infusion.

Administering Medications by Intermittent Infusion

A common method of administering IV medications is by using a secondary, or partial-fill additive bag, often referred to as an IV piggyback (IVPB). A secondary line is a complete IV set (fluid container and tubing with either a microdrip or a macrodrip system) connected to a Y-port of a primary line (see Procedure 29-8). The primary line maintains venous access. The IVPB is used for medication administration. See Chapter 37 for a complete discussion of primary and secondary lines. When the IVPB medication is incompatible with the primary IV solution, the nurse must flush the primary IV tubing with normal saline before and after administering the medication.

Intermittent Infusion Devices When the client requires only the administration of IV medications without the infusion of solutions, an intermittent infusion device is inserted into a peripheral needle or catheter in



Figure 29-27 Volume-control set is connected to a continuous infusion line.



Figure 29-28 Injecting a Medication into a Partially Filled Volume-Control Set

PROCEDURE 29-8

Administering Medications by IV Piggyback to an Existing IV

Equipment

- Medication administration record (MAR)
- Prepared and labeled medication 50-ml solution bag from pharmacy
- Alcohol swab
- Secondary administration set
- Needle-less locking cannula

Action

1. Gather prepared equipment (medication labeled with the client's name, and time tape for fluids to infuse per hour).
2. Wash hands.
3. Check the client's armband.
4. Explain the procedure to the client.
5. Assess the puncture site.
 - Observe for redness and puffiness.
 - Palpate for tenderness.
6. Check patency of infusion site.
 - Observe fluid infusing.
 - Remove IV container from the pole and lower the container below the level of infusion site.

Rationale

1. Ensures correct fluids to be administered to the right client at the infusion rate prescribed by the health care practitioner.
2. Decreases risk of transmission of microorganisms.
3. Ensures correct client.
4. Elicits client's support and decreases anxiety.
5. Indicates signs of infiltration or infection.
6. Verifies patency of IV system with venous access device in the client's vein.

(continues)

PROCEDURE 29-8

Administering Medications by IV Piggyback to an Existing IV (continued)

Action	Rationale
<ul style="list-style-type: none"> Observe for backflow of blood into the hub of the venous access device. Replace container on IV pole. 	
7. Secure medication bag prepared and labeled by pharmacy and check health care practitioner's prescription and the MAR.	7. Ensures the correct client, medication, dosage, route, and frequency.
8. Check the client's chart for allergies, and check the drug compatibility chart.	8. Ensures that the client is not allergic to the drug and that the prescribed drug is compatible with the primary IV solution.
9. Hang the secondary bag on IV pole.	9. Provides easy access for preparation.
10. Add the administration set to the secondary bag and prime the tubing.	10. Removes the air from the tubing.
11. Affix a needle-less locking cannula to the end of tubing (Figure 29-29A).	11. Reduces risk of exposure to IV needles.



Figure 29-29A Administering Medications by IV Piggyback. Connect a needle-free locking cannula to a secondary infusion line.

12. Cleanse needle-less Y-site injection port of primary IV tubing closest to infusion site with an alcohol swab; allow to dry.	12. Reduces risk of transmission of microorganisms.
13. Insert needle-less locking cannula of secondary bag set into Y-site injection port of primary set and secure in place with tape (Figure 29-29B).	13. Provides access for infusion and prevents dislodgement of needle-less locking cannula.
14. Affix the extension hook to the primary bag on the IV pole so that the primary bag hangs below the level of the secondary bag.	14. Ceases flow of primary solution because of an increased hydrostatic pressure in secondary bag.
15. Open clamp of secondary tubing and adjust drip rate to desired infusion rate. <ul style="list-style-type: none"> Slowly close the regular clamp while observing the drip chamber until the fluid is dripping at a slow, steady pace (Figure 29-29C). Count the drops for a 15-second interval and multiply by 4 (e.g., if the drop factor of 	15. Allows solution in the secondary bag to infuse at the prescribed drip rate. <ul style="list-style-type: none"> Determines number of drops falling per minute.

(continues)

PROCEDURE 29-8

Administering Medications by IV Piggyback to an Existing IV (Continued)

Action



Figure 29-29B Connect locking cannula to a Y-site injection port of primary infusion set.



Figure 29-29C Monitor the infusion rate.

tubing is 10 drops/ml then the drop rate should be 10 drops/minute to infuse 50 ml in 50 minutes).

- Recount the drop rate in 5 minutes.
 - Detects changes in rate due to expansion and contraction of tubing.
16. Observe client for any signs of adverse reactions to the medication.
 16. Provides for immediate intervention if client has an adverse reaction.
 17. When secondary bag and drip chamber are empty, close the clamp on secondary system, readjust drip rate of primary solution as indicated, and remove the secondary system.
 17. Allows the primary solution to infuse at prescribed drip rate.
 18. Record medication infusion on the MAR and note any client responses in the nurses' notes
 18. Documents the nursing intervention.

Rationale

the client's vein (Figure 29-30). This device is commonly referred to as a heparin or saline lock depending on the agency's policy regarding the device's maintenance. A lock provides continuous access to venous circulation, eliminating the need for a continuous IV, and it increases the client's mobility.

The device can be used to infuse intermittent IVPB or IV push medications, or it can be converted to a primary IV. A major consideration for inserting a heparin lock device is that it provides venous access in case of an emergency. Lock devices are routinely used with cardiac clients.

Locks are generally flushed every 8 hours to maintain patency (patency refers to being freely opened). Some agencies require a diluted dose of heparin (100 units/ml) to be injected into the lock; other agencies use normal saline to keep the device patent. See Chapter 37 for a complete discussion of heparin and saline locks. When heparin is used, the device must be flushed with normal saline solution before and after administration of a medication.

Administering IV Push Medications

The method of medication administration by IV bolus or IV push injection is determined by the type of IV system. For example, an IV push medication can be injected into a saline or heparin lock (Figure 29-31) or into a continuous infusion line. When giving an IV push medication into a continuous infusion line, the nurse must stop the fluids in the primary line; the nurse usually pinches the IV tubing closed to inject the drug (see Figure 29-32). This technique is safe and prevents the nurse from having to recalculate the drip rate of the primary infusion line.

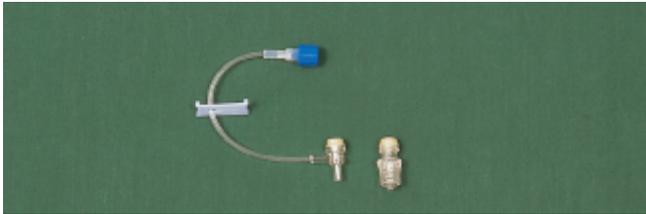


Figure 29-30 Heparin Locking Device



Figure 29-31 Pinch closed the IV tubing of a primary infusion line to administer an IV push medication.



Figure 29-32 Injecting a Bolus of Medication into a Peripheral Saline Lock

IV push medications can also be given into a central line or directly into the vessel by venipuncture. The five rights of medication administration are implemented when administering an IV bolus. The nurse must know the specific time interval to inject the medication and the specific reactions of the infused drug. The client must be monitored closely during and after injection for drug reactions.

Administer Topical Medications

Topical medications may be administered to the skin, eyes, ears, nose, throat, rectum, and vagina. The medication generally provides a local effect but can also cause systemic effects. Drugs directly applied to the skin to produce a local effect include lotions, pastes, ointments, creams, powders, and aerosol sprays. The rate and degree of the drug's absorption are determined by the vascularity of the area.

Topical drugs are usually given to provide continuous absorption to produce different effects: to relieve pruritus (itching), to protect the skin, to prevent or treat an infection, to provide local anesthesia, or to create a systemic effect. Topical medications are usually ordered two or three times a day to achieve their therapeutic effect.

Before applying a topical preparation, the nurse should assess the condition of the skin for any open lesions, rashes, or areas of erythema and skin breakdown. Because secretions are produced by the skin and mucous membranes, the nurse should always implement Standard Precautions when applying a topical drug. The medication can be transferred to the nurse if gloves are not worn or an applicator, such as a sterile tongue depressor, is not used. The nurse should check with the client and the medical record for any known allergies.

Body oils may interfere with the adhesive properties of the patch, disk, or tape. The skin harbors microorganisms, and lesions can cause encrustation. The nurse should cleanse the area by washing with soap and warm water, unless contraindicated by a specific order. The

skin should be thoroughly dry before a topical medication is applied. Open wounds require the nurse to use surgical asepsis. See Chapter 28 for a complete discussion of surgical asepsis.

When the skin is dry, the nurse can apply the medication. When applying a paste, cream, or an ointment, the nurse should use a sterile tongue depressor to remove the medication from the container; this method prevents cross-contamination. The medication is transferred from the tongue blade to a gloved hand for application. The medication should be applied in long, smooth strokes in the direction of the hair follicles to prevent the medication from entering the hair follicles. A new sterile tongue depressor should be used whenever more medication is removed from the container. Two to 4 hours after the application, the nurse should assess the area for signs of an allergic reaction.

Eye Medications

Eye medications, often referred to as ophthalmic medications, refer to drops, ointments, and disks. These drugs are used for diagnostic and therapeutic purposes—to lubricate the eye or socket for a prosthetic eye and to prevent or treat eye conditions such as glaucoma (elevated pressure within the eye) and infection. Diagnostically, eyedrops can be used to anesthetize the eye, dilate the pupil, and stain the cornea to identify abrasions and scars.

The nurse should review the abbreviations used in medication orders to ensure that the medication is instilled in the correct eye. Cross-contamination is a potential problem with eyedrops. The nurse should adhere to the following safety measures to prevent cross-contamination:

- Each client should have his or her own bottle of eyedrops. Clients should never share eye medications.
- Discard any solution remaining in the dropper after instillation.
- Discard the dropper if the tip is accidentally contaminated, as by touching the bottle or any part of the client's eye. The risk of transferring infection from one eye to the other is increased if the tip touches any part of the client's eye.

See Procedure 29-9 for administering eye medications. The nurse should insert medication disks at bedtime because they usually cause blurring of the eyes on insertion. Standard Precautions are used when eye care and medications are being administered because of the potential contact with bodily secretions.

Ear Medications

Solutions ordered to treat the ear are often referred to as *otic* (pertaining to the ear) drops or irrigations. Eardrops may be instilled to soften ear wax, to produce anesthesia, to treat infection or inflammation, or to facilitate removal of a foreign body, such as an insect. External auditory canal irrigations are usually performed for cleaning purposes and less frequently for applying heat and antiseptic solutions. The internal ear is very sensitive to changes in temperature. Sudden changes can cause nausea and dizziness. Eardrops and irrigation fluids should be at room temperature.

Before instilling a solution into the ear, the nurse should inspect the ear for signs of drainage, an indication of a perforated tympanic membrane. Eardrops are usually contraindicated when the tympanic membrane is perforated. If the tympanic membrane is damaged, all procedures must be performed using sterile aseptic technique; otherwise, medical asepsis is used when instilling medications into the ear (see Procedure 29-10). Medication should never be forced into the ear canal especially if it is occluded (as by wax). Forcing medication into an occluded eardrum can injure the eardrum.

Certain conditions have contraindications for specific drugs; for example, hydrocortisone eardrops are contraindicated in clients with a fungal infection or a viral infection such as herpes.

Nasal Instillations

Nasal instillations can be performed with different preparations: drops or nebulizers (atomizer or aerosol). Nasal drugs are administered to produce one or more of the following effects: to shrink swollen mucous membranes, to loosen secretions and facilitate drainage, to treat infections of the nasal cavity or sinuses. Because many of these products are nonprescription drugs, clients should be taught their correct usage. For example, nasal decongestants are common over-the-counter drugs used to shrink swollen mucous membranes; however, when these drugs are used in excess, they may have a reverse or rebound effect by increasing nasal congestion.

The nasal sinuses (frontal, ethmoid, maxillary, and sphenoid sinuses) communicate with the nasal fossae and are lined with mucous membranes similar to those that line the nose. Nose drops can be instilled to remain in the nasal passage, to reach the ethmoid and sphenoid sinuses, or to reach the frontal or maxillary sinuses. Location is determined by the degree of hyperextension and position of the

NURSING ALERT

Systemic Effects of Eyedrops

The nurse should apply pressure to the inner canthus when instilling eyedrops that have potential systemic effects such as atropine and timolol maleate (Timoptic). Gentle pressure over the inner canthus prevents the medication from flowing into the tear duct, thereby decreasing the absorption rate of the drug.

PROCEDURE 29-9

Administering an Eye Medication

Equipment

- Medication administration record (MAR)
- Tissue or cotton ball

- Eye medication
- Nonsterile gloves

Action

1. Check with the client and the chart for any known allergies or medical conditions that would contraindicate use of the drug.
2. Check the MAR against the written orders.
3. Gather the necessary equipment.
4. Follow the five rights of drug administration.
5. Take the medication to the client's room and place on a clean surface.
6. Check client's identification armband.
7. Explain the procedure to the client; inquire if the client wants to instill his or her own eye-drops.
8. Wash hands, don nonsterile gloves.
9. If the eye has crust or drainage along the margins or inner canthus, gently wash the eye. Always wipe from inner canthus to outer. Use warm soaks to soften material if necessary.
10. Place client in a supine position with the head slightly hyperextended.

Instilling Eyedrops

11. Remove cap from eye bottle and place cap on its side.
12. Squeeze the prescribed amount of medication into the eyedropper.
13. Place a tissue below the lower lid.
14. With dominant hand, hold eyedropper 1/2 to 3/4 inch above the eyeball; rest hand on client's forehead to stabilize.
15. Place nondominant hand on cheekbone and expose lower conjunctival sac by pulling on cheek while applying slight pressure to the inner canthus.
16. Instruct the client to look up, and drop prescribed number of drops into center of conjunctival sac (Figure 29-33 on the following page).

Rationale

1. Prevents occurrence of adverse reactions.
2. Ensures accuracy in identification of the medications.
3. Promotes efficiency.
4. Promotes safety.
5. Decreases risk of contamination.
6. Accurately identifies client.
7. Reduces client's anxiety and enhances collaboration; some clients are used to instilling their own eyedrops.
8. Decreases contact with bodily fluids.
9. Crust and drainage harbor microorganisms. Cleansing from inner to outer aspects of eye avoids pushing microorganisms into the lacrimal duct. Soaking allows crusted material to soften and facilitates removal without pressure on the eye.
10. Minimizes drainage of medication through the tear duct.
11. Prevents contamination of the bottle cap.
12. Ensures correct dose.
13. Absorbs the medication that flows from the eye.
14. Reduces risk of dropper's touching eye structure.
15. Stabilizes hand and prevents systemic absorption of eye medication.
16. Reduces stimulation of the blink reflex; prevents injury to the cornea.

(continues)

PROCEDURE 29-9

Administering an Eye Medication (continued)

Action*Rationale*

Figure 29-33 To administer an eye medication, gently press the lower lid down and have the client look upward while instilling drops into the lower conjunctival sac.

- | | |
|---|--|
| <ul style="list-style-type: none"> 17. Avoid instilling medication directly into the cornea. 18. If the client blinks and the drops land on the outer lid or eyelash, repeat the procedure. 19. Instruct client to gently close eyes and move eyes. 20. Remove gloves; wash hands. 21. Record on the MAR the route, site (which eye), and time administered. | <ul style="list-style-type: none"> 17. Pain fibers in the cornea make it very sensitive to anything applied to it. 18. Therapeutic effect achieved only if the drop enters the conjunctival sac. 19. Distributes solution over conjunctival surface and anterior eyeball. 20. Reduces the transmission of microorganisms. 21. Provides documentation that the medication was given. |
|---|--|

Eye Ointment

- 22. Repeat steps 1–10.
 - 23. Lower lid:
 - With nondominant hand, gently separate client's eyelids with thumb and finger, and grasp lower lid near margin immediately below the lashes; exert pressure downward over the bony prominence of the cheek.
 - Instruct the client to look up.
 - Apply eye ointment along inside edge of the entire lower eyelid, from inner to outer canthus.
- Provides access to the lower lid.
 - Reduces stimulation of the blink reflex, and keeps cornea out of way of medication.
 - Ensures that drug is applied to entire lid.

(continues)

PROCEDURE 29-9

Administering an Eye Medication (continued)

<i>Action</i>	<i>Rationale</i>
<p>24. Upper lid:</p> <ul style="list-style-type: none"> • Instruct client to look down. • With nondominant hand, gently grasp client's lashes near center of upper lid with thumb and index finger, and draw lid up and away from eyeball. • Squeeze ointment along upper lid starting at inner canthus. 	<ul style="list-style-type: none"> • Keeps cornea out of way of medication. • Ensures medication applied to entire length of lid.
<p>25. Repeat steps 19–21.</p>	
Medication Disk	
<p>26. Repeat steps 1–10.</p> <p>27. Open sterile package and press dominant, gloved finger against the oval disk so that it lies lengthwise across fingertip (Figure 29-34A).</p>	<p>27. Promotes sticking of disk to fingertip. Allows nurse to inspect disk.</p>
<p>28. Instruct the client to look up.</p>	
<p>29. With nondominant hand, gently pull the client's lower eyelid down and place the disk horizontally in the conjunctival sac. It should float on the sclera between the iris and the lower eyelid (Figure 29-34B,C).</p> <ul style="list-style-type: none"> • Then pull the lower eyelid out, up, and over the disk. 	<p>29. Allows the disk to automatically adhere to the eye. Ensures proper absorption of medication.</p>

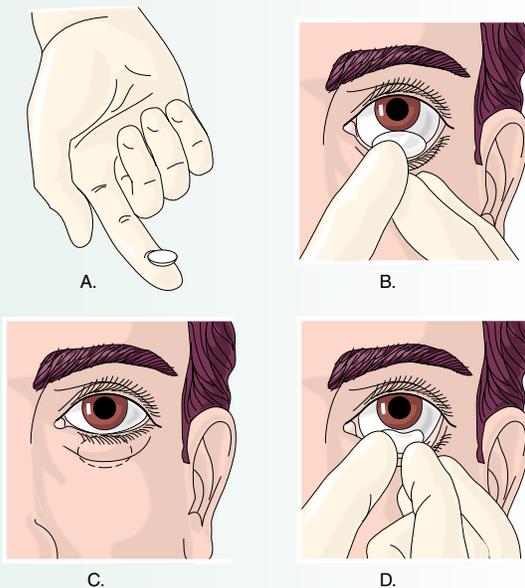


Figure 29-34 Insertion of an Intraocular Medication Disk (Steps A–D)

(continues)

PROCEDURE 29-9

Administering an Eye Medication (continued)

*Action**Rationale*

- Instruct the client to blink several times.
 - If disk is still visible, repeat steps.
 - Once the disk is in place, instruct the client to gently press his fingers against his closed lids; do not rub eyes or move the disk across the cornea.
 - If the disk falls out, rinse it under cool water and reinsert.
30. If the disk is prescribed for both eyes (OU), repeat steps 27–29.
31. Repeat steps 19–21.

30. Ensures both eyes are treated at the same time.

Removing an Eye Medication Disk

32. Repeat steps 4 and 6–10.
33. Remove the disk.
- With nondominant hand, invert the lower eyelid and identify the disk.
 - If the disk is located in the upper eye, instruct the client to close the eye, and place your finger on closed eyelid. Apply gentle, long, circular strokes; instruct client to open the eye. Disk should be located in corner of eye. With your fingertip, slide the disk to the lower lid, then proceed (Figure 29-34D).
 - With dominant hand, use the forefinger to slide the disk onto the lid and out of the client's eye.
34. Remove gloves; wash hands.
35. Record on the MAR the removal of the disk.

- Exposes the disk for removal.

34. Reduces transmission of microorganisms.
35. Provides documentation that the disk was removed.

head during instillation (Figure 29-36). Although the nose is considered a clean (not sterile) cavity, because of its connection with the sinuses, the nurse uses medical asepsis when performing nasal instillations. See Procedure 29-11 for administering nasal instillations.

Nebulizers (inhalers) are used to deliver a fine mist containing medication droplets. The nurse should administer or assist clients with the usage of atomizers and aerosols:

- Instruct the client to clear the nostrils by blowing the nose.
- Client should be in an upright position with head tilted back slightly.

Atomizer

- Occlude one nostril to prevent air from entering the nasal cavity and to allow the medication to flow freely in the open nostril.

- Insert the atomizer tip into the open nostril and instruct the client to inhale, then squeeze the atomizer once, and instruct the client to exhale.

Aerosol

- Shake the aerosol well before each use.
- Grasp between thumb and index finger and insert the adapter tip into one nostril while occluding the other nostril with a finger, then press the adapter cartridge firmly to release one measured dose of medication.
- Repeat the above steps as ordered for the other nostril.
- Instruct the client to keep head tilted backward for 2 to 3 minutes and to breathe through the nose while the medication is being absorbed.

PROCEDURE 29-10

Instilling an Ear Medication

Equipment

- Medication administration record (MAR)
- Cotton-tipped applicator
- Cotton balls

- Medication
- Nonsterile gloves
- Tissue

Action

1. Check with client and chart for any known allergies.
2. Check the MAR against the health care practitioner's written orders.
3. Wash your hands.
4. Calculate the dose.
5. Use the identification armband to properly identify the client.
6. Explain the procedure to the client.
7. Place the client in a side-lying position with the affected ear facing up.
8. Don nonsterile gloves.
9. Straighten the ear canal by pulling the pinna down and back for children or upward and outward for adults (Figure 29-35).

Rationale

1. Prevents the occurrence of hypersensitivity reactions
2. Ensures accuracy in identification of the medication.
3. Reduces the transfer of microorganisms.
4. Ensures the administration of the correct dose.
5. Ensures correct client.
6. Enhances cooperation.
7. Facilitates the administration of the medication.
8. Decreases contact with body fluid.
9. Opens the canal and facilitates introduction of medication. The external ear structures of adults and children are different. If the ear canal is not straightened properly, medication may not reach the deep inner ear structures.

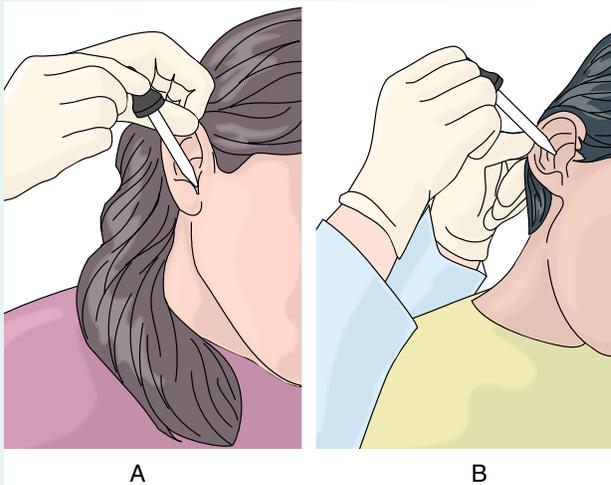


Figure 29-35 To instill eardrops, position client on the side. A. For an adult, pull the pinna up and outward. B. For a child, pull pinna down and back.

10. Instill the drops into the ear canal by holding the dropper at least 1/2 inch above the ear canal.
11. Ask the client to maintain the position for 2 to 3 minutes.

10. Prevents injury to the ear canal.
11. Allows for distribution of the medication.

(continues)

PROCEDURE 29-10

Instilling an Ear Medication (continued)*Action*

12. Place a cotton ball on the outermost part of the canal.
13. Wash hands.
14. Document the drug, number of drops, time administered, and the ear medicated.
15. Evaluate the condition of the skin in the outer ear between instillations.

Rationale

12. Prevents the medication from escaping when the client changes to a sitting or standing position.
13. Reduces the transmission of microorganisms.
14. Documenting the actions of the nurse will reduce the number of medication errors.
15. Determines possible skin reaction.

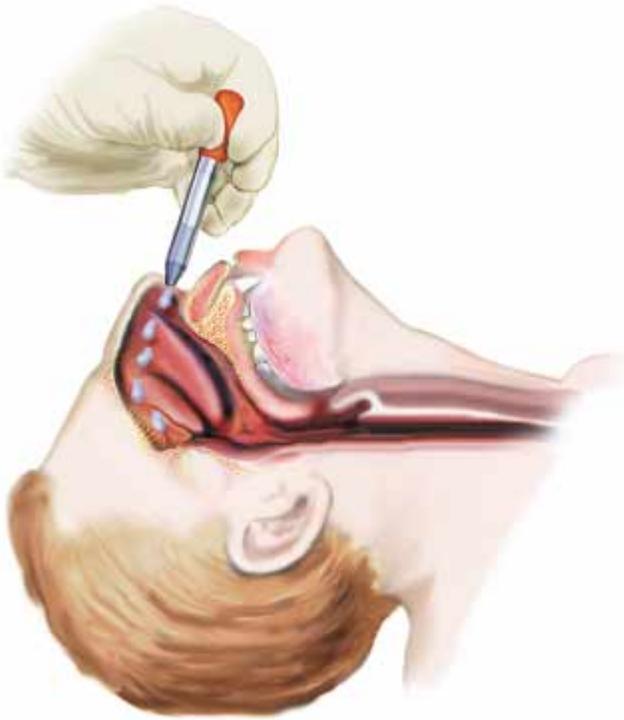


Figure 29-36 Positioning a Client for Nose Drop Instillation

When the client is discharged with a nasal inhaler, the nurse should teach the client how to store and use the device.

Teach Use of Respiratory Inhalants

Respiratory inhalants are delivered by devices that produce fine droplets that are inhaled deep into the respiratory tract. These medication droplets are absorbed almost immediately through the alveolar epithelium into the bloodstream. This chapter addresses only oropharyngeal hand-held inhalers. See Chapter 28 for general anesthetic inhalants and Chapter 31 for a complete discussion of oxygen.

Oropharyngeal hand-held inhalers deliver medications that produce both local and systemic effects, such

as bronchodilators and mucolytics. Bronchodilators improve airway patency and are used to prevent or treat bronchospasms, asthma, and allergic reactions. Mucolytics are used to liquify tenacious (thick) bronchial secretions. There are three types of oropharyngeal hand-held inhalers: metered-dose inhaler, turbo-inhaler, and the nasal inhaler (previously discussed).

Clients must be able to form an airtight seal around the inhaling devices and be able to assemble the turbo-inhaler. This requirement prevents some clients, such as clients with visual or coordination impairments, from using these devices. Bronchodilators are contraindicated in clients who have a history of tachycardia.

The nurse should ensure that the client knows how to use the inhaler correctly so that the prescribed medication dose is delivered. See Procedure 29-12 for teaching a client how to use a metered-dose inhaler.

A metered-dose inhaler delivers a measured dose of the medication with each push of the canister. The nurse needs to evaluate the client's ability to adequately compress the inhaler to deliver a full dose and to inhale at the same time as the dose is expressed. Failure to do either could prevent the client from receiving the full benefit of the inhaler. The ability to compress the inhaler for dose delivery can be affected by hand strength (which diminishes with age), flexibility (as in arthritic changes), and disease related to weakness (such as chronic respiratory disease). Careful discharge instructions and observation of the client performing the task are important to continued therapeutic effect at home (see the accompanying display for home care application).

Rectal Instillations

Rectal instillations can be in the form of enemas, suppositories, and ointments. See Chapter 39 for a complete discussion of enema administration. Rectal ointments are used to treat local conditions and

PROCEDURE 29-11

Instilling Nose Drops

Equipment

- | | |
|--|---------------------|
| ■ Medication administration record (MAR) | ■ Nonsterile gloves |
| ■ Medication with dropper | ■ Tissue |
| ■ Emesis basin (optional) | |

*Action**Rationale*

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Check with the client and chart for any known allergies. 2. Check the MAR against health care practitioner's written order. 3. Wash hands. 4. Check client's identification armband. 5. Explain the procedure to the client and provide privacy. 6. Instruct client to blow nose unless contraindicated by client condition (such as recent nosebleed). 7. Explain that the client may feel a burning sensation to the mucosa or a choking sensation, or both, as the drop trickles back into the throat. 8. Place the client in a supine position and hyperextend the neck. Position the head to the site that facilitates the drops' reaching the expected site, as shown in Figure 29-36. 9. Instruct the client to breathe through his or her mouth. 10. Squeeze some medication into the dropper. 11. Insert the nasal drops about 3/8 inch into nostril, keeping the tip of the dropper away from the sides of the nares. Instill the prescribed dosage of medication and observe the client for signs of discomfort. 12. Instruct the client to remain supine for 5 minutes. 13. Discard any unused medication remaining in the bottle. 14. Return the client to a comfortable position and provide the client with the emesis basin and tissue to expectorate any medication that flows into the oropharynx and mouth. 15. Remove gloves and wash hands. 16. Record on the MAR the drug given, number of drops instilled, and nostril medicated. 17. Observe the patient for side effects for 30 minutes after administration. | <ol style="list-style-type: none"> 1. Prevents the occurrence of hypersensitivity reactions. 2. Ensures accuracy in identification of medication. 3. Reduces transfer of microorganisms. 4. Accurately identifies client. 5. Reduces anxiety and enhances collaboration. 6. Removes mucus and secretions that might block medication absorption. 7. Understanding what to expect reduces anxiety and enhances cooperation. 8. Proper position provides access to passages and helps medication reach the appropriate site. 9. Helps prevent aspiration of drops into the lungs. 11. Prevents contamination of the dropper. 12. Prevents medication from leaking out of the nose prematurely. 13. Prevents contamination of medication in the the dropper. 14. Restores client comfort. 15. Reduces spread of microorganisms. 16. Provides documentation that the medication was given. 17. Drugs given onto the mucosa can be systemically absorbed, causing an adverse reaction. |
|---|---|

PROCEDURE 29-12

Teaching Self-administration with a Metered-dose Inhaler

Equipment

- | | |
|--|-------------------------------------|
| ■ Medication administration record (MAR) | ■ Wash basin or sink to rinse mouth |
| ■ Inhaler | ■ Tissue (optional) |
| ■ Nonsterile gloves | |

Action

1. Check with the client and the chart for known allergies or medical conditions that would contraindicate the use of the drug.
2. Gather necessary equipment.
3. Check the MAR against written health care practitioner orders.
4. Wash your hands.
5. Follow the five rights of medication administration. Check the client's identification band.
6. Review with the client the purpose of each prescribed medication.
7. Allow the client to hold and manipulate the canister. Explain how the canister fits into the inhaler. Have the client demonstrate insertion of the canister.
8. Explain metered-dose concept to client, and discuss frequency of prescribed medications.
9. Explain that the inhaler must be shaken before each use.
10. Remove the mouthpiece and cap from the bottle and insert the stem into the small hole on the flattened portion of the mouthpiece.
 - Client should grasp the inhaler with thumb and first two fingers.
11. Instruct the client to exhale, place the mouthpiece into the mouth, and ensure that the lips form a tight seal around the mouthpiece (Figure 29-37A).
12. Instruct the client to firmly push the cylinder down against the mouthpiece only once (Figure 29-37B), while slowly inhaling until the lungs feel full.
13. Ask the client to remove the mouthpiece while holding breath for about 10 seconds and then to exhale slowly through pursed lips.

Rationale

1. Prevents occurrence of adverse reactions.
2. Promotes efficiency.
3. Ensures accuracy in identification of medication.
4. Reduces the transmission of microorganisms.
5. Ensures correct client.
6. Some clients have several inhalants ordered and need to be taught the correct sequence. For example, fast-acting bronchodilators (albuterol sulfate) are taken before slower acting bronchodilators (ipratropium bromide).
7. Nurse can assess client's ability to manipulate inhaler, and client can become more comfortable with task.
8. Client needs to understand dangers of overuse related to adverse reactions.
9. Medication must be mixed with aerosol propellant to ensure correct dosage of medication.
 - Proper hand position facilitates use of the inhaler.
11. Tight seal prevents escape of medication.
12. Releases the medication; as client inhales medication is distributed into the airway.
13. Allows the medication to reach the alveoli.

(continues)

PROCEDURE 29-12

Teaching Self-administration with a Metered-dose Inhaler (continued)

Action

Rationale



A.



B.



C.

Figure 29-37 Self-administration with a Metered-dose Inhaler. A. Insert mouthpiece into mouth, forming a tight seal with the lips. B. Push the cylinder down and inhale. C. Aerochamber and Nebulizer Medications

- If the client had difficulty coordinating the inhalation and medication dispensing, an aerochamber may be added (Figure 29-37C).
14. Repeat doses as ordered, waiting 1 minute between puffs.
 15. Inform client that a mouthwash can be used to remove the taste of the medication.
- An aerochamber provides dead space for the medicated mist while the client inhales slowly and deeply.
14. Allows for maximal absorption and effect of first dose before another is taken.
 15. Promotes client comfort.

(continues)

PROCEDURE 29-12

Teaching Self-administration with a Metered-dose Inhaler (continued)

Action

16. Show client how to wash the mouthpiece under tepid running water to remove secretions.
17. If two or more metered-dose medications are ordered, wait 5–10 minutes between inhalations or as specifically ordered by the health care practitioner.
18. Record on the MAR the drug's name, dose, date, and time of medication.
19. Observe for effectiveness of the medication and relief of client symptoms.

Rationale

16. Accumulation of medication around mouthpiece can interfere with delivery of next metered dose.
17. Drugs must be inhaled sequentially to maximize therapeutic effect.
18. Provides documentation that medication was given.
19. Evaluates effectiveness of medication.

APPLICATION: HOME CARE

Considerations for Use of Nasal Inhalers

- Provide the client with the manufacturer's directions for the specific type of inhaler, such as how to replace a medication cartridge for a nasal aerosol.
- Inhalers should be stored at room temperature.
- Aerosols are prepared under pressure and should not be punctured or placed in an incinerator.
- Instruct the client not to allow other people to use the inhaler.
- Caution the client about overuse that could cause a rebound effect, making the condition worse.
- Ensure that the client is knowledgeable about the expected and adverse effects of the drug. Some of these drugs do not produce therapeutic effects for several days, and some require 2 weeks of continuous use before the drug effects appear.
- Provide the client with a telephone number to call if assistance is needed.

symptoms such as pain, inflammation, and itching caused from hemorrhoids. Rectal suppositories are cone-shaped masses of substances designed to melt at body temperature and to produce the intended effect at a slow and steady rate of absorption.

Suppositories provide a safe and convenient route for administering drugs that interact poorly with digestive enzymes or have a bad taste or odor. They are also used to provide temporary relief for clients who cannot tolerate oral preparations: for example, to relieve nausea and vomiting. Suppositories are also used to induce relaxation, relieve pain and local irritation, reduce fever, and stimulate peristalsis and defecation in clients who are constipated.

Rectal suppositories are contraindicated in cardiac clients because insertion may stimulate the vagus nerve,

causing cardiac dysrhythmias (abnormal heart patterns). These drugs are also avoided in clients recovering from rectal or prostate surgery because they may cause pain on insertion and trauma to the tissues.

The nurse should assess the rectum for irritation or bleeding and check sphincter control. Some clients may experience problems in retaining the suppository. The nurse should instruct such a client to remain in the Sims' position for at least 15 minutes or should place the client on the abdomen, if the condition allows, and hold the buttocks closed. The health care practitioner should be notified when the client is unable to retain a suppository so that another route can be ordered.

Suppositories are often stored in the refrigerator to preserve the integrity of the drug form. A softened suppository is difficult to insert; to harden a suppository, place it under cold running water while it is still in its original wrapper. The nurse should follow the five rights of medication administration and Standard Precautions when administering rectal instillations. See the Procedure 29-13 for the procedure on inserting a rectal suppository.

Vaginal Instillations

Medications inserted into the vagina are in the form of suppositories, creams, gels, ointments, foams, or douches. These medications may be used to treat inflammation, infections, and discomfort, or as a contraceptive measure.

NURSING ALERT

Tampon Use

Clients should be instructed not to use tampons after the insertion of vaginal medications because the tampon can absorb the medication and decrease the drug's effect.

PROCEDURE 29-13

Administering a Rectal Suppository

Equipment

- | | |
|---|---------------------|
| ■ Medication administration record (MAR) | ■ Nonsterile gloves |
| ■ Prescribed rectal suppository | ■ Tissue |
| ■ Water-soluble lubricant (such as K-Y jelly) | ■ Bedpan (optional) |

Action

Rationale

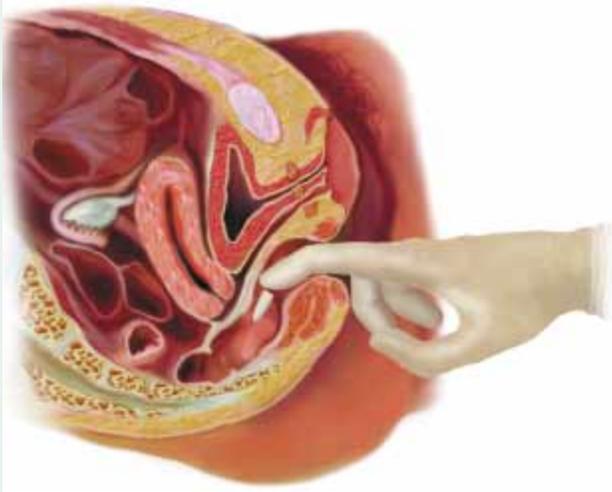
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| <ol style="list-style-type: none"> 1. Check with client and the chart for any known or medical conditions that would contraindicate use of the drug. 2. Gather necessary equipment. 3. Check MAR against written health care practitioner orders. 4. Wash your hands 5. Check the client's identification armband. 6. Ask client if he or she needs to void. 7. Explain procedure to client. 8. Don nonsterile gloves. 9. Place the client in the Sims', left-lateral position, with the upper leg flexed. 10. Fold back the bed linen to expose the rectum. 11. Open the package of lubricant and remove the foil wrapper from the suppository. Read the manufacturer's instructions on the wrapper for the recommended time interval the client should retain the suppository after insertion. 12. Apply a small amount of lubricant to the smooth rounded end of the suppository to reduce mucosal irritation. Lubricate the gloved index finger. 13. Instruct the client to breathe through the mouth. 14. Insert the suppository into the rectal canal beyond the internal sphincter, about 4 inches (10 cm) for an adult and 2 inches (5 cm) for a child (Figure 29-38). Avoid inserting the suppository into feces. 15. Withdraw the finger and wipe the anal area with tissue. 16. Instruct the client to remain in bed for 15 minutes and to resist urge to defecate. 17. Remove gloves, turning them inside out; dispose of gloves; wash hands. | <ol style="list-style-type: none"> 1. Prevents occurrence of adverse drug reaction. 2. Promotes efficiency. 3. Ensures accuracy in identification of the medication. 4. Reduces the transmission of microorganisms. 5. Ensures correct client. 6. Client will have to remain in bed after insertion of suppository. 7. Enhances cooperation. 8. Decreases contact with body fluids. 9. Exposes anus and helps rectal sphincter relax. 10. Provides privacy. 11. Manufacturer's instructions provide important information as part of the instructions for the client. 12. Lubricant facilitates insertion and reduces friction or pain as the suppository is inserted into rectum. 13. Relaxes sphincter and reduces chance of pain. 14. Prevents the suppository from slipping out. Suppository must be placed next to mucosa to facilitate absorption and enhance therapeutic action of the drug. 15. Provides comfort. 16. Allows medication to be absorbed and prevents expulsion of the suppository. 17. Reduces transmission of microorganisms. |
|--|--|

(continues)

PROCEDURE 29-13

Administering a Rectal Suppository (continued)

Action



Rationale

Figure 29-38 Administering a Rectal Suppository

- | | |
|--|--|
| <p>18. Record on the MAR the name of the drug, dosage, route, and time of administration.</p> <p>19. Observe for effect of suppository after administration.</p> | <p>18. Provides documentation that medication was given.</p> <p>19. Evaluates effectiveness of medication.</p> |
|--|--|

Vaginal creams, gels, or ointments usually come with a disposable tubular applicator with a plunger to insert the drug. Standard Precautions are always used by the nurse when inserting suppositories. Body temperature causes the suppository to melt and be absorbed. Suppositories are usually inserted with the index finger of a gloved hand; however, small suppositories may come with an applicator and the suppository is placed in the applicator's tip. Many clients prefer to insert their own vaginal suppository. In this case, provide privacy for the client. See Procedure 29-14 for the procedure on instilling a vaginal suppository. After insertion of these preparations, the client may notice drainage and should be informed that this is expected. If a suppository is given to treat infection, tell the client that the drainage may be foul smelling. The nurse should advise the client to wear a perineal pad to prevent soiling of the underpants.

Sterile technique is usually required by agency policy, especially if there is an open wound when administering a vaginal douche (irrigation). Douches are ordered to apply antimicrobial solutions, to remove offensive or irritating discharge, to reduce inflammation, and to prevent hemorrhage with warm or cold irrigations. The nurse should ensure that the client does not have an allergy to iodine because many vaginal preparations contain povidone-iodine.

Complementary Therapy

The practice of healing has always incorporated the use of herbs as medicines. The World Health Organization recognizes that of 119 plant-derived pharmaceutical medicines, about 74% are used in modern medicine in ways that are correlated directly with their traditional uses as plant medicines by native cultures (Goldberg, 1999). An estimated 25% of all pharmaceuticals are derived directly from plants (White & Foster, 2000): for example, quinine (an extract from the South American *cinchona*) is used to treat malaria; digitalis, which comes from foxglove, is an inotropic drug used to treat congestive heart failure; the active components of periwinkle, vinblastine and vincristine, are used in the treatment of certain cancers (Cassileth, 1998).

Herbal medicine, also known as botanical medicine or, in Europe, as phytotherapy or phytomedicine, refers to the use of a plant or plant part to make medicine, food flavors, or aromatic oils for soaps and fragrances. An herbal medicine can come from a leaf, a flower, a stem, a seed, a root, a fruit, bark, or any other plant part. Herbs are often used to season foods (culinary herbs) or to maintain or restore health (medicinal herbs).

The traditional use of herbs was based on trial and error. The process of discovery produced both positive

PROCEDURE 29-14

Administering a Vaginal Suppository*Equipment*

- | | |
|--|---------------------------|
| ■ Medication administration record (MAR) | ■ Nonsterile gloves |
| ■ Prescribed vaginal suppository | ■ Water-soluble lubricant |
| ■ Disposable applicator | ■ Tissue |

*Action**Rationale*

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Check with the client and the chart for known allergies or medical conditions that would contraindicate the use of the drug. 2. Gather necessary equipment. 3. Check the MAR against written health care practitioner orders. 4. Wash your hands. 5. Follow the five rights of medication administration. Check the client's identification band. 6. Ask the client to void. 7. Position the client in a dorsal recumbent position with knees flexed and hips rotated laterally or in a Sims' position if the client cannot maintain the dorsal recumbent position. 8. Don nonsterile gloves. 9. Explain procedure to patient. If client plans to self-administer, be very specific with instructions. Provide for privacy. 10. Assess perineal area, inspect vaginal orifice, note any odor or discharge from the vagina, and inquire about any problems such as itching or discomfort. 11. If secretion or discharge is present, cleanse the perineal area with soap and water. 12. Remove suppository from the foil wrapper and, if applicable, insert into applicator tip. Apply a small amount of lubricant to rounded tip of suppository. If not using an applicator, apply a small amount of lubricant to gloved index finger. 13. With nondominant hand, spread labial folds. Insert the suppository into the vaginal canal at least 2 inches (5 cm) along the posterior wall of the vagina or as far as it will go (Figure 29-39). If using an applicator, insert as described above and depress plunger to release suppository. | <ol style="list-style-type: none"> 1. Prevents occurrence of adverse reactions. 2. Promotes efficiency. 3. Ensures accuracy in identification of medication. 4. Reduces the transmission of microorganisms. 5. Ensures correct client 6. A full bladder may cause discomfort and injury to vaginal lining when suppository is inserted. 7. Provides good access to vaginal canal, facilitating insertion of suppository, and allows suppository to dissolve without becoming dislodged. 8. Decreases contact with body fluids. 9. Promotes understanding and ensures cooperation. 10. Assessment data provide a baseline for monitoring the effectiveness of the medication. 11. Prevents introduction of microorganism into vagina. 12. Facilitates insertion; reduces mucosal irritation. 13. Exposes vaginal orifice. Proper placement ensures equal distribution of medication and prevents medication from slipping out. |
|--|--|

(continues)

PROCEDURE 29-14

Administering a Vaginal Suppository (continued)

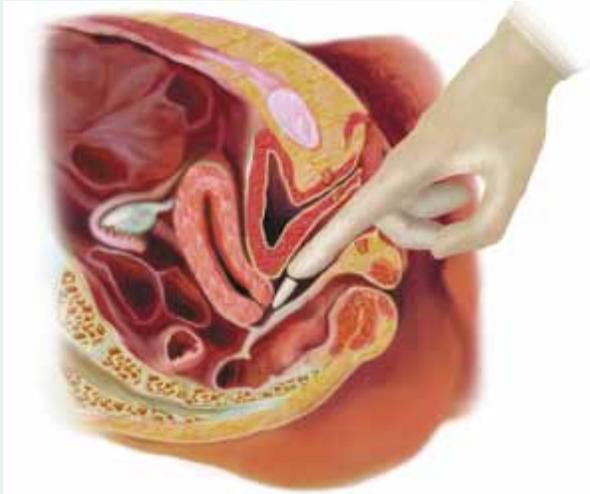
Action*Rationale*

Figure 29-39 Administering a Vaginal Suppository along the Posterior Wall of the Vagina

- | | |
|---|--|
| <p>14. Wipe the perineum with clean, dry tissue.</p> <p>15. Instruct the client to remain in bed for 15 minutes.</p> <p>16. Wash applicator under cool running water to clean (warm water promotes coagulation of protein secretions) and return to appropriate storage in the client's room.</p> <p>17. Remove gloves, turning them inside out; dispose of gloves in the proper receptacle. Wash hands.</p> <p>18. Record on the MAR the drug's name dosage, route, and date and time of administration; document any evidence of discharge or odor from the vagina.</p> <p>19. Check with the client in 15 minutes to ensure that the suppository did not slip out and to allow the client to verbalize any problems or concerns.</p> <p>20. Observe for effectiveness of the medication; inspect the condition of the vaginal canal and external genitalia between applications.</p> | <p>14. Promotes client comfort.</p> <p>15. Promotes absorption of suppository.</p> <p>16. Vaginal cavity is not sterile. Washing will assist in removal of bacteria and residual lubricant or medication.</p> <p>17. Reduces transfer of microorganisms.</p> <p>18. Provides documentation that medication was given.</p> <p>19. Decreases client anxiety.</p> <p>20. Evaluates effectiveness of medication.</p> |
|---|--|

and negative results since many herbs contain poisonous substances that counteract the main ingredients for which they might be taken (Cassileth, 1998). **Pharmacognosy** (the study of the biochemical aspects of natural products) seeks to standardize herbal products so that they consistently include the same amount of

active ingredients and are free of any harmful components that the plant may contain.

Herbs are classified by the U.S. government as dietary supplements (vitamins, minerals, enzymes, hormones, amino acids, and other nutritional products). Congress passed the Dietary Supplement Health and Educational

NURSING CARE PLAN**The Client with Deep Vein Thrombosis****Case Presentation**

Mrs. Landry, a 45-year-old, was admitted to your floor with a diagnosis of deep vein thrombosis. The client noticed swelling of her left leg about a week ago but decided to treat it at home. Four days later, the lower leg was very edematous, warm, and painful to move. After an office visit, the client was admitted to the hospital. This is Mrs. Landry's first hospitalization. On examination you find that the left leg is warmer than the right. The left thigh circumference is 3 inches larger than the right. The physician ordered a heparin IV drip after a loading dose bolus was given. The drip contained 10,000 units heparin in 500 ml of D5W at 10 ml/h (200 units/h). The physician anticipates that Mrs. Landry will be weaned off of the heparin drip and started on subcutaneous heparin within 5 days. At the time of discharge she will be given coumadin.

Assessment

- Edematous left thigh
- Left leg warmer to touch than right
- Left thigh circumference 3 inches larger than right

Nursing Diagnosis #1

Ineffective Tissue Perfusion related to the development of venous thrombi in the deep femoral vein.

Expected Outcomes

The client will:

1. Report an absence of pain.
2. Demonstrate an absence of edema.
3. Experience the same degree of skin temperature in both legs.

Interventions/Rationales

1. Maintain on bed rest.
Reduces the possibility of embolus; may decrease the pain and swelling.
2. Elevate the legs above the heart.
Elevation facilitates venous return and decreases the edema.
3. Measure the circumference of the left thigh and compare with that of the right thigh.
Measuring the circumference provides a quantitative reference point that can be used to evaluate the swelling.
4. Apply moist heat to the affected extremity.
Heat provides an analgesic effect; it decreases venospasms and pain.
5. Administer the heparin drip at 200 units/h.
Heparin prevents the conversion of fibrinogen to fibrin and prothrombin to thrombin, thereby limiting the extension of the thrombus.
6. Monitor the partial thromboplastin time (PTT).
The partial thromboplastin time is used to monitor heparin therapy because heparin, a short-acting anticoagulant, increases the PTT.

Nursing Diagnosis #2

Injury, Risk for, bleeding related to the administration of an oral anticoagulant.

Expected Outcomes

The client will:

1. Not demonstrate evidence of bleeding from gums or nose, in urine or stool, or under the skin.
2. Maintain the prothrombin time (PT) or international normalized ratio (INR) within therapeutic range.

(continues)

NURSING CARE PLAN

The Client with Deep Vein Thrombosis (continued)

Interventions/Rationales

1. Advise the client to withhold the medication in the event that bleeding occurs and to notify the physician immediately. *The dose may need to be adjusted.*
2. Encourage the client to discontinue smoking. *Smoking has a tendency to increase the metabolism of the medication necessitating an increase in the dose.*
3. Advise the client to watch food intake. *Foods high in fat and foods rich in vitamin K can interfere with the PT.*
4. Warn against taking oral contraceptive medication. *There may be a decrease in anticoagulant effect due to the increased production of clotting factors with oral contraceptives.*
5. Warn against taking aspirin and other over-the-counter medications. *Aspirin may increase the risk of bleeding; it inhibits platelet formation.*

Evaluation

Resolution of the signs and symptoms of deep vein thrombus is a measurement of success. The client will be able to ambulate without difficulty, and the swelling, temperature difference, and pain will disappear. The client will be knowledgeable about taking the oral anticoagulant on discharge. Discharge follow-up will be needed to monitor the client's progress on the oral anticoagulant.

Act of 1994 (DSHEA) and “grandfathered” most botanical products as a new class of products known as dietary supplements. Although dietary supplements are not regulated by the FDA, product labeling of herbal medicines is restricted to structure and function claims. Manufacturers can indicate on a product label how the herb can affect a normal body structure or function, but promotional material and packaging cannot claim to treat or prevent a disease. For example, a product label for ginkgo can say “increases microcirculation in the brain,” but it cannot say “cures early-stage Alzheimer’s” or “alleviates tinnitus” even though there is research to support the effectiveness of standardized ginkgo extracts in the treatment of these diseases.

Herbs and supplements are regulated by other organizations such as the American Botanical Council (ABC), the American Herbal Products Association (AHPA), and the Natural Nutritional Foods Association (NNFA). The ABC promotes the safe and effective use of medicinal plants by educating the public, government agencies, research institutions, industry, and the media on the scientific research that can guide decisions about producing and consuming herb-based products that benefit health and well-being. The AHPA is a group of herbalists, researchers, and manufacturers that created a code of ethics that members adhere to and releases product safety alerts regarding adulteration—that is, contamination with an unlabeled substance—of herbal products. The AHPA publishes the *Botanical Safety Handbook*, a reference on the safe and effective use of herbs. The NNFA is a group of manufacturers and retailers concerned with product quality and truth in packaging and advertising. The NNFA supports a True Label Program to ensure that products produced by its members actually contain what their labels claim.

It is estimated that 1 out of every 3 Americans uses one or more herbal products (White & Foster, 2000). Although herbal medicines generally have fewer and far milder side effects than drugs, problems can arise if they are used improperly or in combination with drugs. Nurses need to know which herbs can alter the activity of certain drugs. For example, garlic and ginkgo may increase the effects of blood thinners, whereas goldenseal, Oregon grapefruit, and barberry may counteract short-acting blood thinners. Refer to Chapter 14 for additional information on the safe, effective use of herbal medicines.

EVALUATION

The nurse is responsible for the ongoing evaluation of the client's response to medication. This evaluation requires knowledge of the therapeutic action of drugs and of the side effects and adverse reactions that can occur. Changes in a client's health status can change the way a client responds to medications. For example, clients who develop renal failure do not excrete medications well, and medications can build up within their system. Nurses need to assess for changes in clients' responses to medication. Nurses in the community setting need to evaluate their clients' ongoing ability to manage their own medication regimens. They can discuss the regimen with the client and the family, observe client technique (as in self-administration of injections), and take physiological measures such as blood pressure readings. The nurse uses all information gathered through any source as a way of determining if the intended interventional outcomes are met.

The nurse who identifies a potential medication risk and initiates actions to prevent client injury is perform-

ing another form of evaluation. For example, if the client in the home setting cannot remember if the prescribed medications have been taken, providing the client with a daily or weekly pill box that is filled when the nurse is present prevents the client from taking too much medication or failing to take the dose as ordered.

KEY CONCEPTS

- The *United States Pharmacopeia and National Formulary* outline drug standards for usage in the United States.
- The Food and Drug Administration tests all drugs for toxicity before granting a company the right to market a drug.
- Drugs are usually referred to by their trade (company) or generic (nonproprietary) name.
- The oral administration route is the safest and least expensive administration route, although it is also the slowest to act.
- Parenteral drugs are injected through intradermal (ID), subcutaneous (SC or SQ), intramuscular (IM), or intravenous (IV) routes and are typically fast-acting drugs.
- The pharmacokinetics of drugs includes absorption, distribution, metabolism, and excretion.
- Safe drug administration is facilitated by following the five rights: right drug, right dose, right client, right route, and right time.
- Nurses are both morally and legally responsible for correct administration of medications; this includes following institutional policy, considering clients' desires and abilities, fostering compliance, and correctly documenting all actions related to medication administration and medication errors.
- Drug abuse is a common problem, both in society and in the health care professions; nurses have a responsibility to report addicted colleagues so that they can find resources to help overcome their addictions.
- Before administering medications, the nurse must thoroughly assess the client's drug history, medical history, and psychosocial factors that may affect drug acceptance and compliance.
- Oral medications should be poured and measured at eye level to ensure accuracy.
- Although the health care practitioner will determine the dose and route of a parenteral drug, the nurse is responsible for choosing the correct gauge and length of the needle to be used.
- The nurse must always carefully monitor client reactions to medications and ensure that clients are appropriately educated as to the actions, side effects, and contraindications of all medications they are receiving.

CRITICAL THINKING ACTIVITIES

1. Mrs. Adams is a 76-year-old client being discharged from the hospital with cancer of the lungs. Mrs.

Adams elected not to have surgery and was given her first chemotherapy before discharge. She is not accustomed to taking medications. Before the onset of symptoms that necessitated her admission to the hospital, Mrs. Adams considered herself in good health, only bothered with the discomfort of arthritis in her hands. She is being discharged on the following medications:

- Sulfamethoxazole (sulfonamide anti-infective) 500 mg/5 ml susp PO b.i.d.
- Ganisetron (antiemetic) 1 mg PO q12h
- Morphine 30 mg PO q4h, prn for pain

Describe the nursing interventions that should be included in Mrs. Adams's discharge teaching relative to medication self-administration and other appropriate nursing actions.

2. A client receiving doxycycline, a tetracycline, 100 mg PO daily should avoid which of the following food groups?

Group A	Group B	Group C
Beef liver	Almonds	Aged meat
Brussels sprouts	Buttermilk	Avocados
Cabbage	All cheese	Caffeine
Oils	Pizza	Chicken liver
Kale	Yogurt	Cola drinks
Arugula	Ice cream	Raisins
Spinach	Milk	Soy sauce

3. The health care practitioner writes the order for the client to drink 2 L/24 h. How should the nurse explain this volume of liquid to the client?
4. How would you solve the following problem? The health care practitioner wrote the following medication order: Dilantin 100 mg, PO, t.i.d. In the process of preparing the medication, the nurse noticed that the medication was available in 50-mg tablets only. To calculate the correct dosage the nurse used the following formula:

$$\frac{\text{Dose ordered}}{\text{Dose on hand}} \times \text{Amount on hand} = \text{Amount to administer}$$

$$\frac{100 \text{ mg}}{50 \text{ mg}} \times 1 \text{ tablet} =$$

5. A health care practitioner orders Tylenol PO for an elevated temperature. The child weighs 22 lb (10 kg). The body surface area is 0.30 m². The normal adult dose is 325 mg. Use the nomogram to calculate the following problem.

$$\text{Child's dose} = \frac{\text{Surface area of child}}{1.7 \text{ m}^2} \times \text{Adult dose}$$

$$\text{Child's dose} = \frac{0.30 \text{ m}^2}{1.7 \text{ m}^2} \times 325 \text{ mg} =$$

WEB RESOURCES

Addiction Research Foundation

www.arf.org

Alternative Therapies in Health and Medicine

www.alternative-therapies.com

American Association of Integrative Medicine

www.holisticmedicine.org

American Botanical Council

www.herbalgram.org

American Council for Drug Education

www.acde.org

Drug Enforcement Administration

www.usdoj.gov/dea

International and National Pharmacopoeias

www.pharmacopoeia.org

National Association of Boards of Pharmacy

www.nabp.net

National Institute on Drug Abuse

www.nida.nih.gov

National Integrative Medicine Council

www.nimic.org

Pharmacopoeia Online

www.pharmacopoeia.com

Substance Abuse Resource Center: Robert Wood
Johnson Foundation

www.substanceabuse.rwjf.org

U.S. Consumer Product Safety Commission

www.mcohnecpse.gov

U.S. Food and Drug Administration

www.fda.gov/default.htm

Chapter 30

Responding to the Needs of the Perioperative Client



Life's not just living, it's living in health.

—Guterman (1960)

COMPETENCIES

1. Discuss the three phases of the perioperative experience in relation to the client's expected outcomes and the major functional roles of the nurse.
2. Assess the physiological, psychological, social, cultural, spiritual, and age-related aspects of the perioperative client's health status.
3. Recognize sociocultural and ethical factors that affect decision making in planning care with the perioperative client.
4. Demonstrate an awareness of age-related functions and values when assessing and teaching clients.
5. Plan, implement, and evaluate the nursing care outcomes for perioperative clients in various health care settings.
6. Document nursing interventions that achieve the individualized expected outcomes for perioperative clients.
7. Describe essential components of discharge teaching for the perioperative client.

KEY
TERMS

anesthesia
arthroplasty
continuous passive motion
(CPM) device
Cullen's sign
extubation
incentive spirometers
intraoperative

intubation
lock-out interval
malignant hyperthermia
patient-controlled analgesia
(PCA)
perioperative
pneumatic compression
device

postoperative
preoperative
pulse oximeter
transcutaneous electrical
nerve stimulation (TENS)
urgency

Periodic **perioperative** refers to the management and treatment of the client during the three phases of surgery: preoperative, intraoperative, and postoperative. The three perioperative phases are designated by time intervals, interventions, and settings, using the word roots of *pre*—before; *intra*—during, and *post*—after. **Preoperative** (before surgery) refers to the time interval that begins when the decision is made for surgery until the client is transferred to the operating room (OR). The **intraoperative** (during surgery) phase begins when the client is transferred to the OR and ends with client transfer to a postanesthesia care unit (PACU). When the client leaves the OR and is taken to a PACU, the **postoperative** (after surgery) phase begins; this phase continues until the client is discharged from the care of the surgeon.

Changes have occurred in perioperative services as a result of advances in technology (such as lasers) and limited resources such as cost-containment measures in health care. These changes have challenged health care providers to be more responsive and cost-effective in delivering perioperative services.

Surgery is a major source of a hospital's income. Although major surgical interventions still occur in the hospital setting, the 1980s introduced a trend to perform surgery in ambulatory settings. Many of the services of the hospital's perioperative departments are now performed in outpatient settings. This change has had a positive impact on decreasing health care costs related to surgery. At the same time, health care providers are challenged to work in greater collaboration to decrease the client's length of stay in the hospital, increase satisfaction with the services, and prevent complications.

Ambulatory surgery clinics (free-standing facilities) also began in the 1980s as an outgrowth of federally regulated reforms from the Health Care Financing Administration (HCFA). HCFA's goal in health care reform was to decrease inpatient costs of services. Except for inpatient hospitalization, ambulatory surgery clinics provide all the services offered by hospitals.

In 1989, HCFA developed a listing of urgent and elective surgeries that require preauthorization for Medicare clients. Preauthorization means the surgery must be approved before surgery is performed to ensure that Medicare and other third-party payers will reimburse the facility for incurred surgical costs.

SURGICAL INTERVENTIONS

Surgery is performed to correct an anatomical or physiological defect or to provide therapeutic interventions. Surgeries are categorized according to the degree of **urgency** (timely intervention of surgery):

1. Emergency surgery requires immediate intervention to sustain life.
2. Urgent surgery dictates intervention as necessary to maintain health in situations that are not life-threatening.
3. Elective surgery is usually performed at a time convenient to the client, with the delay presenting no physiological harm.

Once the degree of urgency is established, the reason for performing the surgical intervention is categorized according to the expected outcome (see Table 30-1).

TABLE 30-1
Surgical Interventions Based on Expected Outcomes

Intervention	Expected Outcome
Diagnostic/exploratory	Determine the origin of presenting symptoms and extent of a disease process (e.g., biopsy)
Reconstructive	Correct a disease process or improve cosmetic appearance (e.g., arthroplasty and rhinoplasty)
Curative	Repair or remove a diseased organ or restore normal physiologic functioning (e.g., amputation or aneurysm repair)
Palliative	Decrease the spread of the disease process to prolong life or to alleviate pain (e.g., colostomy or partial tumor removal)
Transplant	Remove diseased tissue or organ and replace with functioning tissue or organ (e.g., kidney)

In a true emergency, saving the client's life is the primary goal. Stat blood work, including a type and cross-match, is performed while the client and the operating room are prepared for the surgery. Urgent and elective surgeries allow the client and physician time to discuss the setting and scheduling of the surgery.

SETTING

Ambulatory care centers and physician offices are the usual settings for minor surgical procedures, such as removal of skin lesions and laparoscopy for inspection and biopsy. Outpatient surgery areas (one-day surgery centers or free-standing ambulatory clinics) provide the client and physician with alternative services for urgent and elective surgeries.

Outpatient surgical units focus on the needs of the client and strive to expedite the rendering of services with a preadmission visit. Preauthorization documents for Medicare or third-party insurance payers should be processed and approved before the preadmission visit.

During the preadmission visit, the nurse and anesthesiologist perform the preoperative assessment and initiate teaching. Diagnostic tests are performed in the outpatient surgical unit as opposed to the traditional process of having a client go to the various hospital departments for testing. Performing diagnostic testing in this fashion promotes a sense of caring for the client's needs and decreases the preadmission time.

On the day of surgery, clients who have been preadmitted go directly to an outpatient surgical unit, where they are prepared for surgery. Family members are encouraged to remain with the client while the client awaits transfer to the operative area.

Perioperative care is initiated for the hospitalized client when the decision is made for surgery. The client is reassessed and the nurse collaborates with the client in planning the care. Client and family teaching is begun as soon as possible to allow time to reinforce the teaching.

Preparing a client for a surgical procedure requires the collaboration of many professionals. Specific role responsibilities focus on assessment, client and family teaching, and interventions to promote client achievement of expected outcomes.

PERIOPERATIVE MANAGEMENT OF CARE

Effective perioperative management is directed by a multidisciplinary team in accordance with recognized standards of care and individualized expected client outcomes. Institutional protocol, which defines how procedures will be performed, is initiated in the preoperative phase and continues throughout the other phases.

Each member of the health care team (surgeon, anesthesiologist, and nurse) has a specific role and responsi-

bility toward the perioperative client. Collaboration between all health care providers is essential in planning client care. "Collaboration means that people with different areas of expertise are working as equals to define issues, design solutions, and achieve high quality outcome" (Rubenfeld & Scheffer, 1999, p. 352).

Surgeon Responsibilities

Physicians are credentialed by health care facilities to perform surgery. The surgeon is the primary physician the nurse communicates with regarding client care needs. Before surgery, the surgeon:

- Determines the need for the surgical intervention on the basis of the client's medical diagnosis and findings from the medical history and physical examination
- Determines the surgical setting in collaboration with the client
- Orders diagnostic tests only if directly correlated to the procedure or client diagnosis (see the accompanying display)
- Obtains client's consent for the surgical procedure
- Teaches the client about the outcomes and risks of the procedure

COMMON DIAGNOSTIC TESTS

- Urinalysis
- Complete blood count (CBC)
- Prothrombin time (PT) and partial thromboplastin time (PTT): Clients with known or suspected coagulation defects or to establish baseline information
- Chemistry profile: Clients with diseases that can alter electrolytes
- Electrocardiogram (ECG)
- Human immunodeficiency virus (HIV) testing: In accordance with agency policy
- Chest x-ray films: Clients over age 60 years, smokers, or those scheduled for general anesthesia

A major role function of the surgeon is *explaining and documenting evidence that the client understands the nature of the surgical procedure, the risk factors, and expected outcomes of the surgery*. This is done with a surgical consent form, the client's written permission to allow the surgeon to provide surgery. Many states, through statutory provisions, require physicians to perform and document client teaching. Once the client demonstrates understanding, the client signs the form, giving permission for the specific surgical intervention.

Anesthesia Provider Responsibilities

The anesthesia provider (anesthesiologist or certified registered nurse anesthetist) actively participates in each perioperative phase. The main role of the

anesthesia provider is to ensure client safety relative to the administration of anesthesia. The anesthesia provider:

- Obtains informed consent for anesthesia services
- Performs a preanesthesia evaluation that includes a thorough history, such as complications from previous anesthesia, and physical examination (American Association of Nurse Anesthetists [AANA], 1999a)
- Selects anesthetic agents
- Teaches the client regarding the anesthetic medications, their side effects, and risk factors
- Performs **intubation** (the insertion of an endotracheal tube into the bronchus through the nose or mouth to ensure an airway) and **extubation** (the removal of an endotracheal tube)

Most surgical procedures have predetermined anesthetic agents based on policy; if there is a variance from the norm, the anesthetist seeks agreement with the surgeon. The decision to use particular anesthetic agents is based on the client's health status, the surgical procedure, and anticipated duration of the surgery.

During the client interview, the anesthesiologist inquires about previous anesthesia experiences that can place the client at risk such as connective tissue abnormalities that suggest the presence of the autosomal dominant malignant hyperthermia (MH) gene. **Malignant hyperthermia** is a potentially lethal syndrome caused by a hypermetabolic state that is precipitated by the administration of certain anesthetic agents, for example, succinylcholine. When appropriate and feasible, medical records from previous surgeries are reviewed as part of the preanesthesia examination.

Nurse Responsibilities

The Association of periOperative Registered Nurses (AORN), formerly called the Association of Operating Room Nurses, promotes quality client care through the development of guidelines and standards of nursing practice. AORN has also developed the Perioperative Nursing Data Set (PNDS) to standardize nursing terminology regarding the perioperative client experience from preadmission until discharge to promote evidence-based practice. The PNDS is the first nursing language developed by a specialty organization that has been recognized by the American Nurses Association.

Perioperative nurses perform critical functions that vary with specific surgical procedures and the unique needs of individual clients to achieve positive client outcomes (Parker, Mimick, & Kee, 1999). Rubenfeld and Scheffer (1999) identified three guiding principles for implementing care based on professional standards: maintain client safety; provide effective care; and provide care as efficiently as possible. These principles are incorporated into each phase of the perioperative standards of nursing practice.

The nurse coordinates the client's care in a timely fashion to ensure safety and avoid surgical delays. Activities include:

- Scheduling the diagnostic tests
- Verifying that all the necessary documents (e.g., signed consent form) are on the client's medical record
- Reporting abnormal diagnostic results to the surgeon. Depending on the test results, treatment may be instituted to correct any abnormalities or the surgery may be canceled

A major part of the nurse's time is spent in preparing and teaching the client. Preoperative teaching is structured to provide planned educational activities to presurgical clients or family (significant others) according to assessed anxiety and fear levels, as discussed later in this chapter.

As technology becomes more sophisticated and health care resources become more limited, ethical issues have become more complex (Schroeter, 1999). Ethical dilemmas are inherent in perioperative nursing such as lack of respect for the client's dignity, withholding information or lying to clients, inadequate consents, incompetent health care providers, and do-not-resuscitate (DNR) orders. These issues have implications for the management of care in perioperative settings. Schroeter (1999) studied the aspects of informed consent and the impaired or incompetent colleague in the perioperative practice setting, and determined that perioperative nurses can accurately identify ethical situations occurring in the environment and that the majority of the participants reported that they would take action. The ethical competency of perioperative nurses is paramount to ensure that safe, competent, and ethical care is provided to all surgical clients.

ANESTHESIA

Anesthesia means the absence of pain. Anesthetic agents render a person insensible to pain during surgical, obstetric, and therapeutic or diagnostic procedures. Anesthesia requires a balancing of several agents to provide sedation, analgesia, muscle relaxation, and anesthesia for procedures of varying complexity. The types of anesthesia and their effects are listed in Table 30-2.

General Anesthesia

General anesthesia refers to the drug-induced state of analgesia, amnesia, muscle relaxation, and unconsciousness. General anesthesia represents a critical experience for surgical clients. The needs of these clients require that perioperative nurses possess knowledge of the basic principles of general anesthesia.

TABLE 30-2
Effects of Anesthetic Agents

Type of Anesthesia	Effects
General anesthesia	<p>Expected result Total unconscious state, placement of a tube into the trachea</p> <p>Technique Intravenous injection or inhalation</p> <p>Risks Mouth or throat pain, hoarseness, injury to mouth or teeth, awareness under anesthesia, injury to blood vessels, aspiration, pneumonia</p>
<i>Regional Anesthesia</i>	
Spinal or epidural analgesic/anesthesia	<p>Expected result Temporary decreased sensation or loss of feeling and movement to lower part of the body</p> <p>Technique Drug injected through a needle or catheter placed either directly into the spinal canal (spinal or subarachnoid) or immediately outside the spinal canal (epidural)</p> <p>Risks Headache, backache, buzzing in the ears, convulsions, infection, persistent weakness, numbness, residual pain, injury to blood vessels, complete spinal</p>
Major/minor nerve block	<p>Expected result Temporary loss of feeling or movement of a specific limb or area</p> <p>Technique Drug injected near multiple nerves or a plexus (major) or into or around a nerve or small nerve group (minor) providing loss of sensation to the area of the procedure</p> <p>Risks Infection, convulsions, weakness, persistent numbness, residual pain, injury to blood vessels</p>
Intravenous regional anesthesia	<p>Expected results Temporary loss of feeling and movement of an extremity</p> <p>Technique Drug injected into veins of arms or leg while using a tourniquet</p> <p>Risks Infection, convulsions, persistent numbness, residual pain, injury to blood vessels</p>

(Adapted with permission from the American Association of Nurse Anesthetists. [1999b]. *Informed consent in anesthesia*. Park Ridge, IL: Author.)

INHALATION GENERAL ANESTHETIC AGENTS

Volatile Liquids

- Halothane (Fluothane, Somnothane)
- Methoxyflurane (Penthrane)
- Enflurane (Ethrane)
- Isoflurane (Forane)

The common routes for administering general anesthetics are inhalation and parenteral; other routes used less frequently are oral and rectal. Inhalation agents are administered in the form of gases or as vapors of volatile liquids through an anesthesia delivery system and a face mask or endotracheal tube. Commonly used inhalation agents that can produce all of the elements of general anesthesia are listed in the accompanying display; these agents are absorbed by the lungs. Nitrous oxide (compressed gas) is both absorbed and eliminated by the lungs, whereas the percentage of volatile liquids varies in their excretion between the lungs and kidneys.

COMMON INTRAVENOUS AGENTS USED FOR GENERAL ANESTHESIA

- Barbiturates: methohexital sodium, thiamylal sodium, thiopental sodium
- Benzodiazepines: diazepam and midazolam
- Narcotics: alfentanil hydrochloride, fentanyl, and sufentanil citrate
- Neuromuscular blocking agents: atracurium bresylate, doxycarium chloride, gallamine triethiodide, metocurine iodide, mivacurium chloride, pancuronium bromide, pipecuronium bromide, succinylcholine chloride, tubocurarine chloride, and vecuronium bromide

Although anesthesia is administered parenterally, it takes several intravenous drugs to produce all of the elements of general anesthesia. Injectable agents used for induction or maintenance of anesthesia are from one of the following drug classifications: barbiturates, benzodiazepines, narcotics, and neuromuscular blocking agents. See the accompanying display for common drugs for each of these classifications.

Barbiturates provide a rapid induction of short duration and are therefore used for invasive diagnostic and obstetric procedures and minor surgery. When barbiturates are contraindicated, other short-acting agents are used: ketamine or a nonbarbiturate drug (etomidate or propofol). Neuromuscular blocking agents produce muscle relaxation required for select surgical procedures; these drugs vary in their duration of action.

The client's individualized plan for balanced anesthesia may involve the concurrent or sequential use of many agents. For instance, thoracic muscle relaxation that is required for lung surgery can be provided by intravenous administration of a neuromuscular blocking agent. During the surgery, various types of vapors and gases may also be administered with oxygen to provide anesthesia. For abdominal surgery, muscle relaxation can be achieved by injecting a local anesthetic into the cerebrospinal fluid; after the abdominal anesthesia level is established, a short-acting barbiturate may be infused to provide general anesthesia during the surgical procedure.

Although the incidence of drug toxicity in anesthesia is rare, clients need to be informed about these inherent risk factors. General anesthetic agents can induce anaphylactic reactions; the incidence is 1:4,500, with a mortality rate of 6%, according to Khrais and Ouellette (1995).

Regional Anesthesia

The increased use of balanced anesthesia for surgical procedures has made it increasingly important for perioperative nurses to be knowledgeable about regional and local anesthetic agents. Regional anesthesia blocks nerve impulse conduction to a specific area or region of the body to decrease intractable pain or to produce an anesthetic field without the loss of consciousness.

An analgesic/anesthetic state is obtained by injecting a local anesthetic solution along a specific nerve path (see the accompanying display for a list of commonly used local anesthetic agents). Regional anesthesia can be administered with or without sedation (refer to Table 30-2 for the various techniques used in administering regional anesthesia).

Local Anesthesia

Local anesthesia refers to use of an anesthetic agent that disrupts sensation at the nerve endings. The two techniques used for administering local anesthesia are topical and infiltration. Topical anesthesia is the direct application of local anesthetics to tissues in the form of ointments, lotions, solutions, or sprays. After the use of oral anesthetic solutions (e.g., viscous lidocaine), *fluids and foods must be withheld until the gag reflex returns.*

Infiltrate anesthesia refers to intradermal, subcutaneous, or submucosal injection to provide a circumscribed area of anesthesia. This technique provides a local nerve block that is used for suturing lacerations or extracting teeth.

COMMONLY USED LOCAL ANESTHETIC AGENTS

- Bupivacaine hydrochloride (Marcaine, Sensorcaine)
- Chloroprocaine (Nesacaine, Nesacaine MPF)
- Etidocaine hydrochloride (Duranest)
- Lidocaine hydrochloride (Xylocaine)
- Mepivacaine hydrochloride (Carbocaine, Polocaine)
- Procaine hydrochloride (Novocain)
- Tetracaine hydrochloride (Pontocaine)

PREOPERATIVE PHASE

The primary goal of preoperative nursing care is to place the client in the best possible condition for surgery through careful assessment and thorough preparation. Assessment of the client's status before surgery establishes baseline data to direct interventions throughout the perioperative phases. Each member of the health care team has identified functions relating to the assessment of the client's physiological, psychological, social, cultural, and spiritual status. *The findings from the client's assessment must be documented throughout the surgical experience.*

Assessment

Assessment of the perioperative client includes a nursing history and physical examination. A complete assessment is performed on the outpatient client during the preadmission visit. On the day of surgery, the nurse conducts a focused assessment to ensure current, accurate data.

During the assessment process, the nurse evaluates the client's level of anxiety and fear. Bulechek and McClosky (1995) describe these feelings:

- Anxiety is a vague, uneasy feeling whose source is often nonspecific or unknown to the client.
- Fear is a feeling of dread related to an identifiable source that the client validates.

Anxiety also has well-defined physiological changes, such as an increased heart rate, clammy hands, muscular tension (especially in the neck muscles), and behavioral manifestations, such as rapid speech and irritability.

Nursing History

The perioperative nursing history provides information relative to factors that can increase a client's risk or influence the expected surgical outcomes. Pertinent data are obtained from the client interview: medical history including family history of anesthesia complications (malignant hypertension); medications; allergies; age-related factors; social, cultural, and spiritual concerns; and psychologic status. See Chapter 6 for more details.

Nurses should conduct the interview in a quiet room, free from background noise. Many elderly clients have some degree of high-tone hearing loss (Eiseman, 1996), so it is necessary to speak in a strong, clear voice.

Clients who have difficulty comprehending the surgical procedure should have a responsible family member present during the interview. A third person can help clarify precisely what the nurse said and can interpret such instructions to other family members.

Medical History

The nurse reviews the client's medical record. The surgeon's history and physical findings provide pertinent data regarding the reasons for surgery. If the client was previously hospitalized, the nurse obtains the previous medical records to have available on the nursing unit. Hospitalization records are reviewed to gain an overview of the client's health status because preexisting medical conditions can increase the client's surgical risks.

During the interview, the nurse questions the client regarding past illnesses and the main reason for seeking surgical treatment. The client is asked to describe prior surgeries and their dates. Any complications from a previous surgery or anesthesia should be recorded.

It is important to note if the client has had prior blood transfusions or reactions. At this time the nurse can ascertain whether the client has objections to receiving blood or blood products or has made arrangements for blood replacement. Some clients prefer to donate their own blood in advance so that it can be held in reserve if the need for it arises during surgery. Family members or friends may also donate blood to decrease the cost to the client.

Medications

During the nursing history, the nurse needs to assess exactly what drugs the client has been taking. The client's response to questions about the use of alcohol, tobacco, "street drugs," prescription, over-the-counter drugs, and herbs should be documented because these substances have surgical implications.

DRUGS THAT PLACE SURGICAL CLIENTS AT RISK

- Aspirin: May increase bleeding
- Antidepressants: May lower blood pressure during anesthesia
- Bromide in medications (e.g., Sominex): Can accumulate and produce signs and symptoms of dementia
- Drugs with anticholinergic effects: Increase the potential for confusion
- Steroids: Suppress immunity
- Nonsteroidal anti-inflammatory medications: Increase the risk of stress ulcers and displace other drugs from blood proteins

Certain prescription drugs (antihypertensives, tranquilizers, steroids, and diuretics) can increase the client's anesthesia risks. Clients with chronic diseases are likely to be taking numerous medications that can cause complications during the perioperative period (see the accompanying display).

Herbs

Question clients regarding their use of herbal products and supplements as part of the preoperative assessment. Certain herbal products and supplements may place the client at risk if taken before surgery such as *Ephedra sinica* (Chinese ephedra or Ma Huang), St. John's wort, and Feverfew.

Ephedra can produce the same side effects of ephedrine such as increased blood pressure and heart rate, insomnia and anxiety. St. John's wort is used widely as a mild to moderate antidepressant because of its ability to inhibit monoamine oxidase (MAO). MAO inhibitors may interact with various types of anesthetic agents. Feverfew inhibits platelet aggregation and may affect the client's clotting time.

Although some herbal products may place the client at risk during surgery, other herbs such as *Bromelain* can reduce healing time and pain following various surgical procedures. Bromelain is obtained from the pineapple plant and refers to a group of sulfur-containing enzymes that digest protein (proteolytic enzymes or proteases). Murray (1995) addresses a double-blind study of persons undergoing oral surgery; bromelain reduced edema, inflammation, and pain when taken preoperatively.

Allergies

Allergies and sensitivities to foods, drugs, or other substances should be documented on the assessment record. Of special importance is questioning the client about allergies to iodine. Povidone-iodine, a common antiseptic, is used to prepare the skin for surgery. The nurse places a note regarding the client's allergies on the front of the chart to alert perioperative team members.

Age-Related Considerations

Age-related considerations are critical aspects of assessment (Eiseman, 1996). The client's age and developmental stage can influence the ability to cope with surgery. Age-related factors can also influence existing health care problems and the client's response to surgery. For instance, infants are at risk during surgical interventions because their physiological functions are immature. The infant's ability to respond to stress is also altered.

Morbidity and mortality rates for surgical clients over the age of 90 are much higher than for those in the 70 to 75 age group (Hogstel, 2001). Older clients may be fearful of death, especially if this is their first hospitalization or surgery. The risk of surgery for many older clients is complicated by chronic disease processes; more than 100,000 clients over 65 years of age die

postoperatively each year (Corey-Plett, 1995). Age-related risk factors for the older adult should be assessed on an individual basis. Hogstel (2001) contends that age should no longer be a major factor in deciding whether or not surgery should be performed to prolong life or to provide comfort for elderly clients. When elderly clients are adequately prepared for a noncomplicated surgical procedure, they can tolerate many types of surgeries as well as younger clients (Cory-Plett, 1995; Hogstel, 2001). However, studies have shown that, when elderly clients are subjected to emergency surgeries or long, complicated surgeries, their decreased ability to adapt to physical and psychological stress may have a negative surgical outcome (Eiseman, 1996). Since 50% of all emergency surgeries are on clients over 65 years of age (Eiseman, 1996), nurses need to provide psychological support to assist the elderly client in coping with the stress of surgery.

Social and Cultural Considerations

Data relative to the client's social and cultural orientation are incorporated into care. These data assist the nurse in selecting appropriate teaching methods. Many facilities provide interpreters to prevent language from being a communication barrier.

Cultural beliefs can influence a client's perception of surgery. Listen to a client's concerns expressed during the interview. Surgeries that cause changes in body image can alter self-esteem. The client may worry about being sexually attractive or active after surgery. The nurse may initiate discussion regarding sexual outcomes of surgery; encourage the client to verbalize fears in order to increase adaptive coping.

Spiritual Considerations

Clients must be provided the opportunity to express their spiritual values and beliefs. Religious beliefs are discussed and incorporated into the client's plan of care. A client may ask to see a member of the clergy before surgery. The beliefs of the client should be respected. The client has the right to refuse certain

types of interventions. For example, some religions do not allow the administration of blood products as treatment. When the client indicates that religious beliefs prevent blood administration, the health care team should identify alternative methods of treatment and discuss these with the client during the preoperative phase. Collaborating with the client preoperatively helps prevent ethical dilemmas from arising during the other perioperative phases in the event that the client loses a large quantity of blood.

Psychosocial Status

A psychosocial evaluation is conducted with the client and family by assessing their degree of understanding and anxiety regarding the surgical procedure (see the accompanying display). Assess the client's knowledge of the surgical procedure and the expected surgical outcomes. It is important that the client express agreement with the surgical plan of care.

ASSESSMENT QUESTIONS: PSYCHOSOCIAL STATUS

- Why are you having surgery?
- When did this problem start?
- What do you think caused this problem?
- Has this caused any problems with your relationships with others?
- Has your problem prevented you from working?
- Are you able to take care of your own needs?
- Are you experiencing any discomfort or pain?
- What are you expecting from this surgery?
- Is there anything that you do not understand regarding your surgery?
- Are you worried about anything?
- Will someone be available to assist you when you return home?

Physical Assessment

The nurse assesses the client's physiological health status by performing either a partial or a complete physical examination. The decision to conduct a partial or complete physical depends on the client's health status relative to the surgical procedure, the setting, and the amount of time available to gather pertinent data.

The nurse in an outpatient setting, on the day of surgery, usually performs a partial examination. The client's medical record should be reviewed to ensure that a complete nursing physical was conducted during the preadmission visit. The nurse should focus on obtaining pertinent assessment data to establish baseline parameters for prioritizing the client's care. The client's neurologic assessment is integrated throughout the interview and physical examination.

THINK ABOUT IT

Responding to Client Altered Self-Image

As a student nurse, how can you assist the client in verbalizing fears about alterations in body image that have sexual implications? A 30-year-old woman is admitted for removal of a cancerous breast. Her mother died at age 30 from breast cancer. The client has been married for 5 years and has a 3-week-old infant. Her husband is with her. You have to admit and interview the client for the nursing history. How would you approach the medical diagnosis? Would you feel comfortable helping this client verbalize her fears?

General Survey

Observe the client's condition starting with the initial contact. For instance, if the client walks into the unit, observe and note the client's gait; note if assistance is needed with ambulation. Does the client need assistance when transferred to a bed? When shaking the client's hand, note the strength and sensation of the hand grasp and the skin temperature. Coldness of the hand may indicate impaired circulation.

During the interview, assess the level of consciousness and orientation. Does the client respond appropriately to your questions? Observe for signs of hearing impairment or loss of vision. Note if the client is wearing glasses.

Head and Neck

While talking with the client, assess if eye contact is maintained. Note the color of the sclera and inspect for drainage from the eyes. Inspect the general condition of the scalp, noting alopecia or seborrheic dermatitis. Inspect the oral cavity, check for any loose teeth, and assess the tongue and mucous membranes (note color and moisture). Observe the client's lips and tongue (especially if client has a history of cardiac disease). Note if the client has dentures.

Inspect the neck and verify the strength of the carotid pulses, one at a time; palpate jugular veins for distension. If the client is a child or has cancer, palpate the cervical lymph nodes. Assess for range of motion.

Upper Extremities

Palpate the client's brachial and radial pulses bilaterally; note the rate and character of each pulse. Check the capillary refill. Assess the skin; note the temperature, texture, and integrity. Assess for range of motion.

Anterior and Posterior Chest and Abdomen

Inspect and palpate the chest wall, noting the breathing pattern and expansion of the chest wall. Auscultate heart sounds and listen to anterior and posterior breath sounds; note crackles, gurgles, or wheezing.

Inspect the abdomen for distension and listen for bowel sounds in all four quadrants. Palpate the abdomen for rigidity, enlarged organs, or rebound tenderness.

Lower Extremities

Assess the length and position of each leg. Palpate the bilateral strength of femoral, popliteal, and pedal pulses, noting the rate and character of each pulse. Assess the skin; note the temperature, texture, integrity, and the presence of edema. Check the capillary refill. Inspect the bony prominences of the ankles and feet. Assess for strength and sensation by having the client bend the leg and push the foot against your hand. Assess for range of motion. Clients scheduled for spinal anesthesia should be assessed for gross motor function and strength.

NURSING ALERT

Spinal Anesthesia

Spinal anesthesia causes temporary paralysis of the lower extremities. Preoperative weakness or impaired movement of the lower extremities should be reported to nurses caring for clients recovering from spinal anesthesia; postoperatively this report prevents the recovery nurse from making the wrong decisions when full motor function fails to return.

The nurse documents on the medical record and communicates to the health care team all significant assessment data. This information establishes baseline parameters to direct decision making throughout the perioperative phases.

Nursing Process Highlight

ASSESSMENT

Mrs. Broussard, 69, was admitted to an outpatient surgical unit for a total hip replacement (**arthroplasty**). The surgeon explained the surgical procedure during her last office visit. Preauthorization has been granted for the surgery. Diagnostic testing, a comprehensive history and physical examination, and postoperative exercise instructions were performed during the preadmission visit. Mrs. Broussard has been suffering for 10 years with chronic degenerative arthritis. She has experienced increasing pain and loss of mobility in her left hip for the past 6 months.

- In collecting data from Mrs. Broussard during the focused assessment, what types of information are essential for the development of a plan of care for her on the day of surgery?
- Which baseline data should be obtained from Mrs. Broussard during the partial physical examination?
- What further data should be collected at this time?

Diagnosis

The nurse formulates nursing diagnoses based on an analysis of assessment data and the nature of surgery. Physical assessment findings are compared against diagnostic test results; for example, cardiovascular findings are analyzed with blood chemistry and ECG results.

Selection of the most appropriate nursing diagnosis should focus on the specific perioperative phase (see the accompanying display). The diagnosis may be pertinent to all three perioperative phases or to one or more phases.

For instance, as described in the Nursing Process Highlight, Mrs. Broussard is experiencing pain that is caused from the degenerative changes in the hip joint as a result of arthritis. Although the surgeon will remove the diseased joint, Mrs. Broussard will continue to experience pain. In fact, the pain may worsen for several weeks postoperatively (Barrows, 1995). The most appropriate diagnosis for Mrs. Broussard is *Pain*. Preoperatively, the pain is related to the degeneration of the hip joint; postoperatively, the pain is related to swelling at the surgery site.

Common nursing diagnoses for the preoperative client are *Deficient Knowledge* related to the surgery, *Anxiety*, and *Fear*. Clients and families view the perioperative experience differently on the basis of prior experiences and coping skills (Bulechek & McCloskey, 1995). Some clients are threatened; others consider the experience to be a challenge. Some clients are highly anxious, whereas others experience a moderate degree of anxiety. Besides the primary threat of surgery, clients also have to deal with separation from family and loss of independence.

Associated nursing diagnoses address the client's pre-existing health condition. For instance, an associated diagnosis for Mrs. Broussard is *Impaired Physical Mobility* related to musculoskeletal impairment. This nursing diagnosis would be initiated preoperatively and throughout the perioperative experience.

Outcome Identification and Planning

The nurse develops goals with client-focused expected outcomes based on relevant nursing diagnoses. Nurses collaborate with other health care team members and the client in establishing the goals and outcomes. The overall goal is to protect the client from injury related to anesthesia and surgery. The plan of care directs the selection of specific nursing interventions that promote the client's achievement of expected outcomes, for example, client teaching.

The current health care system challenges the perioperative nurse to be responsive to surgical clients who may enter and exit the health care setting at various points and with different experiences (Bulechek & McCloskey, 1995). Some clients are admitted to the hospital the day of surgery, some the evening before; some have surgery as an outpatient. Some clients with general anesthesia may be discharged the day of surgery.

Discharge planning needs are incorporated into the plan of care on admission. The following considerations are included in discharge planning:

- Psychosocial and spiritual support systems and community resources
- Financial aspects of the illness
- The degree of illness or disability
- Rehabilitation
- Preventive care
- Client teaching needs

Some clients need the services of a home health agency on discharge. The perioperative nurse usually coordinates home care with the social worker.

Implementation

Preparing the client for surgery requires the nurse to perform multiple interventions within specific time constraints. However, the nurse must remain responsive to the client's needs, demonstrating a caring attitude (see Figure 30-1). Documentation tools are available to assist the nurse in providing safe, timely preoperative care (e.g., the consent form and preoperative checklist). Active planning and intervention are necessary to reduce the risk for complications (Eliopoulos, 1999).

Surgical Consent Form

Although surgeons are responsible for obtaining informed consent, nurses should verify that consent has been obtained before treatment begins. Consent is given only for the extent of action documented on the informed consent. Nurses can identify problems with consent when the client:

- Cannot explain the procedure or identify the risks
- Signed the form more than 30 days before surgery
- Had an unauthorized person sign the consent form
- Did not sign the consent form

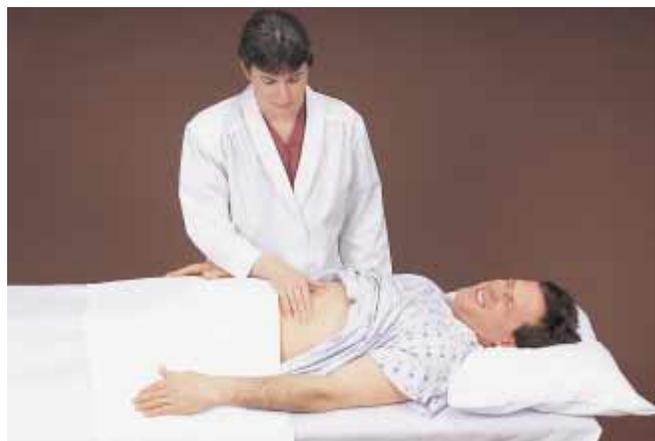


Figure 30-1 The nurse prepares a client for surgery. While the nurse was performing preoperative assessment, the client demonstrated pain through facial expression. What implications might the client's pain have on the surgery? What actions should the nurse take, considering the potential effects on the client's perioperative experience?

PERIOPERATIVE NURSING DIAGNOSES

Preoperative Phase

Deficient Knowledge related to:

- Nature and purpose of the surgical procedure
- Preoperative preparation to decrease postoperative risks

Anxiety related to:

- Deficient knowledge of a new experience
- Inherent risk factors of the surgical procedure and anesthesia

Fear related to:

- The unknown
- Effects of surgery on economic and employment status

Intraoperative Phase

Risk for Perioperative Positioning Injury related to:

- Sensory/perceptual disturbances due to anesthesia
- Edema

Risk for Injury related to:

- Physical (equipment or sponge count)
- Environmental
- Positional

Risk for Infection related to:

- Invasive procedure
- Imbalanced nutrition

Hypothermia related to:

- Exposure to cool environment
- Decreased metabolic rate

Postoperative Phase

Ineffective Airway Clearance related to:

- Anesthesia (diminished cough reflex)
- Increased pulmonary congestion

Ineffective Breathing Pattern related to:

- Pain
- Decreased energy/fatigue

Ineffective Tissue Perfusion (Cardiopulmonary) related to:

- Anesthesia
- Position or immobility

Deficient Fluid Volume related to:

- Active fluid volume loss
- Inadequate fluid intake

Imbalanced Nutrition: Less Than Body Requirements related to:

- Anesthesia
- Surgical manipulation of intestines

(continues)

PERIOPERATIVE NURSING DIAGNOSES (continued)

Urinary Retention related to:

- Anesthesia
- Surgical manipulation of the bladder

Acute Pain related to:

- Surgical incision

Risk for Infection related to:

- Impaired skin integrity from surgical wound
- Deficient knowledge of wound or drainage tube care

Situational Low Self-Esteem related to:

- Altered body image, effects of surgery
- Dependence on others during recuperation from surgery

(From North American Nursing Diagnosis Association. [2001]. *Nursing diagnoses: Definitions & classification*. 2001–2002. Philadelphia: Author.)

The nurse should notify the surgeon in the event that any problems with consent are identified.

If the surgeon proceeds without appropriate consent, nursing administration should be notified and the nurse should make personal notations outside the medical record. This practice protects the nurse should the situation be brought to court. If the client reverses a decision and decides against surgery, the nurse is obligated to inform the surgeon in order to prevent unwanted treatment.

Preoperative Checklist

A checklist is a form that allows the nurse to insert a checkmark (✓) beside symptoms or to fill in one or two words in answer to a cue or a question. Although some variations exist in how agencies format the preoperative checklist, the forms usually have similar content. Nursing activities are usually designated by time intervals: “night before surgery” and “day of surgery.” Time designations help to prevent surgical delays that can increase the client’s anxiety and the agency’s costs. Table 30-3 presents a sample preoperative checklist.

Although clients in outpatient settings arrive the day of surgery, the nurse prepares the client’s medical record the day before for necessary documentation as itemized in Table 30-3. This preparation ensures that assessment, diagnostic tests, and teaching were done on the preadmission visit and allows time to obtain missing information and to assess the need for reinforcement or reevaluation as necessary.

On the day of surgery, the nurse focuses on the immediate physical interventions to prepare the client for surgery. While admitting and preparing the client for surgery, the nurse uses this time to encourage the client to

TABLE 30-3
Preoperative Checklist

	CK (✓)	Comments	Nurse CK (✓)
COMPLETE NIGHT BEFORE SURGERY			
List allergies			
Procedure scheduled			
Surgical permit signed/witnessed			
History/physical on chart and/or dictated			
Pre-anesthetic evaluation done			
Able to state type and purpose of surgery			
Demonstrates ability to perform: Deep breathing, turning and coughing exercises			
Leg exercises			
PM care with shower or bath given			
Nail polish removed and make-up removed			
Old chart requested and obtained			
Type and crossmatch for ___units of blood			
Blood consent signed and witnessed			
Lab work a. CBC _____ b. UA _____			
Tonsillectomy and Adenoidectomy patients: a. ___PTT b. ___PT c. ___Platelets			
If ordered by MD: a. EKG _____ b. Chest X-ray _____			
Add other lab work ordered (specify)			
Notify surgeon of abnormal lab work			
New progress note and physician order sheet on chart			
Weight			
NPO after midnight (if applicable)			
Signature of Nurse _____		Date _____	
COMPLETE DAY OF SURGERY			
Jewelry removed and secured with responsible party			
Dental prosthesis and contact lenses removed			
Hospital gown/cap on and undergarments removed			
Voided on call to surgery			
Indwelling catheter ordered and inserted			
Tampon removed			
Identiband and/or bloodband on/checked for accuracy			
Time _____ Pulse _____ Resp _____ B/P _____ Temp. _____			
Pre-op medicine given Medication _____ Time _____ AM PM			
Siderails up and bed to lowest level			
Patient instructed not to get out of bed without nursing assistance			
Addressograph plate/MAR's on chart			
VS 30 minutes after preop (if remains on unit)			
BP _____ P _____ R _____ T _____			
Old chart sent to surgery per request			
Surgical prep done and checked			
To surgery Time _____ Via _____			
Signature of Nurse _____		Date _____	
Holding Room Nurse Signature _____		Date _____	

verbalize any concerns. Allowance should be made for family members or significant others to remain with the client as the client awaits transfer to the operating room.

Client Teaching

Most clients view surgery as a threatening and anxiety-provoking event (Bulechek & McCloskey, 1995). Client teaching reduces anxiety. The risks of surgical complications are decreased when the client knows what to expect and receives instruction in postoperative exercises (Lindeman & Van Aernam, 1971).

Teaching the client and family members (significant others) is the responsibility of the multidisciplinary team. The nurse verifies that the client or family member is able to describe, in his or her own words, the reason for the surgery, what will be done during the surgical procedure, the side effects of the anesthetic agents, and the possible complications of both the surgery and the anesthesia.

The nurse plays a major role in relieving the client's anxiety by facilitating communication between physicians and the client and family and by reinforcing teaching regarding preoperative care. The client's family should be involved in the teaching sessions. Table 30-4 presents an overview to perioperative teaching activities with the client's expected outcomes.

Teaching aids (videotapes and pamphlets) are resources for client instruction during the perioperative processes. The nurse selects teaching materials based on the client's ability to read and understand. The nurse provides accurate, consistent information throughout the teaching process. The teaching aids must reinforce the

verbal instructions of the nurse, anesthetist, and surgeon. Informational materials should explain what will happen in each of the perioperative areas (such as the holding area) to foster client cooperation. Refer to Chapter 13 for additional information on client teaching.

Types of Surgical Incisions

Nurses need to be knowledgeable about common surgical incisions to reinforce the surgeon's teaching and to answer the client's questions. Two main factors govern incisions: direction and location. Incisions may be vertical, horizontal, transverse, or oblique. Figure 30-2 illustrates and describes the location of common surgical incisions.

Postoperative Exercise Instruction

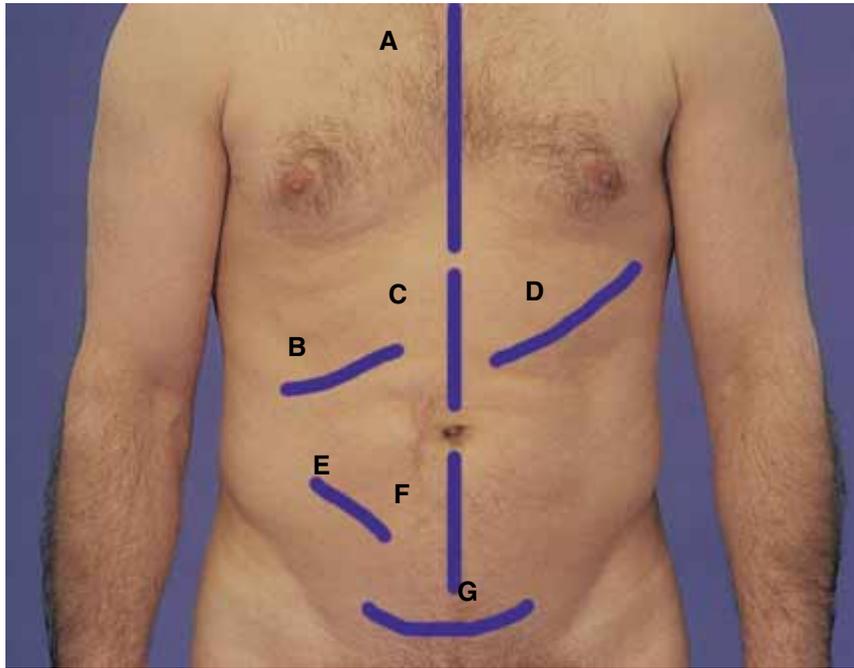
As early as 1941, nurses were challenged to participate in preoperative instruction (Bulechek & McCloskey, 1995). In 1983, Leventhal and his colleagues suggested that the effectiveness of existing preoperative instruction could be increased by assisting clients to assume self-regulation after surgery.

Preoperative teaching of postoperative exercises prepares the client physically and emotionally for the impending surgery (Bulechek & McCloskey, 1995; Eiseman, 1996). Language barriers, identified during assessment, are considered when teaching the client. The goal of instruction is to have the client demonstrate the performance of exercises while verbalizing why the exercises are used during the postoperative phase (Procedure 30-1).

Clients may experience their worst postoperative pain while coughing, deep breathing, and exercising. Clients with abdominal or chest surgery may avoid using muscles

TABLE 30-4
Preoperative Teaching Interventions and Expected Client Outcomes

Intervention	Expected Client Outcomes
Preparation activities	<p>The client can:</p> <ul style="list-style-type: none"> Describe in own terms the purpose, risk factors, and outcomes of surgery and anesthesia. Explain restrictions on food the evening before, identifying the time frame (6–8 hr) when no food and drink are allowed by mouth, NPO Explain the meaning and purpose of skin and bowel preps. Identify medications to be taken or omitted the day of surgery. Describe activities that will occur in each perioperative area: holding area, fluids will be started in a vein; position on the operating room table; stay in recovery until awake, then be transferred to an intensive care unit.
Postoperative exercise instructions	<ul style="list-style-type: none"> Demonstrate on two consecutive occasions postoperative exercises: deep breathing, coughing and pillow splinting, turning and proper body alignment; leg and foot exercises; and out-of-bed transfers.
Proper application and usage of medical devices	<ul style="list-style-type: none"> For example, demonstrate proper use of incentive spirometer, application of TED hose, and self-medicating pain infusion pump.
Physical or environmental changes following surgery	<ul style="list-style-type: none"> Demonstrate knowledge of the rehabilitation process: daily physical therapy for 2 weeks and a home health nurse for 10 days to administer prophylactic antibiotics and to monitor and refill the patient-controlled analgesia pump.



INCISION	LOCATION	ORGAN
A. Sternal Split	Begins at the top of the sternum and extends downward to the sternal notch.	Heart
B. Oblique Subcostal	Begins in the epigastric area and extends laterally and obliquely below the lower costal margin.	Right side: Gallbladder, Biliary Left side: Spleen
C. Upper Vertical Midline	Begins below the sternal notch and distally around the umbilicus.	Stomach, Duodenum, Pancreas
D. Thoracoabdominal	Begins midway between the xiphoid process and the umbilicus and extends across the seventh or eighth intercostal space, to the midscapular line.	Thorax, Heart
E. McBurney	Begins below the umbilicus, goes through McBurney's point, and extends toward the right flank.	Appendix
F. Lower Vertical Midline	Begins below the umbilicus, downward toward the symphysis pubis.	Bladder, Uterus
G. Pfannenstiel	Begins 1.5 inches above the symphysis pubis with a curved transverse cut across the lower abdomen.	Uterus, Fallopian tubes, Ovaries

Figure 30-2 Common Surgical Incisions

in the affected areas to take deep breaths or to cough effectively. Deep breathing and coughing facilitate removal of accumulated pulmonary secretions. Certain anesthetic agents depress the central nervous system, causing some clients to experience shallow respirations. Inhaled gases and oxygen have a direct drying effect on the respiratory mucosa, which increases the viscosity of mucus, making the secretions difficult to raise with coughing. These factors place the client at risk for respiratory complications (see the accompanying display).

To prevent respiratory complications, the nurse teaches clients to use a breathing technique in which the client turns, coughs, and deep breathes to achieve sustained max-

COMMON RESPIRATORY COMPLICATIONS AFTER SURGERY AND ANESTHESIA

- Pulmonary embolism: A blood clot that has moved to the lungs, causing pulmonary obstruction
- Atelectasis: Decreased ventilation caused from the pooling of secretions in dependent areas of the bronchiole
- Pneumonia: Inflammation of lung tissue
- Hypoxemia: Lowered oxygen level in the blood

PROCEDURE 30-1

Postoperative Exercise Instruction

Equipment

- Educational materials
- Tissues
- Disposable volume-oriented incentive spirometer

- Pillow
- Nonsterile gloves

Action

Rationale

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Wash hands and organize equipment. 2. Check the client's identification band. 3. Place client in a sitting position. 4. Demonstrate deep breathing exercise. 5. Have the client return demonstrate deep breathing: <ul style="list-style-type: none"> • Place one hand on abdomen (umbilical area) during inhalation. • Expand the abdomen and rib cage on inspiration. • Inhale slowly and evenly through your nose until you achieve maximum chest expansion. • Hold breath for 2 to 3 seconds. • Slowly exhale through your mouth until maximum chest contraction has been achieved. • Repeat the exercise three or four times; allow client to rest. 6. The nurse demonstrates splinting and coughing. 7. Don gloves. 8. Keep the client in a sitting position, head slightly flexed, shoulders relaxed and slightly forward, and feet supported on the floor. 9. Have the client return demonstrate splinting and coughing: <ul style="list-style-type: none"> • Have the client slowly raise head and sniff the air. • Have the client slowly bend forward and exhale slowly through pursed lips. • Repeat breathing two to three times. • When the client is ready to cough, have client place a folded pillow against the abdomen; | <ol style="list-style-type: none"> 1. Reduces transmission of microorganisms and promotes efficiency. 2. Facilitates proper identification of client. 3. Promotes full chest expansion. 4. Shows the client how to breathe deeply. 5. Fosters learning. <ul style="list-style-type: none"> • Exerts counterpressure during inhalation. • Promotes maximum chest expansion. • Maintains full expansion of the alveoli. • Increases the pressure, preventing immediate collapse of the alveoli. • Promotes maximum chest contraction. • Enforces learning. 6. Shows the client how to raise mucus secretions from the tracheobronchial tree. 7. Reduces transmission of microorganisms. 8. Promotes full expansion of chest cage and use of accessory muscles to produce a deep, productive cough. 9. Fosters learning. <ul style="list-style-type: none"> • Increases the amount of air and helps to aerate the base of the lungs. • Dries the tracheal mucosa as air flows over it; there is a slight increase in the carbon dioxide level, which stimulates deeper breathing. • Loosens mucus plugs and moves secretions to the main bronchus. • Elevates the diaphragm and expels air in a more forceful cough; supports the abdominal |
|---|---|

(continues)

PROCEDURE 30-1

Postoperative Exercise Instruction (continued)

Action

have the client grasp the pillow against the abdomen with clasped hands (see Figure 30-3).

- Have client take a deep breath and begin coughing immediately after inspiration is completed by bending forward slightly and producing a series of soft, staccato coughs.
- Have a tissue ready.



Figure 30-3 Splinting

10. Instruct the client on the use of an incentive spirometer (see Figure 30-4). Have the client:
 - Hold a volume-oriented incentive spirometer upright.



Figure 30-4 Incentive Spirometer

Rationale

muscles and reduces pain when coughing if the client has an abdominal incision.

- Removes secretions from the main bronchus.
- Provides a tissue for sputum disposal.

10. Reinflates the alveoli and removes mucus secretions.
 - Promotes proper functioning of the device.

(continues)

PROCEDURE 30-1

Postoperative Exercise Instruction (continued)

Action

- Take a normal breath and exhale, then seal lips tightly around the mouthpiece; take a slow, deep breath to elevate the balls in the plastic tube, hold the inspiration for at least 3 seconds.
 - The client simultaneously measures the amount of inspired air volume on the calibrated plastic tube.
 - Remove the mouthpiece, exhale normally.
 - Take several normal breaths.
 - Repeat the procedure four to five times.
 - Have the client cough after the incentive effort; repeat Step 9. Have a tissue ready.
 - Have client clean mouthpiece under running water and place in clean container (disposable mouthpiece changed every 24 hours).
11. The nurse explains leg and foot exercises (Figure 30-5).

Rationale

- Allows for greater lung expansion; holding the inspiration increases the pressure, preventing immediate collapse of the alveoli.
 - Encourages the client to do respiratory exercises.
 - Allows normal expiration.
 - Provides client the opportunity to relax.
 - Encourages sustained maximal inspiration and loosens secretions.
 - Facilitates removal of secretions.
 - Prevents transmission of microorganisms.
11. Elicits client cooperation.



A.



B.



C.

Figure 30-5 Leg Exercises

(continues)

PROCEDURE 30-1

Postoperative Exercise Instruction (continued)

*Action**Rationale*

- | | |
|---|---|
| <p>12. Instruct client to return demonstrate in bed:</p> <ul style="list-style-type: none"> • Have the client, with heels on bed, push the toes of both feet toward the foot of the bed until the calf muscles tighten; then relax feet. Pull the toes toward the chin, until calf muscles tighten; then relax feet (see Figure 30-5A). • With heels on bed, lift and circle both ankles, first to the right and then to the left; repeat three times, relax. • Flex and extend each knee alternately, sliding foot up along the bed; relax (see Figure 30-5B, C). <p>13. The nurse shows the client how to turn in bed and get out of bed.</p> <p>14. Instruct the client who will have a left-sided abdominal or chest incision to turn to the right side of bed and sit up as follows:</p> <ul style="list-style-type: none"> • Flex the knees. • With the right hand splint the incision with hand or small pillow. • Turn toward right side by pushing with the left foot and grasping the shoulder of the nurse or partial foot rail of the bed with the left hand. • Raise up to a sitting position on the side of the bed by using the left arm and hand to push down against the mattress (see Figure 30-6). | <p>12. Fosters learning of how to improve venous blood return:</p> <ul style="list-style-type: none"> • Causes contraction and relaxation of the calf muscles. • Causes contraction and relaxation of the quadriceps muscles. • Causes contraction and relaxation of the quadriceps muscles. <p>13. Elicits client cooperation.</p> <p>14. Fosters learning how to turn and get out of bed without putting pressure on the incision line.</p> |
|---|---|



Figure 30-6 Out-of-Bed Transfers

(continues)

PROCEDURE 30-1

Postoperative Exercise Instruction (continued)

Action	Rationale
15. Reverse instructions (use left side instead of right) for the client with a right-sided incision according to step 14.	15. Same as step 14.
16. Instruct clients with orthopedic surgery (e.g., hip surgery) how to use a trapeze bar.	16. Facilitates movement in bed without putting pressure on a leg or hip joint.

imum inspiration (SMI). SMI promotes the reinflation of the alveoli and the removal of mucus secretions.

Several devices help encourage clients to perform SMI exercises. The breathing devices, called **incentive spirometers**, measure the client's ventilatory volume and provide the user with a tangible reward for generating an adequate respiratory flow. Devices range from simple types, a Ping-Pong ball in a plastic tube, to sophisticated models (see Figure 30-4). When the client takes a deep breath, the ball moves upward and the amount of air is measured, making the results visible to the client.

Turning, deep breathing, coughing, and using spirometry prevent respiratory complications by:

- Promoting pulmonary circulation
- Promoting the exchange of gases by increasing lung compliance
- Facilitating the removal of mucus secretions from the tracheobronchial tree

Postoperatively the client is encouraged to move in bed and perform leg exercises as explained in Procedure 30-1. These exercises assist in preventing circulatory complications that can arise from anesthetic agents that depress the metabolic and heart rates; see the accompanying display. Early ambulation also increases respiratory function and the return of peristalsis.

COMMON CIRCULATORY COMPLICATIONS AFTER SURGERY AND ANESTHESIA

- Thrombophlebitis: Inflammation of a vein with the formation of a blood clot
- Thrombus: A blood clot in the circulatory system
- Embolus: A blood clot or air that moves in the circulatory system from its place of origin

Other Devices

Besides exercises, other devices are used to prevent postoperative circulatory complications, namely, antiembolism stockings and pneumatic compression. Another device, continuous passive motion (CPM),

increases range of motion for immobilized clients after surgery. The CPM device also stimulates healing of articular cartilage by reducing swelling and adhesions.

Pain is managed with devices such as transcutaneous electrical nerve stimulation (TENS) and patient-controlled analgesia (PCA). The client needs to be informed about the use of such devices preoperatively to promote achievement of postoperative pain outcomes. All medical devices require a physician's order.

Antiembolism Stockings

Antiembolism stockings are elastic hose that compress leg veins to facilitate the return of venous blood. Depending on the surgical site, these stockings can be applied either preoperatively (e.g., abdominal surgery) or postoperatively (e.g., cardiac catheterization).

Elastic stockings are available in a variety of lengths, colors, and sizes to accommodate specific needs. One type of hose goes from the foot to the knee; another type goes from the foot to midhigh. Some stockings have partial openings on the foot to expose either the toes or heel so that the nurse can assess circulation.

The physician usually specifies the size and style of the hose and the frequency of application. If the physician does not indicate the size, the nurse uses a tape to measure the circumference of the calf and thigh and the length of the client's leg from the heel to the gluteal furrow. Stockings are removed for 20 to 30 minutes three times a day to allow for assessment and hygienic care. Assessment should include inspection for redness, palpation for tenderness or increased temperature, and testing for Homans' sign.



NURSING TIP

Client Safety

Instruct the client with antiembolism stockings to wear slippers or shoes to avoid slipping.

Pneumatic Compression Device

A **pneumatic compression device** provides intermittent compression cycles to the veins of the extremities to promote circulation. The device consists of either vinyl surgical sleeves that slide over each calf or Velcro-secured vinyl compression hoses that are applied under the thigh and leg with a knee-opening site that is placed over each popliteal area (see Figure 30-7). Both types of vinyl appliances have tube connectors that attach to an air pump machine. Observe the client applying the stockings, connecting the tubes to the air pump, and setting the correct pressure.

The air pump has an on-off switch and a dial to set the desired pressure. Turning on the pump initiates compression cycles, which cause the vinyl sleeves to automatically inflate and deflate. The nurse assesses the circulation to the extremities and placement of the stockings every 2 to 3 hours. The stockings are removed three times a day for 20- to 30-minute intervals to allow for hygiene care. Instruct the client on how to clean the vinyl stockings by disconnecting the stockings from the air pump and wiping off with tepid, soapy water.

Continuous Passive Motion Device

The **continuous passive motion (CPM) device** increases range of motion and stimulates healing of the articular cartilage by decreasing swelling and the formation of adhesions. It is used for clients with a nursing diagnosis of either *Impaired Physical Mobility* related to the surgical intervention or *Altered Tissue Perfusion* related to surgical intervention and immobility. The goal is to increase tolerance to the CPM device. The expected client outcome is to maintain maximum mobility of the joint.

Before initiating CPM, the nurse:

- Assesses the client's neurovascular status (skin color and temperature, pulses, capillary refill, sensation, and movement) of the extremity
- Applies the disposable soft goods to the CPM device according to the manufacturer's instructions

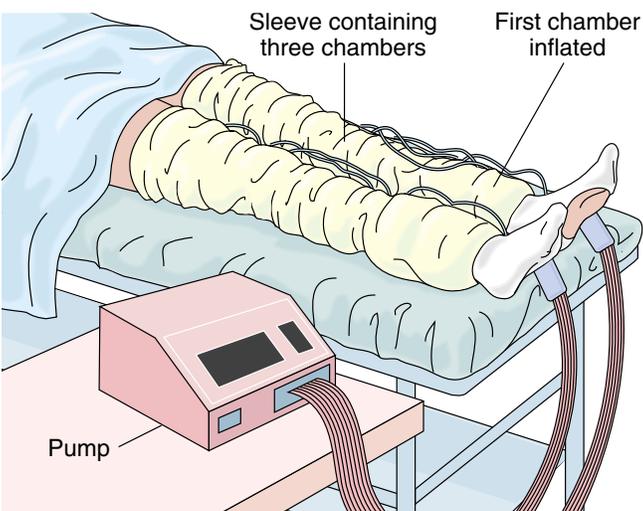


Figure 30-7 Pneumatic Compressed Device



NURSING CHECKLIST

Application of Antiembolism Stockings

- Wash hands and obtain the stockings, making sure the type and size are correct.
- Check the client's identification band.
- Show the client the stockings and explain the procedure to elicit cooperation. Make sure the client knows that the stockings are to be removed routinely and washed daily according to package directions.
- Provide for privacy. The client should be in a comfortable position to observe your technique while you apply one of the stockings.
- Wash, rinse, and dry the legs; stockings should only be applied to clean, dry skin.
- Talcum powder can be applied to the feet and legs to allow the stocking to move more easily over the skin.
- Turn the stocking inside out, except the foot portion.
- Place the foot of the stocking over the client's toes and on the foot; with your nondominant hand supporting the client's ankle, use your dominant hand to pull the heel pocket over the client's heel (see Figure 30-8).



Figure 30-8 When applying antiembolism stockings, support client's ankle while pulling stocking up.

- Slide the stocking up the leg, straightening as you apply; make sure that kinks and wrinkles are smoothed out to provide even pressure.
- Knee-length stockings should end 1 inch (2.5 cm) below the knees.
- If the stocking goes to midthigh, have the client flex the knee while you pull the stocking over the knee and thigh; the stocking should be 1 to 3 inches (2.5 to 7.5 cm) from the groin.
- The top of the stockings should not be folded over because additional constriction can occur.
- Have the client apply the other stocking, and assess the client's learning.
- Document client learning.

- Sets the machine to provide the degree of flexion and extension according to the physician's orders (e.g., 0° extension and 35° flexion)
- Adjusts the speed to control movement

When the device is readied, the client is positioned in the middle of the bed to accommodate the CPM unit. The nurse places the client's legs in the padded CPM device, making sure that the knees are at the hinged joint of the machine. The nurse measures the angle of flexion with a goniometer when the device has reached its greatest height. The client is taught how to operate the "go/stop" button and is instructed to report any discomfort or pain that occurs with motion.

Transcutaneous Electrical Nerve Stimulation Unit

A **transcutaneous electrical nerve stimulation (TENS)** unit controls pain by delivering electrical impulses to nerve endings that block the passage of pain signals from entering the



NURSING CHECKLIST

Instructing the Client on the Use of the TENS Device

- Place electrodes on the skin in the area of pain (e.g., on both sides of an incision).
- Connect the lead wires to the electrodes and portable battery-powered transmitter.
- Turn on and regulate for comfort by working with one lead at a time, beginning with a zero setting.
- Gradually increase the level of stimulation until the client feels discomfort, indicating that maximum stimulation has been achieved to block pain sensation; then reduce the volume slightly to prevent continued contraction of muscles.
- Repeat the same process with the other lead; this time allow the client to perform the actions.
- Ensure that the client knows to apply the electrodes to clean, unbroken skin.



Figure 30-9 Transcutaneous Electrical Nerve Stimulation (TENS) Unit

dorsal spinal root. The TENS unit is effective in reducing pain and the amount of pain medication required to maintain comfort after surgery. The unit consists of a transmitter, lead wires, and electrodes (see Figure 30-9).

Patient-Controlled Analgesia Pump

The **patient-controlled analgesia (PCA)** pump is a device that allows the client to control the delivery of intravenous or subcutaneous pain medication in a safe, effective manner. The client self-regulates the delivery of the medication. Several different types of PCA devices are available; the manufacturers provide instructions for setting up the infusion pump. The pain medication is contained within an infusion pump and set according to the physician's order: type and concentration of pain medication, loading dosage, and **lock-out interval** (minimum time allowed between doses for the client to self-medicate).

Before initiating the PCA pump, the nurse assesses the client's level of consciousness, orientation, reading ability, and ability to learn and comprehend. PCA is used most frequently in adolescents and adults. Family members are also taught how to recognize the signs of drug overdose in home-bound clients. Instruct the client on the PCA unit:

- To self-administer the medication as needed
- That the amount of the drug the machine delivers within a particular time frame is regulated to prevent overdose
- On the use of the control button

The advantages of a PCA unit are rapid pain relief, increased client satisfaction, and often the use of less medication than with the traditional intramuscular analgesia method.

Physical Preparation

Nursing activities related to the physical preparation of the client must be performed. These nursing functions are individualized to the client's needs as determined by health status and the type of surgical procedure scheduled. Activities such as restricting fluids, bowel preparation, or the removal of nail polish are done the evening before, regardless of the setting. Other activities occur the day of surgery in various perioperative settings.

Skin Preparation

The skin and hair follicles harbor microorganisms that can contaminate a surgical wound. The skin around the operative site is prepared to reduce the number of organisms present and to inhibit rebound growth. Preparation of the skin to reduce contamination of the surgical wound occurs in two phases. The evening before or the day of surgery, the client washes the area involved in the surgical procedure with an antimicrobial soap. The client is usually instructed to wash the surgical area vigorously several times to decrease the chance of wound infection.

Most agencies follow the recommendation of the Centers for Disease Control and Prevention (CDC) and the Association of periOperative Registered Nurses regarding the second phase. During the second phase, the skin is surgically prepared by removing hair in the operative site. The CDC and AORN recommend that this be done in the operating room. Shaving with a razor may cause cuts and nicks in the skin that promote the growth of microorganisms; therefore, performing this function immediately before surgery in the operating room, which is basically a controlled and germ-free environment, reduces the risk of wound contamination. Methods used to prep the skin are discussed in the intraoperative phase.

Nutrition

Nutrition and fluid considerations are determined by the client's health status and the nature of the surgical procedure and anesthesia. Clients scheduled for surgical procedures requiring only local anesthetic agents may be allowed a light breakfast or clear liquids the day of surgery. However, clients scheduled for regional or general anesthesia are instructed not to eat or drink (NPO) for 6 to 8 hours before surgery. Restricting food and fluids decreases the risk of aspiration of gastric contents into the lungs during anesthesia.

Clients at risk for dehydration are infants, the elderly, those with preexisting nutritional imbalances, and those having surgical procedures that cause extensive loss of blood and other body fluids. These clients are usually given intravenous fluids preoperatively to maintain fluid and electrolyte balances. Measurement of intake and output allows the nurse to monitor the client's fluid and electrolyte status.

Gastrointestinal Preparation

Gastrointestinal surgeries usually require special procedures to prepare the stomach or intestines.

Nasogastric Tube Some clients may require a nasogastric tube to facilitate stomach decompression to prevent postoperative abdominal distension. Insertion of a nasogastric tube causes client discomfort and can increase apprehension regarding surgery; therefore, the tube is usually inserted during the intraoperative phase when the client is under anesthesia. Inform clients that the tube can cause irritation to the nasal mucosa and may result in a sore throat.

Bowel Preparation The surgeon prescribes the type of bowel preparation on the basis of the surgical procedure. Enemas and laxatives are not routinely administered unless the client is having abdominal surgery. Intestinal surgeries require a bowel preparation to cleanse the intestines of fecal material by administering either a cathartic or enema to empty the bowel. Antibiotics are given to reduce the bacterial content. Cleansing the bowel is necessary because surgical manipulation of the intestines interrupts normal peristalsis. Also, incision of any portion of the gastrointestinal tract places the client at risk for peritonitis if fecal material enters the abdominal cavity.

The client is usually instructed to eat a light meal the evening before, avoiding high-fat foods, and is given a laxative. The morning of surgery, enemas may be given. If the surgeon orders "enemas until clear" (no fecal return), refer to the agency's policy. Administering enemas until clear can place the NPO client at risk for fluid and electrolyte imbalances. The client's stress response may already be compromised by the fear of surgery; administering repeated enemas may further decrease the client's coping mechanisms.

Urinary Elimination

The client is instructed to void before receiving the preoperative medication or being transferred to the operating room. The bladder needs to be empty to prevent distension and incontinence during the surgery.

Some surgeries can require continuous decompression of the bladder; the operating room nurse usually inserts a Foley catheter before or during surgery. See Chapter 39 for details on catheterization. If this occurs, the client should be informed about the catheter and how long the catheter will be left in place. Inform the client that a Foley catheter causes a sensation of pressure and an urge to urinate.

THINK ABOUT IT

Nursing Intervention

What should a nurse do if a client refuses a treatment? You are caring for a 16-year-old boy who was in an automobile accident and is scheduled for bladder surgery. The parents are present for perioperative teaching. You explain what will happen during the surgical procedure and that the boy will have a catheter after surgery. The boy gets upset, saying he does not want a tube. What type of age-related teaching materials might you use in this situation?

Safety Precautions

Outpatient clients are instructed to leave their jewelry at home and to avoid the use of makeup the day of surgery for safety reasons. Jewelry and other metal objects can cause burns when electrocautery is used during surgery. Rings can compromise circulation. Hairpins can injure the scalp when the head is positioned for anesthesia. Makeup and nail polish can interfere with the practitioner's assessment of oxygenation.

Unnecessary prosthetic devices should also be left at home to prevent client injury or loss. Outpatient areas have limited space to secure valuables. Contact lenses should always be removed and stored before surgery to avoid corneal ulceration and displacement. Partial dentures and other orthodontic devices must be removed to prevent displacement into the throat during anesthesia.

If the client feels helpless without certain devices, such as glasses and hearing aids, it should be documented on

the preoperative checklist that the client is wearing such devices. The operating room nurse removes such devices immediately before or after anesthesia induction.

Hospitalized clients are usually instructed to give their valuables to a family member before surgery. Otherwise these items are removed from the client's room and placed in a safe area according to hospital policy. The nurse documents on the preoperative checklist the disposition of valuables and prosthetic devices.

Medications

Efforts are made to continue routine medications throughout the perioperative experience. The physician instructs outpatient clients on which medications to take the day of surgery. The nurse is responsible the day of surgery to document which medications were taken and to notify the surgeon when drugs were omitted.

Clients scheduled to receive only local anesthesia are usually instructed to wait until after the procedure to take their medications unless there may be a time delay that could have a negative effect on the client. The following medications that increase a client's risk are withheld:

- Anticoagulants, ibuprofen, and aspirin: May increase blood loss. Clients routinely taking oral anticoagulants are given subcutaneous heparin to ensure prompt reversal with intravenous protamine sulfate should the need arise; oral anticoagulants are not reversed by protamine sulfate.
- Monoamine oxidase inhibitors: May interact with anesthetic agents and are discontinued 2 weeks before surgery.
- Aminoglycosides: Potentiate the effect of neuromuscular blockers.
- Oral hypoglycemic agents: Are continued until the evening before surgery except for chlorpropamide, which is discontinued 48 hours before surgery; to prevent intraoperative fluctuations in blood sugar, an intravenous infusion of glucose and insulin is begun before surgery.

The medication dosage can be adjusted preoperatively for certain drugs. For instance, corticosteroid therapy should be continued when clients have been maintained on the drug for 2 months or more; the dose to be given the day of surgery depends on the client's daily therapy.

Medications to reduce anxiety and facilitate the induction of anesthesia are administered as prescribed. To prevent client discomfort with traditional intramuscular preanesthetic injections, facilities with a "holding area" use this setting to initiate intravenous therapy and administer the pre-anesthetic drugs intravenously.

Evaluation

Evaluation of actual and expected outcomes of the perioperative client is done over the three phases. Preoperative evaluation focuses on the client's ability to verbalize and demonstrate the exercises. The outcome

is evaluated when the client successfully performs the exercises after surgery. Measurement of the client's ability to perform postoperative exercises should first be assessed during the teaching session and again an hour later to evaluate learning. If the client needs coaching to perform the exercises, reinforce teaching until the client demonstrates the exercises appropriately.

Assessment of the client's knowledge regarding the nature, purpose, and risks of the surgical procedure is measured preoperatively. Likewise, the nurse listens to the client's comments and monitors physiological indicators (e.g., vital signs) to measure fears and anxieties regarding the surgery.

The evaluation of a client's preoperative preparation for surgery should include understanding of the procedure, verbalization and return demonstration of postoperative exercises, and postoperative expectations resulting from the surgery. Refer to the accompanying Nursing Process Highlight to understand how the nurse evaluates achievement of client expected outcomes.

Documentation

Documentation of preoperative activities must be entered in the client's medical record on the appropriate forms. The preoperative checklist is used to document accurate completion of preoperative activities. Documentation on this form means that all aspects of care have been performed as ordered. When the operating room (OR) personnel come to transfer the client, the preoperative nurse signs the checklist, entering the time and mode of transportation to the OR (e.g., by stretcher).

Nursing Process Highlight

EVALUATION

In evaluating the nursing care of Mrs. Broussard during the preoperative phase of her total hip replacement surgery, the following questions should be considered:

- What methods can be used to determine whether Mrs. Broussard understands the events that will occur during the surgery?
- What postoperative exercises should Mrs. Broussard be asked to demonstrate for the evaluation of her ability to perform these measures?
- What types of information should Mrs. Broussard be able to share about the postoperative course of treatment?
- What methods can be implemented to elicit Mrs. Broussard's concern or anxiety about the surgery itself or the expectations for her recovery?

INTRAOPERATIVE PHASE

The intraoperative phase begins when the client is transferred to the OR and ends with the client's discharge from the OR. The goal of nursing care during this phase is to ensure client safety. Maintaining a safe environment includes protecting the client from injury, infection, and complications arising from anesthetic agents, hazards, and the surgical procedure (see the accompanying Research Focus).

Surgical Environment

The surgical area usually consists of three zones: unrestricted, semirestricted, and restricted. The unrestricted area is designed for personnel to enter in street clothes: receiving desk, holding area, and locker rooms. Surgical attire (scrub clothes, disposable shoe covers, and caps) is required in the semirestricted and restricted zones. Hallways and storage areas constitute the semirestricted area. Restricted zones (controlled and germ-free areas) include the OR and rooms where sterile instruments are prepared.

Holding Area

The holding area is a unit where the surgical team prepares the client for surgery (Figure 30-10). The anesthesiologist usually starts the intravenous infusion and administers the preoperative intravenous medication. The nurse confirms that aspects of care on the preoperative checklist have been performed. A family member is usually encouraged to remain with the client while the client awaits transfer to the OR.

Surgical Team

The surgical team consists of the surgeon, anesthesiologist, OR nurses, surgical assistants, and other members of the health care team. The roles and responsibilities of the



Figure 30-10 Holding Area. What is this nurse doing to prepare this client for surgery?

RESEARCH FOCUS

Title of Study

“Clinical Decision-Making Process in Perioperative Nursing”

Authors

Parker, C., Minick, P., & Kee, C.

Purpose

The purpose of this phenomenological study was to reveal the processes of clinical decision-making by expert perioperative nurses.

Methods

Six expert nurses from five different hospitals in a large southern metropolitan area participated in the study. Expert nurses were defined as having worked a minimum of 5 years and considered themselves to be expert circulating nurses in the OR. Based on an interview guide, the participants were asked to describe any perioperative clinical situation in which they intervened on the patient's behalf and affected the patient's outcome by doing so. The interviews were transcribed verbatim; data were loaded into a software program to categorize, sort, and manage the data.

Findings

The predominant pattern contributing to the clinical decision-making process among the expert nurses was “seeing the big picture: engendered through caring.” Multiple decisions were identified within each nurse's practice, and within each decision, certain characteristics were identified and categorized into themes. Data analysis identified three themes as requisite for expert clinical decision-making: connecting with patients; advocating for patients; and embodied knowing.

Implications

This study demonstrates that positive patient outcomes depend on the ability of the perioperative nurse to integrate all nursing knowledge, make rapid decisions, and constantly advocate for the patient. These data also suggest that nurses and nursing students would both benefit if personal care experiences were shared so that the taken-for-granted knowledge of clinical practice could be examined and caring practices could be made explicit.

Parker, C., Minick, P., & Kee, C. (1999). Clinical decision-making process in perioperative nursing. *AORN Journal*, 70(1), 45–62.

surgeon and anesthetist have already been discussed. The OR team usually consists of:

- Surgeon: Scrubbed and in surgical attire to perform the surgery
- Anesthesia provider: Masked and in clean scrub attire to administer the anesthesia
- Surgical assistant (first assistant): Can be another physician, a nurse, or physician's assistant (PA) who is scrubbed, in sterile attire, and assists the surgeon to ligate, suction, and suture
- Scrub nurse or technician: Scrubbed and in sterile attire; prepares the instrument tray and passes the instruments, sponges, needles, and sutures to the surgeon
- Circulating nurse: In clean scrub attire and mask; obtains supplies, delivers materials, pours solutions, handles specimens, positions the client and surgical drapes, and disposes of soiled items

Both the scrub and circulating nurses are responsible for counting the number of used instruments, needles, and sponges. Before the surgeon closes the incision, these items are counted to ensure that nothing is being left in the operative site.

Occupational Hazards

Perioperative personnel are at risk of exposure to harmful pathogens and other dangers. Dangers of a particular concern to perioperative nurses are latex allergies, needlesticks, eye splashes, back injuries, and indoor pollution. Precautions should be in place that are in compliance with Occupational Safety and Healthcare Administration (OSHA) standards regarding blood-borne pathogens, medical waste and hazards materials, including personal protection devices, disposal of needles and syringes, and contaminated supplies. See Chapter 31 for a complete discussion of latex allergy and OSHA's standards.

Health care agencies need to have a process in place to document compliance with OSHA requirements. Akdumann (1999) studied the compliance of OR personnel with universal precautions during surgical procedures in four subspecialties: orthopedic, gynecologic, cardiothoracic, and general surgery. Personnel were informed in advance about data collection regarding the use of protective equipment. The study revealed that only 39% of the personnel wore protective goggles, 5% wore face shields, 32% wore regular glasses, and nearly one-fourth wore no eye protection. Although double-gloving was higher in orthopedics than other areas, only 28% of the observed personnel double-gloved. A 22% rate of exposure was observed during 76 cases with three percutaneous injuries (two scalpel, one needle-stick) and 14 cutaneous blood and bodily fluid exposures. The study proposed the need for consistent training in and reinforcement of OSHA's guidelines.

Slattery (1998) refers to the hospital environment as a "chemical soup" and addresses the agents that compro-

mise the quality of indoor air. Pollution in the OR is caused by fumes from high levels of disinfectants, surgical smoke from tissue being cut, vaporized, or coagulated, and waste gases from anesthetic agents. Disinfectants such as glutaraldehyde used to sterilize instruments are not regulated, and the fumes may cause serious respiratory and dermatologic problems. OR nurses are also at risk with respect to laser plume or surgical smoke, which can lead to respiratory problems, burning, watery eyes, nausea, and viral contamination and regrowth. To decrease the exposure to these dangerous pollutants, agencies should have policies in place that require clients and personnel to wear high-filtration masks and to provide the rooms with smoke evacuators.

Assessment

The first activity of assessment for the OR nurse is to check the client's identification band and confirm the surgical site. Agency protocol and standards of care from the AORN establish the focus areas of assessment for the client and the environment.

Assessment of proper positioning to ensure comfort and safety includes:

- Checking for client alterations that can affect positioning during the procedure, such as previous skeletal or joint surgery, presence of a joint or vascular prosthesis, poor nutrition, and skin integrity
- Making sure the OR bed is prepared to receive the client: for example, warming mattress on bed, proper orientation of bed, bed wheels locked
- Ensuring that accessories are clean and readily available for a specific position: for example, Wilson frame, chest rolls, pillows, headrest

Throughout the surgical procedure, the nurse assesses for pressure areas of the extremities, joints, or any body surface; skin discoloration; and temperature. Whenever the client's position is changed during surgery, the nurse reassesses for signs of circulatory impairment from positioning and equipment in contact with the skin.

Nursing Diagnoses

Common intraoperative nursing diagnoses promote client comfort, safety, and support during the surgical procedure. See the previous display of nursing diagnoses in the section on Perioperative Nursing Diagnoses.

Outcome Identification and Planning

The focus of intraoperative care planning is on nursing activities that promote the client's achievement of expected intraoperative outcomes (see the accompanying display).

COMMON INTRAOPERATIVE CLIENT OUTCOMES

- The client demonstrates knowledge related to the physical environment and surgical intervention.
- The client's needs are met while in a dependent state from the anesthesia.
- The client is maintained in a safe germ-free environment during the surgical procedure.
- The client is free from infection 72 hours postoperatively.
- The client's skin integrity is maintained by proper positioning on the operating room table.
- The client is maintained in proper body alignment to prevent injury from positioning.
- The client is free from injury related to exposure from heat loss.
- The client is free from injury related to chemical, electrical, and physical hazards.
- The client's fluid and electrolyte balance is maintained.

These outcomes are directed at placing the client in a safe environment free from injury. The OR team monitors the client throughout the surgical procedure for complications.

Specific nursing care is planned to encompass the surgeon's specifications for positioning and to alleviate or prevent any individual client problem. Surgeons have preference cards that identify the type of equipment and instruments for various surgical procedures (e.g., indications and use of electrical equipment). Planning also involves determining the appropriate mode of client transfer, determining equipment and positioning aids, or determining the need for ancillary personnel to accom-

THINK ABOUT IT

Nursing Care and Client Populations

What options are available to nurses who have personal objections to caring for certain client populations?

A Special Committee on Ethics of the AORN conducted a study to elicit the acquired immunodeficiency syndrome (AIDS)-related knowledge, attitudes, and practices of perioperative nurses. The findings revealed that:

Nurses continue to be reluctant to provide care to HIV-positive patients if given a choice. Sixty percent of perioperative nurse respondents said they "somewhat agreed" or "strongly agreed" with this sentiment compared with 62% of the respondents in the original study. One AORN respondent said, "I don't believe anyone should be legally required to care for any patient with any illness/disease (Reeder, Hamlet, Killen, King, & Uruburu, 1994, p. 456).

What is your reaction to the AORN respondent? Read the American Nurses Association Code of Ethics in reviewing your own values toward HIV-positive clients.

plish the positioning. The plan of care should be individualized to include needs relative to the client's health status such as diabetes, malnourishment, or paralysis.

Interventions

Nursing interventions are selected to facilitate caring and to achieve the expected outcomes, such as the client is free from infection 72 hours postoperatively. Because anesthesia inhibits the client's ability to protect self, the OR staff implements surgical asepsis, safe positioning, and other interventions that promote client safety (e.g., the client is never left unattended).

Nursing care includes communication skills to reduce the client's anxiety. The OR staff communicates a caring attitude, functioning under the assumption that anesthetized clients will be able to recall comments made during surgery.

Surgical Asepsis

Surgical asepsis is used to decrease the client's risk for an infection. Surgical asepsis refers to handwashing, wearing surgical attire, handling sterile instruments and equipment, and establishing and maintaining sterile fields. The sterile field is free of microorganisms and only sterile items can be placed inside the field. See Chapter 31 for a complete discussion of surgical asepsis.

Surgical handwashing is performed to remove soil and microorganisms from the skin. The skin on the hands and arms should be intact (free of lesions). Agency policy determines how the scrub is to be performed (e.g., method and timing).

Once the scrub nurse is properly attired for surgery, strict adherence to aseptic principles guides all actions. The hands and arms are held above the waist at all times. Only attire from the waist to the gown's collar and the anterior surface of the sleeves is considered sterile. The scrub nurse sets up the instrument table, using sterile drapes and instruments. Only the tops of instrument tables are considered sterile. Items placed within a sterile field are opened, dispensed, and transferred using technique to maintain the item's sterility. Soiled or contaminated articles are removed immediately from the room by the circulating nurse.

Skin Preparation

Skin preparation (prep) is performed to decrease the risk for infection by reducing the resident microbial count on the skin and inhibiting rebound growth of microbes when the skin is incised during surgery. The second phase of the surgical skin preparation is usually done by OR personnel before surgery to prevent the growth of microorganisms.

Guidelines for when and where the skin is to be prepped for the surgical procedure differ according to agency policy, surgeon's preference, and incision site. The preference card usually indicates the type of preparation. The OR nurse ensures that the operative site is clean.

The skin preparation should comply with the CDC recommendations to avoid unnecessary hair removal

and to shave immediately before an operation. Hair can be removed by clipping, depilatory, and shaving with a razor. A dry shave refers to the removal of hair by clipping or the use of a depilatory. Shaving with a razor and a warm, antiseptic solution is often called a wet shave. Figure 30-11 designates the body surfaces to be prepared for surgical procedures involving the head, neck, ear, and upper thorax. Preparation of the upper extremities, chest, and abdomen are illustrated in Figure 30-12.

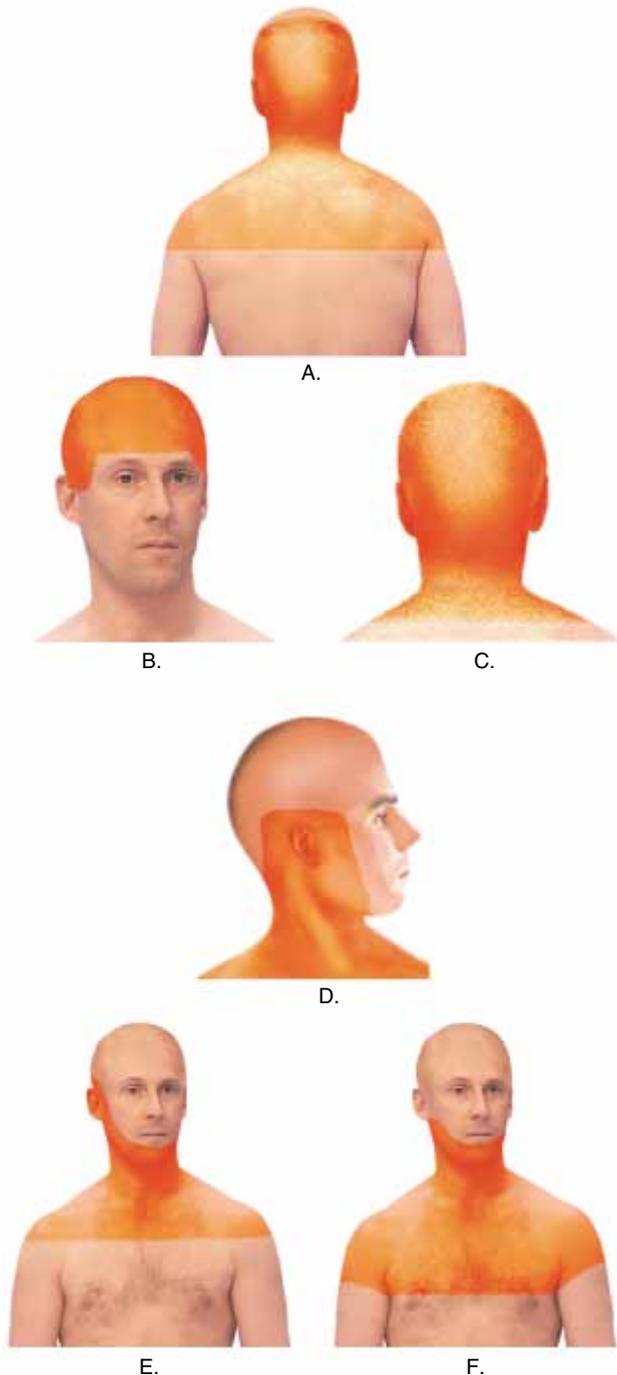


Figure 30-11 Preparation of the Head for Surgery: A.–C. Head for a Craniotomy; D. Neck for Otological Surgery; E., F. Upper Thorax for Thyroidectomy



Figure 30-12 Surgical Preparation of Upper Extremities and Trunk for Surgery, Anterior and Posterior Views

NURSING ALERT

Chemical Burns

After the skin preparation, remove all solution that has pooled under the client; chemical skin burns can result from prolonged exposure to antiseptic solutions.

When performing a skin prep, the nurse should provide the client with an explanation of the procedure, privacy, comfort, and safety. Common agents for prepping the skin include povidone-iodine, chlorhexidine, alcohol, and hexachlorophene. If the client has any adverse reactions to the prep, the nature of the reaction should be documented and the physician notified.

Positioning and Draping

The surgical client is usually sedated or anesthetized and therefore is unable to communicate any discomfort. Proper positioning ensures client comfort and safety, preserves vascular supply, and prevents neuromuscular damage to tissue. At the same time, positioning also provides access to the surgical site, airway, intravenous lines, and all monitoring devices.

All sharp surfaces in contact with the client's skin are padded to prevent injury from positioning. Bony prominences (e.g., sacrum and heels) are padded to avoid excessive pressure on these points. The nurse ensures that skin surfaces are insulated from metal bed attachments (e.g., padded arm boards, headrest, stirrups). Appropriate devices are made available to support extremities to prevent compression of vital structures, such as the ulnar nerve or Achilles tendons.

The circulating nurse ensures that at least four persons are available for positioning clients under general anesthesia. Restraints (or belts) are available to secure the client to the operating bed; sufficient soft padding is used to maintain anatomical alignment of the head and neck with the spine.

Once the client is positioned properly and the site has been prepped, the circulating nurse applies the sterile drapes. OR drapes are designed to expose specific operative sites. The staff keeps the sterile drapes dry and in place.

Electrical Hazards

During surgery the client can be exposed to an electrical surgical generator (electrocautery device to eliminate bleeding and reduce contamination). Electricity cannot flow unless a circuit is complete; thus, electricity introduced into the body has to find a pathway back to the generator. A ground pad is provided for that purpose.

Proper grounding technique is essential for the safe and effective use of the generator. The circulating nurse ensures that the selected ground site is free of skinfolds,

scar tissue, erythema, skin lesions, or bony protuberances. The site should be as close as possible to the operative area. Throughout the surgery, the circulating nurse inspects the ground pad site for any unusual skin discoloration, burns, or skin reaction.

Lasers provide another method for cutting and coagulating tissue during the surgical procedure. Lasers deliver high energy-beams directly onto the tissue and reduce tissue damage and scarring that can inhibit healing. To prevent injury to the skin and eyes, the staff and conscious clients wear special high-filtration masks when the laser produces smoke.

Heat Loss

Injury from hypothermia is prevented by measures implemented to minimize heat loss. During surgery, body heat is lost by positioning on a cold OR table (conduction); administration of cold gases (convection); exposure of large operative sites, such as thoracic and abdominal areas (evaporation); and exposure to cold OR temperatures (radiation). Anesthetic agents can also alter thermoregulation and lower metabolism. Body temperature is maintained by applying warming mattresses or warmed blankets, warming and humidifying inhaled gases, warming irrigating and intravenous solutions, and increasing room temperature when the client is exposed, for example, for skin preparation and positioning.

Monitoring Physiological Functioning

After intubation and induction of anesthesia, the client is monitored for:

- Ventilation and circulation
- ECG and oxygen analyzer alterations
- Fluid intake, urinary output, and calculated blood loss
- Behavioral changes
- Body temperature
- Diagnostic testing (collection of specimens and cultures, x-rays and fluoroscopy)
- Placement of medical devices (ground pad, position support, drains, catheters, implants, packings, and dressings)

These measures assist in identifying and correcting any serious problems before they can result in client injury.

Evaluation

Before the client is transferred to the recovery room, the OR nurse evaluates and documents achievement of client outcomes. Evaluation is based on reassessment findings of the client during and after surgery. The nurse documents the specific data on the OR record,

which usually reflects AORN standards of intraoperative care and other direct care issues pertinent to client outcomes.

Transfer to Postanesthesia Care Unit

While the surgeon is closing the incision, the OR nurse gives a telephone report to a recovery room or PACU nurse regarding the client's health status, surgical outcomes, special equipment needs, and nursing interventions. This information allows the PACU staff time to prepare to receive the client.

Planning for personnel and equipment needed to safely transfer the client is usually handled by the circulating nurse. Moving the semianesthetized client from the OR table to the PACU stretcher for transport requires coordinated effort of at least four persons. Assurance is made that a sufficient number of staff are available to move the client while maintaining proper body alignment and preventing the dislodgement of any tubes, drains, or monitoring devices.

Safety measures are implemented to prevent injury to both client and staff members. The staff uses good body mechanics and assistive devices, such as draw sheets or body rollers, to allow proper weight distribution of the client. The stretcher wheels are locked to prevent movement. The client is always lifted from the table, as opposed to being dragged or pulled with draw sheets, to prevent skin irritation or shearing. The nurse applies stretcher belts (restraints) prior to transport. Also, the head of the stretcher is elevated, side rails are raised, and the placement of tubes and drains is confirmed.

Once on the stretcher, the client is quickly transported by a nurse and anesthetist to the PACU. The client at this time is at high risk for injury related to the effects of residual anesthesia: airway distress, vomiting and aspiration, and circulatory alterations. The anesthetist stays with the client while the OR nurse gives a report to the PACU nurse assigned to the client. The report should include all pertinent anesthesia and surgery information (refer to the Nursing Checklist).

After giving the report, the OR nurse documents the time of discharge, method and disposition of transfer, and a general statement regarding the client's status. The client usually remains on the same PACU stretcher throughout the stay in the unit.

POSTOPERATIVE PHASE

The primary goal of nursing care during the immediate postoperative phase is to maintain the "A-B-Cs": airway, breathing, and circulation. Ongoing care is directed toward restoring the client to the preoperative health status. Clients receiving local anesthetics, without sedation, are usually transferred to the outpatient ambulatory care setting for observation while awaiting discharge. Their postoperative care is usually nonemergent in nature and is discussed later in the section titled Ongoing Postoperative Care.

General anesthesia requires intubation. Extubation is performed by the anesthetist before the client leaves the OR or in the PACU when assessment data confirm adequate gas perfusion. Clients with heart and other major surgeries are not extubated immediately. The endotracheal tube is usually removed on the first postoperative day. Intubated clients are usually transferred to intensive care units for 2 or 3 days.



NURSING CHECKLIST

Preparing the Postanesthesia Report

- Brief history of client's health status: preexisting conditions and medical diagnoses requiring surgery
- Baseline and OR vital signs
- Results of diagnostic testing (e.g., blood gases)
- Administration of anesthetic agents and other medications
- Estimated blood loss
- Total volume of output from all tubes and drains
- Total volume of infused intravenous fluids and blood products
- Presence and status of devices (e.g., tubes, drains, antiembolism hose)
- Any other problems treated during the surgery or other special nursing interventions

Assessment

Following the initial assessment of the client's respiratory status, the nurse performs a total assessment (see Table 30-5). The postoperative nursing care protocol, based on AORN's standards of care, is initiated. The protocol identifies those areas requiring immediate assessment and reassessment as discussed in Table 30-5. Focused assessment is performed relative to the surgical procedure as discussed in the Nursing Process Highlight.

Nursing Diagnosis

Refer to the earlier display of perioperative nursing diagnoses. Clients with preexisting conditions, identified during the preoperative period, will continue to require special nursing care. Depending on the individual client's needs, other nursing diagnoses can be included in the plan of care.

Nursing Process Highlight

ASSESSMENT

During surgery Mrs. Broussard was placed in a lateral position and given a general anesthetic. She was extubated before leaving OR with an oral airway in place on arrival to PACU. Following assessment and management of the “A-B-Cs” the nurse assessed: alignment of the left hip; the client’s level of pain; incision dressing for drainage, inspecting posteriorly where drainage can pool; and circulatory, motor, and sensory status below the site of surgery.

- What immediate assessment parameters must the nurse address to ascertain the status of the postoperative client?
- What priority areas must the nurse assess?
- What measures should be implemented to determine the client’s level of pain?
- What are the nurse’s priorities when inspecting the incision?
- What signs or manifestations should the nurse be alert for regarding the incision?

Some surgeries have unpleasant outcomes. The loss of an extremity or other body part or function can cause the client and family to experience ineffective coping. These situations require compassion and consideration to assist those involved to work through and express their feelings. Support needs to be given not only to the client but also to the family. Physical healing can occur before emotional or spiritual healing does. Learning to cope with a loss sometimes extends beyond the postoperative phase. See Chapters 11 and 21 for more information.

Outcome Identification and Planning

Planning the care for postanesthesia clients addresses the development of nursing interventions to achieve the client’s expected outcomes during recovery from anesthesia and surgery. Care planning is done in two parts: immediate care rendered in the PACU area and ongoing post-PACU care. Nursing care in PACU usually lasts 1 to 3 hours and is directed toward returning the client to a safe physiological level of functioning after anesthesia. Care is prioritized according to the type of anesthesia and surgical interventions through the assistance of appropriate agency protocols (e.g., care of the client following extubation).

TABLE 30-5
Initial Postoperative Assessment: Normal and Abnormal Findings

Area of Assessment	Normal Findings	Abnormal Findings
Airway and Respiratory Status <ul style="list-style-type: none"> • Adequacy of airway and return of gag, cough, and swallowing reflexes • Type of artificial airway • Rate, rhythm, and depth of respirations • Symmetry of chest wall movements and use of accessory muscles • Breath sounds • Color of mucous membranes • Pulse oximeter readings • Amount and method of oxygen administration • If awake, ability to deep breathe and cough 	The client is able to: <ul style="list-style-type: none"> • Expel an oral airway; gag reflex has returned • Breathe deeply and cough freely with normal rate for age, even, without use of accessory muscles, and chest wall symmetry; breath sounds present in all lobes; mucous membranes pink • Pulse oximeter reading between 95% and 100% • If awake, demonstrates proper use of incentive spirometer 	<ul style="list-style-type: none"> • Upper airway obstruction: stridor, retractions, asymmetrical chest movement • Laryngospasm: high-pitched squeaky sounds • Dyspnea: shortness of breath or difficulty in breathing • Diminished breath sounds, wheezing, rales, or rhonchi • Residual neuromuscular blockage: weak inspiratory effort, inability to lift head, or inadequate muscle strength
Circulatory Status <ul style="list-style-type: none"> • Apical and peripheral pulses • Blood pressure (BP) • Nail bed and skin color and temperature • Capillary refill • Homans’ sign Monitoring devices: <ul style="list-style-type: none"> • Cardiac monitor (ECG) 	The client has: <ul style="list-style-type: none"> • Normal apical rate and peripheral pulses • BP within 20 mm of baseline measurements • Pink nail beds; skin warm and dry • Capillary refill <3 seconds • Negative Homans’ sign • Normal ECG rhythm 	<ul style="list-style-type: none"> • Hypotension: BP <20 mm of baseline; rapid, weak pulse; nail beds bluish; capillary refill >3 seconds • Hemorrhage/hypovolemic shock: rapid, weak pulse; increasing respirations; restlessness; hypotension; cold, clammy skin; pallor; urinary output <30 ml/hr

(continues)

TABLE 30-5 (continued)
Initial Postoperative Assessment: Normal and Abnormal Findings

Area of Assessment	Normal Findings	Abnormal Findings
<ul style="list-style-type: none"> Pressure readings (arterial blood pressure or central venous pressure) 		<ul style="list-style-type: none"> Positive Homans' sign (calf pain present on dorsiflexion of foot) ECG pattern: dysrhythmias; signs of cardiac ischemia
Neurologic Status <ul style="list-style-type: none"> Level of consciousness (Glasgow Coma Scale) Eye opening Verbal response Motor response 	The client: <ul style="list-style-type: none"> Spontaneously opens eyes Is orientated Obeys commands (Glasgow Coma Scale of 15, highest rating) 	Glasgow Coma Scale <15 indicates some alteration in consciousness; a score of 7 is considered coma
Fluid and Metabolic Status <ul style="list-style-type: none"> Intake and output Palpate for bladder distention Patency of intravenous (IV) infusion (type, rate, and amount) Signs of dehydration (skin integrity and turgor) or overload (edema) Patency, amount, and character of drainage (catheters, drains, or tubes) Inspect operative dressing (type, color and amount of drainage) Auscultate for bowel tones in all four quadrants and inspect for abdominal distension 	Fluid intake balanced with total output, electrolytes within normal limits, considering replacement of blood volume lost during surgery: <ul style="list-style-type: none"> IV fluids infusing per surgeon's order Absence of bladder distension Good skin turgor Absence of edema Drains and other tubing patent and intact Dressing dry and intact Bowel tones faint or absent during the immediate recovery phase Absence of nausea and vomiting 	<ul style="list-style-type: none"> Signs of deficient fluid volume (thirst, poor skin turgor, low-grade temperature, tachycardia, respirations ≥ 30, a 10–15 mm decrease in systolic blood pressure, slow venous filling, urinary output <25 ml/hr) Bright red blood on operative dressing Signs of excess fluid volume (increased central venous pressure and edema, pulmonary or peripheral)
Level of Discomfort or Pain <ul style="list-style-type: none"> Location, intensity, and duration Type, amount of analgesia administered and client's response 	Client free from pain	Pain not relieved by analgesia
Wound Management <ul style="list-style-type: none"> Inspect the dressing Note type and amount of drainage If drainage is present, reassess in 15-minute intervals 	Dressing dry and intact	Clot dislodged: bright red drainage on the dressing

After discharge from PACU, the nurse ensures that the client is knowledgeable about home care. Post-PACU care is begun for outpatients in the ambulatory setting. The nursing interventions reinforce client safety and teaching for discharge. For clients who are hospitalized postoperatively, the nursing care plan encompasses both inpatient and discharge needs.

Interventions

Care in the recovery unit is directed by standards of care and protocols. These tools assist the nurse in determining the most effective interventions for specific client populations, type of anesthesia, and surgical procedure. Postoperative nursing interventions are based on assessment and reassessment findings.

Safety measures are initiated immediately on arrival into the recovery unit (see Figure 30-13). Intubated clients require the constant attendance of a nurse at the bedside. The head of the stretcher is maintained in a high Fowler's position. Stretcher belts and side rails are left in place from transfer; wheels on the stretcher are locked. Lifesaving equipment is at the client's bedside.

Maintaining Respiratory Status

On arrival to the recovery area the client is placed on high-humidity oxygen and attached to a **pulse oximeter** (sensor device to measure the oxygen saturation level of the blood). The client is at risk for ineffective breathing patterns resulting from the anesthesia. At least every 15 minutes the nurse monitors the reading on the pulse



Figure 30-13 Postanesthesia Care Unit (PACU). What is the most essential action the nurse should implement with the client in this situation?

oximeter along with respirations. A patent airway can be maintained with an endotracheal tube, nasal or oral airways, and suctioning when needed. See Chapter 32 for a complete discussion of airway devices.

If the client is extubated and experiences difficulty in breathing, reestablish the upper airway: bring the chin forward, hyperextend the neck, and turn the head to the side. If the obstruction is unrelieved, insert either a nasal or an oral airway and suction. If these measures fail to relieve the obstruction, notify the anesthetist. The anesthetist is responsible for treating any physiological impairments related to anesthesia.

The nurse tapes the endotracheal tube on intubated clients to ensure proper placement. The client is maintained in a high Fowler's position to optimize breathing and lung expansion, unless contraindicated. Bronchial secretions are removed by suctioning the intubated client. Suctioning is performed on the basis of assessment findings:

- Rhonchi (low-pitched gurgling sounds in large airways)
- Low-pitched, musical wheezes despite bronchodilator therapy
- Increased peak airway pressure in clients receiving mechanical ventilation

The lungs are usually hyperinflated and hyperoxygenated before, between, and after suctioning to prevent hypoxemia and cardiac dysrhythmias. The nurse observes the ECG monitor while suctioning to observe for signs of hypoxemia.

Hypoxemia can be caused by inadequate lung ventilation from the depressant effects of anesthesia or narcotics. The PACU client is at risk for hypoxemia from the effects of general anesthesia, which reduces the inspiratory effort, and the presence of pain, which reduces ventilatory effort. Older or obese clients are especially vulnerable to postoperative hypoxemia (McCaffigan, 1996).

The early symptoms of hypoxemia are drowsiness and confusion. These symptoms are usually present in

PACU clients recovering from anesthesia. A blood oxygen level measurement less than 95% is an indication of hypoxemia.

Extubation

The agency's protocol is implemented to determine the parameters for extubation, such as the client being able to lift the head for 5 seconds and produce strong bilateral hand grasps. The nurse obtains a tidal volume, negative inspiratory force, and vital capacity (if the client can cooperate) before extubation. See Chapter 32 for further discussion. The anesthetist is notified when the oxygen saturation percent is within safe limits to allow extubation.

The nurse confirms the presence of bilateral breath sounds immediately before and after extubation by auscultation. The procedure is explained to elicit client cooperation and to allay anxiety. Before extubation, the pharynx and trachea are suctioned. The client is instructed to inhale deeply while the anesthetist deflates the cuff and removes the endotracheal tube at maximal lung inflation to encourage initial gas flux outward, allowing the forceful exhaling of secretions.

The client is placed immediately on humidified oxygen for at least 30 minutes and monitored with a pulse oximeter for an hour after extubation. Ventilation is maintained by encouraging deep breathing, coughing, turning, and taking deep breaths every 5 to 10 minutes.

Maintaining Circulatory Status

The client is monitored carefully for the signs of hypotension (Table 30-5), which can occur from the myocardial depressant effects of residual anesthesia or hypovolemia. The cardiac monitor displays the client's heart rhythm; it is used to detect and treat tachycardia, bradycardia, dysrhythmias, and cardiac ischemia.

Hypovolemic shock (marked reduction in circulating blood volume) is caused from hemorrhage. The symptoms of hemorrhage are presented in Table 30-5. A rapid pulse rate can indicate pain, bleeding, dehydration, or shock. Impaired capillary refill indicates inadequate tissue perfusion to extremities.

Passive range of motion and the application of antiembolism hose or other devices promote circulation of the intubated or semiconscious client. Postoperative leg exercises are begun as soon as the client recovers from the effects of anesthesia. These measures prevent circulatory complications such as thrombophlebitis, thrombus, and embolus formation.

Maintaining Neurologic Status

Monitoring the client's level of consciousness is done in relation to how the airway is maintained:

- The unconscious client with an absence of the cough and gag reflex will have an endotracheal tube or airway.

- The semiconscious client with partial return of all reflexes will have an oral or nasal airway.
- The conscious client with full return of all reflexes will breathe without assistance from an artificial airway.

The Glasgow Coma Scale is used to measure the client's level of response. See Chapter 36 for a description of the Glasgow Coma Scale.

The nurse monitors clients who had spinal anesthesia for return of reflexes, sensation, and movement of extremities below the level of anesthesia. Extremities are assessed for color, temperature, and pedal pulses.

Nursing care of clients with spinal anesthesia includes the prevention of a postspinal headache. The postspinal headache is thought to be caused by the leakage of cerebrospinal fluid from the puncture site in the dura. Measures to prevent a headache include strict bed rest for 24 to 48 hours, adequate hydration with intravenous saline, and injection of 5 to 20 ml autologous blood into the epidural space at the puncture site.

Maintaining Fluid and Metabolic Status

During the immediate postoperative phase, gastrointestinal and genitourinary assessment and interventions are considered from a fluid and metabolic perspective. The client is maintained on intravenous infusions as prescribed by the surgeon. The goal of intravenous therapy is to maintain the circulating fluid volume. Infusion sites are inspected for patency immediately when the client arrives in the PACU. Frequent inspection of these sites is necessary throughout recovery; intravenous access must be maintained in the event of complications (e.g., hemorrhage) that warrant emergency administration of intravenous fluids or medications. Secretions from tubes, drains, and the incision site are measured to determine output. The client's total output is compared against the volume of intravenous replacement fluids.

After surgery, the muscle tone of the bladder is compromised by analgesic or anesthetic agents. Assess for bladder distension by palpating the contour of the lower abdomen for a rounded mass above the symphysis pubis. When clients cannot void within 8 hours, the surgeon is notified for an order to catheterize. If the client has a Foley catheter, it should flow freely with urine.

Postoperative nausea and vomiting can be caused by multiple factors. Anesthetic agents and opiates can stimulate the chemoreceptors of the inner ear and the vomiting center in the brain. Deficient fluid volume, electrolyte imbalances, drugs, and general anesthesia by mask technique can also cause nausea and vomiting. Nausea and vomiting are treated with antiemetics.

Anesthetic agents can decrease peristalsis, resulting in diminished or absent bowel tones. Manipulation of the intestines further decreases the loss of bowel tones. The nurse auscultates for bowel tones and inspects for abdominal distension. A nasogastric tube is usually in place for clients with abdominal surgery and clients at risk for nausea and vomiting postoperatively.

With abdominal surgery, the nurse also monitors for abdominal distension to detect internal hemorrhage. **Cullen's sign** (a bluish discoloration around the umbilicus in postoperative clients) can indicate intra-abdominal or perineal bleeding.

Clients are kept on an NPO status until the gag reflex returns, they are free from nausea, and the presence of bowel tones is detected. Certain drugs (analgesic/anesthetic agents) have a drying effect on the oral mucous membranes. Dehydration from loss of body fluids also causes dryness and thirst. Oral hygiene is performed frequently to promote comfort and prevent infections.

Managing Pain

Nurses assess for pain by allowing the client to rate the intensity of pain. Studies comparing nurses' and clients' ratings of pain have found little similarity between the two (Pasero, 1996). One study compared the pain ratings of 119 postoperative clients and their nurses. The ratings matched only 35% of the time; nurses underassessed pain in 45% of the cases and overassessed pain in 20% of the cases.

Pain management is monitored and treated by intravenous narcotics in titrated doses until the client is fully conscious. Once the client is fully conscious, pain is managed according to physician order: PCA, continuous epidural anesthesia, intravenous or intramuscular injection, TENS.

The nurse should institute comfort measures such as splinting the incision line and positional changes to decrease the client's pain response. Besides incisional pain, the client can experience pain for other reasons, such as positioning during surgery, presence of tubes (endotracheal, nasogastric, chest, or Foley), and tight dressings or casts. Skin care and back rubs are done to promote comfort and circulation.

The Agency for Health Care Policy and Research (AHRQ) has clinically relevant practice guidelines for the management of postoperative pain. Three interdisciplinary panels, chaired by nurses, developed guidelines to inform the public on pain management:

- The provider should anticipate the pain.
- It is least therapeutic to be medicated when in pain.
- There are alternatives to pharmacologic management of pain.

NURSING ALERT

Abdominal Distension

When clients with abdominal surgery develop abdominal distension, inspect the tape over the incision dressing; tension on the tape can cause disruption of skin integrity (irritation and blisters). This can also increase the client's risk for a wound infection.

Relaxation techniques, distraction, environmental manipulation, massage, and positioning are optional therapies. See Chapter 14 for additional information on complementary therapies for pain management.

Evaluation and Discharge from the PACU

The anesthetist is responsible for releasing the client from the PACU. Agencies have specific standards of care that have to be met before discharge. These standards address achievement of specific client outcomes with inherent parameters for evaluation, such as:

- The client is conscious, oriented, and can move all extremities.
- The client demonstrates full return of reflexes.
- The client can clear the airway and cough effectively.
- Vital signs have been stable or within baseline ranges for 30 minutes.
- Intake and urinary output are adequate to maintain the circulating blood volume.
- The client is afebrile, or a febrile condition has been treated accordingly.
- Dressings are dry or have only minimal drainage.

The surgeon manages the client's treatment throughout the remainder of the postoperative phase.

Ongoing Postoperative Care

The postoperative phase continues until the client is released from the surgeon's care. The primary goal during this phase is to restore physiological functioning, promote healing, and prevent complications. When the client is discharged from the PACU, the client goes either directly to an inpatient hospital bed or to the outpatient ambulatory unit for observation. The surgeon will later decide whether to admit the client to an inpa-

tient 24-hour observation room or to discharge the client. When clients are discharged to their residence, they often require the services of a home health nurse to assist with their postoperative care. The home health nurse will continue to assess and provide necessary care until the client achieves the expected outcomes.

Postoperative nursing care after discharge is based on the nursing diagnoses and expected outcomes that still have not been met (see the accompanying display). Clients who are discharged without the services of a home health agency assume their own care or have a family member or significant other serve as the care provider. In this situation, specific written discharge instructions are explained to the client or care provider.

Ineffective Airway Clearance

Ineffective Airway Clearance during this phase can result from a diminished cough reflex or increased pulmonary congestion. The nurse monitors skin color and respiratory rate and depth and auscultates breath sounds to determine the adequacy of oxygenation and to identify complications (e.g., atelectasis). Deep breathing and coughing and the use of the incentive spirometer are continued until the client demonstrates achievement of respiratory outcomes.

Ineffective Tissue Perfusion

Ineffective Tissue Perfusion (Cardiopulmonary) related to inadequate circulation is a possible nursing diagnosis. The nurse monitors pulse rate and quality, blood pressure, skin and nail bed color and condition, and temperature for indications of decreased oxygenation at the cellular level. Capillary refill and peripheral pulses are checked for adequate circulation to the extremities. The nurse monitors the lower extremities for signs of superficial vein thrombosis (local warmth, swelling, pain, redness) and deep vein thrombosis (a positive Homans' sign).

Postoperative leg exercises are performed until the client is able to ambulate and resume activities of daily living. Antiembolism hose are usually worn until the client returns for the first office visit. At that time the surgeon assesses the need to continue use of the hose.

Other devices, pneumatic compression, and CPM are maintained according to the physician's order. Clients are encouraged to ambulate while these devices are in place to promote respiratory, circulatory, and gastrointestinal functions. The CPM device is used until signs of incision swelling have decreased, healing is evident, and range of motion is achieved.

Deficient Fluid Volume

Deficient Fluid Volume can be related to active fluid volume loss, inadequate fluid intake from being NPO, or nausea and vomiting. The client is monitored for intake and output that includes secretions from drainage tubes, drains, and dressings. If oral fluids are restricted, the client is

DISCHARGE TEACHING

Client Expected Outcomes

Before discharge, the client can:

- List the symptoms to be reported to the physician on occurrence.
- Describe limitations in activity.
- Explain dietary limitations.
- Explain the meaning and purpose of medications.
- Explain potential food or drug interactions.
- Describe the use of Standard Precautions as appropriate.
- Demonstrate aseptic technique in changing dressings.
- Demonstrate use or application of prescribed medical devices (identify appropriate device).

maintained on intravenous infusions as ordered by the surgeon. The nurse monitors the patency of the intravenous line, observes for signs of infiltration, and records the amount and type of fluids infused. The nurse assesses for signs of dehydration or fluid overload. See Chapter 37 for a discussion of fluid balance.

Home health clients with continuous intravenous therapy are maintained on an infusion pump. The caregiver is taught how to add infusions to the line under sterile technique. The home health nurse visits the client daily to assess for intravenous patency. A nurse is usually on call 24 hours for clients receiving continuous infusions.

Imbalanced Nutrition

Imbalanced Nutrition: Less Than Body Requirements is usually related to anesthesia or surgical manipulation of the intestines. Until peristalsis returns and nausea, anorexia, or vomiting subsides, the client is maintained on intravenous therapy to maintain fluid and electrolyte balance. Nasogastric tube drainage is measured, and color and consistency are documented. See Chapter 38 for more information.

Clients with abdominal surgery can take up to 2 to 3 days or longer for return of normal gastrointestinal function. The nurse auscultates the abdomen for gurgling and rumbling sounds in all four quadrants to indicate return of peristalsis. Early ambulation promotes the return of peristalsis. When bowel tones return and nausea subsides, the client's diet is progressive: first ice chips, then clear to full liquids; if tolerated, the diet is progressed to soft or regular. Some clients are on a regular diet within hours after surgery. See Chapter 38 for a discussion of types of modified diets.

Urinary Retention

Urinary Retention is related to anesthesia or surgical manipulation that causes temporary loss of bladder tone. Efforts are made to promote urination (e.g., male clients are more prone to void if they can stand). If the client does not void within 8 hours after surgery, assess for bladder distension and notify the surgeon. The surgeon can order a straight or Foley catheter. *Clients must void before they can be released from the ambulatory setting.*

Acute Pain

Position changes and splinting are continued to relieve pain. Clients can be discharged to home with a PCA pump. Before discharge the nurse ensures that the client is able to correctly self-administer using the PCA. Efforts are made to provide adequate rest by scheduling procedures that do not interfere with sleep.

Risk for Infection

The client with a surgical incision is at risk for infection. Wound healing begins as early as 2 hours after surgery.

The nurse ensures that the dressing is clean, dry, and intact; dressings promote rapid re-epithelialization and protect against infection. Various types of dressings are used: conventional absorbent nonocclusive, semioclusive hydroactive, and occlusive hydrocolloid.

In a study of 250 heart surgery clients, Wikblad and Anderson (1995) found that hydroactive dressings were not as effective as occlusive hydrocolloid and absorbent nonocclusive dressings in preventing wound infections. Hydroactive dressings were difficult to remove and painful to the client. An earlier study by Bolton and van Rijswijk (1991) showed that epithelialization can be delayed by repeated trauma or removal of dressings that have aggressive adhesives.

Nurses use Standard Precautions when caring for clients and sterile technique when changing a dressing. The incision line is assessed when the nurse changes the dressing. For some clients, the surgeon usually orders prophylactic antibiotics and removes any catheters or drains as soon as possible to prevent an infection. If the client were to develop a deep wound infection, it could necessitate prosthesis removal.

To monitor for signs of an infection, the nurse notes the type and amount of drainage on the dressing and the stage of wound healing. Vital signs are measured, recorded, and analyzed against laboratory results, especially the white blood cell count and differential. The client is taught to care for the wound and to observe for the complications of wound healing: hemorrhage, hematoma formation, infection, dehiscence, and evisceration. See Chapter 35 for a discussion of these complications.



NURSING CHECKLIST

Postoperative Documentation

- The client's respiratory function has returned to baseline level within 1 week after surgery as demonstrated by respirations 16 to 20/minute, deep and regular, skin color pink, lungs sounds clear on auscultation; oxygen saturation greater than 95%.
- The client's cardiopulmonary function has returned to baseline level within 1 week after surgery as demonstrated by: blood pressure with 10 to 20 mm Hg of baseline measurement; absence of dysrhythmias; pulse rate 60 to 90 beats per minute; skin pink, warm, and dry; capillary refill less than 3 seconds; peripheral pulses present; negative Homans' sign; output is within 500 ml of intake.
- The client is free from signs of a wound infection within 72 hours after surgery as demonstrated by: afebrile; pulse and respirations at baseline level; sutures intact; incision line without swelling, redness, or purulent exudate; scab sloughing.

Evaluation

Evaluation is based on client-specific postoperative nursing diagnoses and achievement of outcomes. The time frame for the client's achieving the outcomes can vary with the client's health status, surgical procedure, and other factors, such as age. The nurse documents achievement of outcome criteria data (see the Nursing Checklist on the previous page).

KEY CONCEPTS

- The major role of nursing functions in caring for the perioperative client is to foster the achievement of expected outcomes of care.
- Outpatient surgical clinics decrease the client's length of stay in the hospital and health care costs.
- Management of the perioperative client occurs in various health care settings.
- Effective perioperative management is directed by a multidisciplinary team on the basis of recognized standards of care, protocols, and individualized expected client outcomes.
- Assessment of the client's status before surgery establishes baseline data to direct interventions throughout the perioperative phases.
- Interventions of the health care team focus on decreasing the perioperative client's risks for complications.
- Documentation of the client's response to interventions and achievement of expected outcomes provides the framework for evaluation.
- Coordination of discharge care begins in the preoperative phase and is reinforced throughout the other two phases.

CRITICAL THINKING ACTIVITIES

1. Mrs. G is a 45-year-old wife and mother who needs an emergency hysterectomy; however, she has no health insurance. Where should Mrs. G seek surgical intervention? With emergency surgery there is little time for client teaching. How does the nurse handle this challenge? What type of support should the family receive?

2. An 11-year-old child is hospitalized for surgical repair of an ankle injury. The child lives with a single parent, a 5-year-old brother, and a 3-year-old sister. What age-related considerations need to be incorporated into planning the discharge care of the child, keeping in mind the implications on the family unit?
3. Mr. S is an 86-year-old inpatient client scheduled for heart surgery. The evening before surgery he requests the sacrament of Anointing of the Sick. What nursing activities should the nurse institute?
4. Although the primary activity of perioperative nursing is client-centered care, nurses must also have an awareness of inherent "cost" challenges. Discuss how nurses can have a positive or negative impact on health care costs related to surgery.
5. You are working the evening shift on a surgical unit. You assess a client on his second postoperative day; he is receiving morphine, 2 to 4 mg/hr, with a PCA pump. He has had 17 mg morphine during the past 6.5 hours. During your assessment you observe that he is nodding and unable to tell you the day of the week, his color is pale, the vital signs are: T-37°C, P-94, R-12, BP 144/92. What nursing actions should you initiate to determine if the client's symptoms are caused from a lack of sleep, the morphine, or hypoxemia?
6. Identify the ongoing postoperative nursing diagnoses, expected outcomes, interventions, and evaluation criteria in planning the discharge care for Mrs. Broussard from the hospital the second postoperative day.

WEB RESOURCES

Agency for Health Care Policy and Research (AHRQ)
www.ahrq.gov
 Association of periOperative Registered Nurses
www.aorn.org
 Occupational Safety & Health Administration, U.S.
 Department of Labor
www.osha.gov

Unit



Nursing Management of Basic Needs

- 31** Safety, Infection Control, and Hygiene
- 32** Oxygenation
- 33** Comfort and Sleep
- 34** Mobility
- 35** Skin Integrity and Wound Healing
- 36** Sensation, Perception, and Cognition
- 37** Fluid, Electrolyte, and Acid-Base Balance
- 38** Nutrition
- 39** Elimination

Chapter 31

Safety, Infection Control, and Hygiene



We are not sensible of the most perfect health, as we are of the least sickness.

—De Montaigne

COMPETENCIES

1. Describe factors affecting environmental safety.
2. Describe the chain of infection.
3. Explain the principles of medical and surgical asepsis.
4. Contrast various types of isolation precautions.
5. Discuss factors that influence a client's personal hygiene practices.
6. Explain the role of assessment in maintaining a safe environment.
7. Discuss the nursing interventions that can be used to resolve environmental hazards in institutional and home settings.
8. Describe the nursing interventions that promote a client's personal hygiene.

**KEY
TERMS**

acquired immunity	disinfectant	physical agent
agent	disinfection	physical restraints
airborne transmission	equipment accidents	poison
anthropogenic	erythema	prodromal stage
antibody	flora	pyorrhea
antigens	germicide	resident flora
asepsis	gingivitis	restraints
aseptic technique	halitosis	risk for infection
autoimmune disorder	handwashing	sebum
biological agent	host	self-care deficit
body image	humoral immunity	sensory overload
cavities	hygiene	spores
chain of infection	illness stage	sterilization
chemical agent	incubation period	stomatitis
chemical restraints	infection	surgical asepsis
clean object	infectious agent	susceptible host
cleansing	inflammation	systemic infection
client behavior accidents	localized infection	therapeutic procedure
colonization	lymphokine	accidents
communicable agent	medical asepsis	transient flora
communicable disease	mode of transmission	vaccination
compromised host	nosocomial infection	vectorborne transmission
contact transmission	pathogen	vehicle transmission
convalescent stage	pathogenicity	virulence
dirty object	perineal care	

Safe care is a basic need of all clients regardless of the setting. Nurses are responsible for providing the client with a safe environment through the delivery of professional, quality nursing care that incorporates safety precautions, infection control practices, and hygiene assistance. This chapter describes the nurse's role in each of these areas.

SAFE ENVIRONMENT

Safety has a positive association with health promotion and illness prevention. A safe environment reduces the risk of accidents, subsequent alterations in health and lifestyle, and the cost of health care services. There are many factors in the environment that can threaten safety (Figure 31-1).

FACTORS AFFECTING SAFETY

Client safety is influenced by several factors such as age, lifestyle, sensory and perceptual alterations, mobility, and emotional state.

Age

Risk for injury varies with chronological age and developmental stage. Health education about preventive

measures can facilitate injury prevention for various age groups (Figure 31-2).

As infants mature, their potential for injury increases. Infants, toddlers, and preschoolers are explorers of their environment. Most accidents involving these age groups are preventable with careful adult supervision to prevent falls from bed, burns, electrical hazards, choking on small objects, and drowning.

As school-age children explore their environment outside the home, their risk for injury increases. Prevention measures during this stage focus on not accepting candy, food, gifts, or rides from strangers; bicycle, skating, and swimming safety; and substance abuse.

Adolescents and young adults usually enjoy good physical health; however, their lifestyles put them at risk for injury. Since this age group spends much time away from home, collaborative educational efforts among parents, schools, and community health care providers need to focus on environmental safety. High-risk factors for injury and death are automobile accidents, substance abuse, violence, unwanted pregnancies, and sexually transmitted diseases.

Studies indicate that adolescents who initiate substance use in middle school and continue into high school are likely to become multisubstance users (tobacco, alcohol, and drugs). The progression from lighter to heavier use of illicit substances during adolescence leads to more serious multisubstance use careers.

Adult risk for injury is generally related to lifestyle, work practices, and behaviors. Prevention measures

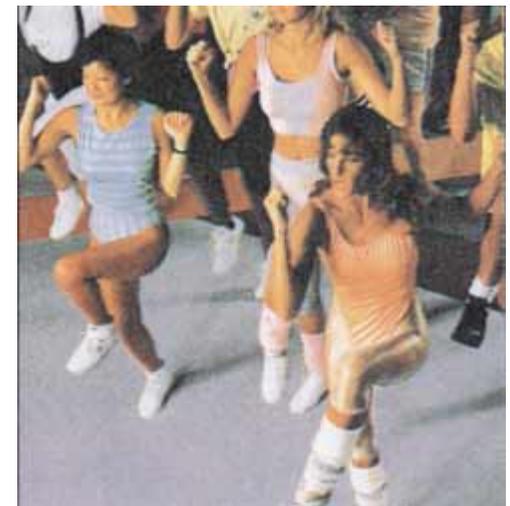


Figure 31-1 Minimization of risks for injury. These photos show various methods by which people in different age groups can lessen or prevent their risk of injury. Can you identify other risks that may be more prevalent in certain age groups than others? What measures can be taken to prevent them?

during this period emphasize nutrition, exercise, and occupational safety. High-risk factors for this age group include fatigue, anxiety, sleep pattern disturbances, caregiver role strain, and altered health maintenance.

The older adult is prone to falls, especially in the bathroom, bedroom, and kitchen, because of a loss of agility and visual acuity, predisposition to dizziness and syncope, and side effects of medications. Prevention measures for this age group emphasize slow position changes, good lighting, hand rails, and skidproof strips in the bathtub or shower and under rugs and carpets.

Each year, approximately one-third of people over the age of 65 who live at home fall; 15% of falls cause serious

injuries, half of which are fractures that cost about \$10 billion for hospital care (Winslow, 1998). Two Maryland hospitals worked together to implement a fall precaution program in their medical-surgical units and within 1 year lowered their fall rates from 9.3 falls per 1,000 client days to 7.3 per 1,000 client days (Sullivan & Badros, 1999). (See Chapter 18 for a complete discussion of the older adult).

Lifestyle

Lifestyle practices can increase a person's risk for injury and potential for disease. Individuals who operate machinery; experience stress, anxiety, and fatigue; use

alcohol and drugs (prescription and nonprescription); and live in high-crime neighborhoods are at risk for injury. Risk-taking behaviors such as daredevil activities, driving vehicles at high speeds, and smoking are factors associated with accidents (Figure 31-2).

Sensory and Perceptual Alterations

Sensory functions are essential for accurate perception of environmental safety. If one of the senses is altered, then the other senses compensate to facilitate perception of the environment. For instance, a blind person usually will develop a keen sense of touch and hearing. Clients who have visual, hearing, taste, smell, communication, or touch perception impairments are at increased risk for injury. These clients are often not able to perceive a potential danger. See Chapter 36 for a complete discussion on sensory or perceptual alterations.

Mobility

Clients who have impaired mobility are at increased risk for injury, especially falls. Mobility impairments may be a result of poor balance or coordination, muscle weakness, or paralysis. Immobility may also precipitate physiological and emotional complications such as decubitus and depression, respectively. See Chapter 34 for a complete discussion on mobility.

Emotional State

Emotional states such as depression and anger affect a client's perception of environmental hazards and degree of risk-taking behavior. These emotional states alter a client's thinking patterns and reaction time. Usual safety precautions may be forgotten during periods of emotional stress. Self-confidence decreases when an elderly person falls; they tend to limit their activities because they fear falling again (Winslow, 1998).

Types of Accidents

In the health care setting, accidents are categorized by their causative agent: client behaviors, therapeutic procedures, or equipment:

1. **Client behavior accidents** occur when the client's behavior or actions precipitate the incident; for example, poisonings, burns, and self-inflicted cuts and bruises.
2. **Therapeutic procedure accidents** occur during the delivery of medical or nursing interventions; for example, medication errors, client falls during transfers, contamination of sterile instruments or wounds, and improper performance of nursing activities.
3. **Equipment accidents** result from the malfunction or improper use of medical equipment; for example, electrocution and fire.



Figure 31-2 Lifestyle practices that can either increase or decrease a client's risk of injury. Can these practices be easily reversed, in terms of risky behavior, or adopted, in terms of promoting healthy approaches, by clients?

National and institutional policies establish safety standards; for example, the risk for equipment accidents can be reduced by having the biomedical engineering department check the equipment inspection label prior to use. All accidents and incident reports must be fully documented according to institutional protocol.

Potential Occupational Hazards

Nurses and other health care providers are at risk for injury in the workplace. Every day in the United States, 9,000 health care workers sustain a disabling injury on the job, according to the National Institute for Occupational Safety and Health (NIOSH) (Slattery, 1998). The Occupational Safety and Health Administration (OSHA), a division of the Department of Labor, has the power to enforce safety standards, and to cite and discipline agencies that are not in compliance with the standards (Bending, 2000).

Numerous hazards exist in today's workplace such as latex allergy, blood-borne pathogens, work-related musculoskeletal disorders (MSDs), chemotherapeutic agents, environmental pollution, and violence. Findings from studies indicate that nurses who prepare or administer chemotherapeutic agents are exposed to occupational hazards from dermal absorption, ingestion, and inhalation from aerosolization of powder or liquid during reconstitution or from spillage (DelGaudio & Menonna-Quinn, 1998). According to the Bureau of Labor, almost two-thirds (64%) of nonfatal workplace assaults occur in nursing homes and hospitals (Slattery, 1998). The salient points regarding latex allergy and MSDs are discussed here; blood-borne pathogens are discussed later in this chapter.

Latex Allergy

NIOSH (1997) issued an *Alert* entitled *Preventing Allergic Reactions to Natural Rubber Latex in the Workplace*. Latex products are manufactured from a milky fluid derived from the Brazilian rubber tree, *Hevea brasiliensis*. The allergic response is attributed to the proteins contained in the milky fluid and to the chemicals that are added during the processing and manufacture of commercial latex. There are three types of latex reactions: irritant contact dermatitis; allergic contact dermatitis, the most common type of reaction; and immediate hypersensitivity, a systemic reaction also called type 1 IgE-mediated reaction.

Since 1992, when OSHA issued regulations requiring health care workers to wear gloves and other protective devices such as surgical masks and goggles as a safeguard against blood-borne pathogens, health care workers were placed at risk for developing latex allergy. Commercial latex is in more than 20,000 medical products (Burt, 1999) such as blood pressure cuffs, stethoscopes, catheters, and wound drains, to name a few, as well as many household items. Reports indicate that 1–6% of the general population and about 8–12% of regularly exposed health care workers are sensitized to latex (NIOSH, 1997).

NOISH'S RECOMMENDATIONS TO PREVENT LATEX EXPOSURE

Employers

- Provide workers with nonlatex gloves.
- Provide appropriate barrier protection for workers handling infectious materials; if latex gloves are chosen, provide reduced protein, powder-free gloves to protect workers from infectious materials.
- Provide good housekeeping to remove latex-containing dust, and ensure that workers change ventilation filters and vacuum bags frequently in latex-contaminated areas.
- Provide education programs regarding latex allergy.
- Periodically screen high-risk workers for latex allergy symptoms.
- Evaluate current policies whenever a worker is diagnosed with latex allergy.

Workers

- Use nonlatex gloves for contact with noninfectious materials.
- Use CDC-appropriate barrier protection when handling infectious materials; if latex gloves are chosen, use reduced protein, powder-free gloves to reduce exposure and reactions to latex chemical additives (allergic contact dermatitis).
- Use appropriate work practices when wearing latex gloves: avoid oil-based hand creams or lotions that can cause glove deterioration unless they have been shown to reduce latex-related problems and maintain glove barrier protection; wash hands with a mild soap and dry thoroughly after removing latex gloves; use good housekeeping practices to remove latex-containing dust.
- Attend latex allergy educational programs to be knowledgeable of procedures and to recognize the symptoms of latex allergy: skin rashes; hives; flushing; itching; nasal, eye, or sinus symptoms; asthma; and shock.
- Avoid direct contact with latex gloves and other products if you develop symptoms until you have been seen by a physician experienced in treating latex allergy.
- If you have latex allergy, consult your physician regarding exposure precautions, contact with gloves and other latex-containing products, and areas that contain latex powder from gloves worn by other workers; inform your employer and health care providers that you have latex allergy.
- Carefully follow your physician's instructions regarding allergic latex reactions.

Adapted from: National Institute for Occupational Safety and Health Centers for Disease Control and Prevention. (1997). *Preventing allergic reactions to natural rubber latex in the workplace*. (DHHS [NIOSH] Publication No. 97-135) U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health.

NIOSH (1997) recommends that employers and employees take a common sense approach based on current knowledge to protect workers from latex exposure and allergy in the workplace; refer to the accompanying display for NIOSH's recommendations. NIOSH recommends that, if latex gloves are worn, they should be powder free and low allergen because these gloves are less likely than powdered ones to produce allergic responses (Gritter, 1998).

Work-Related Musculoskeletal Disorders

One-third of all occupational injuries reported by employers every year to the Bureau of Labor Statistics are work-related MSDs. Employers reported a total of 626,000 lost workdays in 1997, with these disorders costing workers' compensation more than \$15-\$20 billion (OSHA, 2000).

According to OSHA (2000), it is estimated that only 28% of all workplaces in general industry have voluntarily implemented ergonomics programs. In response to these workplace hazards, OSHA has issued mandatory standards that require all employers to set up ergonomic programs to prevent work-related MSDs such as back injuries.

Work-related back pain affects 38% of nurses. The predominant cause of nurse back pain is lifting clients (Slattery, 1998). OSHA ergonomic standards state that a 51-pound stable object with handles is the heaviest amount that can be safely lifted. Health care providers are being challenged, in the midst of personnel cutbacks, to develop and implement safety policies that protect the provider and support OSHA's ergonomic regulations.

The ergonomic standards require that all employers must provide workers the following information: common MSD hazards; signs and symptoms of MSDs, and the importance of reporting them early; how to report MSD signs and symptoms; and a summary of the requirement of the OSHA standard. The standards require the employer to ensure pay and benefits in the event that an employee needs to take time off or go on lighter duty because of a work-related MSD.

INFECTION CONTROL PRINCIPLES

Client safety in the health care environment requires the reduction of microorganism transmission. Infection control practices are directed at controlling or eliminating sources of infection in the health care agency or home. Nurses are responsible for protecting clients and themselves by using infection control practices. Nurses and clients must be educated on the types of infections, modes of transmission, risks for susceptibility, and infection control practices required to control or prevent further transmission.

Pathogens, Infection, and Colonization

Pathogenicity is the ability of a microorganism to produce disease. Microorganisms that cause diseases in humans are called **pathogens**. There are five types of microorganisms that can be pathogenic: bacteria, viruses, fungi, protozoa, and *Rickettsia*. **Virulence** is the degree of pathogenicity of an infectious microorganism (pathogen).

Infection and colonization are not synonymous. **Infection** is an invasion and multiplication of microorganisms in body tissue that results in cellular injury. These microorganisms are called **infectious agents**. Infectious agents that are capable of being transmitted to a client by direct or indirect contact, through a vehicle (or vector), or airborne route are also called **communicable agents**. Diseases produced by these agents are referred to as **communicable diseases**. **Colonization** is the multiplication of microorganisms on or within a host that does not result in cellular injury. However, microorganisms that are colonized on a host may be a potential source of infection, especially if host susceptibility declines or the microorganism's virulence increases.

Some microorganisms reside on the human body as normal flora. This is synonymous with colonization. **Flora** are microorganisms on the human body. There are two types of flora: resident and transient. **Resident flora** are microorganisms that are always present, usually without altering the client's health. Handwashing with soap and water alone is not sufficient to remove resident flora; there must be considerable friction, which is created by rubbing the hands and scrubbing the nails. **Transient flora** are microorganisms that are episodic. They attach to the skin for a brief period of time but do not continually live on the skin. Transient flora are usually acquired from direct contact with the microorganisms on environmental surfaces. Handwashing with soap and water is an effective means of removing transient flora.

Chain of Infection

A susceptible host or presence of a pathogen alone does not mean that an infectious process will occur. The **chain of infection** describes the phenomenon of developing an infectious process. There must be an interactive process that involves the agent, host, and environment. This interactive process must involve several essential elements, or "links in the chain," for transmission of microorganisms to occur. Figure 31-3 identifies the six essential links (elements) in the chain of infection. Without the transmission of microorganisms, an infectious process cannot occur. Therefore, knowledge about the chain of infection for an infectious process permits control or elimination of the microorganism by breaking the links in the chain of infection. Breaking the chain of infection occurs by altering the interactive process of agent, host, and environment, as shown in Figure 31-3.

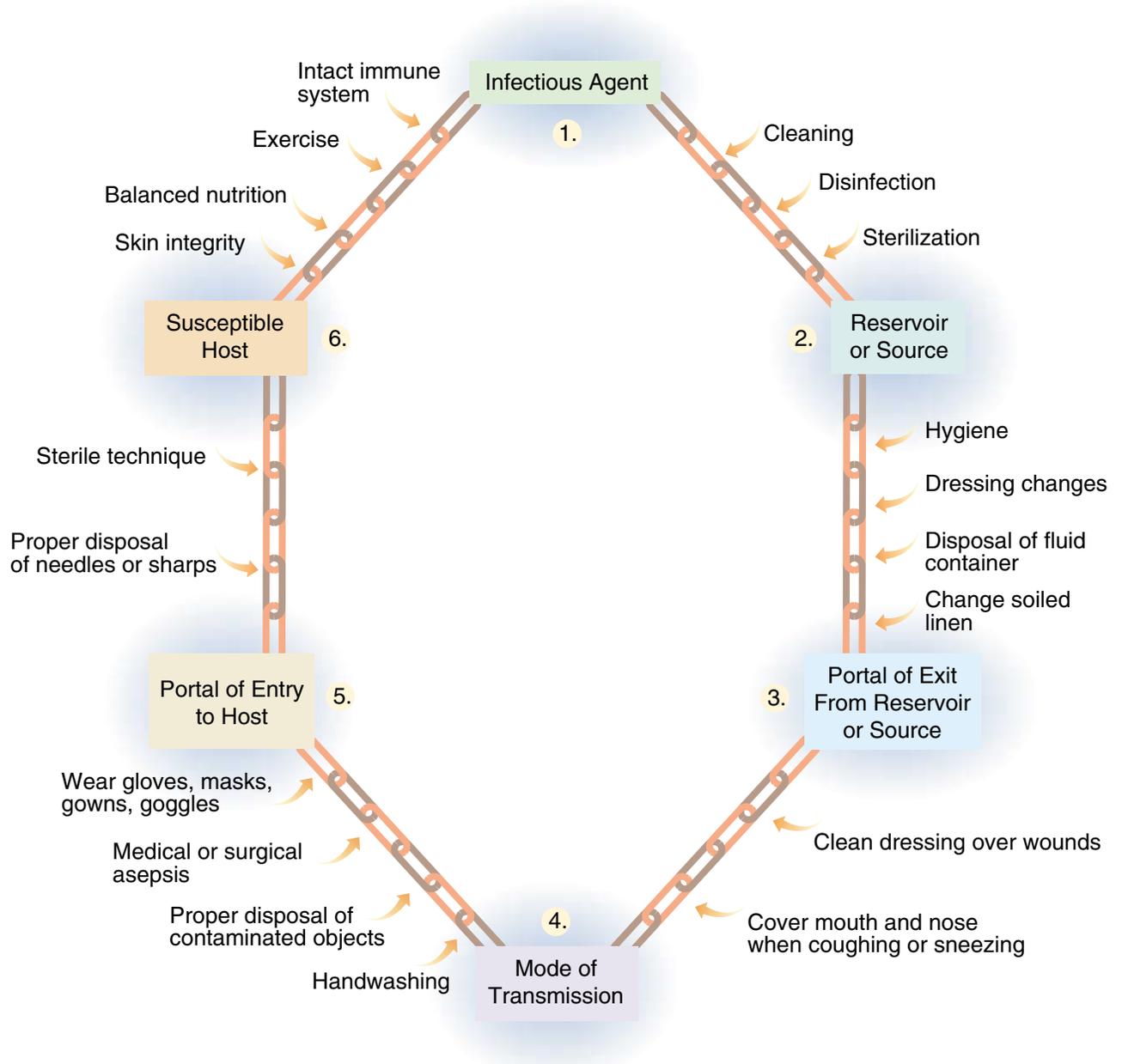


Figure 31-3 Breaking the chain of infection. Preventive measures follow each critical link in the chain of infection.

Agent, Host, and Environment

An **agent** is an entity that is capable of causing disease. Agents that cause disease may be:

- **Biological agents:** Living organisms that invade the host, such as bacteria, viruses, fungi, protozoa, and *Rickettsia*
- **Chemical agents:** Substances that can interact with the body, such as pesticides, food additives, medications, and industrial chemicals
- **Physical agents:** Factors in the environment that are capable of causing disease, such as heat, light, noise, radiation, and machinery

In the chain of infection, the main concern is biological agents and their effect on the host.

A **host** is a simple or complex organism that can be affected by an agent. Generally, a human being is considered a host. A **susceptible host** is a person who lacks resistance to an agent and is thus vulnerable to disease. A **compromised host** is a person whose normal defense mechanisms are impaired and who is therefore susceptible to infection.

Interaction between agent and host occurs in the environment; the environment consists of everything other than the agent and host. Environmental factors that affect the chain of infection are water, food, plants, animals, housing conditions, noise, meteorological conditions, and environmental chemicals. Many of the conditions that promote the transmission of microorganisms are **anthropogenic**, reflecting

changes in the relationship between humans and their environments.

The causes of most emerging infectious diseases are the same today as throughout recorded history: the transfer and dissemination of existing agents to new host populations (a process called “global microbial traffic”). For instance, cholera probably originated in Asia in ancient times; in the 19th century it spread to Europe and the New World because of increased global travel. Cholera entered South America for the first time this century (1992) through the possible contaminated bilge water released from a Chinese freighter. The causes of emerging infectious diseases and outbreaks require careful consideration of environmental changes and especially of anthropogenic factors.

Modes of Transmission

The **mode of transmission** is the process that bridges the gap between the portal of exit of the biological agent from the reservoir or source and the portal of entry of the susceptible “new” host. Most biological agents have a primary mode of transmission; however, some microorganisms may be transmitted by more than one mode. Almost anything in the environment can become a potential means of transmitting infection, depending on the agent.

The most important and frequent mode of transmission is **contact transmission**, which involves the direct physical transfer of an agent from an infected person to a host through direct contact with a contaminated object or close contact with contaminated secretions. Sexually transmitted diseases are examples of diseases spread by direct contact.

Airborne transmission occurs when a susceptible host contacts droplet nuclei or dust particles that are suspended in the air. Vehicle and vectorborne transmission are indirect modes of transmission, because transmission occurs by an intermediate source. **Vehicle transmission** occurs when an agent is transferred to a susceptible host by contaminated inanimate objects such as water, food, milk, drugs, and blood. **Vectorborne transmission** occurs when an agent is transferred to a susceptible host by animate means such as mosquitoes, fleas, ticks, lice, and other animals.

Breaking the Chain of Infection

Nurses focus on breaking the chain of infection by applying proper infection control practices to interrupt the mode of transmission. The chain of infection can also be broken by interrupting or blocking the agent, portal of exit, or portal of entry or by destroying the agent or decreasing the host’s susceptibility. Refer to Figure 31-3, which shows preventive measures that break the chain of infection. Host susceptibility is dependent on the immune system to function as a defense mechanism.

Normal Defense Mechanisms

A host’s immune system serves as a normal defense mechanism to resist the transmission of infectious agents. A unique feature of the immune system is its ability to recognize “self” and “nonself”; that is, the immune system recognizes which agents are not consistent with the genetic composition of the host (self). These agents are usually referred to as antigens (non-self). **Antigens** are foreign proteins. An immune response is mounted against an antigen, which is recognized as nonself, to protect the body from infection. The immune defenses are categorized as nonspecific and specific immune defenses. Nonspecific and specific immune defenses work in harmony to defend the host from pathogens.

Nonspecific Immune Defense

The nonspecific immune defense mounts a response to protect the host from all microorganisms; it is not dependent on prior exposure to the antigen. Nonspecific immune defenses are skin and normal flora; mucous membranes; sneeze, cough, and tearing reflexes; elimination and acidic environment; and inflammation.

Skin and Normal Flora

Intact skin is the first line of defense against infection, serving as a physical barrier to infectious agents. Skin cells are shed along with potentially harmful microorganisms. **Sebum** is produced by the skin and contains fatty acids that kill some bacteria. The normal flora that reside on the skin compete with pathogenic flora for food and inhibit their multiplication. The balance of normal flora may become disrupted as a result of the inappropriate use of antibiotics, which allows pathogenic organisms to proliferate and cause infection or superinfection.

Mucous Membranes and Sneeze, Cough, and Tearing Reflexes

Mucous membranes also function as a physical barrier to infectious agents. Mucus produced by these membranes entraps infectious agents and contains substances such as antibodies, lactoferrin, and lysozyme, which inhibit bacterial growth. Cilia of the respiratory tract trap and propel mucus and microorganisms away from the lungs. The sneeze and cough reflexes physically expel mucus and microorganisms from the respiratory tract and oral cavity with force. Tears protect the eyes by continually flushing away microorganisms.

Elimination and Acidic Environment

Elimination patterns and an acidic environment normally prevent microbial growth of pathogenic organisms. Resident flora of the large intestines prevent the growth of pathogens. The mechanical process of defe-

cation evacuates the bowel of feces and microorganisms. Acidity of the urine prevents microbial growth. The flushing action of urination cleanses the bladder neck and urethra of microorganisms and prevents microorganisms from ascending into the urinary tract.

Normal vaginal flora prevent growth of several pathogens. At puberty, lactobacilli ferment and produce sugars in the vagina that lower the pH to an acidic range. The acidic environment of the vagina prevents pathogenic growth. Inappropriate use of antibiotics destroys the lactobacilli and its protective function.

Inflammation

Inflammation is a nonspecific cellular response to tissue injury or infection. Tissue injury caused by bacteria, trauma, chemicals, heat, or any other phenomenon releases multiple substances that produce dramatic secondary changes in the injured tissue. This entire complex of tissue changes and response to injury is referred to as the inflammatory process (see Table 31-1). The inflammatory process has five stages, which facilitate the localization, neutralization, and resolution of the offending agent within the damaged tissue. The result of the body's response to injury produces the characteristic local and systemic signs of inflammation, discussed in the assessment section of this chapter.

The intensity of the inflammatory process is usually in proportion to the degree of tissue injury. For example, when staphylococci invade the tissues, they release lethal

cellular toxins that cause the inflammatory process to develop quickly; the staphylococcal infection is characteristically walled off rapidly before the organism can multiply and spread. Streptococci, on the other hand, do not cause such intense local tissue destruction, and the walling-off process develops slowly, allowing the organism to reproduce and migrate. Therefore, the streptococci have a far greater tendency than do staphylococci to spread throughout the body and cause death, even though staphylococci are far more destructive to the tissue.

Specific Immune Defense

The specific immune defense mounts an immune response that is specific to the invading antigen. Unfortunately, the specific immune defense sometimes inappropriately reacts to the host's own tissue (**auto-immune disorders**).

The specific immune defense is activated by the failure of phagocytes to completely destroy the antigen; this causes the production of T lymphocytes (T cells), which regulate the immune response by activating other cells. Stimulated T cells are referred to as sensitized T cells. T cells migrate to the area of injury and release chemical substances called **lymphokines**. Lymphokines attract other phagocytes and lymphocytes to the area of injury and assist in antigen destruction.

T cells also stimulate the production of B cells that differentiate into plasma cells, producing antibodies specific

TABLE 31-1
Stages of the Inflammatory Process

Stage	Description	Result
1	Initial injury precipitates release of chemicals: histamine, bradykinin, serotonin, prostaglandins (reaction products of the complement and blood-clotting systems), and lymphokines (hormonal substances released by sensitized T cells).	Activates the inflammation process.
2	Increased blood flow to the inflamed area (erythema).	Produces characteristic signs of redness and increased warmth.
3	Increased capillary permeability with leakage of large quantities of plasma out of the capillaries into the damaged tissue; tissue spaces and lymphatics blocked by fibrinogen clots.	Initiates the inflammation process; infection is "walled off," and nonpitting edema occurs.
4	Damaged tissue infiltrated by leukocytes, which engulf the bacteria and necrotic tissue. After several days, these leukocytes eventually die and form a cavity of necrotic tissue and dead leukocytes (mainly neutrophils and some macrophages).	Produces purulent exudate (pus).
5	Destroyed tissue cells are replaced with identical or similar structural and functioning cells and/or fibrous tissue.	Promotes tissue healing or the formation of fibrous (scar) tissue, which may reduce the functional capacity of the tissue.

to the antigen. **Antibodies** are protein substances that counteract and neutralize the effects of antigenic toxins and destroy bacteria and other cells. Antibodies destroy the antigen. Stimulation of B cells and antibody production are referred to as **humoral immunity**.

B cell activation causes formation of memory B cells. Memory B cells remember the antigen and prepare the host for future antigen invasion. Therefore, when the antigen enters the body again, the immune response will occur more rapidly by producing antibodies faster. The formation of these antibodies is referred to as **acquired immunity**, which protects the individual against invading agents such as lethal bacteria, viruses, toxins, and even foreign tissues from other animals.

The process of **vaccination** provides acquired immunity against specific diseases. There are three ways an individual can be vaccinated:

1. By injection of dead organisms that are no longer capable of causing disease but still have their chemical antigens, such as typhoid fever, whooping cough, and diphtheria.
2. By toxins that have been treated with chemicals so that their toxic nature has been destroyed even though their antigens for causing immunity are still intact, such as tetanus and botulism.
3. By infection with live organisms that have been attenuated (grown in a special culture media or passed through a series of animals for mutation; the organisms then do not cause the disease but still carry the specific antigen). Attenuated vaccines protect against poliomyelitis, yellow fever, measles, smallpox, and many other viral diseases.

Although 10,000 new cases of hepatitis B virus (HBV), formerly called serum hepatitis, are reported each year in the United States; HBV is considered one of the most underreported diseases in the country (Marx, 1998). Risk factors associated with HBV infection among health care workers include the frequency of blood and needle exposures. In order to protect health care workers against HBV infections, the Occupational Safety and Health Administration (OSHA) has established standards relative to vaccination programs.

Stages of the Infectious Process

Activation of the immune response indicates the occurrence of infection. Infection results from tissue invasion and damage by an infectious agent. There are two types of infectious responses:

1. **Localized infections** are limited to a defined area or single organ with symptoms that resemble inflammation (redness, tenderness, and swelling).
2. **Systemic infections** affect the entire body and involve multiple organs.

Localized or systemic infections progress through four stages of infection:

- Incubation
- Prodromal
- Illness
- Convalescence

The **incubation period** is the time interval between entry of an infectious agent in the host and the onset of symptoms. During this time period, the infectious agent invades the tissue and begins to multiply to produce an infection.

NURSING ALERT

Incubation Period

Always check the incubation period of an infection. Depending on the infectious agent, a client may be able to transmit the infection to another person.

The **prodromal stage** is the time interval from the onset of nonspecific symptoms until specific symptoms of the infectious process begin to manifest. During this period, the infectious agent continues to invade and multiply in the host. A client may also be infectious to other persons in this time period.

The **illness stage** is when the client is manifesting specific symptoms of an infectious process. The period of time from the beginning of the disappearance of acute symptoms until the client returns to the previous state of health is referred to as the **convalescent stage**.

Nosocomial Infections

Nosocomial infections are infections acquired in the hospital or other health care facilities that were not present or incubating at the time of the client's admission. Nosocomial infections are also referred to as hospital-acquired infections. Nosocomial infections include those infections that become symptomatic after the client is discharged as well as infections among medical personnel. Most nosocomial infections are transmitted by health care personnel who fail to practice proper handwashing procedures or change gloves between client contacts.

Hospitalized clients are at risk for nosocomial infections because the environment provides exposure to a variety of virulent organisms that the client has not been exposed to in the past; therefore, the client has not developed any resistance to these organisms. In addition, illness, often the reason for hospital admission, impairs the body's normal defense mechanisms.

According to the Centers for Disease Control and Prevention (CDC), the rate of hospital nosocomial infections per 1,000 patient days has increased 36%

from 7.2 in 1975 to 9.8 in 1995. It is estimated that in 1995, nosocomial infections cost \$4.5 billion and contributed to more than 88,000 deaths, one death every 6 minutes (Weinstein, 1998).

Nicolle and Garibaldi (1995) discuss the increased risk of infections in long-term care facilities. The most common endemic infections in this setting affect the urinary tract, upper and lower respiratory tracts, gastrointestinal tract, conjunctiva, and skin. Hospitalized clients have multiple comorbidities that increase their risk of infection. For example, urologic abnormalities (prostatic hypertrophy) are associated with urinary tract infections. Chronic obstructive lung disease and congestive heart failure increase a client's risk of developing pneumonia. Diabetes or vascular insufficiency may lead to more frequent and severe skin infections (pressure ulcers, cellulitis, and vascular ulcers). Since these high-risk clients are housed together, the transmission of pathogens is increased among residents. For instance, organisms may be transmitted through the air (e.g., tuberculosis, influenza), on the hands of staff members (e.g., *Staphylococcus aureus* or uropathogens), and by contaminated items (e.g., *E. coli*).

Nosocomial infections are receiving increased attention because of the development of multiple-drug-resistant organisms (MDROs). The two most common MDROs are bacteria—methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant enterococcus (VRE)—in both hospital and long-term care clients; other drug-resistant organisms include tuberculosis bacilli and *Clostridium difficile* (Davis & Madigan, 1998).

Overuse of antibiotics has increased the prevalence of MDROs (CDC, 1996). “Annually, as many as 150 million outpatient prescriptions written to treat viral upper respiratory tract infections have no effect” (Wolgin & Olmsted, 1999, p. 7). The indiscriminate use of antibiotics has given once-susceptible bacteria the chance to develop resistant strains to antibiotics (Sheff, 1999). MRSA and VRE are spread by infected or colonized clients or colonized health care workers. The most effective way to prevent the spread of MDROs is proper handwashing.

Blood-Borne Pathogens

The risk for blood-borne pathogens in the health care setting is an increasing concern for health care providers. In the fall of 1999, OSHA issued an update that supersedes the one issued in 1992 regarding the risk for blood-borne pathogens to health care providers. OSHA's 1999 directive recognizes the advances made in medical technology such as improved safety equipment and devices, better methods of treatment following exposure and more concise policy interpretations; these advances decrease the risks of health care workers exposed to blood-borne pathogens, specifically the human immunodeficiency virus (HIV), and hepatitis B and C (Bending, 2000).

The major hepatitis viruses in humans in the United States and the world are HAV, HBV, HCV, HDV, HEV, and HGV. HCV is prevalent in the United States, with over 3,000 new cases reported each year; however, it is also underreported, as is HBV (Marx, 1998). Henderson (1999) and Howell (1999) refer to hepatitis C as the “sleeping giant” of occupational infections in the health care settings; unlike for HBV, there is no vaccine for HCV. According to the CDC (1996), 85% of infected persons who contact HCV become chronically infected, and 70% of the infected persons develop chronic hepatitis.

HYGIENE

Hygiene is the science of health. Hygienic care promotes cleanliness, provides for comfort and relaxation, improves self-image, and promotes healthy skin. Client hygiene is an extension of providing client safety and protecting the client's defense mechanisms. The health of the body's first line of defense (skin and mucous membranes) is promoted by client hygiene. Nurses are responsible for assuring that the client's hygienic needs are met. The type of hygienic care provided depends on the client's ability, needs, and practices.

Factors Influencing Hygienic Practice

Hygienic needs and practices are unique to each client; nurses should provide individualized care based on these needs and practices. Hygienic practices are influenced by several factors: body image, social and cultural practices, personal preferences, socioeconomic status, and knowledge.

Body Image

Body image is the client's subjective belief about his or her own physical appearance. Body image is associated with the client's emotions, mood, attitude, and values. See Chapter 19 for a complete discussion of this concept. A client's body image directly affects the type of personal hygiene practiced; this may change if the client's body image is altered because of illness or surgical procedures. During this time, the nurse should help the client maintain hygienic practices in accordance with the client's pre-illness level of hygiene and personal preferences.

Social and Cultural Practices

Social and cultural practices also directly influence hygienic practices. Clients are socialized to their hygienic practices by family practices in early childhood. As a person ages, hygienic practices are influenced by maturational development and socialization with

people outside of the family. For example, teenagers are usually concerned with peer acceptance and follow the latest trends in personal hygiene. In later adulthood, hygienic practices may be influenced by coworkers and social networks.

Cultural practices and beliefs are derived from family, religious, and personal values developed during maturation. See Chapter 16 for a complete discussion of cultural diversity. Clients from diverse cultural backgrounds will have differing hygienic practices. For example, some cultures do not permit women to submerge their bodies in water during the time of menstruation because there is fear that the woman may drown. In North America, people typically bathe daily and use numerous deodorant products. In Europe, people do not bathe daily and seldom use deodorant products. Europeans do not consider the smell of human perspiration as offensive as do North Americans. Nurses should have a nonjudgmental attitude when assessing or providing hygienic care to clients from different social or cultural backgrounds.

Personal Preferences

Personal preferences influence when bathing occurs, what products are used, and what type of bath is performed. For example, some male clients may shave before bathing, while others prefer to wait until after the bath. Some clients prefer to bathe in the morning to facilitate waking, while others prefer to bathe before bedtime to encourage relaxation and sleep. Unless a client's health is affected, the nurse should permit clients to practice their usual routine and use the hygienic products that they prefer. Individualized nursing care should incorporate the client's personal hygiene preferences.

THINK ABOUT IT

Hygiene and Personal Preferences

What role do values have in relation to self-care needs? Do you believe that a client's hygienic activities demonstrate personal preferences and idiosyncrasies that are based on family, culture, religion, and other factors? What should you do to avoid projecting your own values onto the client? If the client states, "I feel uncomfortable about you bathing me," what should you do? Another area that requires sensitivity on your part deals with a client's use or failure to use hygienic products, for example, deodorant. How do you feel about caring for a client who does not use deodorant or whose hygiene habits differ greatly from your own?

Socioeconomic Status

A client's hygienic practices may be influenced by socioeconomic status. Limited economic resources may affect the type, frequency, and extent of hygiene prac-

ticed. Assessment of socioeconomic status provides information about the availability of hygiene supplies. Some clients may not be able to afford deodorants, perfumes, soaps, shampoo, and toothpaste. The nurse can function as an advocate for the client by making referrals to community agencies that provide assistance to needy persons, for example, Catholic Charities or a local chapter of the American Association of Retired Persons (AARP).

Knowledge

Knowledge level influences the client's understanding about the relationship between hygiene and health. Thus, knowledge should influence a client's hygienic practices. In addition to being knowledgeable, before clients perform basic hygiene, they must be motivated and believe that they are capable of self-care.

Frequently, an illness or surgical procedure results in deficient knowledge about basic hygienic practices. In these situations, the client may not know the correct procedures or types of hygiene that can be performed. The nurse is responsible for providing the necessary education about hygiene during an illness. Sometimes, the nurse may have to perform all hygienic practices for a client during an illness until the client is able to regain this ability.

ASSESSMENT

The nursing process facilitates an understanding of the scope of challenges inherent in the nursing care of clients at risk for injury, infections, or a self-care deficit. The assessment data should direct the prioritization of the client's problem and accompanying nursing diagnoses. Clients at risk for injury or infection require frequent reassessment of their status with appropriate changes in the plan of care and expected outcomes.

The assessment and physical examination data are correlated with the laboratory indicators to identify those clients who are at risk for problems relating to safety, infection, or hygiene. One of the assessment models should be used to provide structure to the assessment. See Chapter 6 for a complete discussion of assessment models. Appropriate risk appraisals may be incorporated into the nursing health history interview. These core elements of assessment are discussed in relation to clients in ambulatory, institutional, and home settings. Refer to the accompanying display for a sample format for developing minimum safety standards applicable to all health care settings.

Health History

The nursing health history interview is the first part of assessment; it provides the client's subjective specific

STANDARD OF CARE: SAFETY

Client Outcome

The client will receive care in a safe health care environment and remain free of preventable injuries.

Nursing Practice Standards

1. Perform a client injury risk appraisal on admission and prior to therapeutic nursing interventions. Risk factors for injury include but are not limited to age, altered mental status, previous history of falls, impaired mobility, sensory deficits, perceptual deficits, and inability to communicate.
2. Eliminate or modify risk elements when possible, such as assisting with mobility and placing bed rails up with bed in the lowest position.
3. Implement environmental precautions such as hand rails, nonslip mats or rugs, and adequate lighting.
4. Use infection control practices that prevent or control the transmission of pathogens.
5. Maintain intravenous access according to intravenous protocols.
6. Implement emergency measures in accordance with American Heart Association guidelines for cardiopulmonary resuscitation (CPR) and advanced life support.
7. Know and comply with the institution's Environmental Health and Safety guidelines.
8. Implement emergency measures during fires and disasters.
9. Use mechanical, radiant, chemical, and thermal equipment according to the manufacturer's guidelines and institution's policy and procedures.
10. Use a multidisciplinary approach to enhance client safety as indicated.

health data. Key elements of relevant data regarding the client at risk for safety and infection are obtained in the health history. See Chapter 6 for a sample of a nursing health history tool.

The client is often asked to complete a health history questionnaire; however, depending on the client's status, the nurse may have to perform an interview to obtain these data. If the client is unable to provide the subjective data, the nurse must designate on the questionnaire or in the nursing progress notes who provided the information.

During the nursing health history interview, assess the client's general health perception and management status to determine how the client manages self-care. This information will provide data regarding the client's routine self-care and health promotion needs. Sample questions that relate specifically to habits that foster safe, healthy patterns of behavior are presented in the accompanying display. These questions are appropriate for home health and ambulatory care settings as well as inpatient settings.

KEY INTERVIEW QUESTIONS ABOUT SAFETY, INFECTION CONTROL, AND HYGIENE

- Describe the things you do to stay healthy.
- How do you typically spend a day (e.g., home or work)?
- What are your health care concerns?
- Do you need assistance with bathing and dressing?
- Do you regularly visit the dentist and eye doctor?
- Do you use dental floss on a regular basis?
- Have you recently come in contact with someone who has an infectious disease?
- Do you wash your hands when preparing food?
- Do you keep meats and dairy products refrigerated until ready to use?
- Is there a smoke detector or fire extinguisher in your home?
- Are emergency phone numbers readily available?

Physical Examination

A complete health assessment includes a systematic physical examination, generally conducted from head to toes, in order to obtain objective data relative to the client's health status and presenting problems. See Chapter 27 for a complete discussion of a physical examination.

When assessing the client to determine the level of risk for injury or infection and hygienic deficits, focus the physical examination on the following areas and signs:

- Level of consciousness: Use the Glasgow Coma Scale to evaluate this attribute (see Chapter 36 for discussion of this tool).
- Range of motion or total immobilization of an extremity.
- Localized infection: Redness, swelling, warmth, tenderness, pain, and loss of movement in a specific body part.
- Systemic infection: Fever, with a corresponding increase in pulse and respirations; weakness; anorexia, with possible accompanying findings of nausea, vomiting, and diarrhea; enlarged and/or tender lymph nodes.
- Secretions or exudate of the skin or mucous membranes and detection of crackles, rhonchi, or wheezes in the lungs on auscultation.

The condition of the skin is a good indicator of a client's general health status. Assessment of skin integrity provides data concerning a client's nutritional and hydration status, continuity of intact skin, hygienic practices, and overall physical abilities. Similarly, a client with limited mobility is at risk for developing joint contractures, skin breakdown, and muscle atrophy.

SKIN INTEGRITY RISK APPRAISAL

Area of Assessment	Score
General Physical Condition (Health Problem)	
Good (minor)	0
Fair (major but stable)	1
Poor (chronic/serious, not stable)	2
Mental State/Level of Consciousness (to Commands)	
Alert (responds readily)	0
Lethargic (slow to respond)	1
Semicomatose (responds only to verbal or painful stimuli)	2
Comatose (no response to stimuli)	3
Activity	
Ambulate without assistance/infant	0
Ambulate with assistance	2
Chairfast/out-of-bed to chair	4
Bedfast/confined to bed	6
Mobility (Extremities)	
Full active range	0
Restricted movement (slightly limited)	2
Moves only with assistance	4
Immobile	6
Incontinence (Bowel and/or Bladder)	
None	0
Occasional (less than twice in 24 hours)	2
Usually (greater than twice in 24 hours)	4
Total (no control)	6
Nutrition (for Age and Size)	
Good (eats/drinks adequately)	0
Fair (eats/drinks inadequately)	1
Poor (unable/refuses to eat/drink)	2
Totally depleted	3

Assess the client's risk status for each indicator on the skin integrity risk appraisal form, then total the numbers from all six indicators. The risk rating is as follows:

- 0–8: low risk
- 9–16: moderate risk
- 17–27: high risk

Usually a rating greater than 8 requires implementation of special skin measures; for example, a protocol to prevent skin breakdown.

(Patient Care Admission Sheet courtesy of Tulane University Hospital & Clinic, New Orleans, LA)

The client's self-care abilities, used for determining the level of assistance needed in providing hygienic care, are appraised during the health history. The analysis of relevant risk factors alerts the nurse to actual or possible risks. Skin integrity is usually compromised when a person is placed on bed rest. A skin integrity risk appraisal such as the one shown in the accompanying display should be completed to assist with planning care.

Client in an Inpatient Setting

Inpatient clients should be assessed for fall and infection risk factors. The hospitalized or institutionalized client's risk for falls is identified after compiling specific assessment data that are correlated with contributing factors. Each of these indicators carries a specific weight, as shown in the accompanying Fall Risk Appraisal, to determine the client's risk. The inpatient client should be assessed for falls every shift or as designated by institutional policy. To minimize the chance of falls, make sure the client's environment is safe: the bed is kept in a low position, side rails are up, personal belongings are in easy reach, and assistive devices (e.g., walker) are nearby, as shown in Figure 31-4.

To determine risk for infection, review or listen to the client's response to the health history and inter-



Figure 31-4 This client's risk of falls has been assessed and responded to through the measures shown here. Do all clients within the hospital setting need to be assessed for the risk of falls, regardless of their health status or reason for hospitalization?

Risk Factors

A comprehensive nursing assessment involves using specifically developed risk assessment tools and appraising the client's environment to detect potential hazards.

FALL RISK APPRAISAL

Area of Assessment	Score
General Factors	1
Restraint (posey, arm, leg)	
Orthostatic changes	
History of falls/crawling out of bed/syncope (brief loss of consciousness)	
Seizure disorder	
Elimination Function	2
Decreased bladder/bowel tone	
Urgency/frequency	
Incontinence	
Nocturia (excessive urination at night)	
Age	3
Over 65	
Level of Consciousness/Mental Status	4
Lethargic (slow to respond)	
Inability or refusal to follow directions	
Inability or refusal to call for help	
Impaired judgment, memory, awareness	
Confused, disoriented	
Sensory Deficits	5
Diminished visual acuity, blind, blurred vision	
Slow reaction time	
Mobility/Physical Limitations	6
Decreased mobility in lower extremities	
Up with assistance	
Amputee/joint difficulties	
Weakness, dizziness, fatigability, vertigo (dizziness), syncope	
Cast, splint	
Use of crutches, cane, walker	
Hemiparesis (one-sided paralysis), paraparesis (loss of function), hemiplegic, paraplegic (loss of function in lower limbs)	
Ataxia (unsteady gait)	
Improper fitting/smooth soled/no footwear	
Unsteady gait, decreased balance, imbalance	
Medications	7
Sedatives/hypnotics/tranquilizers	
Diuretics/antihypertensives/laxatives	
Narcotics/analgesics/anesthetics	
Antihistamines	
Antiseizures	
Barbiturates/phenothiazines	
Eye drops	
Antipsychotics/antidepressants	
Scoring: If the client is over 65 years of age, the indicator has a weight of 3. If the client is also receiving a diuretic, which has a weight of 7, the total risk factor for this client is 10. This would place the client at high risk for falls and would require the implementation of special fall measures. (Patient Care Admission Sheet courtesy of Tulane University Hospital & Clinic New Orleans, LA)	

view questions related to “exposure to infectious diseases,” “invasive procedures,” and “behaviors you think you should change.” An infection risk appraisal is based on the defining characteristics that place a client at risk for an infection. These factors are listed in the section entitled Nursing Diagnosis.

Client in the Home

An injury risk appraisal will provide the nurse with assessment data to determine the client’s level of safety knowledge as previously discussed in the standard of care for safety. Injuries in the home are primarily the result of falls, fires, electrical malfunctions, suffocation, weapons, and household and medication poisonings. Home health nurses may use a safety risk appraisal; refer to the accompanying display.

The safety risk data assessed in the home environment direct the nurse in planning for the client and caregiver’s education. The home health nurse needs to prioritize these data when planning the client’s care. Assessment, teaching, and outcome evaluation of all safety hazards can take several home visits.

Diagnostic and Laboratory Data

Appraising the client’s risk for injury should also include an evaluation of laboratory findings relative to an abnormal blood profile (e.g., altered clotting factors, anemic conditions, or leukocytosis). See Chapter 28 for a complete discussion of abnormal blood profiles. Malnourished clients are at risk for injury.

The laboratory indicators for an infection are:

1. An elevated leukocyte (white blood cell [WBC]) and WBC differential:
 - Neutrophils: Increased in acute, severe inflammation
 - Lymphocytes: Increased in chronic bacterial and viral infections
 - Monocytes: Increased in some protozoan and rickettsial infections and tuberculosis
 - Eosinophils and basophils: Unaltered in an infectious process
2. An elevated erythrocyte sedimentation rate (ESR): Increased in the presence of inflammation
3. An elevated pH of involved body fluids (gastric, urine, or vaginal secretions): Indicates the presence of microorganisms
4. Positive cultures of involved body fluids (blood, sputum, urine, or other drainage): Indicates the growth of microorganisms

Refer to Chapter 28 for the age-related normal laboratory values for each of the preceding tests.

HOME SAFETY RISK APPRAISAL

Infant

- Crib has side rails that stay in the up position while infant is in the crib.
- Infants are not left unattended, especially on elevated surfaces or in the bath.
- Bath water temperature is 37.8°–40.6°C (100°–105°F). Check temperature for comfort with wrist.
- Environment is kept warm and draft-free at bath time.
- Bottles are sterilized and formula refrigerated.
- Toys are soft without detachable pieces.
- Car seat has restraint strap and is used consistently.
- Stroller and carry seat are sturdy with a restraint strap.
- Fire, police, and poison control numbers are posted by telephones.
- Caregivers know infant CPR.

Toddler/Preschooler

- Sharp objects are placed out of reach and out of sight.
- Poisons are labeled and placed in a locked cabinet.
- Medications and other toxins have childproof lids and are stored in a locked cabinet.
- Small, hard food objects (peanuts, candy) are kept in locked cabinets.
- Stairs and floor furnaces have gates or barriers.
- Safety locks are on doors and windows.
- Electrical outlets are covered.
- Burners on the stove are not left on and unattended.
- Pots with hot liquids are placed on back burners with handles facing toward the back wall.
- Home and yard are free from poisonous plants.
- Play equipment is kept in proper functioning condition; toys have no small parts; crayons are nontoxic.
- Outdoor play is supervised in a fenced area with locks on gates.
- Car seat/belt is used consistently.
- Supervision is given child when crossing the street.
- Caregivers know child CPR and Heimlich maneuver.

School-Age Child

- Play and sports are supervised.
- Play equipment kept in proper functioning condition and free from hazards.
- Outdoor play limited to soft surfaces.
- Bicycle helmet worn consistently.
- Taught not to open the door or speak with strangers while at play.
- Firearms are kept unloaded in locked cabinets.
- Caregivers know child CPR and the Heimlich maneuver.
- Seat belt is worn at all times.

Adolescent

- Firearm safety is taught.
- Seat belt is worn at all times.
- Teenagers take drivers' education; cautioned about drinking and driving.
- Caregivers know adult CPR and the Heimlich maneuver.

HOME SAFETY RISK APPRAISAL (continued)

Adult

- Firearms have safety latches.
- Smoke detector and fire extinguisher installed in the home.
- Sharp-edged objects are safely stored.
- A nondrinking designated driver is chosen.
- Emergency phone numbers are readily available.
- Caregiver knows adult CPR and Heimlich maneuver.

Older Adult

- Stairs have adequate lighting and nonskid surfaces, and rails are in good condition.
- Throw rugs are not present.
- Hallways are uncluttered.
- Carpets are free from frayed ends/pieces.
- Phone and other cords are behind furniture.
- Bathtub has rails and nonslip surface.
- Shower stall has seat.
- Bathroom is free from drafts.
- Shoes fit properly with nonskid soles.
- Home is adequately ventilated and heated.
- Home is free of space heaters.
- Pilot lights are functional for gas appliances.
- Electrical appliances are in good working condition.
- Food is properly refrigerated.
- Medications are kept in properly labeled containers with readable print.
- Emergency phone numbers are readily available.
- Fire and police departments aware of older adult at home alone.
- Caregiver knows adult CPR and Heimlich maneuver.

NURSING DIAGNOSIS

After data collection and analysis, the nurse is able to formulate a nursing diagnosis. If Gordon's Functional Health Patterns model is used to conduct the assessment, the nurse can use the classification of nursing diagnoses by functional health patterns that relate to safety, infection, and hygienic deficits; for example:

- I. Health perception–health management pattern
 - Risk for injury
 - Risk for infection
- II. Activity-exercise pattern
 - Bathing/hygiene self-care deficit
 - Dressing/grooming self-care deficit
 - Toileting self-care deficit

Risk for Injury

The primary nursing diagnosis *Risk for Injury* exists when the client is at risk of injury as a result of environmental conditions interacting with the individual's adaptive and defen-

sive resources (NANDA, 2001). Although this diagnostic label does not have defining characteristics as set forth by NANDA, it is categorized as having either internal or external potential hazards. An internal biochemical risk factor for a client with impaired vision would be stated as *Risk for Injury* related to sensory dysfunction. In contrast, a home health nurse's assessment data that identify drugs on a nightstand with a toddler in the home as creating an external chemical risk factor for the toddler would be stated as *Risk for Injury* related to drugs (pharmaceutical agents).

NANDA (2001) has six defined subcategories of specific risk factors for this diagnostic labeling:

1. *Risk for Suffocation*: An accentuated risk of accidental suffocation
2. *Risk for Poisoning*: An accentuated risk of accidental exposure to, or ingestion of, drugs or dangerous products in doses sufficient to cause poisoning
3. *Risk for Trauma*: An accentuated risk of accidental tissue injury (e.g., wound, burn, fracture)
4. *Risk for Aspiration*: Risk for entry of gastrointestinal secretions, oropharyngeal secretions, or solids or fluids into the tracheobronchial passages
5. *Risk for Disuse Syndrome*: Risk for deterioration of body or body systems as the result of prescribed or unavoidable musculoskeletal inactivity
6. *Latex Allergy Response*: A response to natural latex rubber products

These six subcategories of nursing diagnoses provide the nurse with the opportunity to relate specific nursing interventions to the diagnosed problem. For example, the specific nursing diagnosis for the situation of a toddler in the home environment encountering medications on a nightstand would be *Risk for Poisoning* related to medicines not stored in locked cabinets and accessible to children. The level of risk would be increased if the medications on the client's nightstand were in open containers or the closed containers failed to have child-proof caps. The subcategory diagnosis provides specific nursing interventions directed at the level of risk for the toddler and the need for client teaching.

Risk for Infection

Risk for infection is the state in which an individual is at increased risk for being invaded by pathogenic organisms (NANDA, 2001). The risk factors that increase the client's vulnerability to infections are:

- Inadequate primary defenses (broken skin, traumatized tissue, decrease in ciliary action, stasis of body fluids, change in pH of secretions, and altered peristalsis)
- Inadequate secondary defenses, acquired immunity, and immunosuppression
- Tissue destruction and increased environmental exposure
- Chronic diseases and malnutrition

- Invasive procedures and pharmaceutical agents
- Trauma
- Rupture of amniotic membranes
- Insufficient knowledge to avoid exposure to pathogens (NANDA, 2001)

Self-Care Deficits

A **self-care deficit** exists when the client is not able to perform one or more of the activities of daily living. NANDA (2001) identifies three self-care deficits related to hygienic practices. These diagnostic labels, together with their defining characteristics and related factors, are presented in Table 31-2.

Other Nursing Diagnoses

Clients who are at risk for injury and infection or have a self-care deficit may have other problems. These associated physiological and psychological problems are discussed in detail in other chapters in this unit. The common nursing diagnoses that often accompany diagnostic labels for risk or self-care deficits are:

- *Imbalanced Nutrition* (specify less than body requirements or more than body requirements)
- *Ineffective Protection*
- *Impaired Tissue Integrity*
- *Impaired Oral Mucous Membrane*
- *Impaired Skin Integrity*
- *Social Isolation*
- *Risk for Loneliness*
- *Ineffective Coping*
- *Impaired Physical Mobility*
- *Hopelessness*
- *Powerlessness*
- *Deficient Knowledge* (specify)
- *Acute Pain*
- *Anxiety*
- *Fear*

This list is not all-inclusive but gives an indication of the number of related problems that need to be considered when planning care.

THINK ABOUT IT

Experiencing Self-Care Deficits

Imagine that you are unable to feed yourself, you cannot dress yourself, and you are incontinent and must rely on others to clean you. You are completely dependent on caregivers since you have no family or friends to assist you. How do you feel about being dependent on caregivers to meet your basic needs? What happens if the caregivers do not respond when you ask for help? How do you feel when others make decisions for you?

TABLE 31-2
Self-Care Deficits

Nursing Diagnosis and Definition	Defining Characteristics	Related Factors
<i>Bathing/Hygiene Self-Care Deficit:</i> A state in which the individual experiences an impaired ability to perform or complete bathing/hygiene activities for self	Inability to wash body or body parts, obtain or get water from a water source, or regulate the temperature or flow of water	Intolerance to activity; decreased strength and endurance; pain, discomfort; impairment of perception or cognition, neuromuscular activity, and musculoskeletal function; depression, severe anxiety
<i>Dressing/Grooming Self-Care Deficit:</i> A state in which the individual experiences an impaired ability to perform or complete dressing and grooming activities for self	Impaired ability to put on or take off necessary items of clothing, obtain or replace articles of clothing, fasten clothing, or maintain appearance at a satisfactory level	Intolerance to activity; decreased strength and endurance; pain, discomfort; impairment of perception or cognition, neuromuscular activity, and musculoskeletal function; depression, severe anxiety
<i>Toileting Self-Care Deficit:</i> A state in which an individual experiences an impaired ability to perform or complete toileting activities for self	Unable to get to toilet or commode, sit on or rise from toilet or commode, manipulate clothing for toileting, carry out proper toilet hygiene, or flush toilet or commode	Impaired transfer ability and mobility status; intolerance to activity; decreased strength and endurance; pain, discomfort; impairment of perception or cognition, neuromuscular activity, and musculoskeletal function; depression, severe anxiety

(From North American Nursing Diagnosis Association. [2001]. *Nursing Diagnoses: Definitions and Classification 2001–2002*. Philadelphia: Author.)

OUTCOME IDENTIFICATION AND PLANNING

The primary nursing goal is to provide safe care through the identification of actual or potential hazards and the implementation of safety measures. The assessment data are reviewed with the client, and the nurse records the areas in which the client indicates a need for change and health teaching, for example, age-related exercise or maintaining a safe environment. These findings are incorporated into the plan of care, reflecting the individualized needs of each client.

During the planning phase, the nurse collaborates with the client and other health care providers to determine the goals, outcomes, and interventions and manipulates the external environment to reduce the risk of injury and infection. Identified outcomes provide direction for the nursing care that is implemented to reduce the risk of injury and infection.

Another critical element of the care plan is client/caregiver education related to the identification of potential hazards and health promotion practices. The nursing care plan should include safety measures that educate clients about preventive actions and modification of an unsafe environment, for example, proper use of a call light or the side effects of medications.

Table 31-3 discusses the basic components of care planning and outcome measurements for clients at risk or with a self-care deficit. Sample statements of goals

and expected outcomes are included in Table 31-3. The nursing interventions are statements taken from the Nursing Intervention Classification System. For each of these nursing interventions, there are specific actions taken by the nurse to individualize the care for each client. The nurse could use Gordon's Functional Health Patterns to plan care. Gordon's Functional Health Patterns that may be used for clients at risk or with a self-care deficit are health perception–health management; activity-exercise pattern; and cognitive-perceptual pattern. Nursing actions are discussed in detail in the following section.

IMPLEMENTATION

Nursing care implemented for clients with alterations in health perception–health management or activity and exercise involves continual assessment of client health risks and prioritization of risk reduction nursing interventions, such as:

- Administration of prescribed medications (refer to Chapter 29)
- Provision of balanced nutritional intake (refer to Chapter 38)
- Promotion of adequate rest and exercise (refer to Chapters 33 and 34)
- Decreasing the spread of infection

TABLE 31-3
Planning the Care of Clients at Risk for Injury or Infection and/or with a Self-Care Deficit

Nursing Diagnosis and Definition	Goals	Expected Outcomes	Nursing Interventions
<i>Risk for Injury</i>	1. The client will identify factors that increase the potential for injury.	1. The client will identify internal and external factors that will increase the risk for injury.	Risk identification: Analysis of potential risk factors, determination of health risks, and prioritization of risk reduction strategies for an individual
	2. The client will remain free of bodily injury.	2. The client will identify and implement safety measures to decrease the risk for injury.	Fall prevention: Instituting special precautions with client at risk for injury
<i>Risk for Infection</i>	1. The client will remain free of nosocomial infection.	1. The client will remain afebrile during hospitalization.	Infection protection: Prevention and early detection of infection in a client at risk
	2. The client will reduce exposure to known infectious agents.	2. The client will not engage in unprotected sexual intercourse.	Infection control: Minimizing the acquisition and transmission of infectious agents
<i>Bathing/Hygiene Self-Care Deficit</i>	1. The client will maintain an optimum functional level in hygienic practices in a safe and effective manner.	1. The client will participate physically and/or verbally in bathing, dressing, and toileting activities.	Bathing: Cleaning of the body for the purpose of relaxation, cleanliness, and healing Dressing: choosing, putting on, and removing clothes for a person who cannot do this for self
	2. The client's skin will remain clean and intact.	2. The client's skin will be free from drainage or secretion, intact, and without redness.	Skin surveillance: Collection and analysis of client data to maintain skin and mucous membrane integrity Perineal care: Maintenance of perineal skin integrity and relief of perineal discomfort
<i>Deficient Knowledge: related to health hazards</i>	The client will not sustain injuries.	The client will verbalize feedback of instructions and willingness to comply.	Teaching individual: Planning, implementation, and evaluation of a teaching program designed to address a client's particular needs

From McCloskey, J. C., & Bulechek, G. M. (Eds.). (1996). *Nursing Interventions Classification (NIC)* (2nd ed.) St. Louis, MO: Mosby Yearbook.

Implementation of safety measures may require an alteration in the physical environment as directed by the fall prevention protocol or Standard Precautions; refer to Table 31-4. Chapter 34 provides additional information on fall prevention.

Nursing measures to counter common physical hazards that impair environmental safety are maintaining electric beds in the low position with side rails up and call light within easy reach and keeping the bedroom and bathroom uncluttered to prevent falls. Some states consider side rails a form of restraint. Nurses must be knowledgeable about statutory provisions relative to health care in their state.

The implementation of standard precautions is the most effective nursing measure to prevent and control the spread of infections. Standard Precautions are discussed in detail later in this chapter.

Raise Safety Awareness and Knowledge

Nurses in all settings must demonstrate an awareness of safety hazards and teach clients accordingly. Clients must be aware of and knowledgeable about safety

TABLE 31-4
Adult Fall Prevention Protocol

Purpose

To direct the nursing management of the client at risk for falls

Level

Interdependent nursing function

Supportive Data

Falls account for nearly 90% of injuries reported in hospitalized clients (Whedon & Shedol, 1989). Risk factors for falls include age, dizziness, confusion, use of medications, and physical or mental alterations. Fall prevention is used to increase staff awareness of clients at risk for falls and to provide preventive safety measures.

Content

Assessment

1. Perform client injury risk appraisal and identify fall risks. Update status of fall risks daily and as needed on nursing care plan.
2. Assess effects of medications administered that increase risk of falling.
3. Implement institution's fall prevention program.

Report to Physician

4. Notify physician of previous fall history and identify risk factors for a fall.
5. Notify physician of adverse effects of medications that may increase the client's risk of falling.

Client Teaching

6. Orient client to environmental surroundings on admission and as necessary.
7. Instruct client and significant others on safety measures.
8. Instruct client and significant others on correct use of hospital equipment.
9. Instruct client with risk for falls to call for assistance when ambulating or performing activities of daily living (ADL).

Environmental Interventions

10. Keep bed in lowest position, brakes locked, and side rails up.
11. Keep call light and frequently used objects within easy reach at the bedside.
12. Keep environment clean and clutter-free.
13. Provide adequate lighting at all times.
14. Lock wheels on wheelchair, bed, and stretcher at all times.
15. Provide nonslip footwear, mats, and rugs.
16. Keep hospital furniture in the same place throughout hospital stay.
17. Provide call cord in bathroom.
18. Encourage use of handrails in bathroom and hallways.
19. Provide nonslip mats in the tub or shower.
20. Place high-risk clients in a room near the nurse's station.

Direct Nursing Care

21. Respond promptly to call lights and verbal requests for assistance.
22. Provide assistance with ADL.
23. Maintain close supervision by performing hourly safety assessments.
24. Encourage significant others to stay with high-risk clients.
25. Provide proper equipment for ambulation and elimination needs.
26. Communicate client's injury risk status in shift report.
27. Provide protective devices such as restraints for client safety (physician's order necessary).

Evaluation

28. Evaluate client's knowledge of safety measures.
29. Evaluate effectiveness of environmental interventions.
30. Evaluate changes in client's injury risk status.
31. Evaluate effectiveness of direct nursing care.

(continues)

TABLE 31-4 (continued)
Adult Fall Prevention Protocol**Content***Documentation*

32. Document the following in the client's medical record:
- Assessment of client's injury risk status
 - Nursing plan of care
 - Safety measures implemented
 - Client education performed
 - Client outcomes

(From Whedon, M. B., & Shedol, P. [1989]. Prediction and prevention of patient falls. *Image: Journal of Nursing Scholarship*, 21(2), 108–114.)

precautions in order to prevent injuries. Clients may also need specific safety information on oxygen, intravenous equipment, use of heating devices, and automatic bed controls.

A Food and Drug Administration (FDA) safety alert addressed entrapment hazards with side rails on hospital beds. The FDA received 102 reports of head and body entrapment incidents that resulted in 68 deaths, 22 injuries, and 12 entrapments without injury that occurred in hospitals, long-term care facilities, and private homes. All reported entrapments occurred in one of the four ways identified in Figure 31-5.

Prevent Falls

Falls occur among clients who are weak, fatigued, uncoordinated, paralyzed, confused, or disoriented. The data obtained from the client's fall risk appraisal will identify which clients require special nursing measures to prevent falls. The risk for falls can be reduced by:

- Good supervision
- Orienting clients to the environment and call system

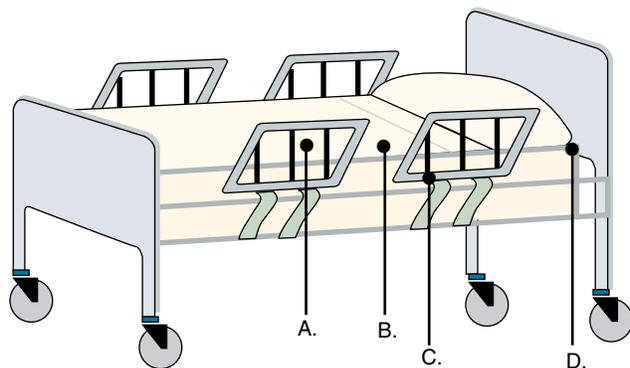


Figure 31-5 Entrapment hazards with hospital bed side rails. A. Through the bars of an individual side rail; B. through the space between split side rail; C. between the side rail and mattress; or D. between the headboard or footboard, side rail, and mattress. (From Food and Drug Administration, *Safety Alert*, August 23, 1995.)

- Providing ambulatory aids (wheelchairs or walkers)
- Placing personal belongings on tables near the bed
- Keeping hospital beds in lowest position with side rails up
- Using nonslip mats and rugs
- Illuminating the environment

Although falls do not necessarily constitute malpractice, they are a major reason why nurses are involved in lawsuits (Ignatavicius, 2000). Sullivan and Badros (1999) and Ignatavicius (2000) identify the need for registered nurses to assess patients' risk of falls and implement evidence-based interventions. The concept of evidence-based practice (EBP) refers to health care based on research findings, expert consensus, or both (Davis & Madigan, 1999).

Apply Restraints

Restraints are protective devices used to limit the physical activity of a client or to immobilize a client or extremity. Restraints are used to protect the client, allow for treatment in a safe environment, and reduce the risk of injury to others.

The use of restraints has become very controversial because of client injuries from restraints. The Omnibus Budget Reconciliation Act (OBRA) of 1987 and the Health Care Financing Administration regulations of 1999 governing client's rights are forcing a reexamination of how clients are cared for in acute and critical care settings (Bower & McCullough, 2000). In response to more individualized care regarding the use of restraints, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) revised their standards for restraint use with nonpsychiatric clients; see the accompanying display for JCAHO-revised standards.

Nurses must document, according to the institutional protocol, the application and care of the client in restraints (see the accompanying display). Refer to



RESEARCH FOCUS

Title of Study

“Nursing Outcome Indicator: Preventing Falls for Elderly People”

Authors

Benzon, J., et al.

Purpose

To identify people at risk of falling and to mitigate that risk through established nursing interventions.

Methods

The study included 115 participants. Each participant received a comprehensive nursing assessment and a fall risk appraisal, which included the client's history of falling, episodes of confusion, diminished eyesight or hearing, and number and types of medications. Interventions were determined by each person's risk factors and included reducing medications or teaching about side effects, correcting vision and hearing, providing walkers and canes to persons who had previously fallen, and promoting improved strength and endurance through exercise. Homes were surveyed, and environmental changes were made: lighting was increased; loose carpet edges were taped; and grab rails were installed in showers, in tubs, and by toilets.

Findings

Only 4 (3%) of the 115 participants fell during the first year of the fall prevention program as opposed to 30 (or 26%) prior to the implementation of the program. Two of the four participants who fell were under the influence of alcohol, and the other two persons fell while they were away from their homes.

Implications

This study demonstrates that it is possible to prevent falls when the risk factors are identified and proper interventions are implemented to counter the risk factors.

Benzon, J., et al. (1999). Nursing outcome indicator: Preventing falls for elderly people. *Outcomes Management Nursing Practice*, 3(3), 132–137.

KEY ELEMENTS OF RESTRAINT DOCUMENTATION

- Reason for the restraint
- Method of restraint
- Application: Date, time, and client's response
- Duration
- Frequency of observation and client's response
- Safety: Release from restraint with periodic, routine exercise and assessment for circulation and skin integrity
- Assessment of the continued need for restraint
- Client outcome

through the application of a device. Most states require a physician's order for the application of physical restraints. **Chemical restraints** are medications used to control the client's behavior. Commonly used chemical restraints are anxiolytics and sedatives.

This chapter limits discussion to the common types of physical restraints:

- **Jacket (body restraint):** A sleeveless vest with straps that cross in front or back of the client and are tied to the bed frame or chair legs (Figure 31-6A).
- **Belt:** Straps or belts applied across the client to secure him or her to the stretcher, bed, or wheelchair (Figure 31-6B).
- **Mitten or hand:** Enclosed cloth material applied over the client's hand to prevent injury from scratching (Figure 31-6C).
- **Elbow:** A combination of fabric and plastic or wooden tongue blades that immobilize the elbow to prevent flexion (Figure 31-6D).
- **Limb or extremity:** Cloth devices that immobilize one or all limbs by securely tying the restraint to the bed frame or chair (Figure 31-6E).
- **Mummy:** A blanket or sheet that is folded around the child to limit movement. Mummy restraints are used to perform procedures on children (Figure 31-6F).

The nursing plan of care should include safety measures to reduce the potential for injury from restraints (Procedure 31-1). Additional safety measures to observe when using restraint devices are:

- Restraints can be changed and released easily, using only a clove hitch knot, as shown in Procedure 31-1.
- Restraints should not interfere with any treatments (e.g., intravenous therapy) or aggravate the client's health problem.
- There should be enough slack on the straps so that the client can move both arms and legs and for range-of-motion exercises.
- At least once every 2 hours, the nurse must perform circulation and neurological exams, assessing the

Chapter 29 for additional information regarding the use of restraints and their legal implications.

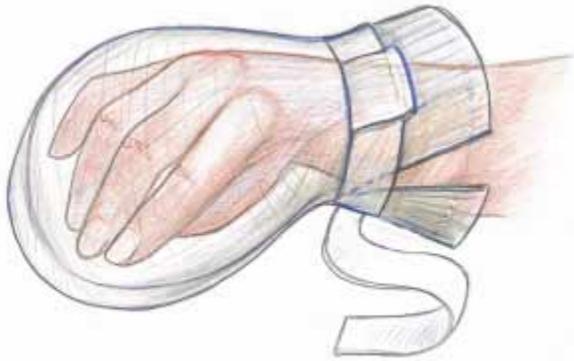
Restraints used to either limit physical activity or immobilize a client can be physical or chemical. **Physical restraints** reduce the client's movement



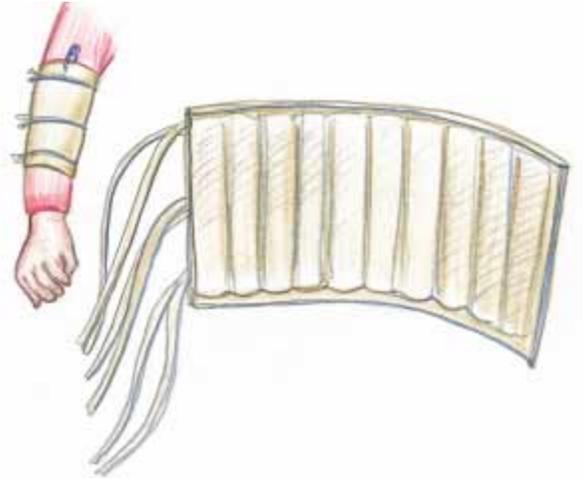
A.



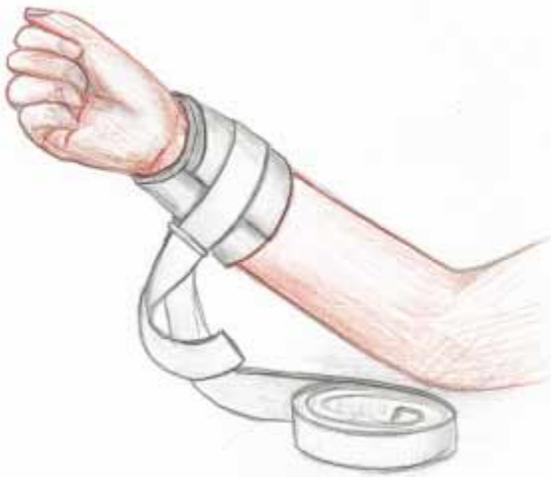
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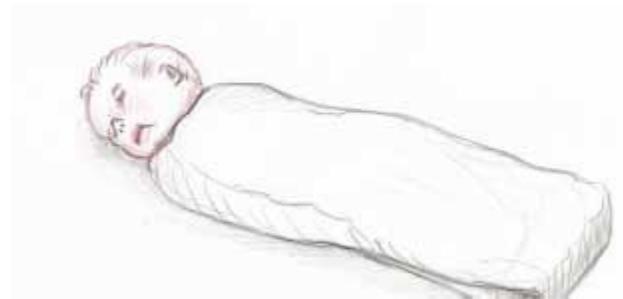
C.



D.



E.



F.

Figure 31-6 Types of Physical Restraints: A. Jacket; B. Belt; C. Mitten or Hand; D. Elbow; E. Limb or Extremity; and F. Mummy.

JCAHO RESTRAINT STANDARDS FOR NONPSYCHIATRIC CLIENTS

Organizational Perspective:

- Be individualized for each institution
- Demonstrate clinical justification
- Demonstrate the use of innovative alternatives
- Delineate preventive strategies
- Identify ways to reduce risks associated with restraint use

Policies/Procedures/Protocols:

- Be clearly stated
- Advocate use of least restrictive measures

Preventive Strategies:

- Identify potentially harmful client behaviors
- Identify effective and tried alternatives

Plan of Care

- Individualized and ensure client's assessed needs are met
- Preserve client's rights, dignity, and well-being

Education:

- Be ongoing for staff and client
- Be provided to families when appropriate

Initiation and Monitoring of Restraint Use:

- Based on state law
- Initiated based on individual orders or approved protocols with written physician order obtained within 12 hours
- Applied/monitored/assessed/reassessed by qualified staff
- Monitored at least every 2 hours
- Renewed every 24 hours when continuous restraint is used

Special Conditions When Restraint Is Applied:

- Based on significant change in the client's condition with the physician notified immediately and written orders obtained within 24 hours
- Initiated by a registered nurse
- Based on protocols established for situations where clients may harm themselves if staff initiate, maintain, and terminate restraint without an order from independent practitioner

Documentation:

- Include all restraint episodes according to organizational policies and procedures
- Occur, at a minimum, every 2 hours
- Indicate alternatives were tried before restraints were applied
- Be entered into the client's medical record

Adopted from: The Joint Commission on Accreditation of Healthcare Organizations for Restraint Use. (1999). *Introduction to the restraint standards in acute medical and surgical (nonpsychiatric) care. Comprehensive accreditation manual for hospitals*. Oakbrook Terrace, IL: Author.

NURSING ALERT

Restraints

Jacket or belt restraints should not restrict respiratory effort. Placing a restraint too tight on the diaphragm will inhibit the expansion of the lungs.

color, sensation, temperature, motion, and capillary refill in the area distal to the restraint.

- There should be a provision for psychological support of client and significant others.

Figures 31-7 and 31-8 demonstrate how to make a clove hitch knot used in applying restraints. Note how the clove hitch restraint, made from a strip of gauze, does not tighten when force is applied against it. The restraint strap is secured to the bed frame, *not to the side rail* so as to avoid accidental injury to the extremity in the event that the side rail is released while the restraint strap is attached to it.

THINK ABOUT IT

Use of Restraints

Gloria Hernandez is an 83-year-old widow who fractured her hip when she fell in the bathtub. She had hip replacement surgery yesterday. Tonight she is very confused and is trying to dislodge the bandage and stitches. Mrs. Hernandez is now being restrained for protection. What other nursing activities could have been implemented prior to the use of restraints? Do you think that restraints will affect Mrs. Hernandez's mental status? If so, in what ways? What are some other effects Mrs. Hernandez may experience as a result of being restrained? How would you feel about the use of restraints if Mrs. Hernandez were your grandmother?

Ensure Adequate Lighting

Adequate lighting assists in the visualization of environmental hazards. Rooms should be adequately lighted so that the client can safely perform ADL and health care providers can perform procedures. Lighting can be supplemented by lamps and nightlights. Lighting can also assist in protecting the home against crime.

Remove Obstacles

Obstacles in heavily traveled areas of health care facilities or homes are a risk to the client's safety. Older adults or persons who are unfamiliar with the environment are at greatest risk of injury from obstacles. The risk that obstacles pose can be reduced by keeping hallways clear, removing excess furniture from heavily traveled areas, removing all electrical cords or taping cords securely to the floor, removing throw rugs, applying

PROCEDURE 31-1

Application of Restraints

Equipment

■ Restraint

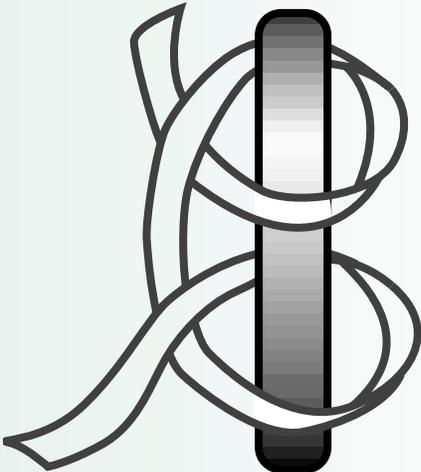
<i>Action</i>	<i>Rationale</i>
<ol style="list-style-type: none"> 1. Explain rationale for application of restraint. Repeatedly reinforce rationale. 2. Select the proper type of restraint. 3. Assess skin for irritation. 4. Apply restraint to client assuring some movement of body part. One to two fingers should slide between restraint and client's skin. Tie straps securely with clove hitch knot as shown in Figure 31-7. To make a clove hitch: make a figure-eight (Figure 31-8A); pick up the loops (Figure 31-8B); put the limb through the loops and secure (Figure 31-8C). Pad bony prominences. 	<ol style="list-style-type: none"> 1. Explanations facilitate cooperation. 2. Least restrictive restraint that does not interfere with client's health status but provides safety should be selected. 3. Provides baseline skin assessment. 4. Maintains adequate circulation and mobility. Prevents skin breakdown. Restraint should be easy to release.
	
<ol style="list-style-type: none"> 5. Secure restraint to bed frame; do not tie the straps to the side rail. 6. Assess restraints and skin integrity every 30 minutes. Release restraints at least every 2 hours. 7. Continually assess the need for restraints (at least every 8 hours). 	<ol style="list-style-type: none"> 5. Prevents accidental injury to client from moving side rails and decreases client's ability to untie restraints. 6. Permits muscle exercise. Promotes circulation. 7. Assist in evaluating client's progress and response to restraints.

Figure 31-7 Clove Hitch Knot

(continues)

PROCEDURE 31-1

Application of Restraints (continued)

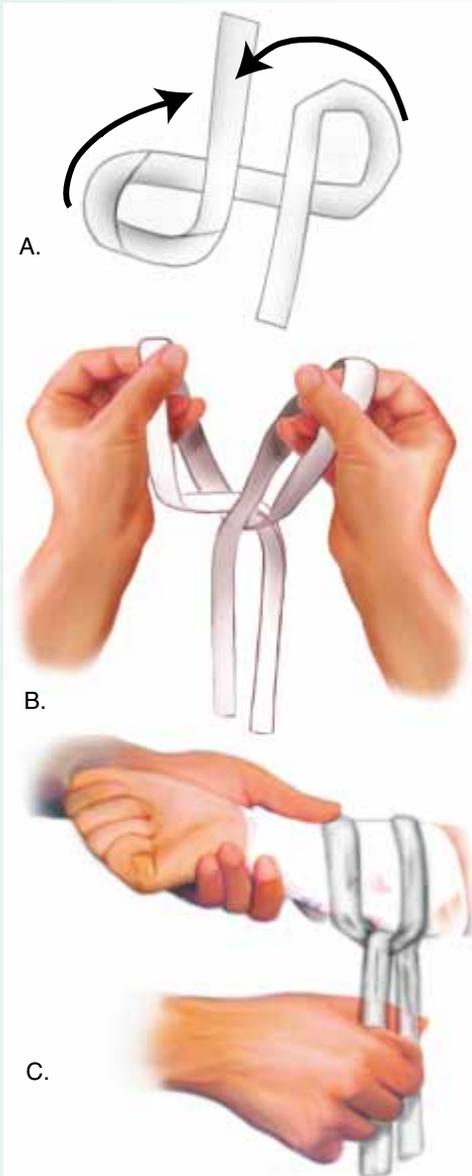
*Action**Rationale*

Figure 31-8 Making a Clove Hitch Knot: A. Make a figure-eight; B. Pick up the loops; and C. Put the limb through the loops and secure.

nonslip pads to rugs, cleaning up spills immediately, and removing objects that could fall from the tops of appliances.

Reduce Bathroom Hazards

Bathrooms pose a threat to the client in the home because of the presence of water and storage of medication. Common bathroom accidents are falls, scalds or

burns, and poisonings. Bathroom accidents can be reduced by the use of grab bars near the tub, shower, and toilet; nonslip mats in the tub and shower; and a secured bathroom rug near the tub or shower. Other safety measures include checking the temperature of the water before entering tub or shower; checking the thermostat setting on the water heater; and storing medications in a locked cabinet, out of reach of children or disoriented or confused adults.

Prevent Fire

Fire is a potential danger to all people in an institutional or home environment. Immobilized or incapacitated clients are at increased risk during a fire. Common causes of fire are smoking in bed, discarding cigarette butts in trash cans, and faulty electrical equipment. Fire occurs with the interaction of three elements: sufficient heat to ignite the fire, combustible material, and oxygen to support the fire.

Nursing goals are fire prevention and protection of clients during a fire. Nursing interventions aimed at preventing or reducing the risk of fire include:

- Clearly marking fire exits
- Knowing locations of fire extinguishers and their operation
- Practicing fire evacuation procedures
- Posting emergency phone numbers by all telephones
- Keeping open spaces and hallways clear of clutter
- Checking electrical cords and outlets for exposed or damaged wires
- Reporting identified electrical hazards
- Educating clients about fire hazards

In the event of a fire, follow institutional policy and procedures for fire containment and evacuation. Nursing interventions during a fire are directed at *protecting the client from injury and containing the fire*. Nurses should be familiar with the location of fire alarm pull boxes. If a fire occurs, the nurse should utilize the nearest fire box for notification and move clients to safety.

Nurses should be familiar with the use of fire extinguishers and their locations. The fire extinguisher should be directed toward the base of the fire. The four types of fire extinguishers used are water, carbon dioxide, regular dry chemical, and multipurpose dry chemical. Each type of fire extinguisher is used for a specific class of fire, as discussed in Table 31-5.

Ensure Safe Operation of Electrical Equipment

Clients have contact with a variety of electrical equipment in the hospital environment, such as bed controls

and intravenous and patient-controlled analgesia (PCA) pumps. All electrical equipment should have a three-pronged electrical plug that is grounded. A grounded plug transmits any stray electrical current from equipment to the ground. To protect the client from electrical injury, the nurse should read the warning labels on all equipment, use only grounded electrical equipment, check for frayed electrical cords, avoid overloading circuits, and report any shocks received from equipment to the biomedical department (see Figure 31-9).

If a client receives an electrical shock, the nurse should turn off or remove the electric source before touching the client. Then, the client's pulse should be checked. If the client has no pulse, CPR should be initiated. If the client has a pulse, the nurse should assess vital signs, mental status, and skin integrity for burns. A physician should be notified of the event. The nurse should note points of entry and exit of electrical current to assess for potential complications.

Reduce Exposure to Radiation

Clients are exposed to radiation during diagnostic testing and therapeutic interventions. Injury can occur from radiation if there is overexposure or exposure to untargeted tissues. Exposure to untargeted tissues can occur with radiation implants that become dislodged. General principles of radiation exposure and protection are based on time, distance, and shielding. Protection from radiation therapy includes:

- Minimizing time in contact with radiation source (implants or client)
- Maximizing distance from radiation source (implants or client)
- Using appropriate radiation shields
- Monitoring radiation exposure with a film badge
- Labeling all potentially radioactive material
- Never touching dislodged implants or body fluids of client

Both the client and the nurse are at risk for radiation injury. The client's risk for injury can be reduced by educating the client about radiation treatment and

TABLE 31-5
Fire Extinguishers

Type	Class of Fire
Water (type A)	Paper, wood, draperies, upholstery, or rubbish
Carbon dioxide or dry chemical (types B and C)	Flammable liquids, flammable gases, or electrical fires
Multipurpose dry chemical (types A, B, and C)	Any type of fire



Figure 31-9 Warning Label on Electrical Equipment

necessary precautions, placing the client in a private room, and providing a lead apron when necessary to protect nontargeted body tissues. The nurse's risk for injury can be reduced by observing all radioactive labels, wearing gloves when handling radioactive body discharges, washing hands, wearing lead aprons, disposing of radioactive substances in special containers, reducing time of client contact, and wearing badges that measure the amount of radiation exposure.

Prevent Poisoning

A **poison** is any substance that causes an alteration in the client's health, such as injury or death, when inhaled, injected, ingested, or absorbed by the body. Antidotes and treatments are available for some but not all types of poisonings. Direct and indirect causes of poisonings are:

- Inadequate supervision of children
- Ingestion of household plants
- Improper storage of toxic substances
- Insect or snake bites
- Accidental ingestion of a toxic substance or medication overdose

The poison control center should be notified when poisoning is suspected. The person reporting the poisoning should be prepared to state the amount and type of poison ingested, inhaled, or injected, client's age, and symptoms. Clients who have ingested poison should be turned on their side to prevent aspiration while awaiting further treatment. Client education about safety measures can prevent some accidental poisonings. The following Client Teaching Checklist provides some safety measures to prevent accidental poisoning. Keep syrup of ipecac available at all times.



CLIENT TEACHING CHECKLIST

Safety Measures to Prevent Accidental Poisonings

- Store medications in child-resistant containers (Figure 31-10).
- Do not take medications in front of children.
- Never call medicine candy.
- Limit the number of tablets in a medicine container.
- Place toxic substances in a locked cabinet out of reach of children.
- Never remove labels from containers.
- Do not place poisonous substances in food or beverage containers.
- Place poison stickers on toxic substances.
- Display poison control center phone numbers near telephones.



Figure 31-10 Poison Prevention Measure: Medications Stored in Child-Resistant Containers.

Reduce Noise Pollution

Noise pollution, a situation that results when the noise level becomes uncomfortable for the client or staff, frequently occurs in the health care setting as a result of visitor traffic, medical equipment, and personnel. It can result in an unorganized environment, hearing loss, and **sensory overload**. Sensory overload is an increased perception of the intensity of auditory and visual stimuli. Sensory overload can alter a client's recovery by increasing anxiety, paranoia, hallucinations, and depression. Safety measures include maintaining a quiet environment, traffic control, and providing earplugs. See Chapter 36 for a discussion of sensory overload.

THINK ABOUT IT

Noise Pollution

A client who you think is experiencing sensory overload has several visitors, including her grandchildren. How would you manage this situation? What explanation would you provide to the family as a rationale for restricting visitation? What explanation would you provide to the client as a rationale for restricting visitation?

Ensure Asepsis

Nurses are responsible for providing the client with a safe environment, which includes preventing the transmission of nosocomial infections. **Asepsis** is the absence of microorganisms. Providing nursing care using aseptic technique decreases the risk and spread of nosocomial infections. **Aseptic technique** is the infection control practice used to prevent the transmission of pathogens. Two types of asepsis are medical and surgical.

Medical Asepsis

Medical asepsis uses practices to reduce the number, growth, and spread of microorganisms. Medical asepsis

is also referred to as “clean technique.” Objects are generally referred to as “clean” or “dirty” in medical asepsis. **Clean objects** are considered to have the presence of some microorganisms that are usually not pathogenic. **Dirty** (soiled) **objects** are considered to have a high number of microorganisms, with some that are potentially pathogenic. Common medical aseptic measures used for clean or dirty objects are handwashing, gloves, changing linens daily, and cleaning floors and hospital furniture daily. Refer to Appendix D for *Your Guide to Gloves*, based on the CDC’s standard precautions.

Handwashing

Handwashing is the rubbing together of all surfaces and crevices of the hands using a soap or chemical and water.

Handwashing is a component of all types of isolation precautions and is the most basic and effective infection control measure that prevents and controls the transmission of infectious agents. The CDC (2000) recommends vigorous scrubbing with warm, soapy water for at least 15 seconds to prevent the transfer of germs.

The three essential elements of handwashing are soap or chemical, water, and friction (see Procedure 31-2 for the proper steps of handwashing). Soaps that contain antimicrobial agents are frequently used in high-risk areas such as emergency departments and nurseries. Friction is the most important element of the three because it physically removes soil and transient flora.

Handwashing should be performed after arriving at work, before leaving work, between client contacts, after

PROCEDURE 31-2

Handwashing

Equipment

- Soap
- Sink

- Paper or cloth towels
- Running water

Action

1. Remove jewelry. Wristwatch may be pushed up above the wrist (midforearm). Push sleeves of uniform or shirt up above the wrist at midforearm level.
2. Assess hands for hangnails, cuts or breaks in the skin, and areas that are heavily soiled.
3. Turn on the water. Adjust the flow and temperature. Temperature of the water should be warm.
4. Wet hands and lower forearms thoroughly by holding under running water. Keep hands and forearms in the down position with elbows straight. Avoid splashing water and touching the sides of the sink.
5. Apply about 5 ml (1 teaspoon) of liquid soap. Lather thoroughly.
6. Thoroughly rub hands together for about 10 to 15 seconds. Interlace fingers and thumbs and move back and forth to wash between digits (Figure 31-11). Rub palms and back of hands with circular motion. Special attention should be provided to areas such as the knuckles and fingernails, which are known to harbor organisms (Figure 31-12).

Rationale

1. Provides access to skin surfaces for cleaning. Facilitates cleaning of fingers, hands, and forearms.
2. Intact skin acts as a barrier to microorganisms. Breaks in skin integrity facilitate development of infection and should receive extra attention during cleaning.
3. Running water removes microorganisms. Warm water removes less of the natural skin oils.
4. Water should flow from the least contaminated to the most contaminated areas of the skin. Hands are considered more contaminated than arms. Splashing of water facilitates transfer of microorganisms. Touching of any surface during cleaning contaminates the skin.
5. Lather facilitates removal of microorganisms. Liquid soap harbors less bacteria than bar soap.
6. Friction mechanically removes microorganisms from the skin surface. Friction loosens dirt from soiled areas.

(continues)

PROCEDURE 31-2

Handwashing (continued)

Action

Figure 31-11 Interlace fingers to wash between the digits.

7. Rinse with hands in the down position, elbows straight. Rinse in the direction of forearm to wrist to fingers.
8. Blot hands and forearms to dry thoroughly. Dry in the direction of fingers to wrist and forearms. Discard the paper towels in the proper receptacle.
9. Turn off the water faucet with a clean, dry paper towel (see Figure 31-13).



Figure 31-13 Turn off faucet with a clean, dry paper towel.

Rationale

Figure 31-12 Provide special attention to washing knuckles and fingernails.

7. Flow of water rinses away dirt and microorganisms.
8. Blotting reduces chapping of skin. Drying from cleanest (hand) to least clean area (forearms) prevents transfer of microorganisms to cleanest area.
9. Prevents contamination of clean hands by a less clean faucet.

NURSING ALERT

Handwashing

Wash hands before and after every client contact. The most common cause of nosocomial infections is contaminated hands of health care providers.

removing gloves, when hands are visibly soiled, before eating, after excretion of body waste (urination and defecation), after contact with body fluids, before and after performing invasive procedures, and after handling contaminated equipment. The exact duration of time required for handwashing is not known. A washing time of 10 to 15 seconds is recommended to remove transient flora from the hands. High-risk areas, such as

nurseries, usually require about a 2-minute handwash. Soiled hands usually require more time (CDC, 2000).

Surgical Asepsis

Surgical asepsis, or sterile technique, consists of those practices that eliminate all microorganisms and spores from an object or area. **Spores** are single-celled microorganisms or microorganisms in the resting or inactive stage. Surgical asepsis refers to handwashing, the donning of surgical attire (caps, masks, and eyewear), handling of sterile instruments and equipment, and establishing and maintaining sterile fields.

Surgical asepsis is practiced by the nurse in the operating room, during labor and delivery, and for many diagnostic and therapeutic interventions at the client's bedside. Common nursing procedures that require sterile technique are:

- All invasive procedures, either intentional perforation of the skin (injections, insertion of intravenous needles or catheters) or entry into a bodily orifice (tracheobronchial suctioning, insertion of a urinary catheter)
- Nursing measures for clients with disruption of skin surfaces (changing a surgical wound or intravenous site dressing) or destruction of skin layers (trauma and burns)

Sterile Field

The nurse needs to establish and maintain a sterile field when performing those procedures that require sterile technique such as changing burn dressings or large wound dressings. Agency policy and supplies vary in different health care settings. Review the agency's policy and gather all the necessary supplies before preparing the sterile field.

Sterile dressing packages can be either commercially prepared or agency wrapped. When opening the package, allow the edges of the wrapper to drop down and away from the package (see Procedure 31-3). The sterile field must be kept free of microorganisms by placing only sterile items inside the field. When adding additional supplies to the field, avoid reaching across a sterile field. Gently drop additional supplies onto the sterile field, making sure that the supply wrapper does not touch the field; always open packages away from the field to prevent crossover and contamination.

When the sterile field is prepared, always face the field and keep sterile objects above waist level to avoid the risk of field contamination. Behaviors such as talking, sneezing, and coughing should be avoided to maintain the field's sterility; if the client is unable to cooperate, explain why a face mask is needed and apply.

Care of a wound requires a sterile dressing change to promote wound healing and to prevent infection. Assess the wound during the dressing change for infection

PROCEDURE 31-3

Surgical Asepsis: Preparing and Maintaining a Sterile Field

Equipment

- | | |
|---|--|
| <ul style="list-style-type: none"> ■ Antimicrobial soap for handwashing ■ Sterile materials (antiseptic solution, bowl, dressing, instruments) ■ Additional sterile supplies (culture swab, gauze, or dressings to complement the type of procedure to be performed) | <ul style="list-style-type: none"> ■ Sterile drape (may be contained in dressing tray) ■ Sterile solution ■ Package of proper-sized sterile gloves ■ Container for disposal of waste materials (follow agency policy, colored bag that designates infectious waste products) |
|---|--|

Action

1. Gather equipment for the type of procedure:
 - a. Select only clean, dry packages marked sterile, and read listing of contents.
 - b. Check the package for integrity and expiration date.
2. Select a clean, easily accessible area in the client's environment to establish the sterile field.
3. Explain procedure to the client; provide specific instructions if client assistance is required during the procedure.

Rationale

1. Prevents break in technique during procedure. If the package is moist or outdated, it is considered contaminated and must be discarded.
2. Promotes access to the sterile field during the procedure.
3. Gains client's understanding and cooperation during the procedure.

(continues)

PROCEDURE 31-3

Surgical Asepsis: Preparing and Maintaining a Sterile Field (continued)

Action

4. Inquire about and attend to the client's toileting needs.
5. Hospital environment: If the procedure is to be performed at the client's bedside, the client should be in a private room or moved to a clean treatment room.
6. Home environment: Secure privacy and remove pets from the room.
7. Position client and attend to comfort measures; the client's position should provide you easy access to the area and facilitate good body mechanics during the procedure.
8. Wash hands; refer to Procedure 31-2.
9. Place sterile package (drape or tray) in the center of the clean, dry work area.
10. Remove the wrapper, pulling away from the body (see Figure 31-14).



Figure 31-14 Open the first flap of a sterile wrapped package.

Rationale

- | | | |
|--|--|--|
| <ol style="list-style-type: none"> 4. Prevents break in technique during the procedure. 5. Minimizes microorganisms in the environment. 6. Puts the client at ease and promotes a clean environment. 7. Helps the client relax and prevents movement during the procedure; prevents reaching, decreasing the risk of contamination and back strain. 8. Prevents transmission of infection. 9. Prevents reaching over exposed sterile items when wrapper is removed. 10. Prevents contamination. | <ol style="list-style-type: none"> 11. Grasp the folded top edge with fingertips of one hand. 12. Remove the drape by lifting up and away from all objects while it unfolds; discard the outer wrapper with other hand. 13. With free hand, grasp the other drape corner, keeping it away from all objects. 14. Lay the drape on the surface, with the drape bottom first touching the surface farthest from you; step back and allow the drape to cover the surface (see Figure 31-15). | <ol style="list-style-type: none"> 11. Edges are considered unsterile. 12. If the drape touches an unsterile object, it is contaminated and must be discarded. 13. Avoids contamination. 14. Prevents you from reaching over the sterile field; stepping back decreases risk that drape will touch your uniform. |
|--|--|--|

(continues)

PROCEDURE 31-3

Surgical Asepsis: Preparing and Maintaining a Sterile Field (continued)

Action



Figure 31-15 Place drape on the surface by first placing the bottom portion of drape farthest from oneself and then placing the top portion of drape over the work surface.

Rationale

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|--|---|
| <p>15. Open and place the tray on the work surface so that the top flap of the sterile wrapper opens away from you.</p> <p>16. Reach around the tray, with thumb and index fingertips grasping the wrapper's top flap, gently pull up, then down to open over the surface.</p> <p>17. Repeat the same steps to open the side flaps.</p> <p>18. Grasp the corner of the bottom flap with fingertips, step back, and pull flap down.</p> <p>19. While facing the sterile field, step back, remove the outer wrapper, and grasp the item in your nondominant hand so that the top flap will open away from you.</p> <p>20. With your dominant hand, open the flaps as previously described (Figure 31-16).</p> <p>21. With your dominant hand, pull the wrapper back and away from the sterile field and place the item onto the field (Figure 31-17).</p> <p>22. When adding additional gauze or dressings to the sterile field, open the package as directed; grasp the top flaps of the wrapper and pull downward as shown in Figure 31-16; then drop the contents onto the center of the field, as shown in Figure 31-17.</p> <p>23. Read the labels and strengths of all solutions three times prior to pouring.</p> | <p>15. Prevents reaching over the sterile items.</p> <p>16. Only the edges of the field can be contaminated; pulling up frees the top folded flap.</p> <p>17. Keeps the arm from reaching over the sterile field.</p> <p>18. Creates a sterile work surface.</p> <p>19. Keeps your dominant hand free; item remains sterile.</p> <p>20. Prevents reaching over the sterile item.</p> <p>21. Prevents the wrapper from touching the sterile field.</p> <p>22. Prevents contamination of item and sterile field.</p> <p>23. Ensures proper solution and strength.</p> |
|--|---|

(continues)

PROCEDURE 31-3

Surgical Asepsis: Preparing and Maintaining a Sterile Field (continued)

Action



Figure 31-16 Grasp the flaps of the wrapped supply and pull downward.



Figure 31-17 Add contents to the sterile field by holding the package 6 inches (15 cm) above the field and allowing the contents to drop onto the field.

Rationale

- | | |
|--|--|
| <p>24. Remove the lid from the bottle of solution and place the sterile side up onto a clean surface.</p> <p>25. Hold the bottle, label in palm of hand, 4 to 6 inches (10 to 15 cm) over the container on the sterile field; slowly pour the solution into the container to avoid splashing.</p> <p>26. Replace the lid on the container, label the container with the date and time, and initial the container if retained for reuse.</p> <p>27. Wash hands and don nonsterile gloves.</p> <p>28. With dominant hand, grasp forceps from the sterile field, making sure only the handles of the forceps are touched.</p> <p>29. Hold forceps above waist level throughout the procedure.</p> | <p>24. Inverting the lid prevents contamination of the inner surface.</p> <p>25. Prevents the label from getting wet; if the solution splashes onto the label, the field is contaminated because moisture conducts microorganisms from the nonsterile surface.</p> <p>26. Sterility of the solution will be lost if exposed to air for an extended period of time.</p> <p>27. Prevents transmission of infection to client.</p> <p>28. Prevents contamination of sterile items.</p> <p>29. Keeps forceps in your view and decreases the risk of contamination.</p> |
|--|--|

(continues)

PROCEDURE 31-3

Surgical Asepsis: Preparing and Maintaining a Sterile Field (continued)

<i>Action</i>	<i>Rationale</i>
30. Keep forceps tips pointing downward when adding, arranging, or removing items to the sterile field during the sterile procedure.	30. Gravity will prevent any liquids from flowing back and forth between forceps tips and handle held in ungloved hand.
31. Dispose of contaminated items in colored plastic bag.	31. Alerts other health care workers of contaminated waste, decreasing their risk of infection.
32. Wash hands and perform open gloving (Procedure 31-4).	32. Prevents transmission of infection.
33. Continue with procedure, keeping gloved hands above waist level at all times, touching only items on the sterile field.	33. Decreases chance of contamination. Any item below waist level and out-of-sight is considered contaminated.
34. If using a solution to cleanse a site, use the sterile forceps to prevent contamination of gloves; dispose of forceps after use.	34. Prevents field contamination.
35. Postprocedure, dispose of all contaminated items in colored plastic bag.	35. Decreases risk of transmission of infection to all health care workers.
36. Remove gloves by grasping the outside of one cuff with the other gloved hand; pull glove off, turning it inside out. Dispose in plastic bag with other contaminated items.	36. Minimizes your risk of contact with infectious wastes on the gloves.
37. Using the fingers of your ungloved hand, slip fingers, palm up, inside the cuff and peel the glove off, inside out. Dispose of glove in colored plastic bag.	37. Outside of the glove does not touch your skin and contaminate it.
38. Reposition the client.	38. Promotes client comfort.
39. Clean the environment; wash hands.	39. Prevents transmission of infection.
40. In the client's medical record, document the procedure, findings (description of infected area), and the response of the client.	40. Demonstrates compliance with sterile procedure and the effectiveness of therapy.

(redness, edema, pain at the incision line, and purulent drainage from the wound) and progression of healing. See Chapter 35 for a complete discussion of wound care.

Wound care often requires the use of a sterile solution to cleanse the wound during a dressing change. Maintain the sterility of the solution by handling the container to keep the inside of the container sterile. When the lid to the container is removed, place the sterile side up and pour some of the solution into a nonsterile container before adding to the sterile container on the field. Gently pour the sterile solution into the sterile container to avoid wetting the field. The sterile technique is maintained throughout wound care; if the sterile field becomes wet or damp, discard all supplies and prepare a new sterile field.

Donning Sterile Gloves

There are two methods for applying sterile gloves: open and closed. The open method is used most frequently when performing procedures that require the sterile technique such as dressing changes (see Procedure 31-4 for applying sterile gloves by the open method). The closed method is used when the nurse wears a sterile gown.

Donning Surgical Attire

Surgical nurses are required to wear a surgical mask and a clean cloth or paper cap that covers all of the hair. After the cap is applied, the nurse positions the mask to cover the nose and mouth (see Procedure 31-5). Protective eyewear (glasses or goggles) is worn during all procedures that pose a threat of splashing body fluids into the eyes.

PROCEDURE 31-4

Performing Open Gloving and Removal of Soiled Gloves

Equipment

- Package of proper-sized sterile gloves

Action

1. Wash hands; see Procedure 31-2.
2. Read the manufacturer's instructions on the package of sterile gloves; proceed as directed in removing the outer wrapper from the package, placing the inner wrapper onto a clean, dry surface.
3. Identify right and left hand; glove dominant hand first.
4. Grasp the 2-inch- (5-cm-) wide cuff with the thumb and first two fingers of the nondominant hand, touching only the inside of the cuff.
5. Gently pull the glove over the dominant hand, making sure the thumb and fingers fit into the proper spaces of the glove (see Figure 31-18).



Figure 31-18 Pull the glove over the dominant hand.

Rationale

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Wash hands; see Procedure 31-2. 2. Read the manufacturer's instructions on the package of sterile gloves; proceed as directed in removing the outer wrapper from the package, placing the inner wrapper onto a clean, dry surface. 3. Identify right and left hand; glove dominant hand first. 4. Grasp the 2-inch- (5-cm-) wide cuff with the thumb and first two fingers of the nondominant hand, touching only the inside of the cuff. 5. Gently pull the glove over the dominant hand, making sure the thumb and fingers fit into the proper spaces of the glove (see Figure 31-18). | <ol style="list-style-type: none"> 1. Prevents transmission of infection. 2. Manufacturers package gloves differently; the instructions will tell you how to properly open to avoid contamination of the inner wrapper; any moisture on the surface will contaminate the gloves. 3. Dominant hand should facilitate motor dexterity during gloving. 4. Maintains sterility of the outer surfaces of the sterile glove. 5. Prevents tearing the glove material; guiding the fingers into proper places facilitates gloving. |
|---|---|
-
- | | |
|---|---|
| <ol style="list-style-type: none"> 6. With the gloved dominant hand, slip your fingers under the cuff of the other glove, gloved thumb abducted, making sure it does not touch any part on your nondominant hand (see Figure 31-19). | <ol style="list-style-type: none"> 6. Cuff protects gloved fingers, maintaining sterility. |
|---|---|

(continues)

PROCEDURE 31-4

Performing Open Gloving and Removal of Soiled Gloves (continued)

Action



Figure 31-19 Slip the fingers under the cuff of the glove for the nondominant hand and abduct the thumb.

7. Gently slip the glove onto your nondominant hand, making sure the fingers slip into the proper spaces.
8. With gloved hands, interlock fingers to fit the gloves onto each finger.
If the gloves are soiled, remove by turning inside out as follows:
9. Slip gloved fingers of the dominant hand under the cuff of the opposite hand or grasp the outer part of the glove at the wrist if there is no cuff (Figure 31-20).



Figure 31-20 Insert gloved fingers under the cuff of the other glove.

Rationale

7. Contact is made with two sterile gloves.
8. Promotes proper fit over the fingers.
9. Contact is made with two sterile gloves.

(continues)

PROCEDURE 31-4

Performing Open Gloving and Removal of Soiled Gloves (continued)

Action

10. Pull the glove down to the fingers, exposing the thumb (see Figure 31-21).



Figure 31-21 Pull the glove down to the fingers and turn inside out.

11. Slip the uncovered thumb into the opposite glove at the wrist, allowing only the glove-covered fingers of the hand to touch the soiled glove.
12. Pull the glove down over the dominant hand almost to the fingertips and slip the glove onto the other hand.
13. With the dominant hand touching only the inside of the other glove, pull the glove over the dominant hand so that only the inside (clean surface) is exposed.
14. Dispose of soiled gloves according to institutional policy and wash hands.

Rationale

10. Frees the thumb for the next step.
11. Contact is made with two sterile gloves.
12. Removes glove without contact with soiled surfaces.
13. Exposes only the clean surface of the gloves.
14. Prevents the transfer of microorganisms.

NURSING ALERT

Disposable Equipment

Disposable equipment should be discarded after use. The materials used for disposable equipment cannot be thoroughly cleaned.

Surgical Handwashing

Surgical handwashing or scrub is used to remove soil and most transient microorganisms from the skin. Nurses working in the operating room perform surgical

handwashing to decrease the client's risk for an infection. The skin on the nurse's hands and arms should be intact (free of lesions). Agency policy determines how to perform the scrub with regard to method and timing (see Procedure 31-6 for the basic principles in performing surgical handwashing).

Gowning and Closed Gloving

Nurses in the operating room and special procedure areas such as cardiac catheterization labs use the closed gloved method when donning a sterile gown. After the surgical scrub, the nurse proceeds to don the sterile gown and gloves using the closed method (see Procedure 31-7). The sterile gown serves as a barrier to

PROCEDURE 31-5

Applying a Surgical Mask

Equipment

- Surgical mask

Action

1. Grasp the two top strings or loops of the mask (the top part of the mask usually has a light-weight metal strip that goes over the bridge of the nose).
2. Position mask to cover your nose and mouth.
3. Tie the top strings above your ears at the top-back of your head (Figure 31-22).



Figure 31-22 Tie the top strings of the mask at the top and back of the head.

Rationale

1. Metal strip fits snugly against the bridge of nose.
2. Establishes a respiratory barrier.
3. Provides for a tight fit of the mask.
4. Tie the bottom strings at the back-base of your neck so that the bottom part of the mask fits snugly around your chin.
5. Grasp and pinch the metal strip around bridge of nose.
4. Prevents irritation to the ears.
5. Minimizes number of microorganisms that can escape around nose.

PROCEDURE 31-6

Surgical Handwashing

Equipment

- Surgical scrub items (antimicrobial soap, two brushes, and nail file)
- Sterile towel
- Surgical shoe covers (booties) and cap, face mask, sterile gown, and proper-sized gloves

Action

Preparing for Surgical Handwashing

1. Remove rings, chipped nail polish, watch, and earrings that do not fit under a surgical cap.
1. Decreases resident and transient microorganisms.

(continues)

PROCEDURE 31-6

Surgical Handwashing (continued)

<i>Action</i>	<i>Rationale</i>
2. Use a deep sink with side or foot pedal to dispense antimicrobial soap and control water temperature and flow.	2. Prevents hands and forearms from touching a soiled surface.
3. Have two surgical scrub brushes and nail file.	3. Enhances mechanical friction during the scrub.
4. Apply surgical shoe covers and cap to cover hair and ears completely.	4. Prevents introduction of contaminants into environment.
5. Apply mask; refer to Procedure 31-5.	5. Provides a respiratory barrier.
6. Before beginning the surgical scrub: <ol style="list-style-type: none"> a. Open the sterile package containing the gown; using aseptic technique make a sterile field with the inside of the gown's wrapper. b. Open the sterile towel and drop it onto the center of field. c. Open the outer wrapper from the sterile gloves and drop the inner package of gloves onto the sterile field beside the folded gown and towel (see Procedure 31-7 for gowning and closed gloving). 	6. Preparing the sterile items prior to the scrub decreases the risk of contaminating scrubbed hands.
Surgical Handwashing	
7. At a deep sink with foot or knee controls turn on warm water; under flowing water, wet forearms and hands (from elbows to fingertips), keeping arms and hands above elbow level during entire procedure (do not allow uniform to get wet).	7. Water should flow from the least contaminated (forearms) to the most contaminated (hands).
8. Apply a liberal amount of soap onto hands and rub hands and arms to 2 inches above elbows.	8. Reduces number of microorganisms on hands.
9. Use nail file under running water, clean under each nail of both hands and drop file into sink when finished.	9. Removes dirt that harbors microorganisms.
10. Wet and apply soap to scrub brush, with brush in your dominant hand; using a circular motion, scrub nails and all skin areas of nondominant hand and arm (10 strokes to each of the following areas): <ol style="list-style-type: none"> a. Nails b. Palm of hand and anterior side of fingers c. Sides of thumb d. Posterior of thumb e. Sides and posterior surface of fingers f. Back of hand 	10. Removes resident bacteria from the skin's surfaces; the circular motion mechanically removes microorganisms. Scrubbing the nondominant hand first sets a routine you can remember if you should get interrupted during the scrub.

(continues)

PROCEDURE 31-6

Surgical Handwashing (continued)

<i>Action</i>	<i>Rationale</i>
11. Rinse brush thoroughly; reapply soap.	11. Decreases transfer of microorganisms.
12. Continue with scrub of nondominant arm with a circular motion for 10 strokes each to the lower, middle, and upper arm; drop brush into the sink.	12. Decreases transfer of microorganisms from the arm; dropping the brush avoids contamination.
13. Maintaining the hands and arms above elbow level, place the fingertips under running water and thoroughly rinse the fingers, hands, and arms (allow the water to run off your elbow into the sink); take care not to get your uniform wet.	13. Allows flow of water to cleanse from area of least to most contaminated. Water conducts microorganisms and keeping uniform dry aids in maintaining sterility of gown.
14. Take the second scrub brush and repeat steps 10 through 13 on your dominant hand and arm.	14. See steps 10 through 13.
15. Keep arms flexed and proceed to area (operating or procedure room) with sterile items.	15. Prevents water from flowing from least to most contaminated area.
16. Secure sterile towel by grasping it on one edge, opening the towel, full length, making sure it does not touch your uniform.	16. Maintains the sterility of the towel.
17. Dry each hand and arm separately; extend one side of the towel around fingers and hand and dry in a rotating motion up to the elbow.	17. Prevents contamination by drying from cleanest to least clean area.
18. Reverse the towel and repeat the same action on the other hand and arm, thoroughly drying the skin.	18. Prevents contamination of the gown.
19. Discard the towel into a linen hamper.	19. Keeps the environment clean.

PROCEDURE 31-7

Performing Gowning and Closed Gloving

<i>Equipment</i>	
■ Sterile gown	■ Sterile and proper-sized gloves
<i>Action</i>	<i>Rationale</i>
Gowning	
1. The sterile gown is folded inside out.	1. Allows ungloved hands to touch only the inside.
2. Grasp the gown inside the neckline, step back, and allow the gown to open in front of you; keep the inside of the gown toward you; do not allow it to touch anything.	2. Keeps the outside of the gown sterile.

(continues)

PROCEDURE 31-7

Performing Gowning and Closed Gloving (continued)

<i>Action</i>	<i>Rationale</i>
3. With hands at shoulder level, slip both arms into the gown; keep your hands inside the sleeves of the gown.	3. Prevents the gown from touching nonsterile objects; allows sterile items to come in contact only with other sterile items.
4. The circulating nurse will step up behind you and grasp the inside of the gown, bring it over your shoulders, and secure the ties at the neck and waist.	4. Prevents any part of the gown from touching a nonsterile object; provides complete coverage of undergarments.
Closed Gloving	
5. With hands still inside the gown sleeves, open the inner wrapper of the gloves on the sterile gown field.	5. Maintains sterility of the gloves.
6. With your nondominant sleeved hand, grasp the cuff of the glove for the dominant hand and lay it on the extended dominant forearm with palm up; place the palm of the glove against the sleeved palm, with fingers of the glove pointing toward elbow.	6. Only sterile items come in contact with each other.
7. Manipulate the glove so that the sleeved thumb of your dominant hand is grasping the cuff; with your nondominant hand, turn the cuff over the end of dominant hand and gown's cuff.	7. Prevents the hands from contaminating the sterile glove.
8. With sleeved nondominant hand, grasp the cuff of the glove and the gown's sleeve of the dominant hand; slowly extend the fingers into the glove, making sure the cuff of the glove remains above the cuff of the gown's sleeve.	8. Provides a closed sterile method for gloving; the glove cuff over the gown prevents contamination of the operative field with microorganisms.
9. With the gloved dominant hand, repeat steps 7 and 8.	9. Only sterile items can touch each other.
10. Interlock gloved fingers, secure fit.	10. Promotes dexterity of gloved hands.

decrease the risk of wound contamination. The sterile gown also allows the nurse to move freely in the environment with sterile drapes and objects.

Reduce or Eliminate Infectious Agents

Transmission of microorganisms to clients may also occur through contact with inanimate objects. Cleansing, disinfecting, and sterilizing can break this link in the chain of infection by reducing or destroying microorganisms on objects. Cleansing, disinfection, and sterilization are usually the responsibility of nursing, housekeeping, and central supply departments. These infection control practices can and should also be practiced in the home care setting.

Cleansing

Cleansing is the removal of soil or organic material from instruments and equipment used in providing client care. Nurses are involved in cleansing instruments after assisting or performing an invasive procedure. Reusable objects are cleansed prior to sterilization and disinfection to reduce the amount of contamination and loosen the material on the object. Cleansing involves the use of water, mechanical action, and sometimes a detergent. Contaminated objects are cleaned using a soft-bristled brush to scrub the surface. The steps for proper cleansing are:

1. Rinse object under cold water since warm water causes proteins in organic material to coagulate and stick.

2. Apply detergent and scrub object under running water with soft-bristled brush.
3. Rinse the object under warm water.
4. Dry the object prior to sterilization or disinfection.

Cleansing presents a potential hazard to the nurse through splashing of contaminated material onto the body. Nurses should wear gloves, masks, and goggles during cleansing.

Disinfection

Disinfection is the elimination of pathogens, except spores, from inanimate objects. **Disinfectants** are chemical solutions used to clean inanimate objects. Bedpans, blood pressure cuffs, linens, stethoscopes, thermometers, and some types of endoscopes are disinfected in the hospital setting. The U.S. Environmental Protection Agency (EPA) licenses (registers) disinfection products and monitors the products to ensure they work as claimed on the label. Common disinfectants are alcohol, sodium hypochlorite, quaternary ammonium, phenolic solutions, and glutaraldehyde. In the home, Lysol and bleach are common disinfectants that are capable of eliminating several pathogens. A **germicide** is a chemical that can be applied to both animate and inanimate objects for the purpose of eliminating pathogens. Antiseptic preparations such as alcohol and silver sulfadiazine are germicides and may be used on skin.

Sterilization

Sterilization is the total elimination of all microorganisms including spores. Instruments that are used for invasive procedures must be sterilized. Methods of achieving sterilization are moist heat or steam, radiation, chemicals, and ethylene oxide gas. The method of sterilization depends on the type of contamination, amount of contamination, and object to be sterilized.

Autoclaving sterilization, which uses moist heat or steam, is the most common sterilization technique used in the hospital setting. Boiling water is not an effective sterilization measure as some viruses and spores can survive boiling water. Objects that have been boiled in water for 15 to 20 minutes at 121°C (249.8°F) are considered clean but not sterilized (Department of Labor, 1991). However, boiling water is still the best and most common sterilization measure used in the home. For example, boiling baby bottles and nipples makes them safe for use.

Home Health Care

“While many home care policies and procedures are developed with the best of intentions, they frequently lack a scientific basis and have been perpetuated over the years” (Friedman & Rhinehart, 2000, p. 99). Home care and hospice nurses are faced with significant chal-

NURSING SUPPLY BAG TECHNIQUE PROCEDURE

- Place the bag on a clean, dry surface.
- Wash hands with soap and running water prior to direct client contact. For MRSA or VRE clients, wash hands with antibacterial soap and running water. Cleanse hands with a waterless product if running water is not available.
- Remove the necessary supplies from the nursing bag, and place them on a clean, dry surface.
- Perform client care.
- Clean and disinfect semicritical equipment such as an oral thermometer with a 70% isopropyl alcohol prep pad, and return the equipment to the supply bag.
- Clean noncritical equipment such as a blood pressure cuff, stethoscope, or scale if soiled and return to the bag. If the client is infected or colonized with MDR bacteria, and equipment has not been designated for the client’s individual use, clean and disinfect the equipment with a disinfectant of the home care or hospice organization’s choice prior to replacing the noncritical items in the bag.
- Remove personal protective items such as a gown and gloves if worn.
- Wash hands with soap and running water prior to direct client contact. For MRSA or VRE clients, wash hands with antibacterial soap and running water. Cleanse hands with a waterless product if running water is not available, and wash hands with soap and running water as soon as possible.

Adopted from Friedman, M., & Rhinehart, E. (2000). Improving infection control home care: From ritual to science-based practice. *Home Healthcare Nurse*, 18(2), 99–106.

lenges when adapting acute care infection control practice to the home care setting such as cleaning and disinfecting equipment and using clean versus sterile technique. Common practice of home care organizations requires special practice regarding the handling of the *nursing supply bag*; see the accompanying display of a basic nursing bag technique procedure that may be followed in the home.

Disposal of Infectious Waste

All health care facilities must have guidelines for the disposal of infectious waste materials as deemed by the OSHA Act of 1991 (see the accompanying display). Always observe the biological hazard symbol and handle all infectious materials as a hazard. OSHA regulations mandate that “immediately after use, sharps shall be disposed of in closable, puncture-resistant, disposable containers that are leakproof on the sides and bottom and are labeled or color coded.” Dispose of soiled and infectious items in the home; do not place in car to dispose elsewhere.

DISPOSAL OF BIOLOGICAL MATERIALS

- Laboratory wastes
- Blood, blood products, and all other body fluids
- Client care items: soiled bed linen and protection pads soiled with visible blood, urinals, and bedpans
- Disposable instruments
- Medication and soiled treatment items
- Surgical wastes

When disposing of infectious waste:

- Wear gloves.
- Use the proper containers (red or one labeled with the biological hazard symbol as required by the facility), leakproof plastic bags for waste from client areas (soiled dressings, gloves, linen), and sharps containers for needles, scalpels, and other sharp instruments or devices (Figure 31-23).
- Ensure that all infectious waste is properly labeled.
- Use care when handling plastic bags to avoid punctures and tearing.
- Disinfect carts used to carry infectious waste.
- Dispose of waste in designated areas only.
- Wash hands after disposing of hazardous materials.

Containers for contaminated sharps should be readily accessible to personnel and maintained in an upright position.

NURSING ALERT

Needle Disposal

Used needles should not be recapped, bent, or broken. Needles should be placed in a puncture-resistant marked or color-coded container close to the work site. Correct disposal decreases the risk of needle punctures to caregivers.

Weltman, Short, and Mendelson (1995) studied disposal-related sharps injuries in a teaching hospital. Of the 361 persons in the study who reported sharps injuries, 72 of the injuries were related to sharps disposal. The majority of exposures to hepatitis B virus (HBV) and human immunodeficiency virus (HIV) were caused by sharp objects. Never attempt to place syringes in a full container.

Practice Standard and Isolation Precautions

The CDC revised the Guidelines for Isolation Precautions in Hospitals in 1996. The new guidelines



Figure 31-23 Sharps Disposal and Infectious Waste Containers

combined the major features of Universal Precautions and Body Substance Isolation into a single set of Standard Precautions (Satterfield, 1995). Refer to the Standard Precautions on the end pages. The Standard Precautions apply to:

- Blood
- All body fluids, secretions, excretions, and contaminated items regardless of whether or not they contain visible blood
- Nonintact skin
- Mucous membranes

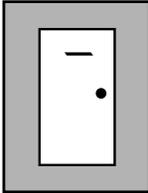
Barrier precautions are used to minimize the risk of exposure to blood and body fluids. Barrier precautions consist of using personal protective equipment, such as masks, gowns, and gloves, to create a barrier between the person and the microorganism that prevents transmission of the microorganism.

The 1996 CDC guidelines eliminated the previous category-specific isolation precautions and condensed the former disease-specific precautions into three sets of precautions based on routes: contact, droplet, and airborne transmission (Figure 31-24). The new

CONTACT PRECAUTIONS

(In addition to Standard Precautions)

VISITORS: Report to nurse before entering



Patient Placement

Private room, if possible. Cohort if private room is not available.

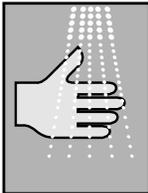


Gloves

Wear gloves when entering patient room.

Change gloves after having contact with infective material that may contain high concentrations of microorganisms (**fecal** material and **wound drainage**).

Remove gloves before leaving patient room.



Wash

Wash hands with an **antimicrobial** agent immediately after glove removal.

After glove removal and handwashing, ensure that hands do not touch potentially contaminated environmental surfaces or items in the patient's room to avoid transfer of microorganisms to other patients or environments.



Gown

Wear gown when **entering** patient room if you anticipate that your clothing will have substantial contact with the patient, environmental surfaces, or items in the patient's room, or if the patient is **incontinent**, or has **diarrhea**, an **ileostomy**, a **colostomy**, or **wound drainage** not contained by a dressing. **Remove** gown before leaving the patient's environment and ensure that clothing does not contact potentially contaminated environmental surfaces to avoid transfer of microorganisms to other patients or environments.



Patient Transport

Limit transport of patient to essential purposes only. During transport, ensure that precautions are maintained to minimize the risk of transmission of microorganisms to other patients and contamination of environmental surfaces and equipment.



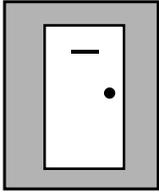
Patient-Care Equipment

Dedicate the use of noncritical patient-care equipment to a single patient. If common equipment is used, clean and disinfect between patients.

DROPLET PRECAUTIONS

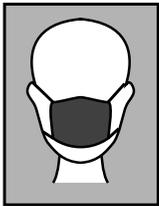
(In addition to Standard Precautions)

VISITORS: Report to nurse before entering



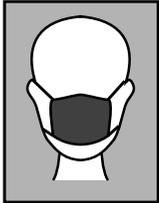
Patient Placement

Private room, if possible. Cohort or maintain spatial separation of **3 feet** from other patients or visitors if private room is not available.



Mask

Wear mask when working within **3 feet** of patient (or upon entering room).



Patient Transport

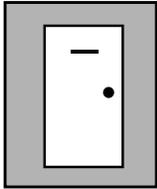
Limit transport of patient to essential purposes only.
Use **surgical mask** on patient during transport.

Figure 31-24B Transmission-Based Precautions: Droplet Precautions (Courtesy of the Brevis Corporation, 3310 S. 2700, Salt Lake City, UT 84109.)

AIRBORNE PRECAUTIONS

(In addition to Standard Precautions)

VISITORS: Report to nurse before entering



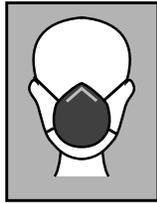
Patient Placement

Private room that has:

Monitored negative air pressure,
6 to 12 air changes per hour,

Discharge of air outdoors or HEPA filtration if recirculated.

Keep room door closed and patient in room.



Respiratory Protection

Wear an **N95 respirator** when entering the room of a patient with known or suspected infectious pulmonary **tuberculosis**.

Susceptible persons should not enter the room of patients known or suspected to have **measles** (rubeola) or **varicella** (chickenpox) if other immune caregivers are available. If susceptible persons must enter, they should wear an **N95 respirator**. (Respirator or surgical mask not required if immune to measles and varicella.)



Patient Transport

Limit transport of patient from room to essential purposes only.

Use **surgical mask** on patient during transport.

precautions are called transmission-based precautions and are to be used in addition to Standard Precautions. Transmission-based precautions are to be used for specific syndromes that are highly suspicious for infections until a diagnosis is confirmed (see Table 31-6).

In addition to the Standard Precautions these temporary precautions are to be used for suspicious infections. Immunosuppressed clients, like Mary Evans with neutropenia, require transmission-based precautions, as described in Table 31-6.

NURSING ALERT

Standard Precautions

Standard Precautions must be practiced with all clients since this is the most effective method to decrease the risk of infection for clients and caregivers.

Nurses use isolation precautions to protect the host's normal defense mechanisms by preventing the transmission of pathogens (nosocomial infections). Isolation precautions include barrier protection that breaks the chain of infection.

When the nurse cares for a client in isolation, additional precautions are used along with handwashing and gloves. A mask and eye protection (or face shield) are worn to protect the mucous membranes of the eyes, nose, and mouth during interventions that are likely to produce splashes or sprays of blood, body fluids, secretions, and excretions. A nonsterile gown is also worn to protect the skin and clothing against splashes or sprays. Procedure 31-8 describes isolation precaution techniques.

Nurses caring for clients with tuberculosis (an infectious disease caused by the tubercle bacillus *Mycobacterium tuberculosis*) are required to wear special masks since transmission occurs between individuals through respiratory contact. There are two types of tuberculosis masks: high-efficiency particulate air (HEPA) mask used for suspected or confirmed multi-drug-resistant (MDR) tuberculosis and the disposable submicrometer mask used for confirmed tuberculosis. These masks form a tight-fitting seal against particulates 1 to 5 μm .

Isolation precautions are usually ordered by the physician; however, nurses may initiate these precautions whenever there is a nursing diagnosis related to the infectious process, for example, *Risk for Infection* related to decreased resistance of immune system. Most agencies require nurses to obtain a culture from a draining body area and to initiate isolation precautions when positive cultures are reported. Once isolation precautions have been instituted, visitors and all personnel should comply with the agency's policy regarding isolation precautions. Signs should be posted in a prominent location outside the client's room indicating the type of isolation precautions, preparation prior to entering the room, and the necessary supplies that should be readily available.

Clients should be placed in a private room with adequate ventilation and have their own supplies. Personal belongings should be kept to a minimum, and health care providers should use disposable supplies and equipment. All articles leaving the room, such as soiled linen and collected specimens, should be labeled and either placed in impermeable bags or double bagged (see Procedure 31-8 for the double-bagging technique). Home health nurses should provide the client and

TABLE 31-6
Transmission-Based Precautions

Category	Private Room	Gloves	Gowns	Masks
Contact precautions	If possible; cohort if not available	Required	If anticipate contact with soiled items; patient is incontinent; diarrhea, ileostomy, colostomy, wound drainage	Not required
Droplet precautions	If possible; cohort or maintain separation of 3 feet	Not required	Not required	Required when within 3 feet
Airborne precautions	Required. Negative air pressure, 6–12 air changes per hour, keep door closed, discharge air outdoors or HEPA filter	Not required	Not required	N95 respirator required for known or suspected tuberculosis and measles or varicella if not immune

PROCEDURE 31-8

Initiating Strict Isolation Precautions

Equipment

- | | |
|---|---|
| <ul style="list-style-type: none"> ■ Isolation sign ■ Disposable gowns ■ Gloves (nonsterile and sterile) ■ Tape or bag ties ■ Room with sink and running water ■ Paper towels ■ Water pitcher, cups, and fresh water ■ Other supplies relative to client's condition, for example, dressings for wound care | <ul style="list-style-type: none"> ■ Disposable caps ■ Disposable masks ■ Impermeable bags (linen and trash) ■ Disposable vital signs equipment (single-use thermometers, stethoscope, and sphygmomanometer) ■ Linen ■ Specimen containers and labels |
|---|---|

Action

1. Review physician orders and agency protocols relative to the type of isolation precautions:
 - a. Implement protocol about the type of disinfectants needed to eliminate specific microorganism.
 - b. Alert housekeeping regarding the room number and type of isolation supplies needed in the room.
 - c. Make sure the room has proper ventilation (the door will have to remain closed at all times) and that the bed and other electrical equipment are functioning properly.
2. Place appropriate isolation supplies outside the client's room and place isolation sign on the door.
3. Gather appropriate supplies to take in the room:
 - a. Soap and paper towels
 - b. Linen
 - c. Impermeable bags
 - d. Disposable vital signs equipment
 - e. Wound care, if appropriate
4. Remove jewelry, lab coat, and other items not necessary in providing client care.
5. Wash hands and don disposable clothing:
 - a. Apply cap to cover hair and ears completely.
 - b. Apply gown to cover outer garments completely: Hold gown in front of body and place arms through sleeves (Figure 31-25A). Pull sleeves down to wrist. Tie gown securely at neck and waist (Figure 31-25B, C).

Rationale

1. Ensures compliance without unnecessary stress being placed on the client and family. Allows housekeeping to have the necessary supplies on their cleaning carts. Provides for client comfort and decreases the spread of microorganisms. Limits the number of personnel coming into the client's room and the client's exposure to microorganisms.
2. Ensures staff follows isolation protocol and alerts visitors to check with the nurses' station before entering the room.
3. Provides for organized care, handwashing, proper isolation, and client care materials. Decreases the spread of microorganisms and the number of times you have to go into and out of the room.
4. Decreases the spread of resident and transient microorganisms.
5. Disposable garments act as a barrier in preventing the transmission of microorganisms from nurse to client and protect the nurses from contact with pathogens.

(continues)

PROCEDURE 31-8

Initiating Strict Isolation Precautions (continued)

Action

Rationale



A.



B.

PROCEDURE 31-8

Initiating Strict Isolation Precautions (continued)

Action

C.

Figure 31-25 Donning disposable gown: A. Hold gown in front of the body and place arms through the sleeves. B. Fasten neck ties. C. Fasten waist ties.

Rationale

- c. Don nonsterile gloves and pull gloves to cover gown's cuff.
 - d. Apply mask by placing the top of the mask over the bridge of your nose (top part of mask has a lightweight metal strip) and pinch the metal strip to fit snugly against your skin.
6. Enter client's room with all gathered supplies; if client is to receive medications, bring them with you at this time. Arrange and store supplies and equipment.
 7. Assess client and family knowledge relative to client's diagnosed infection and isolation:
 - a. Reason isolation initiated
 - b. Type of isolation
 - c. Duration of isolation
 - d. How to apply cap, gown, gloves, and mask
- 6. Prevents trips into and out of client room and keeps supplies clean.
 - 7. The physician usually informs the client and family of the reasons isolation is required. Client's and family's understanding of isolation procedures will increase their participation in care.

(continues)

PROCEDURE 31-8

Initiating Strict Isolation Precautions (continued)

*Action**Rationale*

- | | |
|---|--|
| <p>8. Assess vital signs, administer medications if appropriate, and perform other functions of nursing care to meet the needs of the client. Record assessment data on a piece of paper, avoiding contact with any articles in the client's room.</p> <p>9. Dispose of soiled articles in the impermeable bags, which should be labeled correctly according to contents. If soiled reusable equipment is removed from the room, label bag accordingly.</p> <p>10. Bag soiled linen according to agency policy either in an impermeable bag or in plastic linen bags, double bagging.</p> <p>11. Replenish supplies before leaving the client's room by having another staff member bring the clean supplies and transfer at the door. Ask client if anything is needed (juice or personal care items).</p> <p>12. Before leaving, let the client know when returning; make sure call light is accessible.</p> <p>13. Exiting the isolation room:</p> <p>a. Untie gown at waist.</p> <p>b. Remove one glove by grasping the glove's cuff and pulling down so that the glove turns inside out (glove on glove) and dispose of it. With your ungloved hand, slip your fingers inside the cuff of the other glove, pull it off, inside out, and dispose of it.</p> <p>c. Grasp and release the ties of the mask, and dispose of it.</p> <p>d. Release neck ties of the gown and allow the gown to fall forward. Place fingers of dominant hand inside cuff of other hand and pull down over other hand (Figure 31-26A). With gown covered hand, pull gown over the dominant hand (Figure 31-26B). While gown is still on arm, fold outside of gown together, remove, and dispose of it (Figure 31-26C).</p> <p>e. Remove cap by slipping your finger under the cap and removing from the front to back and dispose of it.</p> | <p>8. Allows for data collection and the performance of client care measures.</p> <p>9. Impermeable bags prevent the leakage of contaminated materials, thereby preventing the spread of infection. Labeling is a warning to other personnel that the contents are infectious.</p> <p>10. Double bagging allows the washing of soiled linen without human contact: When linen is double bagged, the first bag is removed prior to washing; the second bag goes into the machine with the dirty linen and dissolves.</p> <p>11. Decreases the number of times staff members have to go in and out of the room and client exposure to microorganisms.</p> <p>12. Decreases feeling of abandonment; provides client with a means of communication.</p> <p>13. Gloves are removed inside out to avoid contact with skin. The gown is removed and folded with hands touching only the inside of the garment. Only the ties and the inside of the cap are touched with your hands. All articles are disposed of as soon as they are removed.</p> |
|---|--|

(continues)

PROCEDURE 31-8

Initiating Strict Isolation Precautions (continued)

Action

A.

Rationale

B.



C.

14. Wash hands for 10 minutes. Don nonsterile gloves and remove bags from the client's room. Exit room and close door. Dispose of bags according to agency protocol. Remove gloves and wash hands.

Figure 31-26 Removing disposable gown: A. Place fingers of dominant hand inside the cuff of other hand and pull gown down over other hand. B. With the gown-covered hand, pull gown down over dominant hand. C. As the gown is removed, fold the outside of the gown together and dispose of it.

14. Decreases transmission of microorganisms.



NURSING CHECKLIST

Psychological Interventions for Clients Requiring Isolation Precautions

- Explain isolation procedure and rationale.
- Discuss client's feelings about isolation procedures.
- Convey a sense of empathetic understanding.
- Permit visitors in accordance with isolation precautions.
- Support existing coping mechanisms.
- Visit with the client.

family with appropriate written isolation instructions relative to the specific precautions.

Isolation precautions are for the client's protection; however, clients who are placed on isolation precautions may experience psychological discomfort (Figure 31-27). Nurses should be alert for symptoms of anxiety, depression, rejection, guilt, or loneliness. Clients should be educated on which isolation precautions will be practiced and their purposes. Nurses should encourage clients to verbalize their feelings regarding the isolation precautions and provide the client with intellectual stimulation. Visitors should be encouraged to prevent the client's feelings of isolation and loneliness. The following Nursing Checklist lists some psychological interventions.

Alternative Therapies

The American Nurses Association, in its 1995 *Social Policy Statement*, recognizes holistic, complementary, and alter-



Figure 31-27 This nurse is interacting with a client who requires isolation precautions. Although both the client and nurse are observing isolation precautions, they are still able to communicate with one another. In planning the care of this client, what would the expected outcomes of these interventions be?

native practices for the client. More and more clients are seeking alternative therapy for common medical conditions, mainly chronic conditions (Springhouse, 1999). Hospitals are becoming more responsive to client demands by incorporating new practice models to allow the client choices and requests for alternative options as part of a holistic approach to both curing and healing. The Massachusetts and Louisiana state boards of nursing have issued statements regarding the role and scope of registered nurse practice and holistic care.

Documentation of the client's alternative or complementary practices should be included in the health history to ensure an integration of alternative and conventional care. Nurses need to have a knowledge of herbal products and their effects to avoid possible adverse reactions when prescribed drugs are used in combination with the client's herbal regimen. A brief discussion regarding herbal baths and the use of herbs for infections is presented; refer to Chapter 14 for a complete discussion of complementary therapies.

THINK ABOUT IT

Isolation Precautions

Where were the nurses? Pugliese (1995) cited a nursing home that was fined \$75,000 for isolating a 36-year-old stroke client with human immunodeficiency virus (HIV) for 9 months. The client filed a complaint with the division of human rights. Who should have been the advocate for this client? What would you have done if you had been working in this nursing home?

Herbal Baths

Herbal baths are a safe home method of treatment for all clients, especially infants and the elderly, and can be made just for the specific part of the body, such as the hands, hips, or feet, or can be a full body bath (Tierra, 1997). A bath made from freshly grated ginger root tea stimulates circulation, alleviates aches and pains and breaks a cold, helps arthritis, and warms the body. To calm the mind and relax the body, combine equal parts of lavender, rose, chamomile, and skullcap in the bath water. To stimulate circulation and relieve fever and chill, combine equal parts bayberry bark, ginger, and prickly ash, and one-fourth part cayenne pepper in the bath water. Clients using herbs in bath water for the first time should do a simple patch test to rule out a possible allergic response.

Herbs for Infections

Herbs are used in two ways for infections. Through their antimicrobial action, they work directly against

microbes. They also augment and vitalize the body's own defenses. Although research may not always be available to explain exactly how herbs work, many plants have a direct toxic effect upon microbes. "The best anti-microbials that can be used safely to combat infections include *Echinacea*, *Eucalyptus*, *Garlic*, *Myrrh*, *Nasturtium*, *Thyme*, *Wild Indigo*, and *Wormwood*" (Hoffmann, 1998, p. 115).

Provide for Client Bathing Needs

Bathing of clients is an essential component of nursing care. Whether the nurse performs the bath or delegates the activity to another health care provider, the nurse retains the responsibility for assuring that the hygienic needs of the client are met. The type of bath provided will depend on the purpose of the bath and the client's self-care ability. The two general categories of baths are cleaning and therapeutic.



NURSING TIP

Bathing

- Baths are an excellent time to perform a complete skin assessment.
- The bathing process provides time for the nurse to meet the client's psychosocial needs through assessment and counseling.
- Bathing provides time to educate the client on basic and special hygienic needs.

Cleaning Baths

Cleaning baths are provided as routine client care. The purpose of a cleaning bath is personal hygiene. The five types of cleaning baths are shower, tub, self-help, or assisted bed bath, complete bed bath, and partial bath.

Shower

Most ambulatory clients are capable of taking a shower. Clients with limited physical ability can be accommodated by placing a waterproof chair in the shower (Figure 31-28). The nurse provides minimal assistance with a shower. The Nursing Checklist discusses guidelines for helping clients with tub or shower baths.



NURSING CHECKLIST

Tub or Shower Bath

- Schedule use of tub or shower and provide necessary equipment.
- Assist with ambulation to and from tub or shower.
- Place bath mat in tub or shower. Provide shower chair if necessary.
- Place "occupied" sign on door.
- Adjust room temperature and temperature of water.
- Half-fill tub with water. Do not allow client to soak longer than 20 minutes.
- Assist client with getting into and out of tub or shower. Provide with a call system.
- Assist with cleaning as necessary.
- Clean tub or shower after use according to agency policy.



Figure 31-28 Shower Chair

Tub Bath

Clients frequently prefer and enjoy tub baths. A tub bath permits washing and rinsing in the tub. Tub baths can also be therapeutic. Clients with limited physical ability should be assisted with entering and exiting the tub.

Self-Help Bath

A self-help, or assisted, bed bath is used to provide hygienic care for clients who are confined to bed. In the self-help (assisted) bed bath, the nurse prepares bath equipment but provides minimal assistance. This assistance is usually limited to washing difficult-to-reach body areas such as the feet and back.

Complete Bed Bath

A complete bed bath is provided to dependent clients confined to bed. The nurse washes the client's entire body during a complete bed bath. Procedure 31-9 outlines the actions involved in giving a complete bed bath.

Partial Bath

A partial (or abbreviated) bath consists of cleaning only body areas that would cause discomfort or odor if not washed thoroughly. These areas are the face, axillae, hands, and perineal area. The nurse or client may perform a partial bath depending on the client's self-care

ability. Partial baths may be performed with the client lying in bed or standing at the sink.

Therapeutic Bath

Therapeutic baths require a physician's order stating the type of bath, temperature of water, body surface to be treated, and the type of medicated solutions to use. A therapeutic bath is usually performed in a tub and lasts about 20 to 31 minutes. Therapeutic baths are classified as hot or warm water, cool or tepid water, soak, sitz, oatmeal or Aveeno, cornstarch, or sodium bicarbonate, depending on the prescribed type of bath.

Hot- or warm-water tub baths are used to reduce muscle spasms, soreness, and tension. Hot- or warm-water baths, however, have the potential for causing skin burns. Cool or tepid baths are used to relieve tension or lower body temperature. The nurse needs to prevent chilling and rapid temperature fluctuations during a cool or tepid bath.

A soak can include the entire body or be limited to only one body part. A soak consists of applying water, with or without a medicated solution, to reduce pain, swelling, or irritation or to soften or remove dead tissue.

Sitz baths cleanse and reduce inflammation in the perineal and anal areas. Sitz baths are commonly used for hemorrhoids or anal fissures and after perineal or rectal surgery. Skin irritations can be soothed with oatmeal or Aveeno, cornstarch, or sodium bicarbonate baths.

PROCEDURE 31-9

Adult Complete Bed Bath

Equipment

- | | |
|----------------|---------------------|
| ■ Bath towels | ■ Washcloths |
| ■ Bath blanket | ■ Washbasin |
| ■ Soap | ■ Soap dish |
| ■ Lotion | ■ Deodorant |
| ■ Powder | ■ Clean gown |
| ■ Clean linen | ■ Disposable gloves |

Action

1. Assess client's preferences about bathing.
2. Explain procedure to client.
3. Prepare environment. Close doors and windows, adjust temperature, provide time for elimination needs, and provide privacy.
4. Wash hands. Apply gloves. Gloves should be changed when emptying water basin.

Rationale

1. Provides client opportunity to participate in care.
2. Enhances cooperation.
3. Protects from chills during bath and increases sense of privacy.
4. Reduces potential for transmission of pathogens.

(continues)

PROCEDURE 31-9

Adult Complete Bed Bath (continued)*Action*

5. Lower side rail on the side close to you. Position client in a comfortable position close to the side near you.
6. If bath blankets are available, place bath blanket over top sheet. Remove top sheet from under bath blanket (see Figure 31-29). Remove client's gown. Bath blanket should be folded to expose only the area being cleaned at that time. (Top sheets may also be used for bath blankets.)



Figure 31-29 Place a bath blanket over the top sheet and remove the sheet from under the blanket.

Rationale

5. Prevents unnecessary reaching. Facilitates use of good body mechanics.
6. Prevents exposure of client. Promotes privacy. Protects from chills.
7. Fill washbasin two-thirds full. Permit client to test temperature of water with his or her hand. Water should be changed when a soap film develops or water becomes soiled.
8. Make a bath mitten with the washcloth. To make a mitten: grasp the edge of the washcloth with the thumb; fold a third over the palm of the hand; wrap remainder of cloth around hand and across palm, grasping the second edge under the thumb; fold the extended end of the washcloth onto the palm and tuck under the palmar surface of the cloth.
9. Wash the face. Ask the client about preference for using soap on the face. Use a separate corner of the washcloth for each eye, wiping from inner to outer canthus (see Figure 31-30). Wash neck and ears. Rinse and pat dry. Male clients may want to shave at this time. Provide assistance with shaving as needed.
7. Prevents accidental burns or chills.
8. Prevents ends of washcloth from dragging across skin. Promotes friction during bath.
9. Some clients may not use soap on their face. Using separate corners of washcloth reduces risk of transmitting microorganisms. Patting dry reduces skin irritation and drying.

(continues)

PROCEDURE 31-9

Adult Complete Bed Bath (continued)

Action

Figure 31-30 Clean the eye with the corner of the washcloth, wiping from the inner to the outer canthus.

10. Wash arms, forearms, and hands. Wash forearms and arms using long, firm strokes in the direction of distal to proximal (Figure 31-31). Arm may need to be supported while being washed. Wash axilla. Rinse and pat dry. Apply deodorant or powder if desired. Immerse client's hand into basin of water. Allow hand to soak about 3 to 5 minutes. Wash hands, interdigit area, fingers, and fingernails. Rinse and pat dry.



Figure 31-31 Wash forearms and arms in the direction of the wrist to upper arm.

11. Wash chest and abdomen. Fold bath blanket down to umbilicus. Wash chest using long, firm strokes. Wash skinfold under the female client's breast by lifting each breast. Rinse and pat dry. Fold bath blanket down to suprapubic area. Use another towel to cover chest area. Wash abdomen using long, firm strokes. Rinse and pat dry. Replace bath blanket over chest and abdomen. Cover chest or abdomen area in

Rationale

10. Long strokes promote circulation. Soaking hands softens nails and loosens soil from skin and nails. Strokes directed distal to proximal promote venous return. Powder removes excess moisture.

11. Promotes privacy and prevents chills. Long strokes promote circulation. Perspiration and soil collect within skin folds.

(continues)

PROCEDURE 31-9

Adult Complete Bed Bath (continued)*Action*

between washing, rinsing, and drying to prevent chilling.

12. Wash legs and feet. Expose leg farthest from you by folding bath blanket to midline. Bend the leg at the knee. Grasp the heel, elevate the leg from the bed and cover bed with bath towel. Place washbasin on towel. Place client's foot into washbasin. Allow foot to soak while washing the leg with long, firm strokes in the direction of distal to proximal (ankle to thigh; Figure 31-32). Rinse and pat dry. Clean soles, interdigits, and toes. Rinse and pat dry. Perform same procedure with the other leg and foot.



Figure 31-32 Wash the leg and foot in the direction of distal to proximal.

Rationale

12. Supports joints to prevent strain and fatigue. Soaking foot loosens dirt, softens nails, and promotes comfort.

13. Wash back. Assist client into prone or side-lying position facing away from you. Wash the back and buttocks using long, firm strokes. Rinse and pat dry. Give back rub and apply lotion.
 14. Perineal care: Assist client to supine position. Perform perineal care.
 15. Apply lotion and powder as desired. Apply clean gown.
 16. Document skin assessment, type of bath given, and client outcomes and responses.
13. Exposes back and buttocks for washing. Back rub promotes relaxation and circulation.
 14. Removes genital secretions and soil.
 15. Lotion lubricates skin. Powder absorbs excess perspiration.
 16. Provides evidence of nursing care.

Provide Clean Bed Linen

After a bath, clean linens are placed on the bed to promote comfort. If the client is able to get out of the bed, assist the client to a chair and proceed with making the bed. Procedure 31-10 describes the steps

involved with making an unoccupied bed. After surgery, the client should be returned to a clean bed with the linens folded to the foot of the bed to promote easy client transfer.

If the client is unable to get out of the bed, refer to Procedure 31-11 for a description of the steps involved

PROCEDURE 31-10

Bedmaking: Unoccupied Bed

Equipment

- | | |
|--|---|
| ■ Bottom sheet (fitted, if available) | ■ Top sheet |
| ■ Draw sheet (regular top sheet may be used) | ■ Pillowcase (each pillow on the bed) |
| ■ Mattress pad | ■ Antiseptic solution, washcloth, and towel |
| ■ Linen bag hamper outside the room | ■ Nonsterile gloves |

Action

1. Wash hands.
2. Place hamper by client's door if linen bags are not available. Explain procedure to client. Assess condition of blanket and/or bedspread.
3. Gather linen and gloves. Place linen on a clean, dry surface in reverse order of usage at the client's bedside (pillowcases, top sheet, draw sheet, bottom sheet).
4. Don gloves.
5. Inquire about the client's toileting needs and attend as necessary.
6. Assist client to a safe, comfortable chair.
7. Position bed: flat, side rails down, adjust height to waist level.
8. Remove and fold blanket and/or bedspread. If clean and reusable, place on clean work area.
9. Remove soiled pillowcases by grasping the closed end with one hand and slipping the pillow out with the other. Place soiled cases on top of soiled sheet and pillows on clean work area.
10. Remove soiled linens: Start on the side of the bed closest to you; free the bottom sheet by lifting the mattress and rolling soiled linens to the middle of the bed. Go to the other side of the bed, repeat action.
11. Fold soiled linens: head of bed to middle, foot of bed to middle. Place in linen bag or hamper, keeping soiled linens away from uniform.

Rationale

1. Reduces transmission of microorganisms.
2. Provides for proper disposal of soiled linens. Encourages client cooperation. Allows for organization of supplies.
3. Provides easy access to items.
4. Decreases risk of infection from soiled, contaminated linens.
5. Provides for client comfort and prevents interruptions during bedmaking.
6. Increases client's comfort and decreases risk for falls.
7. Promotes good body mechanics and decreases back strain.
8. Keeps reusable bed linens clean.
9. Allows easy removal of the pillowcases without contamination of uniform by soiled linens and keeps pillows clean.
10. Prevents tearing and fanning of linens. Linens are folded from cleanest area to most soiled to prevent contamination.
11. Fanning linens increases number of microorganisms in air. Folding linens decreases the risk of transmission of infection to others.

(continues)

PROCEDURE 31-10

Bedmaking: Unoccupied Bed (continued)

<i>Action</i>	<i>Rationale</i>
<p>12. Check mattress and pad. If the pad is soiled, replace. If the mattress is soiled, clean with an antiseptic solution and dry thoroughly.</p> <p>13. Remove gloves, wash hands, and don second pair of clean gloves.</p> <p>14. Open clean bottom sheet lengthwise onto the bed with the seamed side of the sheet toward the mattress. Unfold half of the sheet's width to center crease and smooth the sheet flat (refer to action 15 for placing sheet onto mattress).</p> <p>15. Proceed with placing bottom sheet onto the mattress:</p> <p>a. Fitted sheet</p> <ul style="list-style-type: none"> • Position yourself diagonally toward the head of the bed. • Start at the head with seamed side of the fitted sheet toward the mattress. • Lift the mattress corner with your hand closest to the bed; with your other hand, pull and tuck the fitted sheet over the mattress corner; secure at the head and sides. • Repeat action at foot of bed. <p>b. Flat regular sheet</p> <ul style="list-style-type: none"> • Lay the bottom of the sheet on the top edge of the mattress at the foot of the bed. • Allow the sheet to hang 10 inches (25 cm) over the mattress on the side and at the top of the bed. • Position yourself diagonally toward the head of the bed. Lift the top of the mattress corner with the hand closest to the bed and smoothly tuck the sheet under the mattress (Figure 31-33). 	<p>12. Reduces transmission of microorganisms.</p> <p>13. Reduces transmission of microorganisms to clean linens.</p> <p>14. Facilitates making bed in an organized, time-saving manner by not having to go from one side of the bed to the other.</p> <p>15. Prevents back strain. Placement of seamed side toward mattress prevents irritation to the client's skin. Proper placement of linens ensures adequate sheeting for all sides of the bed.</p> <p>Ensures proper placement of the sheet so that it can be tightly secured at the top and on both sides of the bed.</p> <p>Prevents straining of back muscles; decreases the chance that the sheet will pull out from under the mattress.</p>



Figure 31-33 Tuck the sheet under the mattress corner.

(continues)

PROCEDURE 31-10

Bedmaking: Unoccupied Bed (continued)*Action**Rationale*

16. Miter the corner at the head of the bed.
 - a. Face the side of bed and lift and lay the top edge of the sheet onto the bed to form a triangular fold (Figure 31-34A).
 - b. With your palms down, tuck lower edge of sheet (hanging free at side of mattress) under mattress.
 - c. Grasp the triangular fold, bring it down over the side of the mattress and tuck the sheet smoothly under the mattress (see Figure 31-34B). Straighten the free hanging sheet on mattress side.

16. Secures sheet tightly to the mattress, with the triangular fold providing a smooth tuck to keep the linen in place.



A.



B.

Figure 31-34 A. Lay the top edge of the sheet onto the bed to form a triangular fold. B. Bring the triangular fold down over the side of the mattress and tuck the sheet under the mattress.

17. Place draw sheet on top of bottom sheet and unfold to middle crease. Both sheets should hang 10 inches (25 cm) over the side of the mattress.
 17. Provides a sheet to lift and move the client in bed without having to use the bottom sheet and remake the bed. Helps to keep bottom sheet clean.
18. Face the side of the bed, palms of hands down. Tuck both the bottom and draw sheets under the mattress. Ensure that the bottom sheet is tucked smoothly under the mattress all the way to the foot of the bed.
 18. Keeps sheet taut, in place, and wrinkle-free, decreasing the risk of skin irritation.
19. Go to the other side of the bed, unfold the bottom sheet, repeating steps 14 to 16.
 19. Unfolding decreases air current, which can spread microorganisms.
20. Unfold the draw sheet and grasp the free hanging sides of both the bottom and draw sheets. Pull toward you, keeping your back straight, and with a firm grasp (sheets taut) tuck both sheets under the mattress. Use your arms and
 20. Uses your body's weight in pulling the sheet taut and prevents strain on your back muscles.

(continues)

PROCEDURE 31-10

Bedmaking: Unoccupied Bed (continued)

<i>Action</i>	<i>Rationale</i>
with a firm grasp (sheets taut) tuck both sheets under the mattress. Use your arms and open palms to extend the linen under the mattress.	
21. Place the top sheet on top of bed and unfold lengthwise, placing the center crease (width) of the sheet in the middle of the bed. Place the top edge of the sheet (seam up) even with the top of the mattress at the head of the bed. Pull the remaining length toward the bottom of the bed.	21. Saves time and movement, making one side of the bed at a time. Seam will be folded down to prevent contact with the client's skin, which can result in irritation.
22. Unfold and apply the blanket or spread; repeat action 21.	22. Provides warmth.
23. Miter the bottom corners as described in action 16.	23. Secures linen at the foot of the bed.
24. Face the head of the bed and fold the top sheet and blanket over 6 inches (15 cm). Fan-fold the sheet and blanket (from the foot to the middle of the bed).	24. Allows the client easy access to the bed.
25. Apply clean pillowcase on each pillow. With one hand, grasp the closed end of the pillowcase. Gather case and turn it inside out over hand. With same hand, grasp the middle of one end of the pillow. With the other hand, pull the case over the length of the pillow. The corners of the pillow should fit snugly into the corners of the case.	25. Keeps clean pillowcase away from your uniform.
26. Return the bed to the lowest position and elevate the head of the bed 31 to 45 degrees. Put side rails up on side, farthest from client.	26. Provides for client safety.
27. Inquire about toileting needs of the client; assist as necessary.	27. Saves client energy and provides time to care for the client's needs.
28. Assist the client back into the bed and pull up the side rails; place call light in reach; take vital signs.	28. Promotes client safety and a means to call for assistance. Sitting up in a chair and movement may cause changes in the client's vital signs.
29. Remove gloves and wash hands.	29. Prevents transmission of microorganisms.
30. Document your actions and the client's response during the procedure and to being up in a chair.	30. Documents completion of procedure and assessment findings of client's tolerance.

in making an occupied bed. Assistance will be needed if the client is in traction or cannot be turned. Care must be taken to avoid disturbing the traction weights. If the client cannot be turned, change the linen from head to toe. Place a waterproof draw sheet on the beds of clients who are incontinent or have profuse drainage.

Provide Skin Care

The skin functions as a protective barrier between the internal and external environments. In addition, the skin functions to regulate body temperature, secrete sebum, excrete sweat, transmit sensations, and facilitate absorption of vitamin D.

PROCEDURE 31-11

Bedmaking: Occupied Bed*Equipment*

- Linen hamper
- Pillowcase
- Bath blanket

- Top sheet, draw sheet, bottom sheet
- Blanket

Action

1. Explain procedure to client.
2. Remove top sheet and blanket. Loosen bottom sheet at foot and sides of bed. Lower side rail on side of nurse. Client may be covered with a bath blanket.
3. Position client on side, facing away from you. Reposition pillow under head.
4. Fan-fold or roll bottom linens close to client toward the center of the bed (Figure 31-35).



Figure 31-35 Fan-fold the bottom linens close to the client toward the center of the bed.

Rationale

1. Promotes client cooperation.
2. Facilitates easy removal of linen. Lowering only side rail close to nurse reduces client's risk of falls. Bath blanket prevents exposure and chills.
3. Provides space to place clean linen.
4. Maintains soiled linen together. Promotes comfort when client later rolls to other side.
5. Smooth wrinkles out of mattress. Place clean bottom linens with the center fold nearest the client. Fan-fold or roll clean bottom linens nearest client and tuck under soiled linen (Figure 31-36). Maintain an adequate amount of sheet at head and foot of bed for tucking.
6. Miter bottom sheet at head of bed, then at foot of bed. To miter, lift mattress and tuck sheet over the edge of the mattress, lift edge of sheet that is hanging to form a triangle, and lay upper part of sheet back onto bed; tuck the lower hanging section under the mattress. Repeat for each corner. Tuck the sides of the sheet under

5. Provides for maximum fit of sheets and decreases chance of wrinkles.
6. Holds linens firmly in place.

(continues)

PROCEDURE 31-11

Bedmaking: Occupied Bed (continued)*Action*

Figure 31-36 Fan-fold the clean bottom linens nearest the client and tuck under the soiled linens.

Rationale

- part of sheet back onto bed; tuck the lower hanging section under the mattress. Repeat for each corner. Tuck the sides of the sheet under the mattress.
7. Fold draw sheet in half. Identify the center of the draw sheet and place close to the client. Fan-fold or roll draw sheet closest to client and tuck under soiled linen (Figure 31-37). Smooth linen. Tuck draw sheet under mattress, working from the center to the edges. Draw sheet should be positioned under the lower back and buttocks.
 8. Log roll client over onto side facing you. Raise side rail.
 9. Move to other side of bed. Remove soiled linens by rolling into a bundle and place in linen hamper without touching uniform.
 10. Unfold/unroll bottom sheet; then draw sheet. Look for objects left in the bed. Grasp each sheet with knuckles up and over the sheet and pull tightly while leaning back with your body weight (Figure 31-38). Client may be positioned supine.
7. Draw sheet facilitates moving and lifting clients while in bed.
 8. Positions client off soiled linen. Protects client from falling.
 9. Prevents cross-contamination.
 10. Tight sheets keep linens wrinkle-free and decrease risk of skin irritation. Leaning back uses body weight for good body mechanics.

(continues)

PROCEDURE 31-11

Bedmaking: Occupied Bed (continued)*Action*

Figure 31-37 Fan-fold the draw sheet close to the client and tuck under the soiled linen.

Rationale

Figure 31-38 Grasp the bottom and draw sheets and pull tightly.

- | | |
|---|--|
| <ol style="list-style-type: none"> 11. Place top sheet over client with center of sheet in middle of bed. Unfold top of sheet over client. Remove bath blankets left on client to prevent exposure during bedmaking. Place top blanket over client, same as the top sheet. 12. Raise foot of mattress and tuck the corner of the top sheet and blanket under. Miter the corner. Repeat with other side of mattress. 13. Grasp top sheet and blanket over client's toes and pull upward, then make a small fan-fold in the sheet. 14. Remove soiled pillowcase. Grasp center of clean pillowcase and invert pillowcase over hand/arm. Maintain grasp of pillowcase while grasping center of pillow. Use other hand to pull pillowcase down over pillow. Place pillow under client's head. While changing pillowcase, client can be instructed to rest head on bed, or place a blanket under client's head. 15. Document procedure used to change linen and client's condition during the procedure. | <ol style="list-style-type: none"> 11. Provides client with top sheet and blanket to prevent chilling. 12. Secures top sheet and blanket in place. 13. Permits client to move feet under the sheets. Provides room under the tight top sheet and blanket. 14. Provides clean pillowcase without shaking pillow or pillowcase. Promotes comfort. 15. Provides documentation of nursing care and assessment of client's status. |
|---|--|

Skin care provides cleansing and conditioning to promote the optimal functioning of the skin. It consists of providing adequate nutrition, baths, perineal care, and back rubs. Excessive or abrasive skin care can damage skin and result in loss of function. Performing skin care provides an excellent opportunity for the nurse to assess skin integrity.

Perineal Care

Perineal care is cleansing of the external genitalia, perineum, and surrounding area. Perineal care is also referred to as “peri-care” or “perineal-genital” care. The purposes of perineal care are to prevent or eliminate infection and odor, promote healing, remove secretions, and provide comfort. Perineal care can be provided alone or as part of the bed bath.

Perineal care may be an embarrassing procedure for both the client and the nurse, especially if the client is of the opposite sex. Clients who are embarrassed may elect to perform their own perineal care. In this situation, the nurse should provide the client with warm water, moistened washcloth, soap, a dry towel, and privacy. If the client is unable to perform perineal care, the nurse is responsible for providing this care in a professional and private manner (see Procedure 31-12).

THINK ABOUT IT

Perineal Care

How would you approach providing perineal care to someone of the opposite sex or similar age? If the client were embarrassed and unable to perform perineal care, how would you handle this situation? How would you feel if someone of the opposite sex or similar age were going to provide perineal care for you?

Offer Back Rubs

Back rubs and massages stimulate the client’s circulation, relax muscles, and relieve muscle tension as well as provide the nurse with an opportunity for skin assessment. Emollient creams and lotions are used to facilitate the rubbing and lubrication of the skin during a back rub or massage.

The client is positioned prone or side-lying. Nurses create friction and pressure by rubbing their hands on the client’s skin. The friction creates heat, which dilates the peripheral circulation and increases the blood supply to the skin. The pressure provides manual stimulation to muscle fibers, which relaxes the

PROCEDURE 31-12

Perineal Care

Equipment

- | | |
|---------------------------|----------------------|
| ■ Bath basin | ■ Waterproof pads |
| ■ Soap | ■ Toilet tissue |
| ■ Two or three washcloths | ■ Lotion or ointment |
| ■ Dry bath towel | ■ Disposable gloves |
| ■ Bath blanket | |

Action

1. Explain procedure and purpose to client. Obtain permission. Close door and pull curtain around bed.
2. Wash hands and apply gloves.
3. Place waterproof pad under client’s buttocks. Client may be placed on a bedpan for perineal care. Females usually assume the dorsal recumbent position. Males may assume the dorsal recumbent or supine position with knees and hips flexed.

Rationale

1. Promotes cooperation. Provides privacy.
2. Reduces transmission of pathogens.
3. Waterproof pad prevents wetting of linen. Dorsal recumbent position provides maximal visualization of genital area.

(continues)

PROCEDURE 31-12

Perineal Care (continued)

Action

4. Expose perineal area. Fold client's gown up above the genital area. Place a bath blanket over the client using a "diamond" draping technique. Corners of bath blanket should point toward the head, sides of body, and between the client's legs. Fold top linen down to the end of the bed. Tuck side corners of bath blanket around client's legs. Lift corner between client's legs to expose perineal area (Figure 31-39).



Figure 31-39 Drape the client for perineal care.

5. Moisten and lather washcloths.

Female: Clean perineal area in the downward direction (from pubic area to rectum). Clean and dry upper thighs. Use separate quarters of the washcloth for each cleaning stroke. Discard soiled washcloths as necessary. Clean the labia majora. Separate the labia majora to clean between the labia majora and labia minora. With the labia separated, clean the clitoris, urethral meatus, and vaginal orifice (Figure 31-40). Rinse the area well with warm water. Pat perineal area dry. Apply lotion to upper thighs.

Male: Gently raise penis. Place a bath blanket under the penis. If the client develops an erection, delay perineal care. Gently grasp the shaft of the penis. If the client is uncircumcised, retract the foreskin. Use a circular motion to clean the meatus of the penis and glans in an outward direction (Figure 31-41). Replace the foreskin after cleansing the glans. Clean the shaft of the penis. Rinse penis. Pat glans and shaft of penis dry. Clean and dry scrotum. Scrotum may need to be lifted during cleaning. Discard soiled washcloths as necessary.

Rationale

4. Draping promotes a sense of privacy and decreases exposure.
5. Cleaning in the direction of the pubic area to rectum reduces risk of transmitting fecal material to the urinary tract. Using clean area of washcloth for each stroke reduces risk of transmitting organisms. Cleaning between the labia removes accumulated smegma.

Gentle handling reduces chance of an erection. Smegma accumulates around the foreskin. Replacing of foreskin prevents phimosis. Cleaning moves from area of least to most soiled.

PROCEDURE 31-12

Perineal Care (continued)

Action

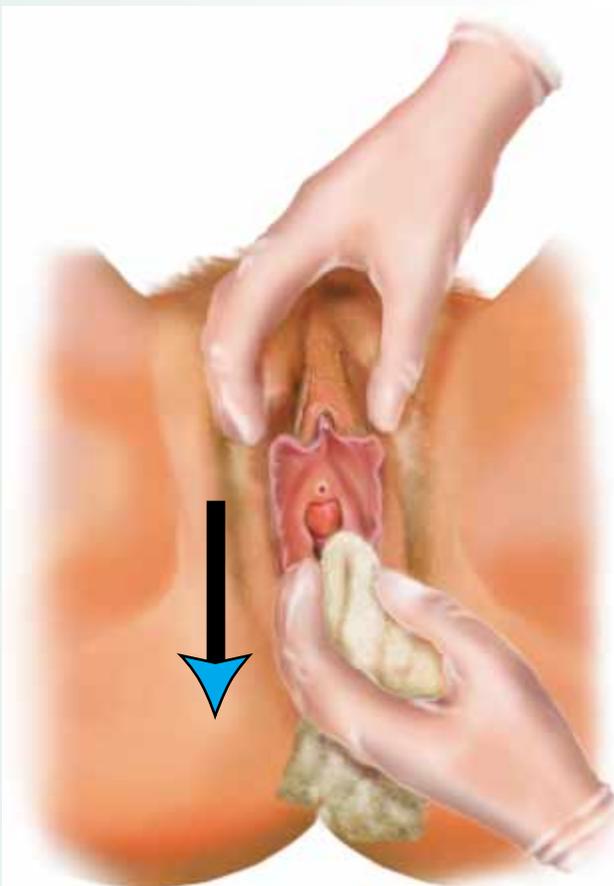


Figure 31-40 Clean the female perineal area.

6. Perform anal care. First remove any fecal material with toilet tissue. Clean perineal area by wiping from genitals to anus with one stroke. Discard soiled washcloths as necessary. Clean anus in circular motion. Rinse anal area. Pat dry. Apply lotion.
7. Remove gloves. Wash hands. Remove bath blanket. Place gown down over genitals. Place top linen on client.
8. Document procedure performed, client's response, and assessment findings.

Rationale

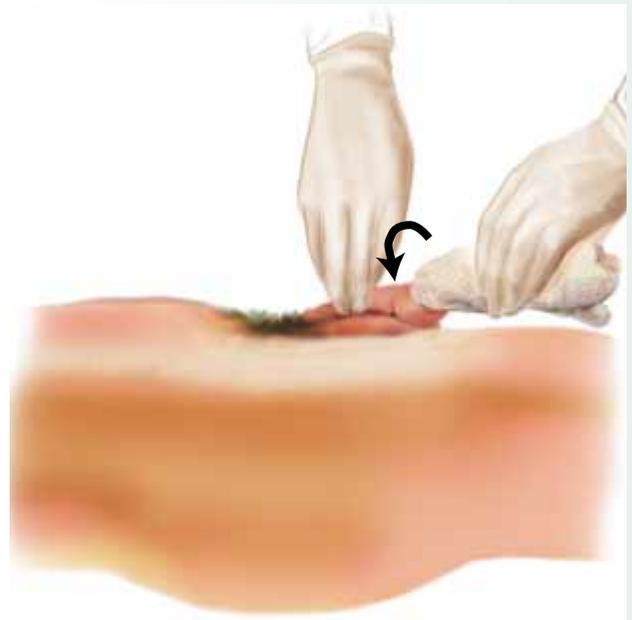


Figure 31-41 Clean the male perineal area.

6. Cleaning fecal material with toilet tissue removes the bulk of soil prior to washing. Cleaning from genitals to anus reduces chances of transmitting fecal microorganisms to urinary tract. Patting dry reduces skin irritation.
7. Reduces transmission of microorganisms. Covering genitals maintains client's privacy.
8. Provides evidence of nursing care.

NURSING ALERT

Massage

Do not massage red, tender areas since such signs may indicate a thrombus.

muscles. Chapter 14 presents the technique for performing a back rub.

Prior to performing a back rub or massage, the nurse must assess for contraindications. Caution should be exercised when massaging limbs. Massaging limbs, especially the lower limbs, could dislodge a thrombus (blood clot), creating an embolus (circulating blood

clot). Bony prominences should be massaged lightly to avoid damaging underlying tissue.

Provide Foot and Nail Care

Proper foot and nail care are essential for ambulation and standing. Foot and nail care are often ignored until problems exist. Common problems with feet and nails may be a direct result of abuse and neglect, such as from inadequate foot and nail hygiene, fingernail and cuticle biting, incorrect nail trimming, poorly fitted shoes, and exposure to harsh chemicals. These problems result in alterations of skin integrity with the potential for infection.

The first signs of foot and nail problems are usually pain or tenderness. These symptoms affect a client's posture and may result in limping with subsequent strain on certain muscle groups. Clients with illnesses such as diabetes mellitus need special foot and nail care. Clients with diabetes mellitus experience alterations in circulation that predispose them to foot problems.

The purposes of foot and nail care are to prevent infection and soft tissue trauma from ingrown or jagged nails and to eliminate odor. Hygienic care of feet and nails consists of regular trimming of nails; cleaning under nails; cleaning, rinsing, and drying feet and nails; and wearing properly fitted shoes. The following Nursing Checklist discusses the specific interventions that should be taken in providing foot and nail care.

Soaking of nails assists with their cleaning if nails are dirty or thickened. An orangewood stick is used to clean under nails since a metal instrument can roughen the nail and cause it to harbor dirt. The safest instrument to trim nails is the nail clipper; however, some clients feel that cutting the nails makes them brittle. If the client chooses not to cut the nails, the nails should be filed straight across. Special attention should be given to drying the areas between the toes.



NURSING CHECKLIST Foot and Nail Care

- Soak feet in warm water and a detergent or in warm oil.
- Use an orangewood stick to clean the nails and release the cuticle growth from the nail.
- File or cut the nails straight across to prevent ingrown nails.
- Trim the cuticles as necessary.
- Pat all areas dry with a clean towel.
- Apply an emollient.

An emollient, such as cold cream, helps to keep nails and cuticles soft.

Callused areas should never be cut. Repeated soaking usually facilitates the removal of calluses. Lotion should be applied to the foot to maintain moisture and soften callused areas. If the client's feet maintain excessive moisture (sweat), water-absorbent powder should be applied between the toes.

The client should wear clean, properly fitted shoes. The fit should not be extremely tight but should be snug enough to provide support to the foot. An arch support should be in each shoe. Shoe size should be large enough so that the shoe is one-half inch longer than the longest toe. Common foot problems can often be alleviated by assessing footwear and providing proper education on footwear and foot and nail care.

Provide Oral Care

The oral cavity functions in mastication, secretion of mucus to moisten and lubricate the digestive system, secretion of digestive enzymes, and absorption of essential nutrients. Common problems occurring in the oral cavity are:

- Bad breath (**halitosis**)
- Dental caries (**cavities**)
- Plaque
- Periodontal disease (**pyorrhea**)
- Inflammation of the gums (**gingivitis**)
- Inflammation of the oral mucosa (**stomatitis**)

Poor oral hygiene and loss of teeth may affect a client's social interaction and body image as well as nutritional intake. Daily oral care is essential to maintain the integrity of the mucous membranes, teeth, gums, and lips (see Procedure 31-13). Through preventive measures, the oral cavity and teeth can be preserved. Preventive oral care consists of fluoride rinsing, flossing, and brushing.

Fluoride

Researchers have determined that fluoride can prevent dental caries. This finding has led to the fluoridation of water supplies in many communities. Fluoride is a common component of mouthwashes and toothpastes. However, persons with excessive dryness or irritated mucous membranes should avoid commercial mouthwashes because of the alcohol content, which causes drying of mucous membranes.

Fluoride supplements are available without a prescription. Infants can be given fluoride drops as early as 2 weeks of age to prevent dental caries. Nurses should educate clients about fluoride being an excellent preventive measure against dental caries.

However, excessive fluoride usage can affect the color of tooth enamel. To prevent discoloration of the tooth enamel, fluoride should be administered with a drop-per directed toward the back of the throat.

Flossing

Flossing should be performed daily in conjunction with brushing of teeth. Flossing prevents the formation of plaque, removes plaque between the teeth, and removes food debris. Dental caries and periodontal disease can be prevented by regular flossing. Flossing is best performed after toothpaste is applied to the teeth but before brushing (see Procedure 31-13). This order permits the fluoride in the toothpaste to have direct contact with the tooth surfaces, thus preventing dental caries.

Flossing can also be performed after brushing, but brushing first does not maximize the fluoride’s contact with the tooth surfaces.

Brushing

Brushing of teeth should follow flossing. Teeth should be brushed after each meal. Brushing should be performed using a dentifrice (toothpaste) that contains fluoride to aid in preventing dental caries. An effective homemade dentifrice is the combination of two parts salt with one part baking soda. Brushing removes plaque and food debris and promotes blood circulation of the gums. Dentures should be brushed using the same brushing motion as that used for brushing teeth. Refer to Procedure 31-13 for brushing of teeth and denture care.

PROCEDURE 31-13

Oral Hygiene

Equipment

Brushing and Flossing

- Toothbrush
- Toothpaste
- Emesis basin
- Towel
- Cup of water
- Nonsterile gloves
- Dental floss
- Dental-floss holder
- Mirror
- Lip moisturizer

Denture Care

- Denture brush
- Denture cleaner
- Emesis basin
- Towel
- Cup of water
- Nonsterile gloves
- Tissue
- Denture cup

Special Care Items for Clients with Impaired Physical Mobility or Who Are Unconscious (comatose)

- Soft toothbrush or toothette
- Tongue blade
- 3 × 3 gauze sponges
- Suction machine and catheter
- Prescribed solution and/or milk of magnesia
- Cotton-tip applicators
- Plastic Asepto syringe

Action

Rationale

Self-Care Client

Flossing and Brushing

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Assemble articles for flossing and brushing. 2. Provide privacy. 3. Place client in a high-Fowler’s position. 4. Wash hands and don gloves. 5. Arrange articles within client’s reach. 6. Assist client with flossing and brushing as necessary. Position mirror and emesis basin near client for use during activity. | <ol style="list-style-type: none"> 1. Promotes efficiency. 2. Relaxes the client. 3. Decreases risk of aspiration. 4. Reduces microorganism transfer and exposure to body fluids. 5. Facilitates self-care. 6. Flossing and brushing decrease microorganism growth in mouth. Use of mirror permits cleaning back and sides of teeth. |
|--|--|

(continued)

PROCEDURE 31-13

Oral Hygiene (continued)

<i>Action</i>	<i>Rationale</i>
7. Assist client with rinsing mouth.	7. Removes toothpaste and oral secretions.
8. Reposition client, raise side rails, and place call button within reach.	8. Promotes comfort, safety, and communication.
9. Rinse, dry, and return articles to proper place.	9. Promotes a clean environment.
10. Remove gloves, wash hands, and document care.	10. Prevents the transmission of microorganisms and documents nursing care.
Denture Care	
11. Assemble articles for denture cleaning.	11. Promotes efficiency.
12. Provide privacy.	12. Relaxes the client.
13. Assist client to a high-Fowler's position.	13. Facilitates removal of dentures.
14. Wash hands and don gloves.	14. Reduces microorganism transfer and exposure to body fluids.
15. Assist client with denture removal:	15. Breaks seal created with dentures without causing pressure and injury to oral membranes.
a. Top denture:	
• With tissue, grasp the denture with thumb and forefinger and pull downward.	
• Place in denture cup.	Prevents breaking of dentures.
b. Bottom denture:	
• Place thumbs on the gums and release the denture. Grasp denture with thumb and forefingers and pull upward.	
• Place in denture cup.	
16. Apply toothpaste to brush and brush dentures either with cool water in the emesis basin or under running water in the sink.	16. Facilitates removal of microorganisms.
17. Rinse thoroughly.	17. Removes toothpaste.
18. Assist client with rinsing mouth and replacing dentures.	18. Freshens mouth and facilitates intake of solid food.
19. Reposition client, with side rails up and call button within reach.	19. Promotes comfort, safety, and communication.
20. Rinse, dry, and return articles to proper place.	20. Maintains a clean environment.
21. Remove gloves, wash hands, and document care.	21. Prevents the transmission of microorganisms and documents nursing care.
Full-Care Client	
Brushing and Flossing	
22. Assemble articles for flossing and brushing.	22. Promotes efficiency.
23. Provide privacy.	23. Relaxes client.

(continues)

PROCEDURE 31-13

Oral Hygiene (continued)

<i>Action</i>	<i>Rationale</i>
24. Wash hands and don gloves.	24. Reduces microorganism transfer and exposure to body fluids.
25. Position client as condition allows: high-Fowler's, semi-Fowler's, or lateral position, head turned toward side.	25. Decreases risk of aspiration.
26. Place towel across client's chest or under face and mouth if head is turned to one side.	26. Catches secretions.
27. Moisten toothbrush, apply small amount of toothpaste, and brush teeth and gums.	27. Moistens mouth and facilitates plaque removal.
28. Grasp the dental floss in both hands or use a floss holder and floss between all teeth, holding floss against tooth while moving floss up and down sides of teeth (Figure 31-42).	28. Removes plaque and prevents gum disease.

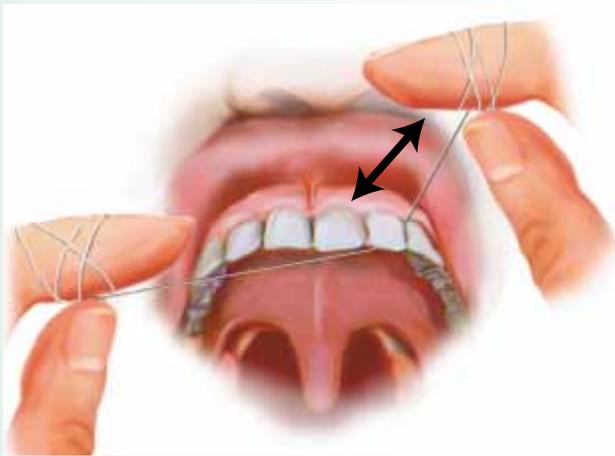


Figure 31-42 Floss teeth.

29. Assist the client in rinsing mouth.	29. Removes toothpaste and oral secretions.
30. Reapply toothpaste and brush the teeth and gums using friction in a vertical or circular motion. On inner and outer surfaces of teeth, hold brush at 45 degree angle against teeth and brush from sulcus to crowns of teeth. On biting surfaces, move brush back and forth in short strokes. All surfaces of teeth should be brushed from every angle (Figure 31-43).	30. Permits cleaning of back and sides of teeth and decreases microorganism growth in mouth.
31. Assist the client in rinsing and drying mouth.	31. Removes toothpaste and oral secretions.
32. Apply lip moisturizer, if appropriate.	32. Maintains skin integrity of lips.
33. Reposition client, raise side rails, and place call button within reach.	33. Promotes comfort, safety, and communication.
34. Rinse, dry, and return articles to proper place.	34. Provides an orderly environment.

(continues)

PROCEDURE 31-13

Oral Hygiene (continued)

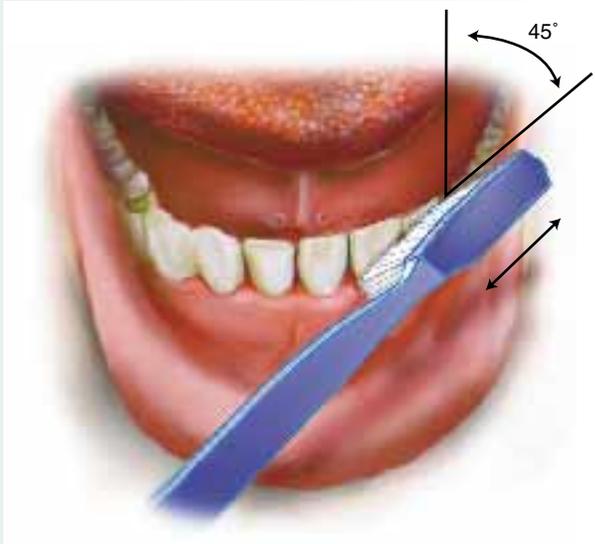
Action*Rationale*

Figure 31-43 Brush teeth.

35. Remove gloves, wash hands, and document care.

35. Prevents transmission of microorganisms and documents nursing care.

Clients at Risk for or with an Alteration of the Oral Cavity

Follow steps 22 through 24.

36. Bleeding:

- a. Assess oral cavity with a padded tongue blade and flashlight for signs of bleeding.
- b. Proceed with the actions for oral care for a full-care client, except:
 - Do not floss.
 - Use a soft toothbrush, toothette, or a tongue blade padded with 3 × 3 gauze sponges to gently swab teeth and gums.
 - Dispose of padded tongue blade into a biohazard bag according to institutional policy.
 - Rinse with tepid water.

36. Determines if bleeding is present, amount, and specific areas.

Decreases risk of bleeding.

Promotes proper disposal of contaminated waste.

Cleanses mouth.

37. Infection:

- a. Assess oral cavity with a tongue blade and flashlight for signs of infection.
- b. Culture lesions as ordered.

37. Determines appearance, integrity, and general condition.

Identifies growth of specific microorganisms.

(continues)

PROCEDURE 31-13

Oral Hygiene (continued)

<i>Action</i>	<i>Rationale</i>
<p>c. Proceed with the actions for oral care for a full-care client except:</p> <ul style="list-style-type: none"> • Do not floss. • Use prescribed antiseptic solution. • Use a tongue blade padded with 3 × 3 gauze sponges to gently swab the teeth and gums. • Dispose of padded tongue blade into a biohazard bag according to institutional policy. • Rinse mouth with tepid water. 	<p>Prevents irritation, pain, and bleeding.</p> <p>Antiseptic solutions decrease growth of microorganisms.</p> <p>Promotes proper disposal of contaminated materials.</p> <p>Cleanses mouth.</p>
<p>38. Ulcerations:</p> <p>a. Assess oral cavity with a tongue blade and flashlight for signs of ulcerations.</p> <p>b. Culture lesions as ordered.</p> <p>c. Proceed with actions for oral care for a full-care client except:</p> <ul style="list-style-type: none"> • Do not floss. • Use prescribed antiseptic solution. • Use a tongue blade padded with 3 × 3 gauze sponges to gently swab the teeth and gums. • Dispose of padded tongue blade into a biohazardous bag according to institutional policy. • Rinse mouth with tepid water. • Apply milk of magnesia (or other solution as prescribed) with cotton-tip applicators. 	<p>38. Same as for step 37.</p> <p>Provides a coating that promotes healing of the tissue.</p>
Unconscious (Comatose) Client	
<p>39. Follow steps 22 to 24 for full-care client.</p> <p>40. Explain the procedure to the client.</p> <p>41. Place the client in a lateral position, head turned toward the side.</p> <p>42. Use a floss holder and floss between all teeth.</p> <p>43. Moisten toothbrush, apply small amount of toothpaste, and brush the teeth and gums as described in action 30.</p>	<p>39. Same as for steps 22 to 24 for full-care client.</p> <p>40. Demonstrates respect for the client.</p> <p>41. Prevents aspiration.</p> <p>42. Prevents transfer of microorganisms from a client bite.</p> <p>43. See rationale 30.</p>

(continues)

PROCEDURE 31-13

Oral Hygiene (continued)

*Action**Rationale*

- | | |
|--|--|
| <p>44. After flossing and brushing, rinse mouth with an Asepto syringe and perform oral suction (see Chapter 31 for a description of oropharyngeal/nasopharyngeal suctioning).</p> <p>45. Dry the client's mouth.</p> <p>46. Apply lip moisturizer.</p> <p>47. Leave the client in a lateral position with head turned toward side for 30 to 60 minutes after oral hygiene care. Remove the towel from under the client's mouth and face.</p> <p>48. Dispose of any contaminated items in a biohazard bag and clean, dry, and return all articles to the appropriate place.</p> <p>49. Remove gloves, wash hands, and document care.</p> | <p>44. Promotes cleansing and removal of secretions and prevents aspiration.</p> <p>45. Prevents skin irritation.</p> <p>46. Maintains skin integrity of lips.</p> <p>47. Prevents pooling of secretions and aspiration.</p> <p>48. Promotes proper disposal of contaminated materials.</p> <p>49. Prevents the transmission of microorganisms and documents nursing care.</p> |
|--|--|

Oral Care for the Unconscious Client

Oral care for the unconscious client maintains a clean oral cavity and intact mucous membranes. Special care should be exercised when performing oral care to unconscious clients to prevent client aspiration or injury to the nurse (client biting because of gag reflex). The accompanying Nursing Checklist provides essential safety guidelines for providing oral care to unconscious clients.

**NURSING CHECKLIST***Oral Care for the Comatose Client*

- Never place your fingers in the client's mouth. A bite block or padded tongue blade can be used to hold the client's mouth open. Assess for gag reflex.
- Client's head should be turned to one side with a basin placed under the mouth. Oral suctioning facilitates the removal of secretions. Only a small amount of liquids should be used.
- Flossing and brushing of teeth and tongue can be performed in the usual manner. Caution should be exercised to prevent aspiration.

Provide Hair Care

Hair affects a client's personal appearance and body image. Hair functions to maintain the body temperature and as a receptor for the sense of touch. Assessment of hair texture, growth, and distribution provides information on a client's general health status.

Common hair problems are dandruff, hair loss, tangled or matted hair, and infestations such as pediculosis and lice. Hair problems can be reduced by daily hair care, which helps to promote hair growth, prevent hair loss, prevent infections or infestations, promote circulation of the scalp, evenly distribute oils along hair shafts, and maintain the client's physical appearance. Hair care consists of brushing and combing, shampooing, shaving, and mustache and beard care.

Brushing and Combing

Hair should be brushed or combed daily according to the client's preferred hairstyle. Brushing and combing stimulate circulation to the scalp, distribute oils along hair shafts, and arrange the placement of hair. A clean brush or comb should be used. Hair should be brushed from the scalp toward the hair ends. Sensitive scalps should be brushed or combed gently. Wetting the hair with water before brushing or combing can prevent damage to the hair and painful pulling of the scalp.

NURSING TIP

Cultural Influences on Hygiene

Keep in mind that all self-care and hygiene practices are influenced by the client's background and cultural values. Always ask clients about preferences prior to performing care and show sensitivity to those practices that may differ from your own.

Clients who are immobilized may have tangled or matted hair. Care should be taken to prevent pain when combing tangled or matted hair by holding the tangled hair near the scalp while combing. If the client permits, the hair can be braided to avoid tangling or matting, but braiding the hair tightly should be avoided since tight braids may cause pain and hair loss. A nurse must receive written informed consent to cut a client's hair.

Shampooing

When soiled, hair should be shampooed according to the client's usual routine. The purposes of shampooing are to stimulate scalp circulation, remove soil from hair, and facilitate brushing and combing. Hair can be shampooed in the tub, in the shower, at the sink, or in the bed depending on the client's abilities and preferences.

Clients confined to bed can have their hair shampooed with water or with shampoos that do not require water (see Nursing Checklist: Shampooing Hair in Bed). Hair is shampooed by thoroughly wetting all hair, applying about a teaspoon of shampoo, lathering shampoo, and gently massaging the scalp with the pads of the fingertips. Hair should be rinsed thoroughly after shampooing. Hair should be dried with an absorbent towel, then brushed or combed in the preferred hairstyle.

Shaving

Shaving is the removal of hair from the skin surface. Males often shave to remove facial hair, and women may shave to remove leg and/or axillary hair. Operative procedures may also require skin preparation that requires shaving of an area of the body.

Shaving may be performed before, during, or after the bath. Care should be used to avoid cutting the skin. Prior to shaving, the area should be washed with soap and warm water to soften the hair. A warm washcloth may be placed over the area for a few minutes to assist with softening the hair. A shaving cream or mild soap is applied to the area to ease hair removal. To shave, the skin should be pulled taut. The razor is held at a 45

NURSING CHECKLIST

Shampooing Hair in Bed

- Remove pillow. Position client with head and shoulders near edge of bed. Cotton may be placed in the external ear canal.
- Place a linen protector or plastic head-washing tray under the head to protect the bed from becoming wet and to facilitate the draining off of water and shampoo.
- Offer the client a towel to cover eyes, if desired (Figure 31-44).
- Shampoo hair beginning at the hair line and working toward the back of the head.
- Rinse thoroughly to remove all residue from the scalp. Repeat washing and rinsing until hair squeaks when fingers move through hair.
- Squeeze excess water from hair. Wrap a towel around client's head and rub hair and scalp with towel. Remove linen protector or plastic tray and complete drying of hair.

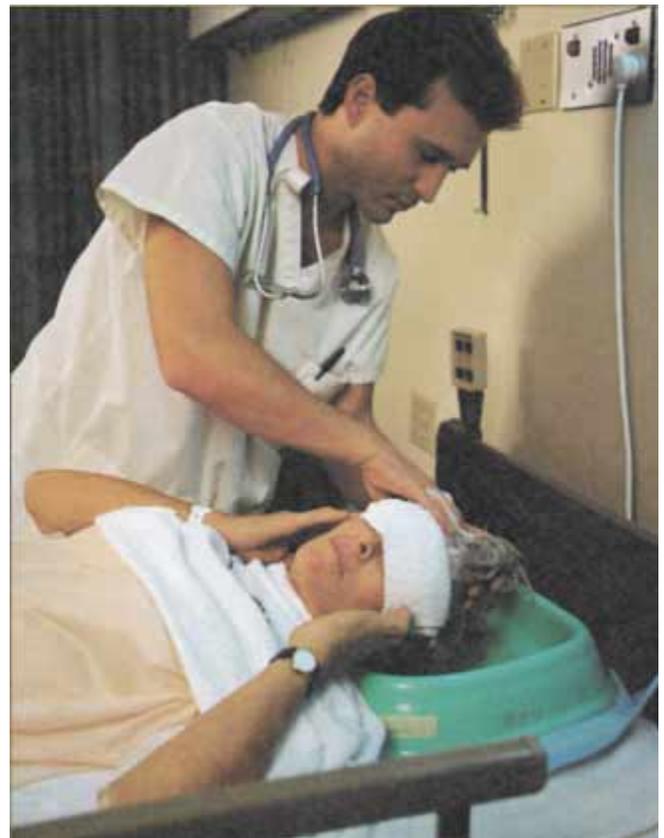


Figure 31-44 Shampooing Hair in Bed

degree angle and moved over the skin in short, firm strokes in the direction of hair growth. After the skin is shaved, it should be washed, rinsed, and patted dry.

Mustache and Beard Care

Mustaches and beards require daily care. Mustache and beard care consists of keeping the hair clean, trimmed, and combed. Mustaches and beards can be washed with soap or a shampoo. Frequently, mustaches and beards require only gentle wiping with a moist washcloth. A mustache or beard should never be shaved by the nurse without written informed consent.

NURSING ALERT

Shaving

Review the client's medical record and the facility's policy regarding the use of razors for shaving. Clients prone to bleeding, such as those on anticoagulants, should be instructed to use only electrical razors for shaving.

Provide Eye, Ear, and Nose Care

Eye, ear, and nose care should be included in routine hygienic care.

Eyes

Eyes are continually cleansed by the production of tears and movement of eyelids over the eyes. Eyelids should be washed daily with a warm washcloth from the inner to outer canthus. Eyelashes function to prevent foreign material from entering the eyes and conjunctival sacs. Eyelashes and eyebrows should be washed as necessary.

A client's artificial eye (prosthetic) may require daily cleaning, which requires that the eye be removed from the eye socket and washed (see Procedure 31-14). Some artificial eyes are permanently implanted.

Comatose clients have special eye care needs since they lack a blink reflex. These clients require frequent instillations of lubricants or eyedrops to prevent corneal abrasions. The accompanying Nursing Checklist describes eye care for the comatose client.

Contact Lenses

The nursing history should indicate if the client wears contact lenses, and the routine care and level of assistance should be recorded on the client's care plan. Clients who can insert, remove, and manage the care of their lenses will require minimal assistance from the nurse. If the client is unable to assist with lens care and also has corrective eyeglasses, suggest to the client that he or she wear the eyeglasses during hospitalization. There are two types of contact lenses: hard and soft. Each type requires different cleaning and care (see Procedure 31-14). During emergency situations, the nurse should remove the lenses and place them in the appropriate solution.



NURSING CHECKLIST

Eye Care for the Comatose Client

- Cleanse eyelids, eyelashes, and eyebrows with warm washcloth at least every 4 hours. Clean from inner to outer canthus.
- If eyes remain open and blink reflex is absent, liquid tear solutions should be applied to prevent corneal drying and ulcerations.
- Eyes can be closed and covered with an eye patch or protective shield. The eye patch or protective shield should be removed at least every 4 hours to assess eyes and provide eye care.

Ears

Hearing can be affected by foreign material or wax in the external ear canal. Cleaning of the ears involves cleaning of the external ear canal and auricles. Objects should not be inserted into the ear canal. Excess wax or foreign material should be removed by gently washing the external ear and auricles with a warm washcloth while pulling the ear downward in the adult client. Irrigation of the ear may be necessary to remove dried wax. The physician should be notified prior to irrigation of the ear.

Hearing Aids

Hearing aids amplify sound. The health history should indicate if the client is wearing a hearing aid and the plan of care should discuss the cleaning schedule of this aid. Clients with hearing aids should clean the ear mold regularly to ensure proper functioning. There are four types of hearing aids:

- Body-worn
- Eyeglass
- Behind the ear
- In the ear

Some hearing aids have a telephone switch that can be turned on and off.

If the hearing aid is not functioning properly, check the on-off switch and volume control, battery (replace as necessary), plastic tubing for cracks and loose connections, and telephone switch, which should be in the off position unless the client is using the phone. Hearing aids should be handled carefully since dropping or bumping the hearing aid can damage its delicate mechanisms. When not in use, the hearing aid should be stored in a container because dust and dirt can damage the mechanism.

When communicating with a client who has a hearing aid, you should address the client by name and then wait for the client to face you before speaking further. Always face the client and speak in a slow, natural voice.

PROCEDURE 31-14

Eye Care: Artificial Eye and Contact Lens Removal

Equipment

Artificial Eye

- Storage container
- Mild soap
- 3 × 3 gauze sponges
- Cotton balls
- Towel
- Emesis basins
- Eye irrigation syringe (optional)
- Running water
- Nonsterile gloves
- Biohazardous bag
- Saline solution

Contact Lenses

- Lens container
- Soaking solution (type used by client)
- Towel
- Suction cup (optional)
- Scotch tape (optional)
- Nonsterile gloves

Action

Artificial Eye Removal

1. Inquire about client's care regimen and gather equipment accordingly.
2. Provide privacy.
3. Wash hands; don gloves.
4. Place client in a semi-Fowler's position.
5. Place the cotton balls in emesis basin and half fill with warm tap water.
6. Place 3 × 3 gauze sponges in bottom of second emesis basin, and half-fill with mild soap and tepid water.
7. Grasp and squeeze excess water from a cotton ball. Cleanse the eyelid with the moistened cotton ball, starting at the inner canthus and moving outward toward the outer canthus. After each use, dispose of cotton ball in biohazard bag. Repeat procedure until eyelid is clean (without dried secretions).
8. Remove the artificial eye:
 - a. Using dominant hand, raise the client's upper eyelid with index finger and depress the lower eyelid with thumb (Figure 31-45).
 - b. Cup nondominant hand under the client's lower eyelid.
 - c. Apply slight pressure with index finger between the brow and the artificial eye and remove it.
9. Place the artificial eye in the emesis basin that has soap and water.

Rationale

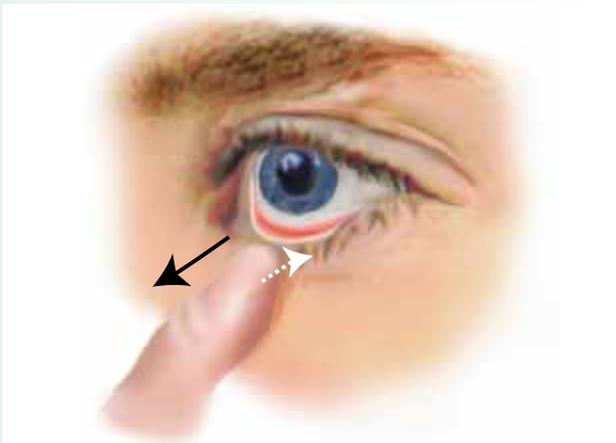
1. Promotes continuity of care.
2. Relaxes the client.
3. Prevents transmission of microorganisms.
4. Facilitates procedure and client participation.
5. Dry cotton balls could cause irritation.
6. Gauze serves as padding to prevent breakage of the prosthesis.
7. Eliminating the excess water prevents water from running down the client's face. Cleansing the eyelid prevents contamination of the lacrimal system (inner canthus area). Disposal of cotton balls prevents transmission of microorganisms to other health care workers.
8. Promotes removal of artificial eye. Cupping prevents dropping and possible breaking of the eye. Applying pressure will help the prosthesis to slip out.
9. Prevents secretions from adhering to the prosthesis.

(continues)

PROCEDURE 31-14

Eye Care: Artificial Eye and Contact Lens Removal (continued)

Action



Rationale

Figure 31-45 Removal of an Artificial Eye

- | | |
|---|--|
| <p>10. Grasp a moistened cotton ball and cleanse around the edge of the eye socket. Dispose of the soiled cotton ball into biohazard bag. Replace the prosthesis in the soap-and-water solution.</p> <p>11. Inspect the eye socket for any signs of irritation, drainage, or crusting.</p> <p><i>Note:</i> If the client's usual care regimen or physician order requires irrigation of the socket, proceed with step 12; otherwise, go to step 13.</p> <p>12. Eye socket irrigation:</p> <p>a. Lower the head of the bed and place the client in a supine position. Place protector pad on bed; turn head toward socket side and slightly extend neck.</p> <p>b. Fill the irrigation syringe with the prescribed amount and type of irrigating solution (warm tap water or normal saline).</p> <p>c. With nondominant hand, separate the eyelids with your forefinger and thumb, resting fingers on the brow and cheekbone.</p> <p>d. Hold the irrigating syringe in dominant hand several inches above the inner canthus; with thumb, gently apply pressure on the plunger, directing the flow of solution from the inner canthus along the conjunctival sac.</p> <p>e. Irrigate until the prescribed amount of solution has been used.</p> | <p>10. Cleanses the eye socket. Disposal of cotton ball prevents transmission of microorganisms to other health care workers. Keeping eye in solution during cleaning decreases risk of damage.</p> <p>11. Indicates an infection.</p> <p>12. Cleanses the eye socket and removes secretions. Positioning of client facilitates ease in performing the procedure and client comfort.</p> <p>Assures compliance with client's regimen or prescribed orders.</p> <p>Keeps the eyelid open and the socket visible.</p> <p>Prevents injury to the client.</p> |
|---|--|

(continues)

PROCEDURE 31-14

Eye Care: Artificial Eye and Contact Lens Removal (continued)

<i>Action</i>	<i>Rationale</i>
<p>f. Wipe the eyelids with a moistened cotton ball after irrigating. Dispose of soiled cotton ball in biohazard bag.</p> <p>g. Pat the skin dry with the towel.</p> <p>h. Return the client to a semi-Fowler's position.</p> <p>i. Remove gloves, wash hands, and don clean gloves.</p> <p>13. Rub the artificial eye between index finger and thumb in the basin of warm soapy water.</p> <p>14. Rinse the prosthesis under running water or place in the clean basin of tepid water. Do not dry the prosthesis.</p> <p><i>Note:</i> Either reinsert the prosthesis (step 15) or store in a properly labeled container (step 16).</p> <p>15. Reinsert the prosthesis:</p> <p>a. With the thumb of the nondominant hand, raise and hold the upper eyelid open.</p> <p>b. With the dominant hand, grasp the artificial eye so that the indented part is facing toward the client's nose and slide it under the upper eyelid as far as possible.</p> <p>c. Depress the lower lid.</p> <p>d. Pull the lower lid forward to cover the edge of the prosthesis.</p> <p>16. Place the cleaned artificial eye in a labeled container with saline or tap water solution.</p> <p>17. Grasp a moistened cotton ball and squeeze out excessive moisture. Wipe the eyelid from the inner to the outer canthus. Dispose of the soiled cotton ball in a biohazard bag.</p> <p>18. Clean, dry, and replace equipment.</p> <p>19. Reposition the client, raise side rails, and place call light in reach.</p> <p>20. Dispose of biohazard bag according to institutional policy.</p> <p>21. Remove gloves and wash hands.</p> <p>22. Document procedure, client's response and participation, and client teaching and level of understanding.</p>	<p>Prevents transmission of microorganisms to prosthesis.</p> <p>13. Creates cleaning with friction and prevents breakage of the prosthesis.</p> <p>14. Removes soap and secretions. Keeping the artificial eye wet prevents irritation from lint or other particles that might adhere to it and facilitates reinsertion.</p> <p>15. Facilitates reinsertion of the prosthesis without discomfort to the client.</p> <p>Allows the prosthesis to slide into place.</p> <p>16. Protects the prosthesis from scratches and keeps it clean.</p> <p>17. Squeezing the cotton ball removes moisture. Cleansing the eyelid prevents contamination of lacrimal system. Disposal of cotton ball prevents the transmission of microorganisms to other health care workers.</p> <p>18. Promotes a clean environment.</p> <p>19. Promotes client's comfort, safety, and communication.</p> <p>20. Prevents the transmission of microorganisms to other health care workers.</p> <p>21. Same as step 20.</p> <p>22. Demonstrates that the procedure was done and the level of client participation and learning.</p>

(continues)

PROCEDURE 31-14

Eye Care: Artificial Eye and Contact Lens Removal (continued)

<i>Action</i>	<i>Rationale</i>
<i>Contact Lens Removal</i>	
<ol style="list-style-type: none"> 1. Assemble equipment for lens removal. 2. Assess level of assistance needed, provide privacy, and explain the procedure to the client. 3. Wash hands and don gloves. 4. Assist the client to a semi-Fowler's position. 5. Drape a clean towel over the client's chest. 6. Prepare the lens storage case with the prescribed solution. 7. Instruct the client to look straight ahead. Assess the location of the lens. If it is not on the cornea, either you or the client should gently move the lens toward the cornea with pad of index finger. 8. Remove the lens. <ol style="list-style-type: none"> a. Hard lens: <ul style="list-style-type: none"> • Cup nondominant hand under the eye • Gently place index finger on the outside corner of the eye and pull toward the temple and ask client to blink (Figure 31-46). b. Soft lens: <ul style="list-style-type: none"> • With nondominant hand, separate the eyelid with your thumb and middle finger. • With the index finger of the dominant hand gently placed on the lower edge of the lens, slide the lens downward onto the sclera and gently squeeze the lens. • Release the top eyelid (continue holding the lower lid down) and remove the lens with your index finger and thumb (Figure 31-47). <p><i>Note:</i> If step 8 is unsuccessful, secure a suction cup to remove the contact lens. If you are unable to remove the lens, notify the physician.</p> <ol style="list-style-type: none"> 9. Store the lens in the correct compartment of the case ("right" or "left"). Label with the client's name. 10. Remove the other lens by repeating steps 8 and 9. 	<ol style="list-style-type: none"> 1. Promotes efficiency. 2. Level of assistance determines level of intervention. Privacy reduces anxiety. Explanation of procedure promotes cooperation. 3. Reduces transfer of microorganisms. 4. Facilitates removal of lens. 5. Provides a clean surface and facilitates the location of a lens if it falls during removal. 6. Hard lenses can be stored dry or in a special soaking solution. Soft lenses are stored in sterile normal saline without a preservative. 7. Client's position promotes easy removal of lens. Positioning lens on the cornea aids removal. Use of the finger pad of the index finger prevents damage to cornea and lens. 8. Cupping the hand under eye helps to catch the lens and prevent breakage. Pulling corner of the eye tightens eyelid against eyeball. Pressure on upper edge of lens causes lens to tip forward. <p style="margin-left: 20px;">Separating the eyelid exposes the lower edge of lens.</p> <p style="margin-left: 20px;">Positions lens for easy grasping with the pad of the index finger, which prevents injury to the cornea and lens. Squeezing the lens allows air to enter and release the suction.</p> <p style="margin-left: 20px;">Suction cup is used to remove a lens from an unconscious or dependent client.</p> 9. Storage prevents damage to the lenses and ensures that each lens will be reinserted into the correct eye. 10. Refer to steps 8 and 9. <i>(continues)</i>

PROCEDURE 31-14

**Eye Care: Artificial Eye and Contact Lens Removal
(continued)**

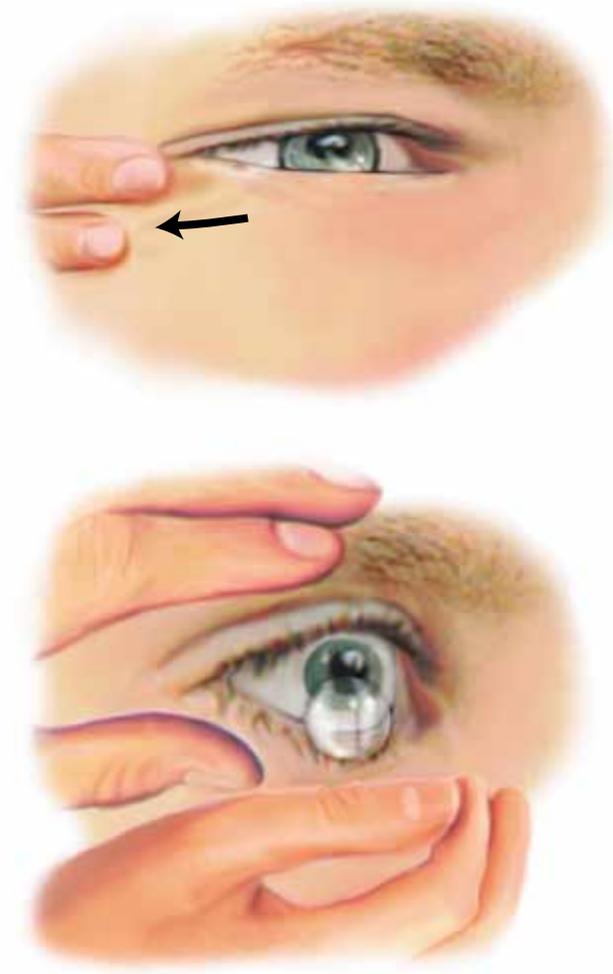
<i>Action</i>	<i>Rationale</i>
	

Figure 31-46 Removal of a Hard Contact Lens

- | | |
|--|--|
| <ul style="list-style-type: none"> 11. Assess eyes for irritation or redness. 12. Store the lens case in a safe place. 13. Dispose of soiled articles and clean and return reusable articles to proper location. 14. Reposition the client, raise side rails, and place call light in reach. 15. Remove gloves and wash hands. 16. Document procedure, client's response and assessment findings, and the storage place of the lenses. | <ul style="list-style-type: none"> 11. Signs of corneal irritation. 12. Prevents damage or loss. 13. Reduces transmission of infection. 14. Promotes client comfort, safety, and communication. 15. Prevents transmission of infection. 16. Documents the removal of lenses, condition of the cornea, and where the lenses are stored. |
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(continues)

PROCEDURE 31-14

Eye Care: Artificial Eye and Contact Lens Removal (continued)

Action

Rationale

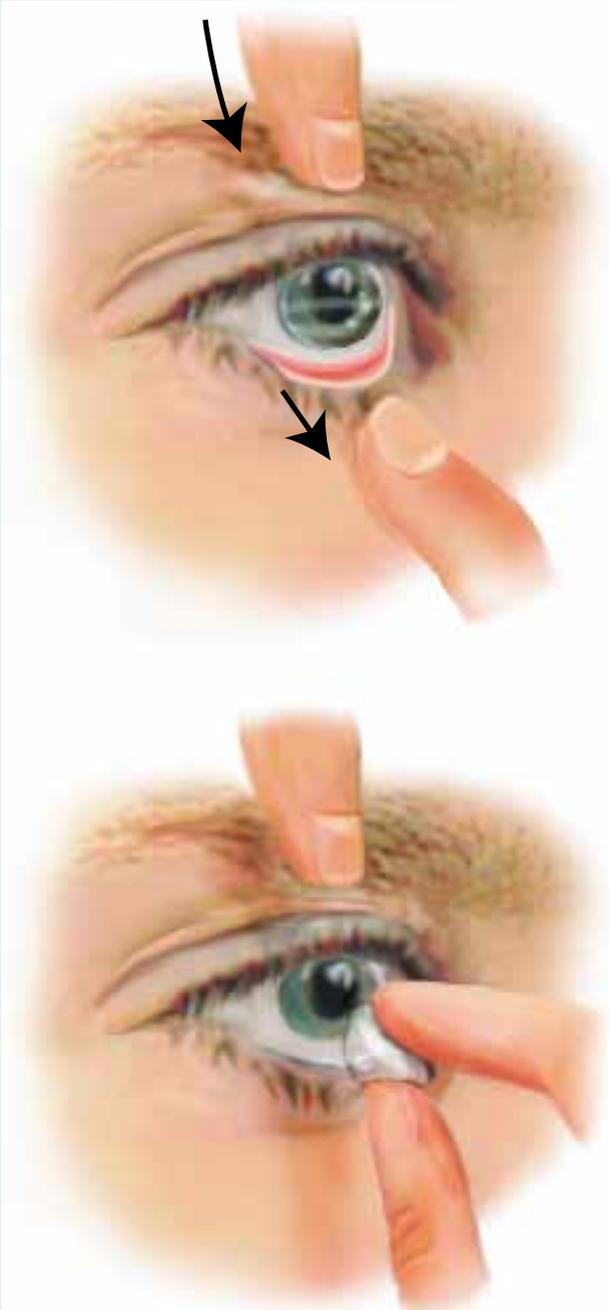


Figure 31-47 Removal of a Soft Contact Lens

Shouting causes distortion of sound and usually makes the client feel uncomfortable.

Nose

The nose provides the sense of smell, prevents entrance of foreign material into the respiratory tract, humidifies

inhaled air, and facilitates breathing. Excessive or dried secretions may impair nasal function. Excessive nasal secretions are removed by inserting a cotton-tipped applicator moistened with water or saline into the nostrils. The applicator should not be inserted beyond the cotton tip. Infants may have excessive nasal secretions removed by a suction bulb. Clients with a nasogastric

NURSING CARE PLAN**Client at Risk for Injury****Case Presentation**

Mr. Simon, age 75, is admitted to the hospital with coronary heart disease (CHD). He has a family history of CHD. He smokes two packs of cigarettes per day, has diabetes mellitus, and is obese.

Assessment

- Weight gain of 7 pounds in past month
- Blood cholesterol 320 mg/dl
- High-density lipoproteins (HDL) 28 mg/dl
- Blood pressure 186/116
- Diminished visual acuity
- Decreased bladder tone
- Weakness and syncope
- Glasgow Coma Scale (GCS) score of 12

Nursing Diagnosis #1

Risk for injury related to sensory dysfunction and altered level of consciousness.

Expected Outcome

The client will be protected from injury during the hospitalization.

Interventions/Rationales

1. Initiate the fall prevention protocol.
Identifies and reduces risk for injury.
2. Reassess the client's injury status every 4 hours.
Identifies changes and highlights need to modify plan of care.
3. Place the client in a room as close as possible to the nurses' station.
Facilitates faster response time to client's needs.
4. Place fall alert signs on the client's door and head of bed.
Alerts other health care workers to client's risk status.
5. Put the bed alarm on.
Helps monitor client status and facilitates prompt response if client tries to get out of bed unassisted.
6. Monitor the client and the environment every 2 hours and whenever a caregiver goes by the client's room.
Provides information on status, progress, and needs of client; encourages team approach to client care.
7. Instruct all caregivers to respond promptly to call light.
Ensures rapid response to client's needs.
8. Teach the client to use the call light; reinforce teaching each time before leaving the client alone.
Ensures that client has means and knowledge to call for assistance if necessary.

Evaluation

Fall prevention protocol implemented; client discharged on third day of hospitalization free from injury.

tube should receive meticulous skin care to the nose area to prevent skin breakdown.

EVALUATION

Evaluation is based on the achievement of goals and client expected outcomes, regardless of the setting. Clients with alterations in health perception–health management pattern or activity-exercise pattern are at

risk for injury, infection, and self-care deficits. Keeping the client free from injury and infection requires frequent reassessment, through the use of risk appraisals, with timely adjustments made in the plan of care in order for nursing interventions to be effective.

It is imperative that the client not only be free of injury during hospitalization but also develop a true awareness of the internal and external factors that increase the risk for injury. Achievement of this outcome measure is directly related to the behaviors the

Nursing Process Highlight

INTERVENTION

The use of restraints or other protective devices on confused clients usually increases their confusion, placing them at a greater risk for injury. Implementation of the fall protocol with frequent reassessment and visual observations and special beds with alarms that notify the staff when the client is trying to get out of the bed are actions that support client safety. Restraints should be used only when all other nursing measures are ineffective in providing client safety.

client observes while in the hospital and through client teaching. Modification of a home to a safe environment is evidence for the home health nurse that learning has taken place.

Adherence to barrier precautions is critical in preventing the spread of infectious agents, especially nosocomial infections to clients, self, and other health care workers. The nurse needs to correlate the client's diagnostic laboratory results and temperature in evaluating the expected outcome of remaining free of signs and symptoms of infection. If the nurse is caring for a client with an infection, the evaluation should indicate the stage of the inflammatory process (refer to Table 31-1).

The therapeutic value of hygiene is maximized when the client can participate and is kept free from infection and alterations in skin integrity. Evaluation should identify the client's level of functioning in self-care activities.

At the time of discharge from the hospital, appropriate referrals should be made to home health care agencies to assist the client in achieving optimum functioning levels for safety and hygienic practices. Clients at risk for infection should have follow-up visits by the home health nurse to measure the effectiveness of client teaching and resources in the home to prevent the transmission of infections.

KEY CONCEPTS

- Factors influencing client safety are age, lifestyle, sensory and perceptual alterations, mobility, and emotional state.
- Types of accidents that can occur in the health care setting are client behavior, therapeutic procedure, and equipment accidents.
- Assessment of a safe environment consists of performing an injury risk appraisal.
- Nurses can help clients in maintaining a safe environment by resolving or alleviating hazards related to

falls, lighting, obstacles, bathroom hazards, fire, electricity, radiation, poisoning, and noise pollution.

- The chain of infection involves a biological agent, a reservoir of the agent, a portal of exit, a mode of transmission, a portal of entry of the agent into the host, and a susceptible host.
- Medical and surgical asepsis prevent the transfer of microorganisms by implementation of practices that reduce the number, growth, or spread of microorganisms from an object or area.
- The new guidelines from the CDC require that transmission-based precautions be used for specific syndromes that are highly suspicious for infections until a diagnosis is confirmed.
- Hygienic practices are influenced by body image, social and cultural practices, personal preference, socioeconomic status, and knowledge.
- Basic hygienic practices include bathing, skin care, perineal care, back rubs, foot and nail care, oral care, hair care, and eye, ear, and nose care.

CRITICAL THINKING ACTIVITIES

1. Write a description of the typical hospital room. From this description, describe what nursing interventions would be implemented to provide a safe client environment.
2. Develop a safety protocol for a 65-year-old client who is confused and has severe arthritic contractures of the hands.
3. A client admitted to the intensive care unit has been diagnosed with methicillin-resistant *Staphylococcus aureus* (MRSA). The MRSA is transmitted by direct contact. What isolation precautions are necessary to break the chain of infection?
4. Several factors are known to affect a client's personal hygiene practices. List these factors. Describe how these factors may influence a client's personal hygiene practices.

WEB RESOURCES

- Agency for Health Care Policy and Research (AHRQ)
www.ahrq.gov
- Association for Professionals in Infection Control and Epidemiology
www.apic.org
- Avert
www.avert.org
- Certification Board of Infection Control and Epidemiology
www.cbic.org
- HealthCare Report Cards
www.healthcarereportcards.com
- Hospital Infections Program, Centers for Disease Control and Prevention
www.cdc.gov

International Health Care Worker Safety Center at the
University of Virginia
www.med.virginia.edu
John Hopkins University Infection Control
Department
www.hopkins-id.edu
Joint Commission on the Accreditation of Healthcare
Organization
www.jcaho.org
National Center for Infectious Diseases, Centers for
Disease Control and Prevention
www.cdc.gov

National Foundation for Infectious Diseases
www.nfid.org
Occupational Safety & Health Administration, U.S.
Department of Labor
www.osha.gov
Society for Healthcare Epidemiology of America, Inc.
www.medscape.com
University of Michigan Health System's Infection
Control Manual
www.med.umich.edu
Washington University Infectious Diseases Division
www.id.wustl.edu

Oxygenation



And what nursing has to do in either case, is to put the patient in the best condition for nature to act upon him.

—Florence Nightingale (in Skretkowicz, 1992)

COMPETENCIES

1. Describe the basic physiological mechanisms of ventilation, circulation, and oxygenation.
2. Assess the client's ventilatory, circulatory, and oxygenation status.
3. Explain potential client outcomes when oxygenation is impaired.
4. State common client knowledge deficits related to oxygenation impairment.
5. Develop nursing interventions that promote oxygenation.
6. Describe actions for emergency support of airway, ventilation, and circulation.

KEY
TERMS

aerobic metabolism
anaerobic metabolism
anemia
angina pectoris
atelectasis
atherosclerosis
autoregulation
cardiac conduction system
cardiac cycle
cardiac output
cardiopulmonary
resuscitation (CPR)
chest physiotherapy (CPT)
chronic obstructive
pulmonary disease
(COPD)
cyanosis
dead-space

diastole
diffusion defect
external respiration
gallop
heart failure
Heimlich maneuver
hypercapnia
hypoxemia
hypoxia
infarction
intermittent claudication
internal respiration
ischemia
murmur
obstructive pulmonary
disease
oxygen uptake

oxyhemoglobin dissociation
curve
paroxysmal nocturnal
dyspnea
postural drainage
precapillary sphincters
restrictive pulmonary disease
shunting
sleep apnea
surfactant
systole
tachypnea
tracheotomy
ventilation
ventilation-perfusion (V/Q)
mismatching
work of breathing

Oxygenation (the delivery of oxygen to the body's tissues and cells), is necessary to maintain life and health. Clients with compromised oxygenation status need careful assessment and thoughtful nursing care to achieve an adequate and comfortable level of oxygenation function. The purpose of this chapter is to explore the elements of the process of oxygenation, common mechanisms by which it may be impaired, and interventions that are aimed at improving oxygen delivery to the cells.

PHYSIOLOGY OF OXYGENATION

The delivery of oxygen to the body's cells is a process that depends upon the interplay of the pulmonary, hematologic, and cardiovascular systems. Specifically, the processes involved include ventilation, alveolar gas exchange, oxygen transport and delivery, and cellular respiration. The basic anatomy of the lungs is shown in Figure 32-1.

Ventilation

The first step in the process of oxygenation is **ventilation**, which is the movement of air into and out of the lungs for the purpose of delivering fresh air into the lung's alveoli (Figure 32-2). Ventilation is regulated by respiratory control centers in the pons and medulla oblongata, which are located in the brain stem. The rate and depth of ventilation are constantly adjusted in response to changes in the concentrations of hydrogen ion (pH) and carbon dioxide (CO₂) in the body's fluids. For instance, an increase in carbon dioxide in the blood or a decrease in pH in the body's fluids will stimulate

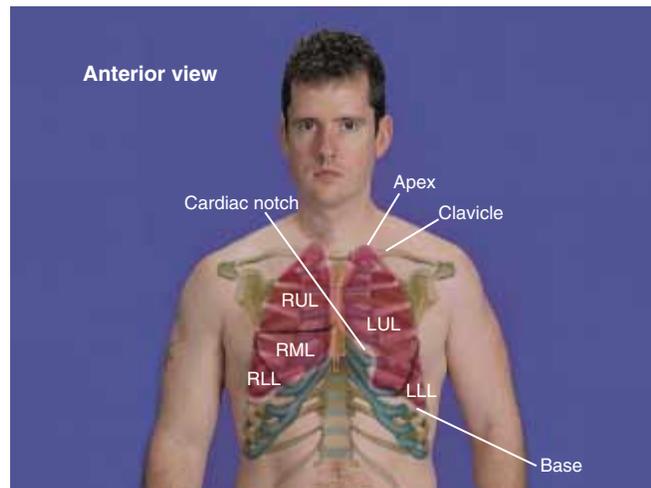


Figure 32-1 Lungs. RUL=right upper lobe, RML=right middle lobe, RLL=right lower lobe, LUL=left upper lobe, LLL=left lower lobe.

faster and deeper ventilation. A decrease in blood oxygen concentration (**hypoxemia**) will also stimulate ventilation, but to a lesser degree.

Inhalation of air is initiated when the diaphragm contracts, pulling it downward and thus increasing the size of the intrathoracic space (Figure 32-3). This space is also increased by contraction of the external intercostal muscles, which elevate and separate the ribs and move the sternum forward. The effect of increasing the space inside the thorax is to decrease the intrathoracic pressure, so that air will be drawn in from the atmosphere. Stretch receptors in the lung tissue send signals back to the brain to cause cessation of inhalation, preventing overdistension of the lungs. Exhalation occurs when the respiratory muscles relax, thus reducing the size of the intrathoracic space, increasing the intrathoracic pressure, and forcing air to exit the lungs. Under normal conditions, exhalation is a passive process.

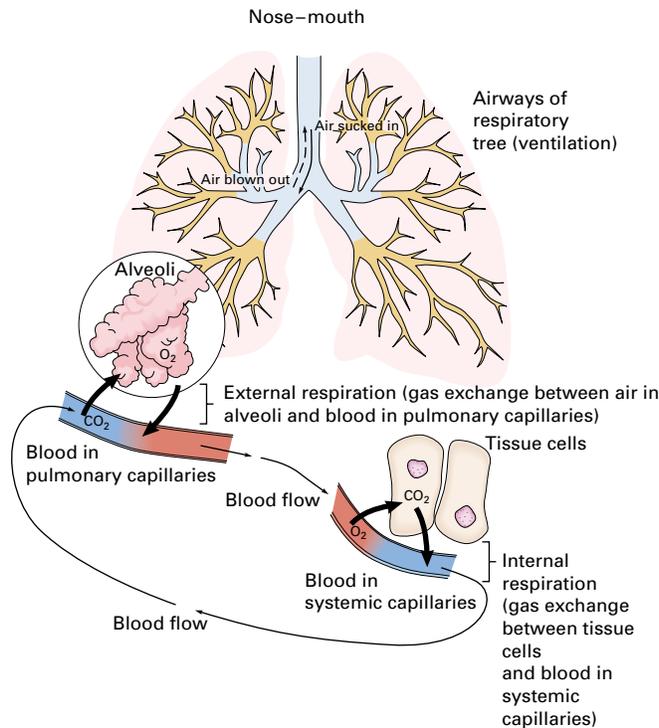


Figure 32-2 Elements of Oxygenation of the Pulmonary and Hematologic Systems

When the movement of air is impeded, additional muscles may be used to increase the ventilatory ability. These accessory muscles of ventilation include the sternocleidomastoid muscle, the abdominal muscles, and the internal intercostal muscles. In some disease states,

exhalation is impaired, requiring that the individual actively force air out of the lungs rather than passively exhaling. Forced expiration is aided by the intercostal muscles and the abdominal recti. When additional muscular force is required for breathing, the **work of breathing** is said to be increased.

Several mechanisms exist to keep the airways clear of microorganisms and debris. As air is inhaled through the nose, the larger particles are filtered out through hairs lining the nasal passages. The mucous membranes of the nasopharynx and sinuses warm and humidify the inspired air, and the film of mucus lining these membranes traps smaller particles. Closure of the glottis protects the airway from aspiration of food and fluids during swallowing. In the trachea and larger bronchi, tiny hairlike cilia continually produce wavelike movements to propel mucus and particles upward, where they can be coughed out. If any invaders manage to reach the alveoli, specialized alveolar macrophages will engulf and destroy the offending organism. Disease processes can interfere with any of these protective mechanisms, increasing the individual's vulnerability to infection and injury.

Alveolar Gas Exchange

Once fresh air reaches the lung's alveoli, the next step in the process of oxygenation begins. The exchange of oxygen from the alveolar space into the pulmonary capillary blood is referred to as **oxygen uptake**; it may also be called **external respiration**. Oxygen diffuses across

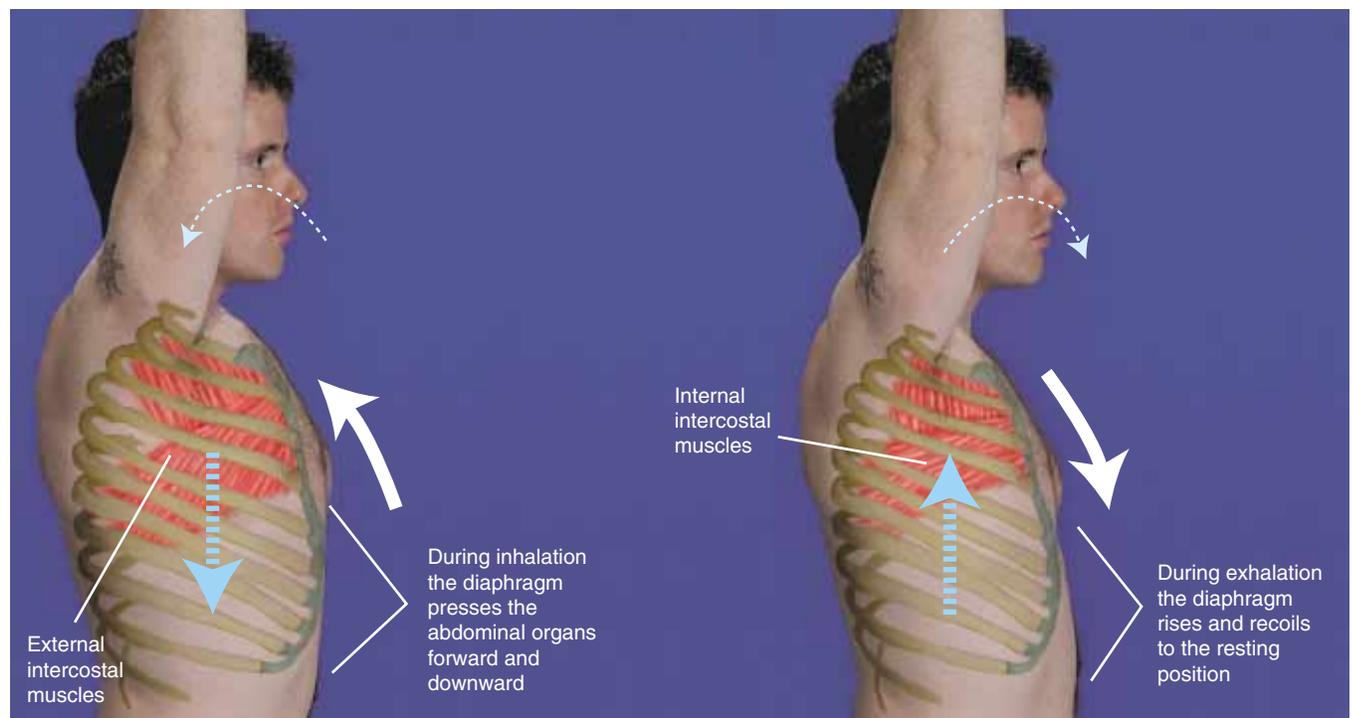


Figure 32-3 Mechanics of breathing. Inhalation increases the volume of the thorax by diaphragmatic excursion and elevation of the sternum. Exhalation is normally accomplished by passive elastic recoil.

the alveolar membrane in response to a concentration gradient; that is, it moves from an area of higher concentration (the alveoli) to an area of lower concentration (the pulmonary capillary blood), seeking equilibrium. At the same time, carbon dioxide diffuses from the blood to the alveolar space, also in response to a concentration gradient (Figure 32-4).

Oxygen Transport and Delivery

Oxygen Transport in the Blood

Once the diffusion of oxygen across the alveolar-capillary membrane occurs, the oxygen molecules are dissolved in the blood plasma. Three factors influence the capacity of the blood to carry oxygen: the amount of dissolved oxygen in the plasma, the amount of hemoglobin, and the tendency of the hemoglobin to bind with oxygen. However, the plasma is not able to carry nearly enough dissolved oxygen to meet the metabolic needs of the body. The oxygen-carrying capacity of the blood is greatly enhanced by the presence of hemoglobin in the erythrocytes.

The amount of oxygen carried in a sample of blood is measured in two ways. Oxygen dissolved in plasma is expressed as the partial pressure of oxygen (PaO_2). The normal PaO_2 in arterial blood is about 80 to 100 mm Hg. The oxygen dissolved in plasma, however, represents only about 1% to 5% of the total oxygen content of the blood. The vast majority of oxygen in the blood is carried bound to the hemoglobin molecule. The amount of oxygen bound to hemoglobin is expressed as the percentage of hemoglobin that is saturated with oxygen (SaO_2), with 100% being fully saturated. Since the SaO_2 is a percentage indicating the relationship

between oxygen and hemoglobin, the nurse should interpret the client's SaO_2 measurement with the hemoglobin level. Normal saturation of arterial blood (SaO_2) is about 96% to 98%.

Hemoglobin molecules have the ability to form a reversible bond with oxygen molecules, so that the hemoglobin readily takes up oxygen in the lungs, while it also readily releases oxygen to the body's cells in the systemic capillary beds. This seemingly paradoxical shift in hemoglobin's affinity for oxygen is represented by the **oxyhemoglobin dissociation curve**, which is a graphic representation of the relationship between the partial pressure of oxygen and oxygen saturation.

The affinity of hemoglobin for oxygen is highest when the PaO_2 (the measure of oxygen dissolved in the arterial blood plasma) is 70 mm Hg or higher; in this portion of the curve, further increases in PaO_2 result in very little change in SaO_2 (Figure 32-5A). This characteristic of the oxyhemoglobin dissociation curve accounts for the rapid uptake of oxygen by hemoglobin in the pulmonary circulation and allows for some decrease in PaO_2 (such as might occur with disease or in high altitudes) without significantly sacrificing SaO_2 .

As the oxygen-saturated blood is circulated to the peripheral capillary beds, dissolved oxygen diffuses out of blood. This decrease in dissolved oxygen causes hemoglobin to lose its affinity for oxygen, so the oxygen is then released to the body's cells. Once the partial pressure of oxygen in the blood drops below 60 mm Hg, hemoglobin releases oxygen very easily. This release is represented in the lower left portion of the curve, also known as the venous portion, and permits rapid unloading of oxygen to the cells (Figure 32-5B).

Several physiological factors may alter the affinity of hemoglobin for oxygen, and these shifts can be represented on the oxyhemoglobin dissociation curve. A shift to the left occurs when affinity is increased so that, for a given PaO_2 , the associated SaO_2 will be higher. This means that, although the arterial blood may be carrying adequate oxygen, little of it is being released to the tissues. A shift to the left may be caused by increased pH (alkalosis), hypothermia, or a decrease in the red blood cell enzyme 2,3-diphosphoglycerate (2,3-DPG), which may occur after massive transfusions of banked blood.

A shift to the right of the oxyhemoglobin dissociation curve means that, for a given PaO_2 , the SaO_2 will be lower. This phenomenon represents a decreased affinity of hemoglobin for oxygen so that oxygen is more readily released to the tissues. This shift occurs in response to acidosis, hyperthermia, and hypoxia (which induces increased production of 2,3-DPG) and results in improved delivery of oxygen to the tissues.

Circulation

Once oxygen is bound to hemoglobin, the oxygen is delivered to the cells of the body by the process of circulation. Circulation of the blood is the function of the heart and blood vessels.

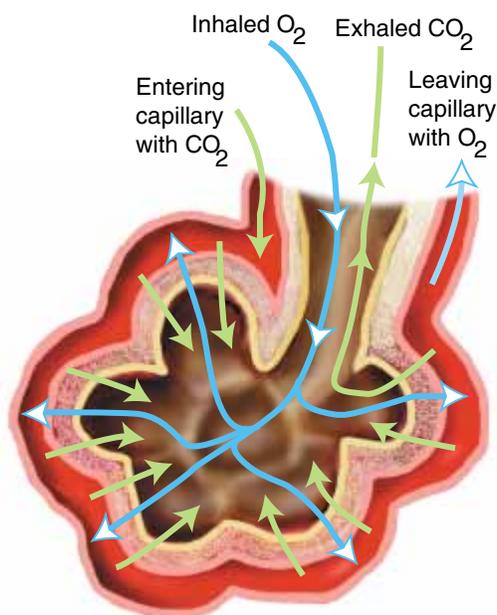


Figure 32-4 Alveolar Gas Exchange

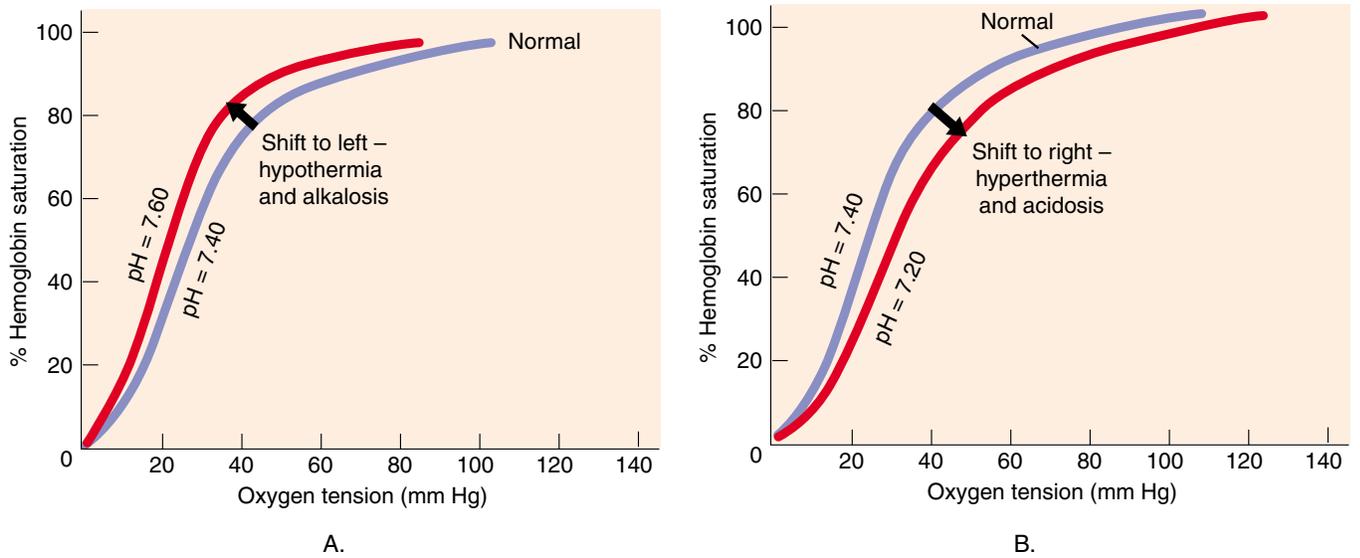


Figure 32-5 Oxyhemoglobin Dissociation Curve: A. Effect of increase in pH; B. Effect of decrease in pH

The heart is a muscular pump that is divided into four chambers: the right and left atria and the right and left ventricles (Figure 32-6). A series of valves allows for unidirectional blood flow through the chambers, which is driven by the sequential contraction and relaxation of the heart muscle.

A single cycle of atrial and ventricular contraction and relaxation is referred to as a **cardiac cycle**, which is the product of the interplay of electrical and mechanical events. The electrical activity of the heart involves the generation and transmission of electrical current by specialized cardiac cells known as the **cardiac conduction**

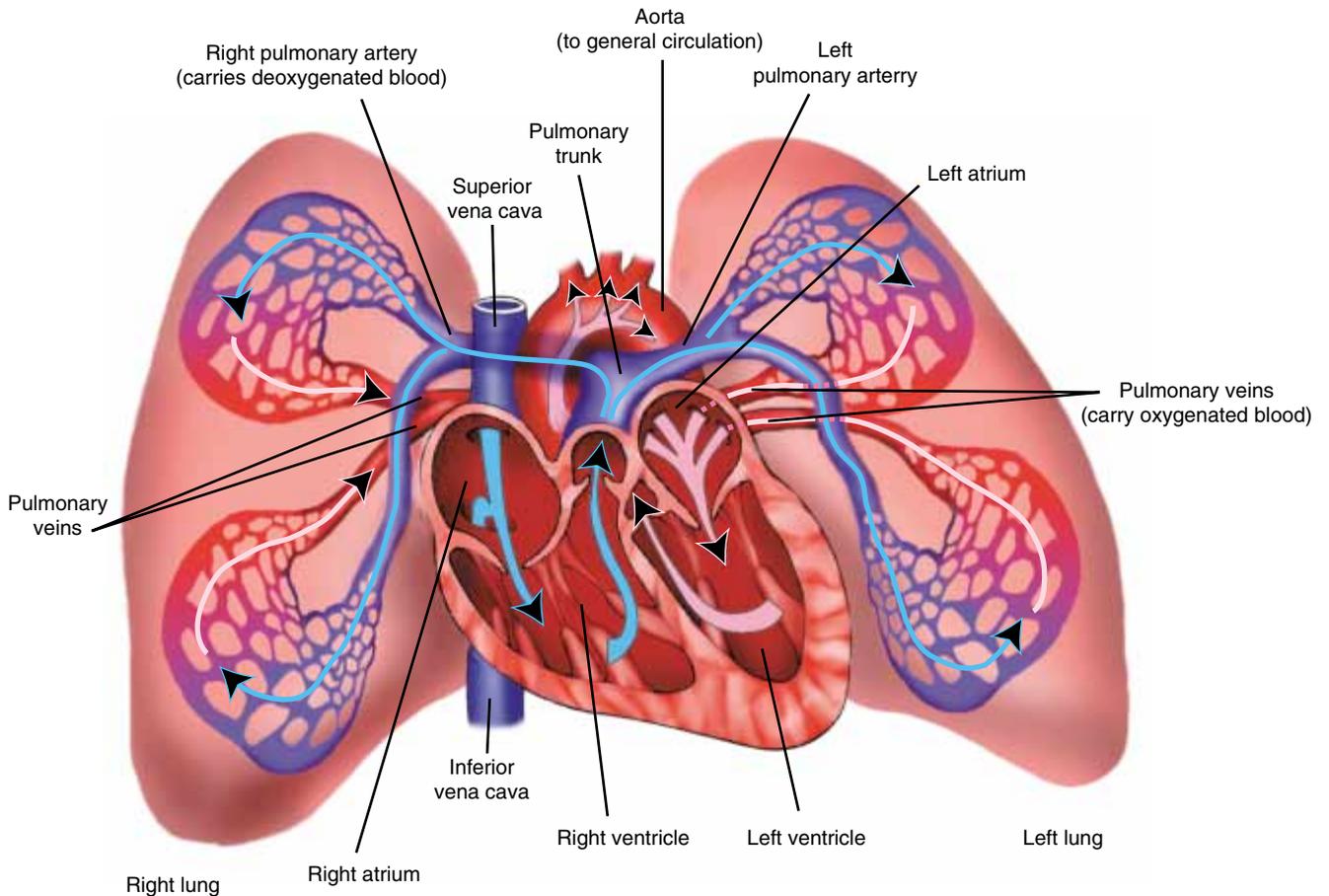


Figure 32-6 Major Structures of the Heart and Pulmonary Circulation

system (Figure 32-7). A small mass of cells in the right atrium, the *sinoatrial node*, or *SA node*, normally controls the heart rate by rhythmically generating electrical impulses. For this reason, the SA node is often referred to as the heart's "pacemaker." The impulses created by the SA node travel along specialized internodal pathways to spread throughout the atria, resulting in mechanical muscular contraction. The electrical activity is then transmitted down to the ventricles via the *atrioventricular (AV) node* and spreads through the ventricular tissue along the *bundle of His*, *right and left bundle branches*, and *Purkinje fibers*. Again, the result is muscular contraction. The sequential contraction and relaxation of the atria and ventricles is an essential factor in the cyclical filling and emptying of the chambers, which produce circulation.

The process of chamber filling is referred to as **diastole**, and the process of a chamber emptying is **systole**. Atrial diastole occurs as the right and left atria relax and blood flows into the right and left atrial chambers from the venae cavae and pulmonary veins, respectively. As pressure rises in the atria, the atrioventricular valves (the mitral and tricuspid) open, permitting the blood to begin flowing into the ventricles. Ventricular filling is further augmented by contraction of the atrial muscle (atrial systole), forcing additional blood into the ventricles. This contribution to ventricular filling is sometimes called "atrial kick."

Filling of the ventricles causes the intraventricular pressure to rise. When the intraventricular pressure exceeds the pressure in the atria, the atrioventricular

valves close. The ventricular muscle then begins to contract, further increasing intraventricular pressure until it is sufficient to force open the two semilunar valves (the pulmonic and aortic valves). As contraction of the ventricular walls proceeds, blood is forced out of the ventricles and into the circulation (ventricular systole).

Blood leaving the right ventricle is pumped into the pulmonary artery, which quickly branches into right and left pulmonary arteries. Further division of the pulmonary arterial tree culminates in the pulmonary capillary bed. Blood in the pulmonary capillaries is in very close contact with the alveolar air; it is here that alveolar-capillary gas exchanges take place. From the pulmonary capillaries, the freshly oxygenated blood flows into the pulmonary veins and to the left atrium, which delivers it to the left ventricle (Figure 32-8).

Blood leaving the left ventricle enters the aorta. The aorta serves as the "trunk" of the arterial tree, with branches leading to every organ and tissue group in the body. Blood flow through the arterial system is driven by the pressure generated during ventricular systole and is influenced by the volume and viscosity of the blood and the amount of resistance within the arterial system. Blood flow to specific organs and tissues may be increased or reduced by the relaxation or contraction of **precapillary sphincters**, which are rings of smooth muscle surrounding the arterioles. This mechanism allows for redistribution of blood flow to the areas of greatest need, a process known as **autoregulation**.

Blood return through the venous system is also driven by pressure gradients, although the venous sys-

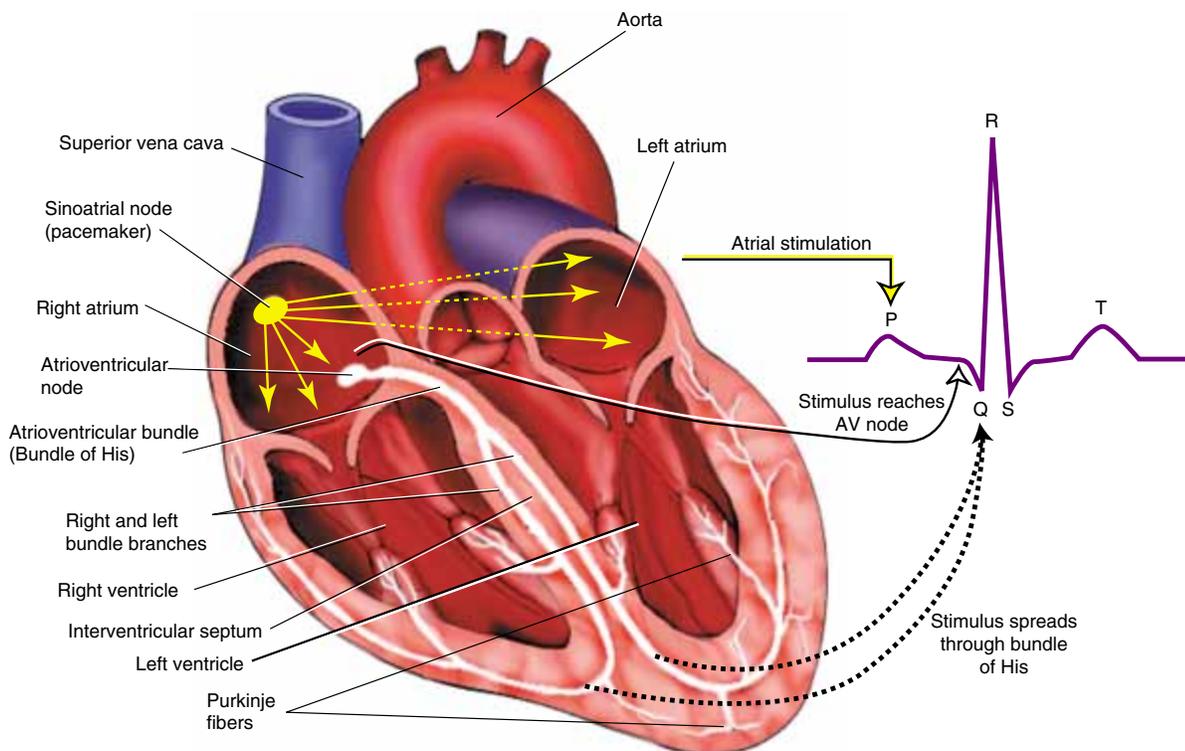


Figure 32-7 Cardiac Conduction System

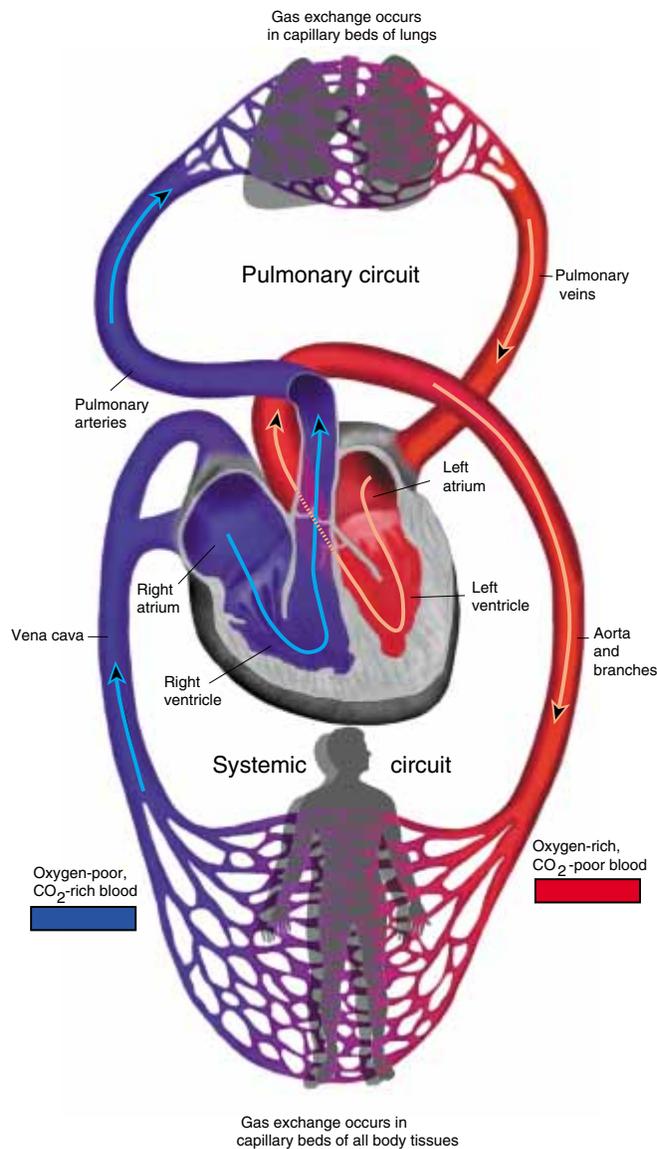


Figure 32-8 Systemic and Pulmonary Circuits

tem operates under lower pressure than the arterial system does. In order to boost venous return, many veins (particularly in the lower extremities) are equipped with valves that prevent backward flow of blood (regurgitation); as the veins are compressed by their surrounding skeletal muscles, blood is forced along toward the vena cava and ultimately to the right atrium.

Cellular Respiration

Gas exchange at the cellular level, like that at the alveolar level, takes place via diffusion in response to concentration gradients. Oxygen diffuses from the blood to the tissues, while carbon dioxide moves from the tissues to the blood; the blood is then reoxygenated by the heart. This process is referred to as **internal respiration**.

FACTORS AFFECTING OXYGENATION

Adequate oxygenation is influenced by many factors, including age, environmental and lifestyle factors, and disease processes.

Age

Oxygenation status can be influenced by age. Older adults may exhibit a barrel chest and require increased effort to expand the lungs. Loss of alveolar gas exchange is accompanied by a decrease in the partial pressure of oxygen. Older adults are also more susceptible to respiratory infection because of decreased activity in the cilia, which normally are an effective defense mechanism.

THINK ABOUT IT

Tobacco Use

If you are a smoker, would you feel comfortable suggesting that your clients avoid smoking in order to maintain a healthy oxygenation status? Imagine that a client smelled cigarette smoke on your breath when you returned from your break. How would you respond?

Environmental and Lifestyle Factors

Environmental and lifestyle factors can significantly affect a client's oxygenation status. Clients who are exposed to dust, animal dander, asbestos, or toxic chemicals in the home or workplace are at increased risk for alterations in oxygenation. Individuals who experience

NURSING TIP

Maintaining Healthy Oxygenation

Encourage clients to:

- Leave windows open for ventilation instead of using an air conditioner or humidifier.
- Change filters on furnaces, heaters, and range hoods as recommended by manufacturer.
- Wear a mask when working with hazardous materials, such as asbestos.
- Limit physical exertion if it causes shortness of breath.
- Refrain from smoking.

significant physical or emotional stress or who are obese or underweight are also subject to changes in oxygenation status. Smokers and those exposed to second-hand smoke should be questioned as to the type and amount of tobacco and number of years of exposure.

Disease Processes

Oxygenation alterations can often be traced to disease states related to alterations in ventilation, alveolar gas exchange, oxygen uptake, or circulation. There are many disease states that may affect oxygenation, including obstructive pulmonary disease, restrictive pulmonary disease, diffusion defects, ventilation-perfusion mismatching, atherosclerosis, heart failure, anemia, and alterations in oxygen uptake.

Obstructive Pulmonary Disease

Alterations in ventilation may be related to obstructive or restrictive pulmonary disease. **Obstructive pulmonary disease** occurs when the airways become partially or completely blocked, diminishing airflow, or the lungs lose some of their elastic recoil, trapping stale air, which should be exhaled. In both cases, the end result is impaired exhalation, air trapping, and difficulty bringing fresh air into the alveoli (Figure 32-9). The most common obstructive pulmonary diseases are asthma, emphysema, and chronic bronchitis, collectively known as **chronic obstructive pulmonary disease (COPD)**.

Restrictive Pulmonary Disease

Restrictive pulmonary disease represents pathologies that impair the ability of the chest wall and/or lungs to expand during the inspiratory phase of ventilation. This impairment increases the work of breathing and also reduces airflow to the alveoli. A wide variety of disorders cause restrictive lung disease, including pneumonia and pulmonary fibrosis (scarring).

NURSING ALERT

Risk Factors for Pneumonia

The following compromise a client's respiratory health, increasing the susceptibility to pneumonia:

- Smoking
- Emphysema
- Intoxication
- Weak cough reflex
- Immunosuppressed status
- Medicated or unconscious status

Traumatic injury to the thorax or a break in the pleural membrane that surrounds the lungs may also produce restrictive pulmonary dysfunction. The stability of the chest depends upon the rib cage; multiple rib fractures may produce a type of paradoxical chest wall movement called “flail chest” that impedes normal airflow. The dual-layer pleural membrane also has an important structural function; it helps maintain a negative pressure between its two layers that keeps the lungs from collapsing upon themselves. A break in either layer of the membrane or an abnormal collection of fluid between them interferes with this function, permits alveoli to collapse, and increases the work of breathing. Common pleural defects are described in Table 32-1.

Alveolar collapse, known as **atelectasis**, can be caused by pleural defects as described above, by compression from a mass such as a tumor, or by occlusion of the small airways by secretions, which prevents air movement into the associated alveoli. Failure of a client to breathe deeply after abdominal surgery may result in atelectasis. Regardless of the cause, atelectasis results in restrictive pulmonary dysfunction and reduces the amount of alveolar-capillary surface area engaged in gas exchange.

Diffusion Defects

Another mechanism of oxygenation impairment is a decrease in the efficiency of gas diffusion from the alveolar

TABLE 32-1
Common Pleural Defects

Pleural Defect	Description
Pleural effusion	Collection of fluid between the pleural layers. May consist of serous fluid (hydrothorax), purulent fluid (empyema), or chyle (chylothorax).
Hemothorax	Collection of blood between the pleural layers.
Pneumothorax	A collection of air between the pleural layers caused by a hole in one or both layers of the pleural membrane. May be classified as <i>open</i> (communicating with a chest wall wound) or <i>closed</i> (no exterior wound).
Tension pneumothorax	A pneumothorax that rapidly expands with each respiratory cycle, compressing the lungs and heart and pushing the great vessels and trachea toward the opposite side of the chest. A <i>tension pneumothorax</i> is a medical emergency requiring immediate intervention.

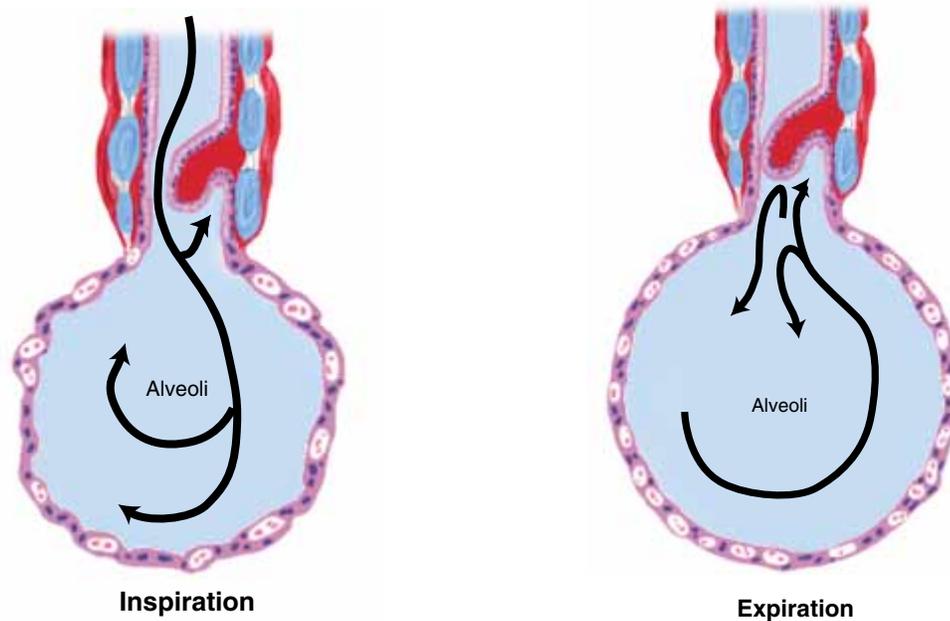


Figure 32-9 One mechanism of air trapping in COPD. During inspiration, the airway widens and opens. During exhalation, the airway closes, trapping air distal to the obstruction and preventing fresh air from entering the alveoli.

space into the pulmonary capillary blood, known as a **diffusion defect**. This may be caused by thickening of the alveolar-capillary basement membrane or by marked increases in the speed of blood flow through the pulmonary capillary beds, which reduce contact time with the alveoli. Diffusion defects by themselves are uncommon but may coexist with obstructive or restrictive pulmonary disease such as emphysema, pulmonary edema, or fibrosis.

Ventilation-Perfusion Mismatching

Gas exchange across the alveolar-capillary membrane is also influenced by **ventilation-perfusion (V/Q) mismatching**, or the balance between ventilation and perfusion. The amount of fresh air entering the alveoli (alveolar ventilation) and the amount of blood flow to various regions of the pulmonary capillary network (perfusion) are not uniform throughout the lungs. Due to alterations in position and the effect of gravity, certain zones of lung tissue may have better ventilation or perfusion than others at any given time.

An important mechanism of compensation in healthy lung tissue is to produce vasoconstriction or bronchoconstriction as needed to better match ventilation to perfusion or vice versa. Many disease states, however, produce areas of ventilation-perfusion mismatching that cannot be overcome by compensatory responses. When mismatching occurs, some alveolar regions will be well ventilated but poorly perfused (a condition known as **dead space**), while others may be well perfused but poorly ventilated (known as **shunting**). This phenomenon is illustrated in Figure 32-10.

Alterations in circulation may occur in either the pulmonary or the systemic vasculature and may be localized or generalized. Generalized decreases in pulmonary circulation may be caused by right-sided heart failure or by

pathologies in the pulmonary vascular system such as pulmonary hypertension and the resultant pulmonary artery sclerosis. Regional decreases in pulmonary circulation may be related to blockage of a pulmonary artery by an embolus or by regional vasoconstriction.

Atherosclerosis

Alterations in systemic circulation may also be generalized or localized. A common cause of altered arterial circulation is **atherosclerosis**. This disease is characterized by narrowing and eventual occlusion of the lumen (opening of the arteries) by deposits of lipids, fibrin, and calcium on the interior walls of the arteries (Figure 32-11). The



NURSING TIP

Reducing Risk for Atherosclerosis

Because accumulation of fats is a primary cause of atherosclerosis, encourage your clients to reduce their risk of this disease by:

- Monitoring cholesterol intake
- Lowering fat intake to less than 30% of daily calories
- Increasing intake of carbohydrates to compensate for loss of calories not consumed in fat
- Exercising according to a plan outlined by a health care provider

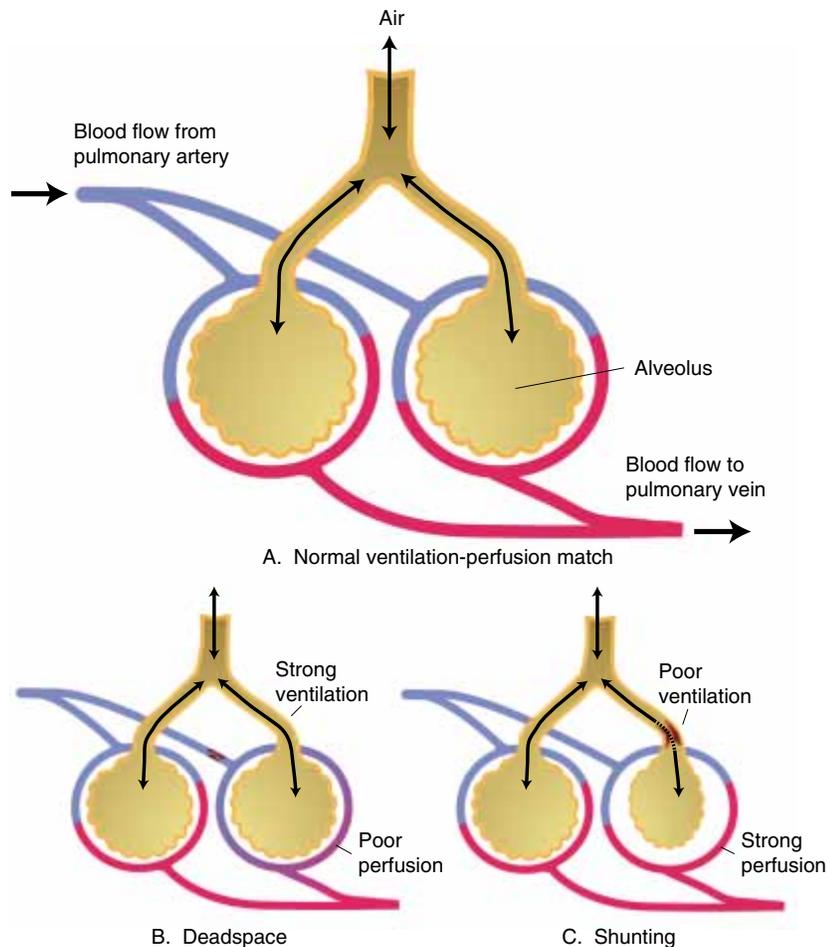


Figure 32-10 Types of Ventilation-Perfusion Abnormalities

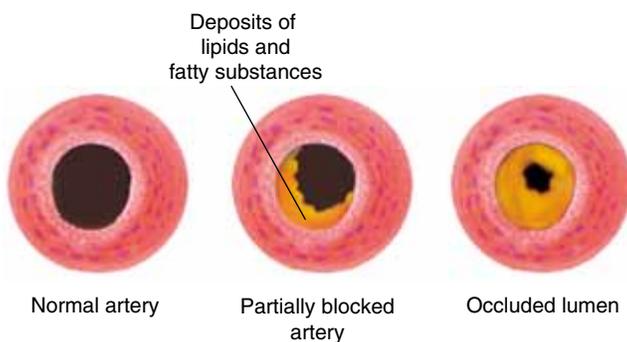


Figure 32-11 Progression of Atherosclerosis

reduction in blood flow with accompanying oxygen deprivation leads to **ischemia** (deprivation of blood flow) and eventual **infarction** (necrosis or death) of the affected tissue. Atherosclerosis in the coronary arteries (coronary heart disease) and the arteries of the brain (cerebral vascular disease) causes myocardial infarction and stroke, respectively, two of the leading causes of death in our society.

Heart Failure

Generalized decreases in tissue perfusion may be caused by left-sided heart failure or by loss of circulating blood volume

as may occur with shock or hemorrhage. **Heart failure** is a condition in which the heart is unable to pump enough blood to meet the metabolic needs of the body; typically, this is accompanied by a backup of blood in the venous circuits (pulmonary and systemic veins), leading to the condition known as congestive heart failure. The increased pressure of the blood in the engorged veins causes fluid to leak out of the associated capillary beds, causing edema in the tissue, including the lungs (pulmonary edema).

Congestive heart failure results in poor arterial perfusion to the body's tissues. This reduction in **cardiac output** (amount of blood pumped by the heart) may be mild, causing only vague symptoms, or may be profound enough to cause death. Causes of congestive heart failure include myocardial infarction, hypertensive heart disease, and valvular disorders, among others.

Loss of circulating blood volume (hypovolemia) may result from massive bleeding, loss of fluid through a wound (such as an extensive burn injury), or severe dehydration.

Anemia

Another factor that influences oxygenation is the amount of hemoglobin in the blood available to bind with oxygen. A deficiency of hemoglobin (**anemia**) may decrease the oxygen-carrying capacity of the blood. A

SPECIAL CONSIDERATIONS

Sexuality

Clients who are recovering from acute cardiac compromise, such as congestive heart failure or myocardial infarction, will need sensitive nursing care and education regarding sexual activity. Help alleviate their concerns by sharing the following American Heart Association (AHA) recommendations:

- Check with your health care provider.
- Resume sexual activity when you feel ready; most cardiac-compromised clients can safely resume sexual activity within 2 to 4 weeks.
- Take it slow and establish your comfort level; begin with lower energy forms of sexual expression, such as touching and holding.
- Continue taking prescribed cardiac medications; report to your health care provider any impact of these medications on sexual desire and performance.
- Experiencing an increased awareness of breathing, heartbeat, and muscle tightening during sexual activity is normal.

person who is anemic may have normal SaO₂ levels but still continue to experience inadequate tissue oxygenation at the cellular level. Certain poisoning syndromes, most notably carbon monoxide poisoning, mimic anemia in that they reduce oxygenation by competing with oxygen for binding sites on the hemoglobin molecule.

Alterations in Oxygen Uptake

A final factor to consider in the process of oxygenation involves the uptake of oxygen by the body's cells. Certain conditions may impair the cells' ability to take up and utilize oxygen, particularly when the mitochondria are damaged. Cyanide poisoning and severe sepsis impair mitochondrial functioning, rendering the oxygen in arterial blood useless to the cells.

Physiological Responses to Reduced Oxygenation

When oxygen delivery is inadequate to meet the metabolic needs of the body, various responses to this deficit can be expected, including changes in metabolic pathways and efforts to increase the extraction of available oxygen. If these efforts fail, cells will be damaged and ultimately die.

Increased Oxygen Extraction

Under normal conditions, the cells of the body do not extract all of the oxygen carried in the arterial blood. In fact, blood returning to the heart via the venous circulation

is typically about 75% saturated with oxygen. In response to poor oxygen delivery or increased oxygen need, the cells can extract more oxygen from the arterial blood.

Anaerobic Metabolism

The utilization of food (glucose) for cellular energy occurs via metabolic pathways that use oxygen; this is known as **aerobic metabolism**. Many cells are also capable of utilizing alternate metabolic pathways in the absence of oxygen for short periods of time; this is referred to as **anaerobic metabolism**. Anaerobic metabolism is limited by several factors:

1. Not all cells are capable of significant anaerobic metabolism (most notably brain cells).
2. Anaerobic metabolism yields less energy per unit of fuel than does aerobic metabolism.
3. Anaerobic metabolism results in the accumulation of acid byproducts, such as lactate, which upset the chemical environment of the cell and induce the release of cell-damaging (lysosomal) enzymes.

Tissue Ischemia and Cell Death

Prolonged oxygen deprivation (**hypoxia**) will lead to a syndrome ending in cellular death. The decreased production of adenosine triphosphate (ATP) resulting from anaerobic metabolism reduces the amount of energy available for cellular metabolic functions and results in a breakdown in all cellular functions. The integrity of the cell membrane becomes impaired, and the cell begins to swell. Cellular organelles may become damaged and lysosomal enzymes released, killing the cell. The destruction of tissues or organs as a result of oxygen deprivation is known as an infarction. Widespread cellular death resulting from oxygenation disturbances is the underlying characteristic of a devastating syndrome known as *multiple-organ-system failure*.

Carbon Dioxide Transport and Excretion

Carbon dioxide is a natural byproduct of glucose metabolism. Like oxygen, it exists normally as a gas and can be dissolved in the plasma as well as loosely bound to the hemoglobin molecule (although carbon dioxide attaches to a different binding site on the hemoglobin molecule than does oxygen). In the lungs, carbon dioxide is released into the alveoli by diffusion, and when the individual exhales, the carbon dioxide exits to the atmosphere.

In the body fluids, carbon dioxide functions as an acid because, combined with water, it produces carbonic acid. The hydrogen ions that are liberated in this process stimulate the respiratory control centers in the pons and medulla to increase the rate and depth of breathing; more carbon dioxide is then released by the lungs and the pH of the body is brought back to normal. Likewise,

increased production of carbon dioxide, as may be associated with fever or exercise, is often a cause of increased ventilatory rate (**tachypnea**) and depth. Elevated blood levels of carbon dioxide (**hypercapnea**) indicate inadequate alveolar ventilation.

ASSESSMENT

Health History

The health history of the individual experiencing oxygenation deficits is important in the development of the plan of care. The health history should begin with a thorough exploration of the presenting problem (Table 32-2), including how long it has been present and whether it has recently gotten worse, then should proceed to explore the medical history, impact of the illness on activities of daily living, and the client's knowledge level and coping abilities.

Physical Examination

Inspection will begin when the nurse first encounters the client. This is a time to make general notes of the client's

TABLE 32-2
Health History Related to Oxygenation

Presenting Problem	Qualifiers
Cough	Onset: sudden or gradual, how long ago Nature: dry, moist, barking, hacking, productive, nonproductive Pattern: continuous, occasional, related to time of day, position or activity, weather Severity Associated symptoms: pain, shortness of breath, wheezing Alleviating factors: vaporizers, OTC medications
Sputum	Amount, color, odor Presence of blood in sputum
Shortness of breath	Onset: sudden or gradual Nature: precipitated by choking or gagging Pattern: associated with activity or position; continuous or intermittent Associated symptoms: pain, cough, diaphoresis Alleviating factors
Pain	Location/radiation Nature: stabbing, dull, aching, burning, squeezing, crushing Associated symptoms: dizziness, nausea, diaphoresis, palpitations Aggravating factors Alleviating factors

efforts at ventilation, especially anxious or distressed appearance, flaring of nostrils, position preferences, and general chest configuration (Figure 32-12). While counting the respiratory rate, also note the rhythm or pattern of the breathing for regularity or irregularity (Figure 32-13). The signs and symptoms of hypoxia are relative to the onset. Early clinical manifestations of hypoxia include restlessness, apprehension, anxiety, dizziness, inability to concentrate, confusion, agitation, increased pulse rate, increased rate and depth of respiration, and elevated blood pressure (unless the hypoxia is caused by shock). If the hypoxia goes untreated, the respiratory rate may decline and changes in the level of consciousness progress to stupor, or coma indicating ischemia of neuronal cells resulting from oxygen deprivation. Perfusion deficits resulting in poor circulation can be visually noted in mottled skin, **cyanosis** (bluish coloration of the skin), and edema. The bluish discoloration of cyanosis is the result of the presence of desaturated hemoglobin in capillaries that may occur from either hypoxia or stagnant blood flow. When cyanosis is observed in the tongue, soft palate, and conjunctiva of the eye, it indicates hypoxemia, whereas cyanosis of the extremities, nail beds, and earlobes is often a result of vasoconstriction and stagnant blood flow. Clubbing of the fingers, which manifests as a flattened angle of the nailbed and a rounding of the fingertips, is a sign of chronic hypoxia (Figure 32-14).

Common palpation findings related to compromised ventilation include vocal fremitus and displacement of

NURSING ALERT

Cyanosis

Regardless of the mechanism behind it, it is important to remember that cyanosis is often a late development in clients with poor oxygenation and may be further delayed in those with dark skin pigmentation or low blood hemoglobin (anemia). *Therefore, the absence of cyanosis should not be taken as an assurance that oxygenation is adequate.* However, the presence of cyanosis, especially central cyanosis, should be considered to be an indicator of a hypoxic emergency.

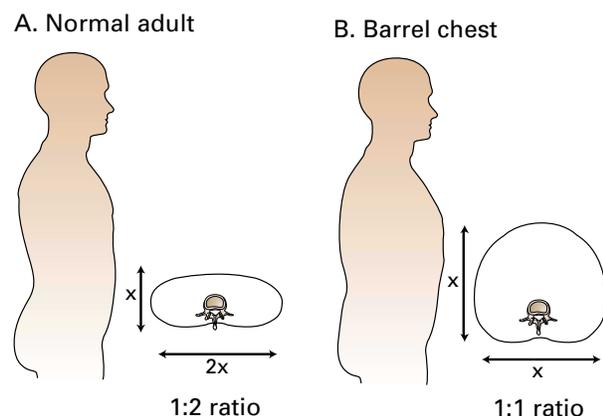


Figure 32-12 Changes in chest configuration and posture. The normal ratio of the anterior posterior diameter to the lateral diameter is 1:2. With a barrel chest, the ratio between the diameters is 1:1.

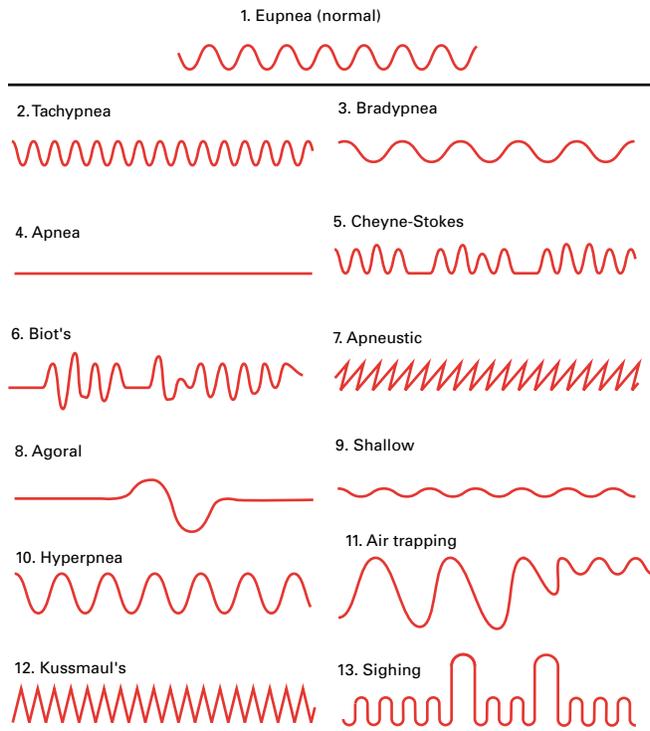


Figure 32-13 Respiratory Patterns

the trachea. Perfusion deficits are noted in changes in pulse rate or character, clammy skin, and ulcers in the lower extremities.

Percussion may reveal hyperresonance, dull percussion tone, or changes in the density of the lungs and surrounding tissues.



Figure 32-14 Clubbing of the Fingers as a Result of Chronic Hypoxia (Courtesy of Robert A. Silverman, M.D., Clinical Associate Professor, Department of Pediatrics, Georgetown University.)

NURSING TIP

Percussion Hint

Sound waves travel better through a solid medium than through an air-filled medium. Therefore:

- The more solid a structure, the higher its pitch, the softer its intensity, and the shorter its duration.
- The more air-filled a structure, the lower its pitch, the louder its intensity, and the longer its duration.

Auscultation may reveal adventitious breath sounds such as rales (crackles) or wheezes (rhonci), pleural friction rub, or stridor, all indicators or alterations in ventilation (Table 32-3). Circulation deficits will be noted upon auscultation by **gallops**, or extra heart

TABLE 32-3
Characteristics of Adventitious Breath Sounds

Breath Sound	Respiratory Phase	Description	Conditions
Fine crackle	Predominantly inspiration	Dry, high-pitched crackling, popping; short duration; roll hair by ears between your fingers to simulate this sound	Chronic obstructive pulmonary disease, congestive heart failure, pneumonia, pulmonary fibrosis, atelectasis
Coarse crackle	Predominantly inspiration	Moist, low-pitched crackling, gurgling; long duration	Pneumonia, pulmonary edema, bronchitis, atelectasis
Sonorous wheeze	Predominantly expiration	Low-pitched; snoring	Asthma, bronchitis, airway edema, tumor, bronchiolar spasm, foreign body obstruction
Sibilant wheeze	Predominantly expiration	High-pitched; musical	Asthma, chronic bronchitis, emphysema, tumor, foreign body obstruction
Pleural friction rub	Inspiration and expiration	Creaking, grating	Pleurisy, tuberculosis, pulmonary infarction, pneumonia, lung abscess
Stridor	Predominantly inspiration	Crowing	Croup, foreign body obstruction, large airway tumor

sounds, and **murmurs**, or sounds produced by blood flowing through a malfunctioning valve.

Diagnostic and Laboratory Data

There are many tests to measure oxygenation status. Pulse oximetry uses light waves to measure oxygen saturation (SaO_2) noninvasively (Figure 32-15). Arterial blood gases (ABGs) measure a number of indicators that can affect oxygenation status; these factors and their values are listed in Table 32-4. Sputum collection is another valuable tool in assessing a client's oxygenation functioning; this procedure is outlined in Table 32-5, and common findings and their indications are listed in Table 32-6. Measurements of lactic acid, hemoglobin,



Figure 32-15 Client with Pulse Oximeter

TABLE 32-4
Arterial Blood Gases

Measurement	Normal Arterial Values	Clinical Significance
pH	7.35–7.45	Indicates acid-base balance
Pco_2	35–45 mm Hg	Partial pressure of carbon dioxide; indicates adequacy of alveolar ventilation; represents respiratory component of acid-base balance
HCO_3^-	22–26 mEq/L	Bicarbonate level; indicates metabolic component of acid-base balance
PaO_2	80–100 mm Hg	Partial pressure of oxygen; represents oxygen dissolved in plasma
SaO_2	96%–98%	Saturation of hemoglobin with oxygen

TABLE 32-5
Protocol: Assisting a Client with Sputum Collection

Purpose	To collect an adequate sample of sputum for laboratory analysis and/or culture; To minimize contamination of the sample with oral or other secretions.
Level	Independent
Supportive data	Increasing the client's knowledge promotes cooperation and increases the diagnostic value of the sample obtained.
Assessment	Verify the type of test to be performed (cytology studies should be collected into a cup containing a preservative solution; cultures must be collected into a sterile container). Assess the client's level of consciousness and ability to follow instructions. Assess the client's breath sounds; coarse rales indicate the presence of sputum in the airways.
Interventions	Obtain correct specimen container. Wash hands and don clean gloves. Assist the client to rinse the mouth with water (not mouthwash). Instruct client to raise sputum from the lungs, not the throat or nose. Instruct client to expectorate sputum into the cup without touching the inside of the container. Replace cap on container as soon as sample is obtained. Label container and wash the outside if indicated. Place in a bag with a biohazard label for transport. Provide mouth care for the client and assist to a comfortable position. Remove gloves and wash hands. Send specimen to lab immediately.
Documentation	Document amount, color, character, and odor of sputum obtained and time the specimen was sent to the lab.

and hematocrit are also useful in determining the effectiveness of the body's oxygen delivery to tissues.

Selected tests to determine oxygenation status are discussed in Table 32-7. (See also Figure 32-16 for ventilatory function.) Clients undergoing these tests are often apprehensive and need nursing care and education directed at their knowledge levels. Refer to Chapter 28 for further diagnostic information.

TABLE 32-6
Pathologies Associated with Different Colors of Sputum

Sputum Color	Pathology
Mucoid	Tracheobronchitis, asthma
Yellow or green	Bacterial infection
Rust or blood-tinged	Pneumonia, pulmonary infarction, tuberculosis
Black	Black lung disease
Pink	Pulmonary edema

TABLE 32-7
Selected Tests for Oxygenation Status

Test	Indications/Possible Findings
Ventilatory function tests	<ul style="list-style-type: none"> Volume of air in the lungs at various phases of the ventilatory cycle Speed and ease of airflow through the airways Strength of the respiratory muscles
Chest x-ray	<ul style="list-style-type: none"> Areas of fluid accumulation (infiltrates) Solid masses (suggestive of tumors) Abnormal accumulations of calcium, areas of necrosis (as seen in tuberculosis) Excessive air trapping (suggestive of emphysema) Abnormal accumulations of air or fluid in the pleural space (suggestive of pleural effusion or pneumothorax) Gross abnormalities in size, shape, position of thoracic structures
Computerized tomography (CT) scan, magnetic resonance imaging (MRI)	<ul style="list-style-type: none"> Detailed pictures of thoracic structures
Ventilation scan	<ul style="list-style-type: none"> Areas of impaired airflow (suggestive of pulmonary emboli)
Bronchoscopy	<ul style="list-style-type: none"> Sputum collection Examination of tissue
Thoracentesis	<ul style="list-style-type: none"> Tissue sample collection
Echocardiography	<ul style="list-style-type: none"> Size and motion of cardiac structures Accumulation of fluid in the pericardial sac (suggestive of pericardial effusion)
Electrocardiography	<ul style="list-style-type: none"> Heart rate and rhythm Abnormal sites of impulse formation (ectopic pacemakers) Areas of blocked or delayed impulse transmission Chamber enlargement (as seen in heart failure) Areas of ischemia, injury or infarction
Stress test	<ul style="list-style-type: none"> Changes in ECG tracings (may indicate ischemic heart disease)

NURSING DIAGNOSIS

Nursing care of the client experiencing oxygenation problems should be prioritized on the basis of the A-B-C format used in basic life support; that is, consider the

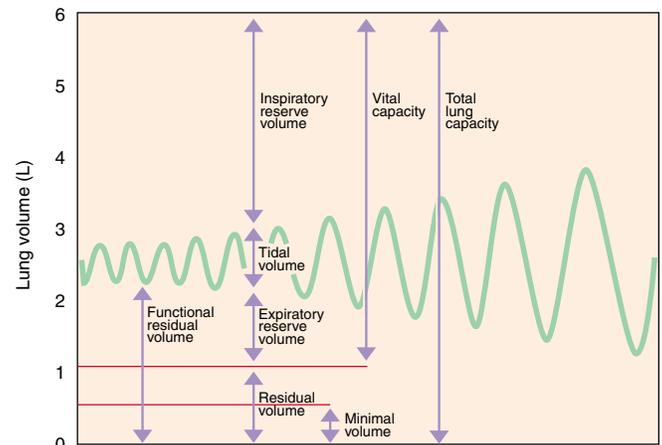


Figure 32-16 Graphic Representation of Lung Volumes and Capacities

airway, breathing, and circulation first and foremost. The primary nursing diagnoses are related to these priorities.

Ineffective Airway Clearance

Ineffective airway clearance exists when the client has difficulty maintaining a patent (open) airway at any point along the airway. This occlusion of the airway may be partial or complete. Causes of ineffective airway clearance include:

- Obstruction of the airway by the tongue (as may occur in the comatose or anesthetized client)
- Obstruction of airway by secretion (as may occur with excessive sputum production, and ineffective or absent cough)
- Upper airway obstruction caused by edema of the larynx or glottis
- Obstruction of the trachea or a bronchus by foreign body aspiration
- Partial occlusion of the bronchi and bronchioles by infection (bronchitis, bronchiolitis), inflammation and smooth muscle spasm (asthma), or occlusion or compression by a tumor mass
- Occlusion of the more distal airways by the changes associated with emphysema

Assessment findings in the client with ineffective airway clearance include a complaint of feeling short of breath or suffocating, a condition sometimes referred to as “air hunger.” The use of accessory muscles of ventilation may be noted, and the client may complain of fatigue. Shortness of breath may be noted on observation, and the client may have difficulty speaking because of it. A cough may be noted, and on auscultation rales and rhonchi may be heard. Poor aeration of the alveoli, as can occur with emphysema and severe asthma, will cause diminished breath sounds over the peripheral lung fields. Complete obstruction of a large or medium-sized airway will result in a loss of breath sounds over the affected lung segment.

Ineffective Breathing Patterns

Ineffective breathing pattern is commonly a problem for clients with restrictive pulmonary disease or central nervous system disorders that affect breathing. Those with restrictive pulmonary disease, in an effort to decrease their work of breathing, tend to adopt a pattern of rapid, shallow respirations. This respiratory pattern does not deliver adequate fresh air to the alveoli, resulting in chronic air hunger while contributing to muscle fatigue. Central nervous system disorders, including the effects of anesthetics and narcotics, may reduce both the rate and the depth of ventilation. Lesions affecting the brain stem in particular may reduce ventilation to dangerous levels.

Another group of clients at risk for ineffective breathing patterns are those who have had major abdominal or thoracic surgery or whose mobility is restricted. These individuals have a tendency to take shallow breaths and to avoid sighing and coughing, both necessary to maintain airway integrity.

Neuromuscular diseases that weaken the respiratory muscles may also result in ineffective breathing patterns as well as impaired airway clearance. Examples of such disorders include Guillain-Barré syndrome and myasthenia gravis. Alterations in thoracic structures that interfere with breathing patterns include abnormal curvatures of the spine (scoliosis, kyphosis), chest wall injury, and pleural defects.

Impaired Gas Exchange

Impaired gas exchange occurs when, despite the delivery of fresh air to the alveoli, adequate oxygen does not enter the arterial blood and/or carbon dioxide is not removed from the venous blood. Often this condition is the result of ventilation-perfusion mismatching or overall decreases in the amount of alveolar-capillary surface area available for gas exchange, a characteristic of emphysema. Another cause of impaired gas exchange is widespread shunting, as may occur with atelectasis (alveolar collapse) and pneumonia. Impaired gas exchange is assessed by measuring the oxygen and carbon dioxide content in the arterial blood via arterial blood gas analysis or pulse oximetry or both.

Decreased Cardiac Output

Decreased cardiac output impairs oxygen delivery to the tissues and may also be a factor in impaired gas exchange, as when congestive heart failure causes pulmonary edema. Causes of decreased cardiac output include heart failure and various types of shock. The assessment findings associated with decreased cardiac output may include low blood pressure; cool, clammy skin; weak, thready pulses; low urine output; and a diminished level of consciousness. If pulmonary edema is present, crackles will be heard over the lung bases and the client may produce frothy pink or white sputum.

Ineffective Tissue Perfusion

Ineffective (decreased) tissue perfusion may be widespread, as in the case of decreased cardiac output, or it may be confined to one or more tissues or organs of the body. A common cause of regional decreases in tissue perfusion is atherosclerosis, which may impair perfusion to the heart, brain, kidneys, or extremities. Assessment findings depend upon the organ or tissue involved, but one common finding is pain. The tissue that is deprived of oxygen will in many cases be painful, as the accumulation of lactic acid and the chemical mediators of the inflammatory response stimulate local pain receptors.

Other Nursing Diagnoses

The relationship between the primary nursing diagnoses discussed above and the secondary nursing diagnoses in the client with oxygenation problems is reciprocal; that is, the primary diagnoses both influence and are influenced by the secondary diagnoses. A holistic approach to nursing care requires that all diagnoses affecting the patient be considered and prioritized in developing the plan of care.

Deficient Knowledge

Deficient knowledge may exist to varying degrees in the client with either acute or chronic oxygenation problems. Involving the client in the plan of care requires that the client be informed regarding the disease process, diagnostic procedures, and treatment modalities. Assessment for deficient knowledge involves questioning the client and family with regard to their understanding and perceptions of these subjects. It is a mistake to assume that a client with a long-standing chronic illness has a good understanding of that illness.

Activity Intolerance

Activity intolerance reflects the impact of the illness on the client's ability to perform activities of daily living; the degree of this impairment may range from mild to severe, but it is important that this judgment be based on the client's, not the nurse's, perception of the activity intolerance. Activity restrictions that may be a mere annoyance for one individual can be viewed as catastrophic by another.

To assess activity intolerance, both interview and observation are useful. Ask the client to compare the current level of activity with the previous level and desired level. In addition, observe the client performing activities such as moving about in bed, ambulating, and performing personal care activities; note the point at which fatigue and/or dyspnea occurs and the amount of rest required. Objective tests of exercise tolerance, such as stress tests, may be performed in certain cases.

Disturbed Sleep Pattern

Disturbed sleep pattern is common in people with both cardiac and pulmonary disease. As mentioned earlier, many people with restrictive and obstructive pulmonary diseases find that breathing is easiest in an upright position; this position is also more comfortable for those with congestive heart failure. Sudden attacks of dyspnea during sleep, called **paroxysmal nocturnal dyspnea**, may interrupt the sleep of these clients, resulting in chronic fatigue. Complaints of poor sleep, along with daytime sleepiness and fatigue, are common assessment findings. Severe sleep deprivation can result in personality changes, hallucinations, and delusions.

A particular sleep problem associated with airway obstruction is **sleep apnea**. It is often seen in males who are overweight and have short, thick necks and is commonly associated with loud, heavy snoring. The soft tissues of the upper airways collapse during sleep, resulting in periods of absence of breathing (apnea). The individual then rouses enough to resume breathing, interrupting the normal sleep cycle. These individuals may complain of persistent daytime fatigue despite what seems to be adequate nighttime sleep.

Imbalanced Nutrition

Nutritional alterations are also commonly associated with both cardiac and pulmonary disease. The client with dyspnea may have difficulty consuming adequate food because of the effort involved; in turn, the malnutrition contributes to respiratory muscle weakness. The client with a productive cough may have an unpleasant taste in the mouth, interfering with appetite. Congestive heart failure may cause a poor appetite (anorexia) because of decreased perfusion to the gut. On the other hand, obesity can affect oxygenation by increasing the work of breathing as well as the cardiac workload.

Acute Pain

Acute pain may be present in the client with ischemia to the heart or to the extremities due to inadequate perfusion; chest wall or pleuritic pain may also be a feature of many pulmonary disorders. Adequate pain control can influence the effectiveness of breathing patterns and coughing, making pain control a priority in these cases. Pain assessment should address the nature of the pain, its intensity, its location and radiation, factors that make it better or worse, and any associated symptoms. For instance, pain caused by myocardial ischemia is called **angina pectoris** and is often described as crushing or squeezing in nature; it may be confined to the chest or it may radiate to the neck, shoulder, jaw, arm, or hand. Ischemia to the extremities (most often the legs) produces a pain known as **intermittent claudication**, which is typically brought on by exercise and relieved by rest. See Chapter 33 for further discussion of pain assessment.

Anxiety

Anxiety is often a prominent finding in individuals who are experiencing breathing difficulties or acute cardiac problems, such as chest pain. The anxious client may have difficulty answering questions and focusing on the instructions being given and may expend excessive amounts of precious energy in the process. Therefore, recognition and control of anxiety bring both psychological and physiological benefits.

OUTCOME IDENTIFICATION AND PLANNING

In identifying goals and planning nursing care for the client with oxygenation disorders, carefully consider individual goals for each nursing diagnosis and each client; the goals should be individualized to reflect the client's capabilities and limitations. In many cases, identifying desired outcomes of care is best accomplished in small steps, progressing from one level of functioning to the next until the ultimate objective is attained. Such an approach prevents the client from feeling overwhelmed with the magnitude of the task at hand while allowing for the satisfaction of reaching intermediate outcomes. Outcomes may be based on physiological parameters such as respiratory rate or arterial blood gas values, on activity tolerance and client comfort levels, or on identified learning needs.

The outcomes for a particular client should be based upon the assessment findings that led to the nursing diagnoses at hand. For example, if a respiratory rate of 30 breaths per minute with a shallow breathing pattern and suprasternal retraction led to a diagnosis of ineffective breathing pattern, then the desired outcome of intervention might be a respiratory rate of 20 breaths per minute or less and the absence of retractions. Achievement of the outcome indicates resolution of the problem.

IMPLEMENTATION

Interventions to Promote Airway Clearance

Interventions to promote airway clearance focus on clearing the airways of secretions, relieving bronchospasm, and, when necessary, bypassing the natural airway structures with an artificial airway. All of these procedures are facilitated when the client has been well informed of the purpose for the interventions and knows what to expect.

Teach Effective Coughing

Effective coughing techniques may need to be taught to the client experiencing either short-term or chronic airway obstruction. Coughing is an important element of postoperative care in order to prevent pulmonary complications. Effective coughing should be preceded by a series of slow, deep breaths. One technique that may be useful is "huffing," or delivering a series of short, forceful exhalations, prior to actual coughing. The intent is to raise the sputum to the level where it can then be coughed out. If the client is recovering from thoracic or abdominal surgery, splinting the incision by holding a pillow firmly against it will reduce the pain caused by coughing. In most cases, assisting the client to a sitting position will increase the effectiveness of the cough.

Assess the sputum produced by coughing, noting the amount, color, and odor. Recognize that the client may become fatigued after coughing and need a rest period; also offer oral care such as a mouth rinse after sputum has been expectorated.

Initiate Postural Drainage and Chest Physiotherapy

Postural drainage and **chest physiotherapy (CPT)** are techniques intended to promote the drainage of secretions from the lungs. Positioning for drainage of each of the lung lobes is accompanied by percussion and/or vibration applied to the chest wall to loosen secretions (Figure 32-17). Percussion involves using a cupped hand to beat firmly on the chest wall (Figures 32-18 A,

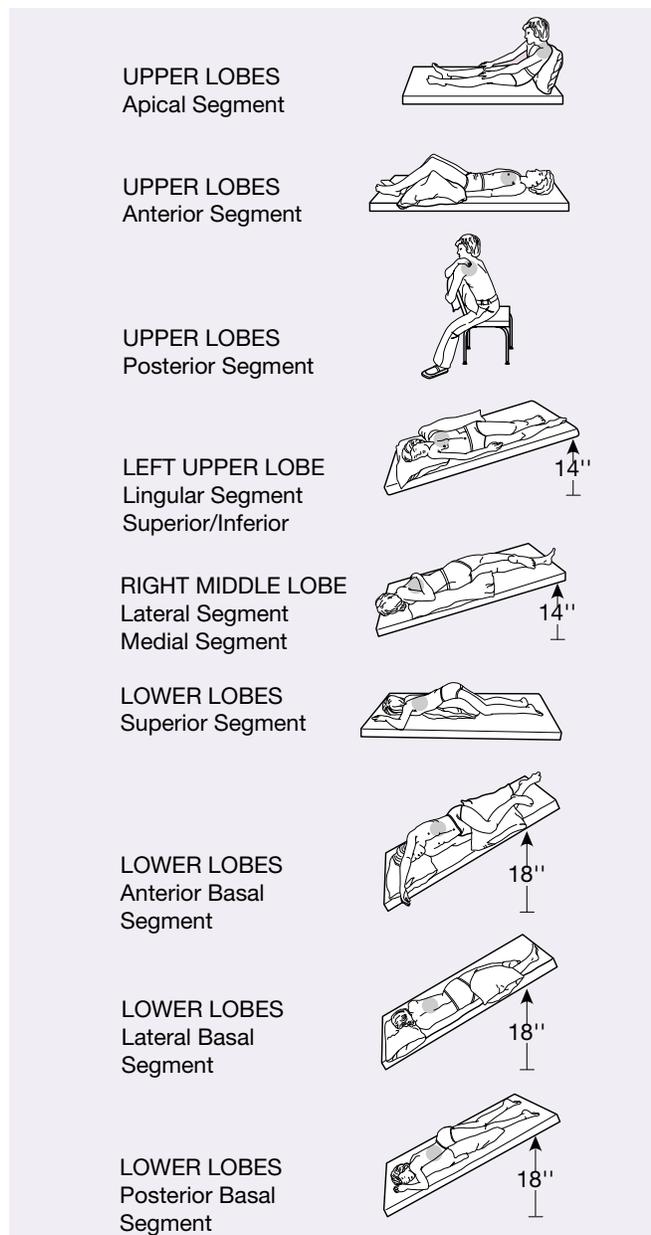


Figure 32-17 Postural Drainage Positions

B); a firm rubber cup of a size appropriate to the client's body size may also be used. Vibration is done using a special vibrator applied to the chest wall. Inhalation treatments containing bronchodilator or mucolytic drugs may be administered before chest physiotherapy and postural drainage.

Measures should be taken to minimize the client's anxiety and discomfort during these procedures. Pain medications, if indicated, should be timed so that their effectiveness peaks at the time of the treatment. Also, the nurse must recognize that some clients may be unable to tolerate certain postural drainage positions, and the treatment must be modified. Those with congestive heart failure or increased intracranial pressure particularly will not be able to tolerate a head-down position.

Monitor Hydration

Hydration, that is, the provision of adequate fluid intake, is important in thinning the pulmonary secretions so that they may be more easily expectorated. This may be beneficial in cases of pneumonia, bronchitis, and asthma. Clients experiencing congestive heart failure, on the other hand, may require limitation of fluid intake to reduce pulmonary congestion due to fluid volume overload.

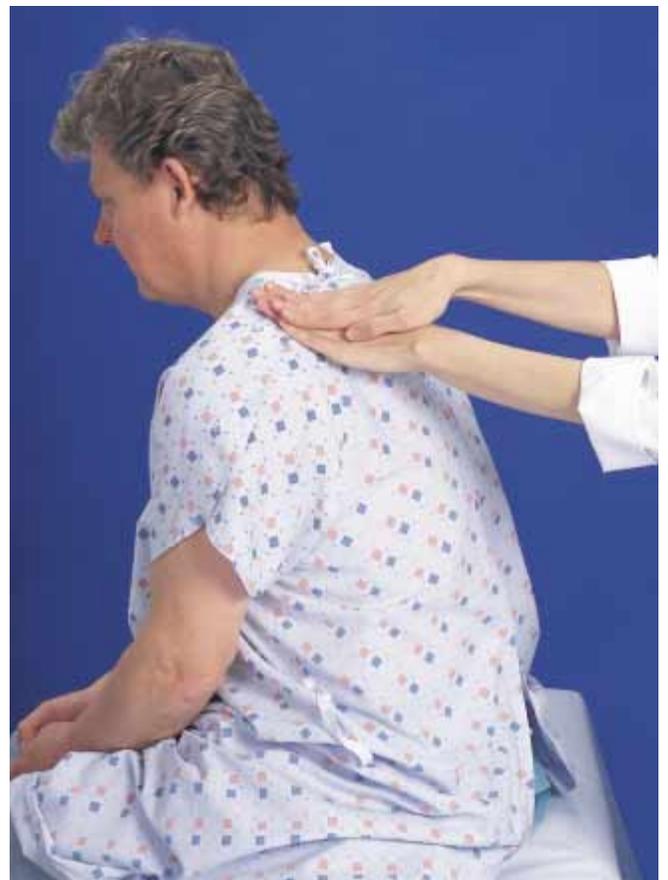
Each exhalation contains not only carbon dioxide and other gases but also water vapor. This "insensible fluid loss" will be increased in those who are tachypneic as well as in clients receiving supplemental oxygen if the oxygen is not adequately humidified. Artificial airways that bypass the natural humidification processes of the nose and oropharynx also contribute to increased insensible fluid losses. Drying and inflammation of the respiratory mucosa may result. For this reason, humidification of inspired oxygen, especially that which is delivered through an artificial airway, is very important.

Administer Medications

Medications that assist in airway clearance include expectorants, mucolytics, and bronchodilators. It may be beneficial to administer the medications before chest physiotherapy or postural drainage treatments in order to maximize the treatment's effectiveness. Clients must be taught the name of the medications they are receiving, the purpose of the medication, the dose, and how it is to be taken. The most common and/or most significant side effects should also be reviewed with the client. A summary of medications for airway clearance is presented in Table 32-8.



A.



B.

Figure 32-18 Chest Wall Percussion: A. Positions of hands to strike; B. Strike completed.

TABLE 32-8
Medications Used for Airway Clearance

Drug Type	Common Examples	Actions
Mucolytic/expectorant	Mucomyst (acetylcysteine) Guaifenesin	Thins respiratory secretions by increasing the amount of fluid produced
Methylxanthine	Aminophylline Theophylline	Dilates bronchi Increases ciliary movement
Beta-adrenergic sympathomimetic	Epinephrine Isoproterenol Albuterol Metaproterenol Terbutaline	Causes bronchial smooth muscle relaxation (dilates bronchi)
Mast cell stabilizer	Cromolyn sodium	Prevents histamine release from mast cells
Corticosteroid	Beclomethasone Prednisone Prednisolone Hydrocortisone	Anti-inflammatory action

Monitor Environmental and Lifestyle Conditions

Environmental and lifestyle conditions may greatly influence the client's long-term recovery. Allergic conditions such as asthma may improve dramatically if the allergens to which the client is sensitive are identified and removed from the client's environment. Certain allergens such as animal dander or feather pillows may be relatively easy to eliminate; others, such as house dust and pollen, may be impossible to eliminate but can be reduced using devices such as air filters.

Smoking is a significant contributing factor in both heart and lung disease. Smoking cessation may not reverse advanced disease but will often reduce the client's symptoms and improve the quality of life. Smoking cessation programs and support groups, along with nicotine replacements such as transdermal patches, may help the client succeed in quitting smoking.

Introduce Artificial Airways

Artificial airways (Figure 32-19A–D) may be used for clients with significant airway obstruction that cannot be relieved by more conservative means or who require mechanical ventilatory support. Nasal airways, also known as nasal trumpets, may be placed in conscious adults who have adequate breathing ability but require assistance in keeping their upper airways open. These airways are usually fairly well tolerated and can provide a conduit for frequent nasotracheal suctioning while minimizing trauma to the nasal mucosa.

The oral airway is used to maintain the tongue away from the posterior oropharynx in the unconscious client. It is essential to choose the correct size, since an airway that is too large may actually cause occlusion, while one that is too small may compress the tongue, stimulating the vomiting center. Oral airways are not well tolerated in conscious individuals, who may gag and vomit if an oral airway is in place.

Endotracheal tubes bypass the upper airway structures altogether; they may be inserted via the nose or mouth and are passed beyond the vocal cords into the trachea. An inflatable cuff near the distal end of the tube serves to seal off the airway, allowing for mechanical ventilatory assistance and protecting the airway from aspiration.

Since endotracheal tubes bypass the filtration and humidification normally provided by the nose and oropharynx, care must be taken to humidify the inspired air and to prevent introduction of pathogenic organisms into the lungs. Meticulous attention to aseptic technique when caring for clients with endotracheal tube and ventilator circuits is mandatory.

NURSING TIP

Cigarette Smoking

Cigarette smoking is the primary risk factor for chronic bronchitis, emphysema, and lung cancer. Lung cancer is the primary cause of cancer deaths among men and now surpasses breast cancer as the number one cancer killer in women.

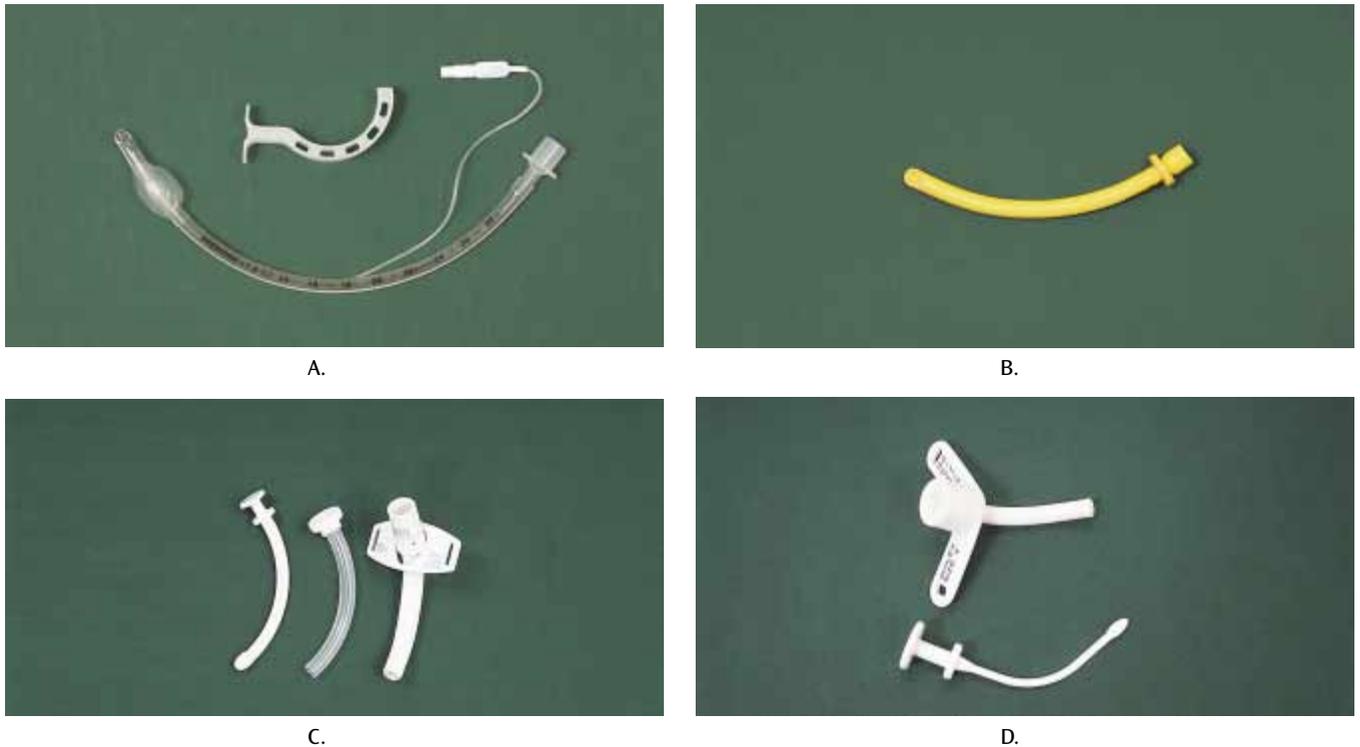


Figure 32-19 Types of Artificial Airways: A. Oral airway and endotracheal tube; B. Nasal trumpet; C. Tracheostomy tube; D. Pediatric tracheostomy tube.

Mouth care must be provided for the client with an endotracheal tube. The tube prevents adequate swallowing, so the client will be unable to eat. Frequent cleansing and suctioning of the oral cavity (every 2 hours) reduces discomfort and the risk of breakdown and infection of the oral mucosa.

Nutritional needs for the client with an endotracheal tube must be addressed by providing enteral feeding (via nasogastric or gastrostomy tube) or total parenteral nutrition (hyperalimentation). Whatever the means, adequate nutrition is necessary to maintain and improve respiratory muscle strength.

A **tracheotomy** is a surgical procedure done to provide long-term airway support or as an emergency procedure when an endotracheal tube cannot be passed successfully. An opening (stoma) is made in the trachea below the cricoid cartilage, and a semirigid plastic tube (tracheostomy tube) is passed through the opening and

into the trachea. A cuff, similar to that in an endotracheal tube, is inflated near the distal airway.

Many tracheostomy tubes consist of two tubes or *cannulae*: an outer cannula that stays in place and an inner cannula that can be removed to be cleaned or replaced. This permits thorough removal of encrusted secretions to prevent occlusion of the airway. The outer cannula is connected to a flange that permits the tubes to be secured around the neck with twill tape or a cloth strap. See Procedure 32-1 for tracheostomy care.

Like an endotracheal tube, a tracheostomy tube bypasses the upper airways, so humidification and prevention of infection must be considered. Because both types of airways prevent the movement of air through the vocal cords, which produce speech, the client will not be able to talk while these tubes are in place (some long-term tracheostomy clients may be outfitted with a tracheostomy tube that has slits, or “fenestrations,” that permit speech). If possible, reviewing an alternate method of communication prior to tube insertion can reduce the anxiety and isolation that may be felt by the intubated client. Writing of messages and use of an alphabet board are two possible methods of communication. Significant others should also be advised that the intubated client will not be able to speak but can hear and understand what is being said.

NURSING ALERT

Artificial Airways

The cuff of an endotracheal tube or tracheostomy tube must be deflated before removing the tube; removal of a tube with an inflated cuff may cause laryngeal edema and damage to the vocal cords. For this reason, the tube must be taped securely in place, and confused or agitated clients may require sedation and/or wrist restraints to prevent them from pulling at the tube.

Suction the Airway

Suctioning of the airway, whether a natural or artificial airway, may be necessary to clear secretions the client cannot remove by coughing. Suctioning becomes

PROCEDURE 32-1

Performing Tracheostomy Care

Equipment

- Tracheostomy care kit (includes two sterile containers, sterile cotton-tip applicators, sterile pipe cleaner, sterile nylon brush, sterile 4 × 4 gauze pads, tweezers, sterile drapes, and tracheostomy ties)
- Two pairs of sterile gloves
- Plastic bag or biohazard container for disposal
- Sterile 0.9% sodium chloride solution
- Hydrogen peroxide solution
- Suction kit and suction equipment (see Procedure 32-2)
- Sterile precut 4 × 4 drain sponges
- Personal protective devices: gown, mask, and goggles or face shield

Action

1. Explain procedure to the client and assist the client to a semi-Fowler's position. Remove pillows from behind the client's head.
2. Place plastic bag or disposal container within easy reach. Position in an area that does not require crossing over the sterile field or stoma to discard soiled items.
3. Place additional items on a clean overbed table or other easily accessible work space.
4. Wash your hands.
5. Loosen the caps on the bottles of sterile saline and hydrogen peroxide.
6. Put on goggles and mask or face shield and gown and don sterile gloves (see Procedure 31-4).
7. Suction the client's tracheostomy tube (see Procedure 32-3); then remove the soiled tracheostomy dressing. Note the amount, color, and odor of any drainage around the stoma. Remove the gloves by pulling them over the discarded dressing, and discard the gloves and dressing.
8. Open the tracheostomy care kit, taking care to avoid touching the inside of the kit.
9. Using sterile gloving technique (see Procedure 31-4), put on the gloves supplied in the tracheostomy care kit (if included) or a separate pair of sterile gloves.
10. Open the inner wrapper of the tracheostomy care kit to form a sterile field. Separate the two sterile containers and place them on the field. Lay the cotton applicators, pipe cleaners, nylon brush, and sterile 4 × 4's pads on the field. Place the sterile drape on the patient's chest, with its upper edge as near to the tracheostomy tube as possible. Fold a tuck of the drape over your fingers as you position the drape.

Rationale

1. Reduces anxiety and increases client's ability to cooperate. Semi-Fowler's position allows comfortable access to the tracheostomy site, and removal of pillows reduces neck flexion.
2. Prevents contamination of sterile field or stoma.
3. This space will be used to set up a sterile field for the tracheostomy care supplies.
4. Prevents the transmission of pathogens.
5. Permits easy opening of the bottles when ready.
6. Protects you from splattering with body fluids (sputum).
7. Suctioning clears the airway of loose secretions. Inspection of the exudate reveals signs of possible peristomal infection. The old dressing and gloves used for suctioning are discarded to prevent reintroduction of pathogens. Removing the gloves over the old dressing permits containment of infectious exudate (if present).
8. Prevents contamination of sterile items in the kit.
9. Maintains sterility of the supplies in the kit.
10. Provides a sterile area in which to work. Prevents contamination of your sterile gloves.

(continues)

PROCEDURE 32-1

Performing Tracheostomy Care (continued)

Action

11. Designate one hand as *sterile* (able to touch only sterile items) and the other as *clean* (able to touch only nonsterile items).
12. *Using your clean hand*, open the bottles of sterile saline and peroxide, laying the caps outside of the sterile field. Pour about 100 ml of saline into one sterile container and about 100 ml of hydrogen peroxide into the other container. Set the bottles down outside of the sterile field.
13. *Using your sterile hand*, pick up a sterile cotton swab and saturate the tip with hydrogen peroxide. Swab the peristomal skin, including the area under the tracheostomy tube's faceplate. If you must touch the tracheostomy tube or the client, do so with your *clean* hand (Figure 32-20).



Figure 32-20 Clean stoma under faceplate.

14. *Using your clean hand*, gently loosen the inner cannula of the tracheostomy tube by twisting the outer ring counterclockwise; then withdraw the inner cannula in a smooth motion. Place the inner cannula into the basin of peroxide.
15. *Using your sterile hand*, pick up the cannula. Using your clean hand, pick up the nylon brush and scrub to remove any visible crusts or secretions from inside and outside the cannula (Figure 32-21).
16. Place the cannula into the container of sterile saline. Agitate so that all surfaces are bathed in saline.
17. Inspect the inner cannula again to be sure it is clean; then remove excess saline from the lumen by tapping the cannula against a sterile surface.

Rationale

11. Usually, the dominant hand is the sterile hand, while the nondominant hand is clean. This system prevents contamination of sterile supplies while allowing you to handle unsterile items.
12. These solutions will be used to clean the tracheostomy tube's inner cannula. Since the bottles and caps are unsterile, they should not be placed in the sterile field.
13. This action removes exudate and other material from the skin to maintain skin integrity.
14. Minimizes trauma to the client's tracheal tissues and reduces reflexive coughing. The hydrogen peroxide serves to dissolve crusted secretions. *Note:* Some tracheostomy tubes use disposable inner cannulae that would be replaced at this point in the procedure. If replacing a disposable inner cannula, skip to step 18.
15. Any secretions retained on the inner cannula may be aspirated into the client's lungs, causing infection and possible airway obstruction. In some cases, the pipe cleaners may be needed to gain access to the inner surface of the cannula.
16. Rinses the peroxide off of the cannula before it is returned to the client.
17. Fluid trapped in the lumen of the cannula can be aspirated by the client.

(continues)

PROCEDURE 32-1

Performing Tracheostomy Care (continued)

Action



Figure 32-21 Clean lumen and inner cannula.

Rationale

- | | |
|--|--|
| <p>18. Gently replace the inner cannula, following the curve of the tube. When fully inserted, lock the inner cannula in place by rotating the external ring clockwise until it clicks into place.</p> <p>19. Place a new precut sterile gauze dressing around the stoma, between the faceplate and the skin.</p> <p>20. Inspect the ties or strap securing the faceplate. If damp or soiled, carefully cut the ties (or loosen the Velcro to remove a strap). Remove the ties or strap and inspect the underlying skin for redness or breakdown.</p> <p>21. To replace ties (Figure 32-22), cut a length of twill tape about as long as the circumference of the client's neck. Fold over one end to 1 inch and cut a small ($\frac{1}{2}$ inch) slit into the folded end.</p> | <p>18. Minimizes tissue trauma and unintentional displacement.</p> <p>19. Protects the skin from irritation and breakdown due to friction with the faceplate and absorbs exudate if present. Using <i>precut</i> gauze dressings is important because cutting a regular 4×4 gauze will create loose fibers that may be inhaled by the client.</p> <p>20. Ties or straps that are wet contribute to skin breakdown and infection. <i>Note:</i> Tracheostomy ties should not be removed or changed for the first 24 hours after tracheostomy tube insertion to prevent dislodgement of the tube and bleeding from the stoma.</p> <p>21. Creates a slit through which the end of the tie can be threaded and secured.</p> |
|--|--|



Figure 32-22 Change tracheostomy ties.

(continues)

PROCEDURE 32-1

Performing Tracheostomy Care (continued)

Action	Rationale
22. Thread the slit end of the tape through the eye of one side of the tracheostomy faceplate from the underside of the faceplate. Thread the end of the tie through the cut slit and secure it with a knot.	22. Creates a secure knot that can be easily cut when the tape needs to be removed and changed.
23. Slip the tape under the client's neck, keeping it smooth and flat against the skin.	23. Prevents excessive looseness or bunching of the tape.
24. Bring the loose end of the tape around to the other side of the faceplate. Ask the client to flex his or her neck and slip one of your fingers under the tape as you measure the desired tightness of the tie.	24. Flexion of the neck simulates the increase in neck circumference that occurs with coughing. The tape should be secure but not tight. <i>Caution: clients who have had neck surgery or injury should be monitored frequently for tightening of the tape due to neck swelling.</i>
25. Fold the end of the tape and cut a slit as in step 21, then tie the end as in step 22. Trim off excess tape from the end and knot the cut ends of the tape.	25. Prevents fraying of tape ends.
26. To replace a Velcro™ strap: Place new strap behind client's neck and thread ends through faceplate eyelets. Adjust tightness as above and secure Velcro™.	26. Velcro™ straps may be more comfortable for some clients and are easier to adjust for proper fit.
27. Reconnect the patient to oxygen and reposition for comfort.	27. Restores supplemental oxygen and humidification to the patient. <i>Note:</i> Some clients may not tolerate removal from supplemental oxygen during the entire tracheostomy care procedure. In this case, an assistant may be needed to intermittently replace and remove oxygen throughout the procedure. Always work quickly, and continuously assess your client's response to the procedure.
28. Discard soiled items in the appropriate container. Remove and discard soiled gloves. Wash hands.	28. Prevents cross-contamination.
29. Document the procedure, noting the appearance of the stomal site and any exudate.	29. Increasing exudate or a change in its color or character may indicate infection.

especially important when an endotracheal tube or tracheostomy tube is present because coughing is significantly impaired by these devices.

Nasotracheal suctioning involves passing a suction catheter or nasal trumpet through the nare, down the pharynx, through the larynx, and into the trachea. See Procedures 32-2 and 32-3 regarding suctioning. Once

the tip is in the trachea, a strong cough reflex will often be elicited. At this time suction is applied to the catheter and it is withdrawn while a twisting motion is applied to the catheter.

Endotracheal suctioning involves passing the suction catheter through the endotracheal tube or tracheostomy into the trachea and applying suction as the

PROCEDURE 32-2

Performing Nasopharyngeal and Oropharyngeal Suctioning

Equipment

- Suction source (wall suction regulator with collection bottle or portable suction machine)
- Sterile suction kit (contains suction catheter, sterile gloves, sterile solution container; may contain a small container of sterile normal saline)
- Sterile water-soluble lubricant
- Extension tubing connected to suction device
- Small bottle of sterile water or normal saline if not included in kit
- Personal protective devices: gown, mask and goggles or face shield if splattering is likely (e.g., a client with a vigorous productive cough)

Action

1. Assess the client's need for suctioning: inability to effectively clear the airway by coughing and expectoration; coarse bubbling or gurgling noises with respiration.
2. Choose the most appropriate route (nasopharyngeal or oropharyngeal) for your client. If nasopharyngeal approach is considered, inspect the nares with a penlight to determine patency. Alternatively, you may assess patency by occluding each nare in turn with finger pressure while asking the client to breathe through the remaining nare.
3. Explain the procedure to the client. Advise that suctioning may cause coughing or gagging but emphasize the importance of clearing the airway.
4. Wash your hands.
5. Position the client in a high Fowler's or semi-Fowler's position.
6. If the client is unconscious or otherwise unable to protect his or her airway, place in a side-lying position.
7. Connect extension tubing to suction device if not already in place, and adjust suction control to between 110 and 120 mm Hg.
8. Put on gown and mask and goggles or face shield if indicated.
9. Using sterile technique (Figure 32-23), open the suction kit. Consider the inside wrapper of the kit to be sterile, and spread the wrapper out carefully to create a small sterile field.
10. Open a packet of sterile water-soluble lubricant and squeeze out the contents of the packet onto the sterile field.

Rationale

1. Suctioning is an uncomfortable and traumatic procedure and should be used only when needed.
2. The oropharyngeal approach is easier but requires that the client cooperate; it may also produce gagging more readily in some persons. The nasopharyngeal route is more effective for reaching the posterior oropharynx but is contraindicated in clients with a deviated nasal septum, nasal polyps, or any tendency toward excessive bleeding (low platelet count, use of anticoagulants, recent history of epistaxis or nasal trauma).
3. Promotes cooperation and reduces anxiety.
4. Reduces the transmission of pathogens.
5. Maximizes lung expansion and effective coughing.
6. Protects the client from aspiration in the event of vomiting.
7. Excessive negative pressure can cause tissue trauma, whereas insufficient pressure will be ineffective.
8. Protects you from splattering with body fluids.
9. Produces an area in which to place sterile items without contaminating them.
10. Lubricant will be used to further lubricate the catheter tip if the nasopharyngeal route is used.

(continues)

PROCEDURE 32-2

Performing Nasopharyngeal and Oropharyngeal Suctioning (continued)

Action



Figure 32-23 Sterile Technique

Rationale

- | | |
|--|--|
| <ol style="list-style-type: none"> 11. If sterile solution (water or saline) is not included in the kit, pour about 100 ml of solution into the sterile container provided in the kit. 12. Carefully lift the wrapped gloves from the kit without touching the inside of the kit or the gloves themselves. Lay the wrapped gloves down next to the suction kit, and open the wrapper. Put on the gloves using sterile gloving technique (see Procedure 31-4). 13. If a cup of sterile solution is included in the suction kit, open it. 14. Designate one hand as <i>sterile</i> (able to touch only sterile items) and the other as <i>clean</i> (able to touch only nonsterile items). 15. <i>Using your sterile hand</i>, pick up the suction catheter. Grasp the plastic connector end between your thumb and forefinger and coil the tip around your remaining fingers. 16. Pick up the extension tubing <i>with your clean hand</i>. Connect the suction catheter to the extension tubing, taking care not to contaminate the catheter (Figure 32-24). 17. Position your clean hand with the thumb over the catheter's suction port. 18. Dip the catheter tip into the sterile solution, and activate the suction. Observe as the solution is drawn into the catheter. | <ol style="list-style-type: none"> 11. This solution will be used to lubricate the catheter and to rinse the inside of the catheter to clear secretions. 12. The gloves should be kept sterile for handling the sterile suction catheter to avoid introducing pathogens into the client's airway. 13. This solution will be used to lubricate the catheter and to rinse the inside of the catheter to clear secretions. 14. Usually, the dominant hand is the sterile hand, while the nondominant hand is clean. This prevents contamination of sterile supplies while allowing you to handle unsterile items. 15. Prevents accidental contamination of the catheter tip. 16. The extension tubing is not sterile. 17. Suction is activated by occluding this port with the thumb. Releasing the port deactivates the suction. 18. Tests the suction device as well as lubricates the interior of the catheter to enhance clearance of secretions. |
|--|--|

(continues)

PROCEDURE 32-2

Performing Nasopharyngeal and Oropharyngeal Suctioning (continued)

Action



Figure 32-24 Attach catheter to tubing.

19. For oropharyngeal suctioning, ask the client to open his or her mouth. Without activating the suction, gently insert the catheter and advance it until you reach the pool of secretions or until the client coughs.
20. For nasopharyngeal suctioning, estimate the distance from the tip of the client's nose to the earlobe and grasp the catheter between your thumb and forefinger at a point equal to this distance from the catheter's tip.
21. Dip the tip of the suction catheter into the water-soluble lubricant to coat catheter tip liberally.
22. Insert the catheter tip into the nare with the suction control port uncovered. Advance the catheter gently with a slight downward slant. Slight rotation of the catheter may be used to ease insertion. Advance the catheter to the point marked by your thumb and forefinger (Figure 32-25).



Figure 32-25 Insert catheter into nostril.

Rationale

19. To minimize trauma, do not apply suction while the catheter is being advanced.
20. Ensures placement of the catheter tip in the oropharynx and not in the trachea.
21. Promotes the client's comfort and minimizes trauma to nasal mucosa.
22. Guides the catheter toward the posterior oropharynx along the floor of the nasal cavity.

(continues)

PROCEDURE 32-2

Performing Nasopharyngeal and Oropharyngeal Suctioning (continued)

<i>Action</i>	<i>Rationale</i>
23. If resistance is met, <i>do not force the catheter</i> . Withdraw it and attempt insertion via the opposite nare.	23. Forceful insertion may cause tissue damage and bleeding.
24. Apply suction intermittently by occluding the suction control port with your thumb; at the same time, slowly rotate the catheter by rolling it between your thumb and fingers while slowly withdrawing it. Apply suction for no longer than 15 seconds at a time.	24. Prolonged suction applied to a single area of tissue can cause tissue damage.
25. Repeat step 24 until all secretions have been cleared, allowing brief rest periods between suctioning episodes.	25. Promotes complete clearance of the airway.
26. Withdraw the catheter by looping it around your fingers as you pull it out.	26. Allows you to maintain control over the catheter tip as it is withdrawn.
27. Dip the catheter tip into the sterile solution and apply suction.	27. Clears the extension tubing of secretions that would promote bacterial growth.
28. Disconnect the catheter from the extension tubing. Holding the coiled catheter in your gloved hand, remove the glove by pulling it over the catheter. Discard catheter and gloves in an appropriate container.	28. Contains the catheter and secretions in the glove for disposal.
29. Discard remaining supplies in the appropriate container.	29. Follow institutional policy regarding the disposal of patient care supplies.
30. Wash your hands.	30. Prevents the transmission of pathogens.
31. Provide the client with oral hygiene if indicated or desired.	31. Suctioning and coughing may produce an unpleasant taste.
32. Document the procedure, noting the amount, color, and odor of secretions and the client's response to the procedure.	32. Changes in the amount, color, or odor of pulmonary secretions may indicate infection.

catheter is withdrawn. In both types of suctioning procedures, the guidelines listed in the Nursing Tip on page 897 should be followed.

Interventions to Improve Breathing Patterns

Properly Position Client

Client positioning to improve breathing patterns may begin by taking cues from the client. If the client finds that breathing is easier in an upright or sitting position, you should allow that position to be maintained. Supporting the client with elevation of the head of the bed or with pillows can reduce the

client's workload and minimize fatigue. Maintaining proper body alignment and preventing slouching or slumping in the bed increase the efficiency of ventilatory efforts.

As previously stated, clients with obstructive respiratory disease may find that leaning forward, with the clavicles elevated, is most comfortable. Providing an

NURSING ALERT

Safety

Clients with oxygenation impairment may be confused or agitated, making safety a vital concern of the nurse.

PROCEDURE 32-3

Performing Tracheostomy Suctioning

Equipment

- Suction source (wall suction regulator with collection bottle or portable suction machine)
- Sterile suction kit (contains suction catheter, sterile gloves, sterile solution container; may contain a small container of sterile normal saline)
- Extension tubing connected to suction device
- Small bottle of sterile water or normal saline if not included in kit
- Personal protective devices: gown, mask and goggles or face shield

Action

1. Assess the client's need for suctioning: inability to effectively clear the airway by coughing and expectoration; coarse rales auscultated over the upper airways.
2. Explain the procedure to the client. Advise that suctioning may cause coughing; emphasize the importance of clearing the airway.
3. Wash your hands.
4. Position the client in a high Fowler's or semi-Fowler's position.
5. Connect extension tubing to suction device if not already in place, and adjust suction control to between 80 and 100 mm Hg.
6. Put on gown and mask and goggles or face shield if indicated.
7. Using sterile technique (see Figure 32-23), open the suction kit. Consider the inside wrapper of the kit to be sterile, and spread the wrapper out carefully to create a small sterile field.
8. If sterile solution (water or saline) is not included in the kit, pour about 100 ml of solution into the sterile container provided in the kit.
9. Carefully lift the wrapped gloves from the kit without touching the inside of the kit or the gloves themselves. Lay the wrapped gloves down next to the suction kit, and open the wrapper. Put on the gloves using sterile gloving technique.
10. If a cup of sterile solution is included in the suction kit, open it.
11. Designate one hand as *sterile* (able to touch only sterile items) and the other as *clean* (able to touch only nonsterile items).

Rationale

1. Suctioning is an uncomfortable and traumatic procedure and should be used only when needed.
2. Promotes cooperation and reduces anxiety.
3. Reduces the transmission of pathogens.
4. Maximizes lung expansion and effective coughing.
5. Excessive negative pressure can cause tissue trauma, hypoxemia, and atelectasis, whereas insufficient pressure will be ineffective.
6. Protects you from splattering with body fluids.
7. Produces an area in which to place sterile items without contaminating them.
8. This solution will be used to lubricate the catheter and to rinse the inside of the catheter to clear secretions.
9. The gloves should be kept sterile for handling the sterile suction catheter to avoid introducing pathogens into the client's airway.
10. This solution will be used to lubricate the catheter and to rinse the inside of the catheter to clear secretions.
11. Usually, the dominant hand is the sterile hand, while the nondominant hand is clean. Prevents contamination of sterile supplies while allowing you to handle unsterile items.

(continues)

PROCEDURE 32-3

Performing Tracheostomy Suctioning (continued)

Action	Rationale
12. Using your sterile hand, pick up the suction catheter. Grasp the plastic connector end between your thumb and forefinger and coil the tip around your remaining fingers.	12. Prevents accidental contamination of the catheter tip.
13. Pick up the extension tubing with your clean hand. Connect the suction catheter to the extension tubing, taking care not to contaminate the catheter (see Figure 32-24).	13. The extension tubing is not sterile.
14. Instruct the patient to take several slow, deep breaths.	14. Promotes optimal opening of airways and reduces suction-induced hypoxemia. <i>Note:</i> Clients who are especially prone to suction-induced hypoxemia may be preoxygenated by taking several deep breaths with supplemental oxygen set at 100% or by delivery of 100% oxygen via manual resuscitation bag. Always return oxygen flow to the prescribed rate after the suctioning procedure is completed.
15. Using your clean hand, remove the oxygen delivery device from the tracheostomy tube and place it on a clean surface.	15. Permits access to the tracheostomy tube. Placing the oxygen device on a clean surface reduces contamination (the sterile glove wrapper may be used for this purpose).
16. Position your clean hand with the thumb over the catheter's suction port.	16. Suction is activated by occluding this port with the thumb. Releasing the port deactivates the suction.
17. Dip the catheter tip into the sterile solution, and activate the suction. Observe as the solution is drawn into the catheter.	17. Tests the suction device as well as lubricating the interior of the catheter to enhance clearance of secretions.
18. Without occluding the suction control port, insert the catheter tip into the tracheostomy tube and advance it until the patient coughs (Figure 32-26).	18. To minimize trauma, do not apply suction while the catheter is being advanced.



Figure 32-26 Suction tracheostomy.

(continues)

PROCEDURE 32-3

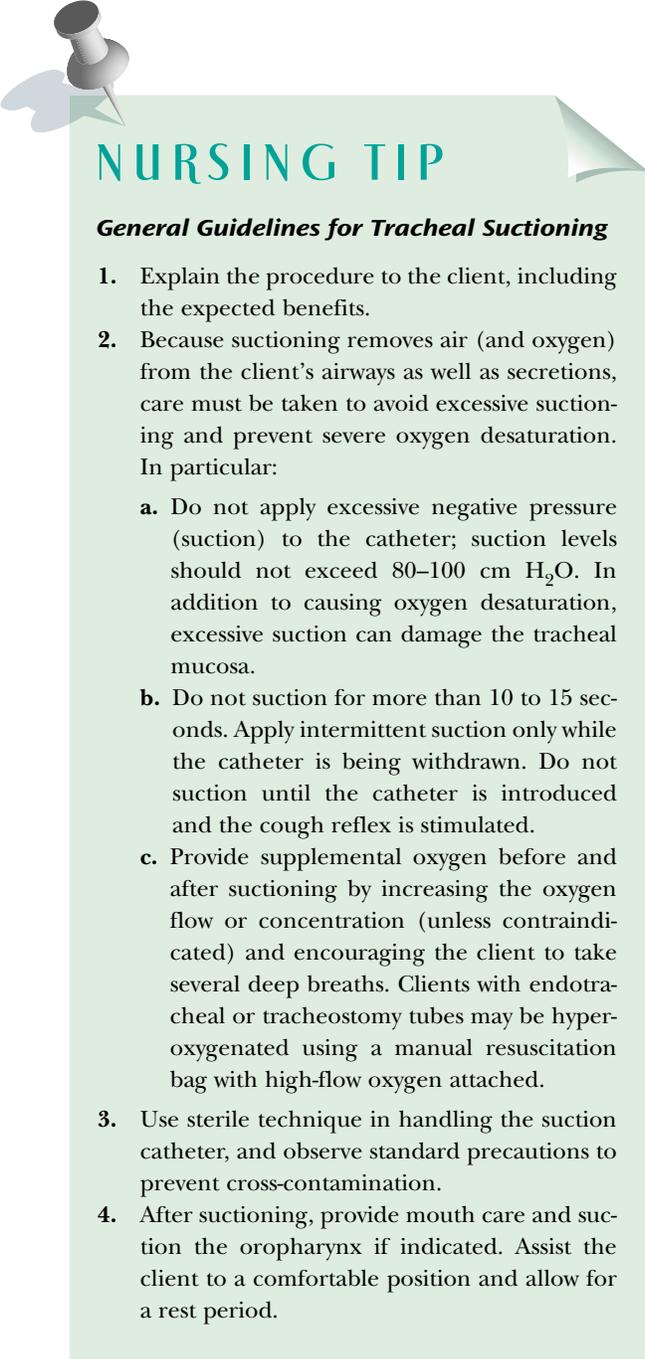
Performing Tracheostomy Suctioning (continued)

Action	Rationale
19. If extremely strong coughing occurs, withdraw the catheter slightly.	19. The tracheal tissue at the point of bifurcation (the <i>carina</i>) is extremely sensitive to touch and produces a vigorous cough.
20. Apply suction intermittently by occluding the suction control port with your thumb; at the same time, slowly rotate the catheter by rolling it between your thumb and fingers while slowly withdrawing it. Apply suction for no longer than 15 seconds at a time.	20. Prolonged suction can cause tissue damage, atelectasis, and hypoxemia.
21. Repeat step 20 until all secretions have been cleared, allowing brief rest periods between suctioning episodes. Encourage client to breathe deeply between suctioning episodes.	21. Promotes complete clearance of the airway.
22. Withdraw the catheter by looping it around your fingers as you pull it out.	22. Allows you to maintain control over the catheter tip as it is withdrawn.
23. Ask the client to open his or her mouth. Insert the catheter and advance it along the oropharynx until resistance is felt. Apply suction and slowly withdraw the catheter.	23. Removes pooled secretions above the cuff of the tracheostomy, which may provide a source of infection if aspirated. <i>Note:</i> At this point the catheter is contaminated. If another suctioning pass into the tracheostomy is needed, a new sterile catheter must be used.
24. Dip the catheter tip into the sterile solution and apply suction.	24. Clears the extension tubing of secretions, which would promote bacterial growth.
25. Disconnect the catheter from the extension tubing. Holding the coiled catheter in your gloved hand, remove the glove by pulling it over the catheter. Discard catheter and gloves in an appropriate container.	25. Contains the catheter and secretions in the glove for disposal.
26. Reapply oxygen delivery device.	26. Restores supplemental oxygen and humidification.
27. Discard remaining supplies in the appropriate container.	27. Follow institutional policy regarding the disposal of patient care supplies.
28. Wash your hands.	28. Prevents the transmission of pathogens.
29. Provide the client with oral hygiene if indicated/desired.	29. Suctioning and coughing may produce an unpleasant taste.
30. Document the procedure, noting the amount, color, and odor of secretions and the client's response to the procedure.	30. Changes in the amount, color, or odor of pulmonary secretions may indicate infection

overbed table for the client on which to rest his or her elbows may facilitate this position, *provided the wheels are locked or removed to prevent the table from rolling away and placing the client at risk for a fall.*

Teach Controlled Breathing Exercises

Controlled breathing exercises may also improve breathing efficiency for the client with obstructive respiratory disease. One technique that is especially useful is *pursed-lip breathing*. This technique involves forced exhalation against pursed (partially closed) lips, which



NURSING TIP

General Guidelines for Tracheal Suctioning

1. Explain the procedure to the client, including the expected benefits.
2. Because suctioning removes air (and oxygen) from the client's airways as well as secretions, care must be taken to avoid excessive suctioning and prevent severe oxygen desaturation. In particular:
 - a. Do not apply excessive negative pressure (suction) to the catheter; suction levels should not exceed 80–100 cm H₂O. In addition to causing oxygen desaturation, excessive suction can damage the tracheal mucosa.
 - b. Do not suction for more than 10 to 15 seconds. Apply intermittent suction only while the catheter is being withdrawn. Do not suction until the catheter is introduced and the cough reflex is stimulated.
 - c. Provide supplemental oxygen before and after suctioning by increasing the oxygen flow or concentration (unless contraindicated) and encouraging the client to take several deep breaths. Clients with endotracheal or tracheostomy tubes may be hyperoxygenated using a manual resuscitation bag with high-flow oxygen attached.
3. Use sterile technique in handling the suction catheter, and observe standard precautions to prevent cross-contamination.
4. After suctioning, provide mouth care and suction the oropharynx if indicated. Assist the client to a comfortable position and allow for a rest period.

maintains positive pressure in the lungs during the expiratory phase and prevents collapse of the smaller airways. This in turn reduces the amount of air trapping characteristic of obstructive disease.

Deep-breathing exercises encourage the client to take slow, deep breaths instead of the rapid, shallow breathing pattern that may be present in restrictive lung disease and in those who are anxious. Abdominal breathing involves the use of the abdominal muscles to pull the diaphragm downward. Placing your hand on the client's abdomen and instructing the client to watch it rise give a visual aid to teaching the technique.

Apical and basal expansion exercises direct the client to focus on achieving maximal expansion of the upper lung

lobes (apices) and lower lobes (bases), respectively. To perform these techniques, place your hands flat against the chest wall just below the clavicles for apical exercises or over the lower ribs along the midaxillary lines for basal exercise and apply gentle pressure. Instruct the client to push your hands away with the chest wall by breathing. These exercise should be repeated several times a day.

Incentive spirometry is another technique used to encourage deep breathing. The client draws air through the spirometry device, which measures the volume of air displaced by moving a float ball or similar device up a column. Goals (incentives) can be marked on the spirometer and the client can compare his or her progress, with the desired goal. Incentive spirometry is often performed in the care of postoperative clients and is usually done every 1 to 2 hours while awake.

Deep breathing may also be augmented using intermittent positive-pressure breathing (IPPB). An IPPB machine delivers a volume of air under pressure through a mouthpiece when the client draws air through the mouthpiece. IPPB requires the client's cooperation, so preparatory teaching is essential. IPPB may include the administration of aerosolized medications and may be followed by coughing exercise, CPT, and postural drainage.

Introduce Chest Drainage Systems

Chest drainage systems (chest tubes) improve breathing patterns by removing accumulations of air and/or fluid from the pleural space, permitting the lungs to return to normal expansion. The tubes are inserted through the chest wall via a stab wound; multiple holes in the tip of the tube collect drainage from the pleural space. This drainage is then collected into a drainage system by either suction control or gravity. A special feature called a water seal prevents the reintroduction of air into the pleural space through the chest tube.

Interventions to Improve Oxygen Uptake and Delivery

Administer Oxygen

Oxygen uptake in the pulmonary capillary beds can be improved by increasing the concentration of oxygen in the alveolar air; this increase in the partial pressure of oxygen in the alveoli (PaO₂) increases the driving pressure for gas diffusion across the alveolar-capillary membrane.

The percentage of oxygen in the inspired air is referred to as the fraction of inspired oxygen, or FiO₂, expressed as a percentage; normal atmospheric air has an FiO₂ of 21%. Supplemental oxygen delivery systems are capable of increasing the FiO₂ to anywhere from 24% to nearly 100% oxygen (Figures 32-27 and 32-28). See Procedure 32-4.

Oxygen administration, like the administration of any drug, is not without hazards. Clients who have chronic pulmonary disease associated with carbon dioxide retention (**hypercapnia**) may become insensitive to carbon dioxide levels to drive their respiratory rate. Instead,



Figure 32-27 Oxygen Delivery Systems: A. Nasal cannula; B. Single face mask; C. Open face tent; D. Reservoir mask; E. Venturi mask.

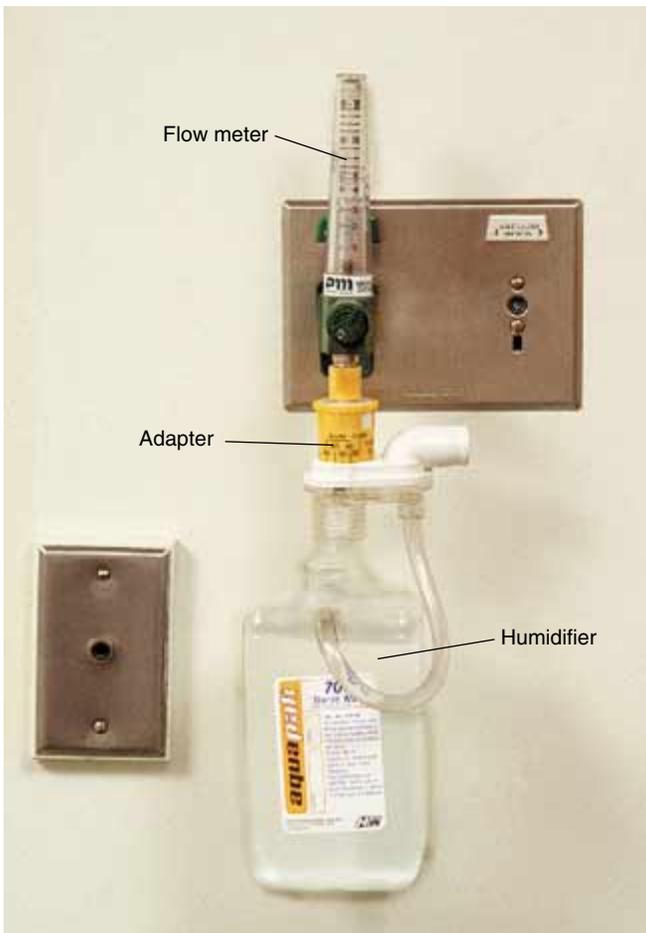


Figure 32-28 Oxygen Flowmeter Attached to Wall

these clients may depend upon a chronic low oxygen level in the blood (hypoxemia) to stimulate their respiratory drive. While low-flow oxygen may be beneficial to these clients, excessive oxygen administration may obliterate that hypoxic drive, resulting in apnea.

Another possible hazard of oxygen administration is oxygen toxicity. Prolonged administration of high FiO_2 (greater than 50% for more than 24 hours) may actually damage lung tissue and produce severe respiratory difficulties. The mechanisms by which oxygen toxicity occurs are twofold. First, it should be understood that 78% of the inspired air consists of the gas nitrogen. Although nitrogen is (under normal conditions) physiologically inert, it does serve an important function in the lung: it keeps the alveoli open simply by occupying space. High concentrations of oxygen displace nitrogen from the alveoli; as this oxygen is absorbed by the alveolar capillary blood, the volume of gas in the alveolar space is reduced and the alveoli collapse. Once the alveoli have collapsed (atelectasis), no airflow occurs and the work of breathing increases dramatically.

Second, oxygen in high concentrations is toxic to the type II alveolar cells, which are responsible for the production of **surfactant**. Surfactant is a substance that assists in keeping the alveoli open by reducing the alveolar surface tension (the tendency of the alveolar walls to collapse upon themselves). Atelectasis results when surfactant is insufficient.

Widespread atelectasis due to oxygen toxicity may result in a syndrome known as the adult respiratory distress syndrome (ARDS), which is characterized by diffuse pulmonary edema, severe stiffness of the lung tissue, and profound hypoxemia.

PROCEDURE 32-4

Administering Oxygen

Equipment

- Oxygen source (wall outlet or tank)
- Humidifier bottle, if used
- Nasal cannula and tubing

- Oxygen regulator or flowmeter
- Nipple adapter for flowmeter, if humidification is not used

Action

1. Verify written order for oxygen therapy, including methods of delivery and flow rate.
2. Wash hands.
3. Explain procedure to client. If oxygen is being given in a facility where smoking is permitted, instruct the patient and any other persons in the room to refrain from smoking or lighting matches while oxygen is in use. Check that all electrical equipment in use in the room has been inspected for electrical safety. Post appropriate signs in the room and on the door.
4. Assess the client for obstruction of the nasal passages by observing of breathing patterns and, if indicated, inspecting of nasal passages with a pen light. Notify physician if significant obstruction is present.
5. If using a wall outlet as oxygen source, plug flowmeter into outlet by pushing until it snaps into place. If a lock-release button is present, depress it as you insert the flowmeter.
6. If a tank is used as the oxygen source, the flowmeter should already be attached.
7. If humidification is used, remove the cover from the humidifier bottle to expose the adapter that connects the bottle to the flowmeter. Attach the bottle to the flowmeter by screwing the plastic nut on the adapter to the threaded outlet of the flowmeter.
8. If no humidification is used, attach the nipple adapter to the flowmeter by screwing it onto the threaded outlet of the flowmeter.
9. Attach oxygen tubing to the port on the humidifier bottle or the pointed end of the nipple adapter. Turn on oxygen flow by turning the thumbscrew (wall outlet) or knob (tank).

Rationale

1. Oxygen is a drug, and its use must be ordered by a physician. Oxygen delivered by nasal cannula is prescribed in flow rates expressed as liters per minute (L/min).
2. Prevents transmission of pathogens.
3. Explanation reduces anxiety. Oxygen, while not itself flammable, makes fires burn more readily than they otherwise would, so strict fire safety must be observed. Faulty electrical equipment may produce sparks that could ignite materials nearby.
4. If nasal passages are obstructed, oxygen delivery by nasal cannula will be ineffective and another route should be chosen.
5. Wall outlets are sealed by heavy steel valves that prevent the escape of oxygen from the system. If you hear hissing from the valve, the flowmeter is not fully engaged.
6. Special tools are used to attach valves to oxygen tanks.
7. If long-term oxygen therapy is anticipated, if flow is 6 L/min or higher, or if drying of the respiratory mucosa and/or thick secretions are present, humidification of oxygen is indicated. Short-term and/or low-flow oxygen use, such as during a medical procedure, may not require humidification.
8. This adapter allows the oxygen tubing to be connected directly to the flowmeter.
9. Establishes proper functioning of equipment. If humidifier bottle is used, bubbling of oxygen through the bottle will be noted. In addition, verify flow by feeling for the flow of air from the cannula's nasal prongs.

(continues)

PROCEDURE 32-4

Administering Oxygen (continued)

Action

10. Adjust flow rate to the prescribed amount.
11. Gently position nasal prongs into client's nares, with curves of prongs pointing toward the floor of the nostrils (Figure 32-29).

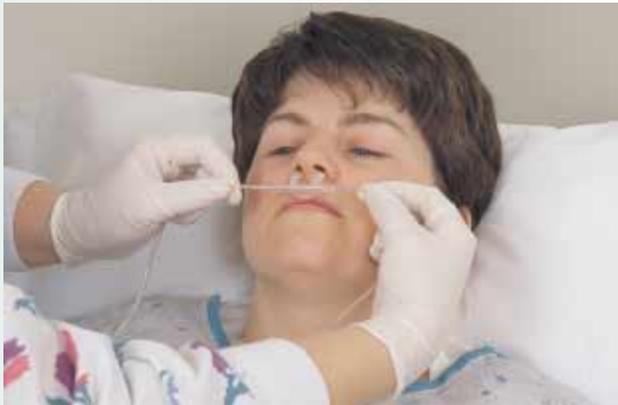


Figure 32-29 Insert cannula prong into nostrils.

12. Loop the cannula tubing over the client's ears; adjust the fit of the tubing by sliding the adjuster upward to hold the cannula in place (Figure 32-30).



Figure 32-30 Adjust tubing.

13. Assess the client's nares, face, and ears every 4 hours for signs of skin irritation or breakdown and document your findings. At the same time, inspect the nasal prongs for the presence of nasal secretions or crusts. If needed, wipe the prongs clean with a gauze pad.

Rationale

10. As for any drug, correct dosing of oxygen is essential. Both insufficient and excessive amounts can be harmful to the client.
11. Directs the flow of oxygen into the nasal cavity, where it will mix with inspired room air.

12. The fit of the cannula should be secure but not tight. A too-tight fit is uncomfortable, may cause skin breakdown (especially above the ears), and can occlude oxygen flow.

13. Pressure from the tubing or cannula may cause skin breakdown. Accumulated secretions can impair the flow of oxygen.

APPLICATION: HOME SETTING

Oxygen increases the risk of fire. Although oxygen itself is not a flammable gas, it is a necessary catalyst for fire to occur. The presence of any fuel (bed linens, paper) along with any source of ignition (a lighted cigarette, an electrical spark) will lead to fire more rapidly, and the fire will burn more vigorously, in an oxygen-rich environment. Instruct clients on oxygen administration to caution all family members and visitors to the home to avoid lighting matches, cigarettes, or any other substances in the presence of the oxygenation equipment. Also advise clients receiving therapy in the home to inspect all electrical equipment prior to use.

Administer Blood Components

Blood component administration is indicated when the client's oxygenation is impaired because of decreased circulating blood volume, decreased hemoglobin concentration in the blood (anemia), or hemorrhage. Red blood cells, plasma, clotting factors, proteins, or whole blood may be administered. Since a blood transfusion is really a type of tissue transplant, extreme care must be taken to decrease the possibility of an immune system rejection response known as a transfusion reaction.

NURSING ALERT**Blood Administration**

To minimize the risk of a serious transfusion reaction when administering blood components, be sure to:

- Follow institutional policy regarding client identification for each transfusion.
- Assess and record client vital signs (temperature, pulse, blood pressure, respirations) before initiating the transfusion and within 1 hour of completing the transfusion.
- Instruct the client to report any unusual feelings, including flushing, itching, headache, or back pain.
- Reassess vital signs after the first 10 to 15 minutes of slowly infusing the blood component. Stop the transfusion immediately if fever, tachycardia, hypotension, dyspnea, or any reports of the above symptoms occur. Notify the client's physician and the blood bank for further instructions.

Interventions to Increase Cardiac Output and Tissue Perfusion

The client with impaired cardiac output and tissue perfusion is likely to be experiencing edema of the lower extremities and/or the lungs, fatigue, activity intoler-

ance related to poor tissue oxygenation, and possibly angina and/or intermittent claudication. Interventions are aimed at reducing symptom severity while optimizing cardiac performance.

Manage Fluid Balance

Management of fluid balance is a cornerstone in the care of the client with reduced cardiac output. If congestive heart failure is present, fluid intake may be restricted to prevent edema and circulatory overload. Often, sodium intake is also limited because sodium promotes fluid retention. Diuretics may also be given to increase fluid excretion by the kidneys.

Monitoring of fluid balance by the nurse may involve the measurement of fluid intake and output (I&O) and measurement of daily weights. I&O measurement involves teaching the client the importance of accounting for all intake and output and providing a container for the measurement of urine. Daily weights should be performed at the same time each day (usually early in the morning) with the same amount of clothing on, and on the same scale, to maximize accuracy.

Clients receiving diuretics may also require monitoring for electrolyte imbalances. Potassium, particularly, may become depleted in the client receiving loop diuretics such as furosemide. Encouraging the consumption of potassium-rich foods such as bananas, and perhaps potassium supplementation, is often required.

Suggest Activity Restrictions and Assistance with Activities of Daily Living

Activity restrictions and assistance with activities of daily living (ADL) should be based upon the client's activity tolerance. The purpose of activity assistance is to decrease the oxygen demands of the body. The client's activity tolerance may be gradually increased through a sequence of exercise protocols as part of a cardiac rehabilitation program. Such a program incorporates careful monitoring of the client as the exercise level increases over time.

Position Client Properly

Positioning of the client with decreased cardiac output is done to decrease the fluid load to the heart and to decrease the development of pulmonary edema. The venous system is able to pool blood when aided by gravity; this "venous capacitance" is increased when the client's head and upper body are elevated and the legs are in a dependent position. Although it is customary in the hospital environment to place clients in a supine position, this position may be detrimental for the client with congestive heart failure, as evidenced by worsening dyspnea, tachycardia and tachypnea, and decreased arterial oxygen saturation.

Administer Medications

Medications to improve cardiac output and perfusion include diuretics as mentioned above, cardiac glycosides, and other inotropic agents. Antihypertensives, nitrates, and vasodilators may also be given to increase cardiac oxygen supply and/or reduce the myocardium's demand for oxygen. Table 32-9 lists the drugs most commonly used.

Emergency Interventions

Complete airway obstruction, cardiac arrest, and respiratory arrest are emergency situations that will result in death if not immediately rectified. Nurses receive regular training in the basic life support techniques described below; hands-on practice is an essential component of that training, and this text is not intended to serve as a substitute.

Remove Airway Obstruction

Complete airway obstruction is often the result of aspiration of food or some other foreign object into the trachea. The presence of a complete airway obstruction is characterized by an inability to speak or cough; the victim may also raise his or her hands to the throat and will likely appear very

anxious. The rescuer should verify that obstruction is present by asking the victim, "Are you choking?"

Relief of the obstruction is attempted by way of the **Heimlich maneuver**, which is described in Procedure 32-5.

Initiate Cardiopulmonary Resuscitation

Cardiac and respiratory arrest require artificial support of circulation and ventilation if the victim is to survive. **Cardiopulmonary resuscitation (CPR)** is the accepted technique of basic life support, as described in Procedure 32-6.

The technique described above is used for adult victims; different techniques are applied for children and infants and can be learned through courses such as those offered by the American Heart Association or the American Red Cross.

Interventions to Address Associated Nursing Diagnoses

Explore Lifestyle and Activity Adaptations

Lifestyle and activity adaptations may be necessary for the client with chronic alterations in oxygenation.

TABLE 32-9
Medications Used to Improve Cardiac Function

Drug Type	Common Examples	Actions
Diuretic	Furosemide (Lasix) Bumetanide (Bumex) Hydrochlorothiazide (Hydro-diuril, HCTZ) Spironolactone (Aldactone)	Affects renal tubules, resulting in increased excretion of water and certain electrolytes Lowers blood pressure and decreases cardiac workload
Cardiac glycoside	Digoxin (Lanoxin)	Increases force of cardiac contraction and slows heart rate
Inotropic agent	Dobutamine (Dobutrex) Amrinone (Inocor) Dopamine (Intropin) Isoproterenol (Isuprel)	Increases force of cardiac contraction
Antihypertensive	ACE inhibitors (captopril, enalapril) Beta-adrenergic blockers (labetolol, propranolol, atenolol) Calcium channel blockers (nicardipine, diltiazem) Centrally acting alpha-adrenergics (clonidine, methyldopa) Ganglionic blockers (trimethaphan) Peripherally acting anti-adrenergics (guanethidine, prazosin) Vasodilators (minoxidil, hydralazine)	Lowers blood pressure by various mechanisms, decreasing the heart's workload
Nitrate	Nitroglycerin Isosorbide dinitrate (Isordil)	Dilates the coronary arteries and peripheral vessels, increasing cardiac oxygen supply while decreasing cardiac workload

PROCEDURE 32-5

Clearing an Obstructed Airway

Equipment

■ None required

Action

1. Recognize the signs of airway obstruction. In the conscious person, airway obstruction is signaled by the inability to cough, speak, or breathe and often occurs during eating. In the unconscious person, note the absence of respiratory movements and the absence of air movement. A partial obstruction, indicated by high-pitched noises while breathing, a weak ineffective cough, and cyanosis, should be treated as a complete obstruction.
2. If the victim is conscious, announce that you can help. Position yourself behind the victim and wrap your arms around the victim's waist.
3. Make a fist with one hand. Place the thumb side of the fist against the victim's abdomen just above the umbilicus and well below the xyphoid process. Grasp the fist with the other hand (Figure 32-31).

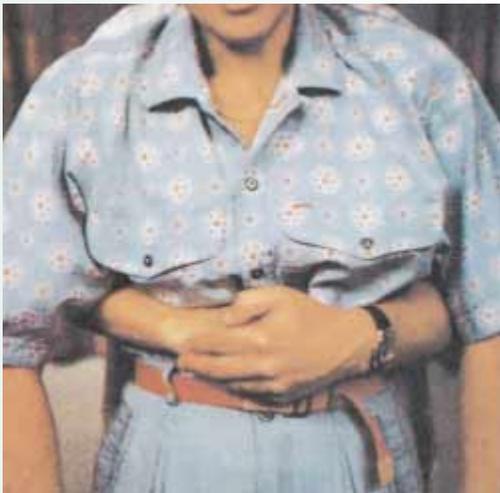


Figure 32-31 Placement of Fist into Abdomen

Rationale

1. Allows you to react quickly and effectively. If the person with a partial airway obstruction has an effective cough, you must observe closely for exacerbation. Prompt intervention is necessary if the person is unable to dislodge the obstruction.
2. A person who cannot breathe is likely to panic; announcing your intentions will elicit cooperation.
3. This position allows for rapid compressions of the diaphragm. Avoiding the xyphoid process (lowermost point of the sternum) reduces the risk of internal injury.
4. Press the fist into the victim's abdomen with quick, upward thrusts. Repeat thrusts until the object is expelled or the victim becomes unconscious.
5. If the victim become unconscious, lower him to the floor and call for help by activating the Emergency Medical System (EMS) if outside the
4. The thrusts should be of sufficient force to produce an artificial cough.
5. At this point Advanced Life Support equipment and personnel should be mobilized.

(continues)

PROCEDURE 32-5

Clearing an Obstructed Airway (continued)

Action

hospital or the internal emergency call system if inside the hospital.

6. Place the victim in a supine position. Kneel astride the victim with your body over the lower trunk or upper legs.
7. Place the heel of one hand on the victim's abdomen just above the umbilicus but well below the xyphoid process. Place the second hand on top of the first (Figure 32-32).



Figure 32-32 Placement of Hands on Abdomen for Unconscious Client

Rationale

6. This position allows you to apply abdominal thrusts to the unconscious victim.
7. This position allows for rapid compressions of the diaphragm. Avoiding the xyphoid process (lowermost point of the sternum) reduces the risk of internal injury. *Note:* If the rescuer is too short to reach around the victim from behind, this position may also be used for the conscious victim.

8. Press into the abdomen with quick, upward thrusts.
 9. If the victim is in the late stages of pregnancy or is markedly obese, the hand position may be changed. In this case, place the fist over the midportion of the sternum, avoiding the xyphoid process.
 10. After five abdominal thrusts in the unconscious victim, open the mouth and sweep with the index finger.
 11. Open the airway using the head tilt–chin lift method (see Procedure 32-6) and attempt to ventilate. If successful, proceed with cardiopulmonary resuscitation sequence. If unsuccessful, repeat steps 5 through 10 in sequence until successful.
8. The thrusts should be of sufficient force to produce an artificial cough.
 9. A very large abdomen will make effective abdominal thrusts impossible.
 10. Abdominal thrusts may have raised the foreign body up to a level where it can be removed manually.
 11. Until the obstruction is removed, no other resuscitation efforts will be successful.

PROCEDURE 32-6

Performing Adult Cardiopulmonary Resuscitation

Equipment

■ Backboard (optional)

■ Resuscitation mask or face shield (optional)

Action

1. Determine unresponsiveness in the victim by tapping or gently shaking and shouting, “Are you OK?”
2. If the victim is unresponsive, call out for help and activate the EMS if outside the hospital or the internal emergency paging system if inside the hospital.
3. Position the victim for CPR: Place supine on a firm surface. If in a bed, roll the victim onto his or her side and place firm backboard under the torso, then roll back into a supine position.
4. Open the victim’s airway using the head tilt–chin lift method (Figure 32-33). Once the airway is open, place your cheek very close to the victim’s mouth; look, listen, and feel for breathing.



Figure 32-33 Open airway by head tilt–chin lift.

Rationale

1. Quickly determines whether an emergency exists. *Note:* If the victim has sustained an injury to the head or neck, to avoid furthering a spinal cord injury, move the victim only if absolutely necessary.
2. Rapid initiation of Advanced Life Support techniques, particularly defibrillation, is associated with increased success of resuscitation.
3. Facilitates airway opening and chest compressions, and the firm surface increases the effectiveness of chest compressions.
4. Removal of the tongue from the posterior oropharynx may restore breathing in the unconscious adult victim. *Note:* If this maneuver restores breathing, place the victim in a side-lying position or continue to hold the airway open and monitor breathing until help arrives.
5. Minimizes neck movement but is more difficult to perform.
6. A mask or shield can be used to reduce the exposure of the rescuer to the oral secretions, blood, vomitus of the victim.
7. Slow breath delivery improves the distribution of air in the victim’s lungs and decreases the risk that air will enter the stomach. Uncovering
(continues)

PROCEDURE 32-6

Performing Adult Cardiopulmonary Resuscitation (continued)

Action

chest rise as the breath is given, and feel for exhalation after the breath is given.

8. Locate the carotid artery in the victim's neck (in the groove between the larynx and the large muscle of the neck). Palpate for at least 5 seconds to determine whether a pulse is present. If a pulse is present, continue to deliver breaths at a rate of 10 to 12 per minute, or a breath every 5 to 6 seconds.
9. If no pulse is present, begin chest compressions: Position yourself over the victim with your shoulders directly over the victim's chest (Figure 32-34). Place the heel of one hand over the lower half of the sternum, avoiding the xiphoid process. Place the second hand directly on top of the first, keeping the fingers up and off of the chest wall. Lock your elbows.

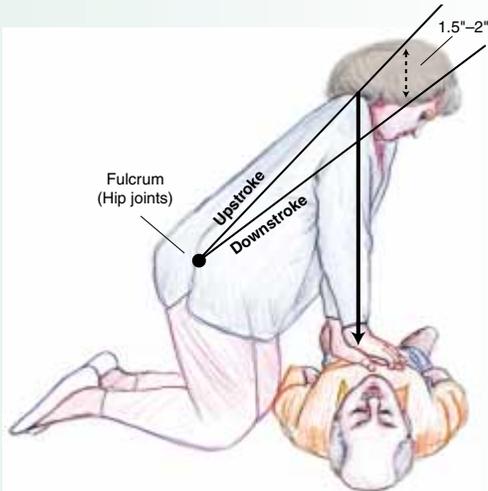


Figure 32-34 Proper Position of Rescuer

Rationale

mouth after breath delivery permits passive exhalation. Watching the chest rising and feeling exhalation verify successful delivery of breaths.

8. Too-rapid pulse assessment may cause the rescuer to miss a slow or weak pulse. If a pulse is present, chest compression should not be performed.
9. Correct hand position maximizes the effectiveness of compressions while minimizing the risk of injuries such as fractured ribs, pneumothorax, and lacerations of internal structures. Correct hand position may be achieved by running the middle finger along the bottom rib toward the sternum until the xiphoid process is felt. Place the opposite hand on the sternum two finger widths above this point.

10. Compress the sternum $1\frac{1}{2}$ to 2 inches; then release fully while maintaining correct hand position. Repeat the compression and release sequence 15 times at a rate equivalent to 80 to 100 compressions per minute.
11. After 15 chest compressions, return to the victim's head and open the airway as in step 4. Deliver two slow, full breaths as in steps 6 and 7. Repeat the sequence of 15 compressions to two breaths until help arrives or pulse and breathing are restored.
12. Reassess for the return of breathing and pulse every few minutes; then resume CPR.

10. Compression of the sternum forces blood to be ejected from the heart, mimicking normal ventricular systole. Release of the pressure moves blood into the heart, mimicking diastole.
11. Repeated cycles of breaths and compressions are necessary to deliver oxygenated blood to the vital organs.
12. In rare instances, breathing and circulation may be restored with CPR; in most circumstances, CPR sustains minimal tissue oxygenation until Advanced Life Support measures are available.

THINK ABOUT IT

Mouth-to-Mouth Breathing

In recent years, increased concern over the possibility of disease transmission during mouth-to-mouth breathing has led to the development of newer variations on this technique. Several styles of masks that fit over the victim's mouth and contain a one-way valve through which the rescuer breathes are available for both in-hospital and community use. Have you ever performed mouth-to-mouth breathing through one of these masks? Knowing that there is a possibility of disease transfer, would you be willing to administer mouth-to-mouth breathing without a mask?

Interventions related to lifestyle and activity have three general purposes:

- To minimize energy and oxygen consumption
- To reduce factors that contribute to the disease process
- To systematically increase activity tolerance

Measures to reduce energy and oxygen consumption are chosen after a careful assessment of the client's activity tolerance. Clients may need assistance with activities of daily living, including hygiene and toileting; however, it should be noted that complete bedrest is not always the best option. Many clients find that using a bedside commode or toilet is less physically taxing than using a bedpan, especially for bowel movements.

Occupational roles may also need to be modified. If the client is not able to continue working in the old job, it may be possible to take on a new job that is less taxing or to reduce the number of hours worked. If such changes are not possible, the client may have to quit working altogether. All of these possibilities may cause much distress to the client and family, who must grapple with role issues, authority and autonomy issues, and possibly financial con-

APPLICATION: HOME SETTING

Activity adaptations in the home setting may involve alterations in the physical environment of the home, changes in family roles, or changes in work roles. The client who cannot climb stairs may need to have his or her sleeping quarters moved to the first floor of the house. Clients may also need to give up household chores that cause distress and perhaps take on other, less physically taxing roles. Changes such as these can be trying for the entire family, and they will need support during the period of transition. Home health nurses are a tremendous resource for families facing role changes related to illness.



Title of Study

"Functional Status from the Patient's Perspective: The Challenge of Preserving Personal Integrity"

Authors

Leidy, N. K., & Haase, J. E.

Purpose

The purpose of this quantitative research was to explore how clients with chronic obstructive pulmonary disease (COPD) cope with the changes in their ability to perform day-to-day activities.

Methods

Twelve clients from a pulmonary outpatient clinic in the southeast with varying sociodemographic backgrounds and moderate to severe emphysema, chronic bronchitis, asthma (with underlying chronic airways obstruction), or COPD participated in the study. During recorded interviews, the clients were asked to describe a typical day and were then encouraged to self-direct the content of the interview. The interviews were transcribed, and theme clusters were identified and findings validated for credibility.

Findings

Clients with COPD experienced ongoing challenges in preserving a sense of wholeness as they faced physical changes that interfered with their daily activities. They wanted to maintain personal integrity, which was described as having a sense of effectiveness and connectedness through their daily activities.

Implications

This study identifies the need for further research in order to define nursing interventions that focus on individual, client needs, and support emotional expression, goal setting, and recollection.

Leidy, N. K., & Haase, J. E. (1999). Functional status from the patient's perspective: The challenge of preserving personal integrity. *Research in Nursing Health*, 22(2), 67–77.

cerns. Signs of inadequate family coping, such as marital discord, anger or hostility, sleep disturbances, and depression, should be noted and appropriate interventions, such as a referral for counseling, should be instituted.

Lifestyle adaptations aimed at reducing factors that contribute to the disease process include removal of allergens from the environment, smoking cessation, and control of modifiable risk factors for heart disease.

Allergen control and smoking cessation were discussed in the section Interventions to Promote Airway Clearance. Modification of cardiac risk factors includes smoking cessation as well as dietary alterations and weight control, control of diabetes and hypertension if present, exercise, and stress management. A comprehensive cardiac rehabilitation program addresses all of these issues while monitoring the client's progress toward his or her individualized goals.

Encourage Dietary and Nutritional Modifications

Dietary modifications for cardiovascular disease may include reduction of sodium intake and reduction of total fat, saturated fat, and cholesterol intake. Sodium consumption may be reduced by decreasing or eliminating salt used in cooking and added at the table and avoiding highly processed foods such as prepared meats, canned meat or fish, and many prepared sauces. The client should be taught to examine food labels for sodium content per serving.

The client who is not receiving adequate nutrient intake because of poor appetite or severe dyspnea will need assistance in finding ways to increase intake of calories and essential nutrients. Eating small, frequent

meals of high nutritional value and using dietary supplements are often helpful.

Promote Comfort

Promoting comfort for the client with oxygenation disturbances can be a challenge but is extremely important. Comfort influences the client's ability to eat, sleep, learn, and cope with the illness and the care being provided.

Altered comfort related to pain is best approached by removing or modifying the cause of the pain if possible and administering analgesics if indicated. The use of analgesics in the postoperative client is particularly important in allowing the client to participate fully in deep-breathing and coughing exercises. See Chapter 33 for more discussion of pain management.

Pain related to tissue ischemia is best relieved by improving the oxygen delivery to the tissues while reducing the oxygen demand. The first response to ischemic pain should be to rest the affected tissue. If the pain is in the legs, for example, the client should sit down. Improving delivery of oxygen to the legs in the client with peripheral vascular disease may involve positioning the legs lower than heart level (elevating the legs will often make the pain worse).

Heart pain related to ischemia (angina pectoris) should also be dealt with first and foremost by resting. Resting will decrease the heart's workload and in some cases is sufficient to relieve the pain. Improving oxygen delivery to the heart may be accomplished by providing supplemental oxygen or by using medications, such as nitrates, that improve coronary blood flow. In some cases, narcotic analgesics such as morphine are necessary.



CLIENT TEACHING CHECKLIST *Following a Healthy Diet*

Reduction of total dietary fat, saturated fat, and cholesterol can be a challenge and requires careful client teaching. Use food labels and reference charts to help clients follow these dietary outlines:

- Reduce fat intake to no more than 30% of the total caloric intake.
- Keep saturated fats down to no more than 10% of the total caloric intake. (Saturated fats include those from animal sources such as milk and dairy products. Palm and coconut oils, although from a vegetable source, have the same effect as animal fats in terms of raising serum cholesterol.)
- Limit cholesterol intake to no more than 300 mg per day.
- Eat less meat and dairy products and more fresh fruits, vegetables, and whole grains.
- Avoid processed foods, especially those with sauces or fillings. When eating out, choose baked or grilled dishes rather than fried, sautéed, or stewed.
- Enjoy treats such as rich desserts only occasionally; choose low-fat desserts such as low-fat frozen yogurt, fruit sorbets, or angel food cake whenever possible.



CLIENT TEACHING CHECKLIST *General Reminders*

- Assess the client's and family's level of knowledge.
- Focus on identifying misconceptions that need to be clarified.
- Ask open-ended questions, such as, "Tell me what your medications are for," instead of simple yes/no questions.
- Set goals with the client's input; base goals upon realistic expectations.
- State goals clearly: for example, "Mr. Jones will be able to name all of his medications, the dose, and frequency they are taken and list one major side effect of each."
- Individualize teaching methods, taking into account the client's particular needs and abilities.
- Involve the family in teaching sessions.

Complementary Therapies

Many complementary therapies that enhance oxygenation originate in ancient healing traditions of China and India. For example, the practice of meditation and yoga produces a sense of serenity and relaxation, and other positive physiologic benefits. Harvard Medical School professor Herbert Benson studied the effects of people who practiced transcendental meditation in the 1970s and showed that meditation decreases oxygen consumption and metabolism; lowers blood pressure, heart rate, and respiratory rate; increases the production of alpha brain waves; and relieves stress and enhances overall well-being. Dean Ornish, M.D., has successfully reversed coronary artery disease by using yoga with dietary changes, moderate exercise, and support groups.

Herbs

Herbs are often used with relaxation techniques, exercise, and diet to prevent diseases of the cardiovascular and respiratory systems; see the accompanying display for commonly used herbs for these systems. Respiratory stimulants are expectorants that loosen mucus from the

HERBS

Herbs for the Circulatory System

<i>Broom</i>	<i>Buckwheat</i>	<i>Cayenne</i>	<i>Dandelion</i>
<i>Ginger</i>	<i>Hawthorn</i>	<i>Horsechestnut</i>	<i>Lime Blossom</i>
<i>Mistletoe</i>	<i>Yarrow</i>		

Herbs for the Respiratory System

Stimulants (expectorants):

<i>Bittersweet</i>	<i>Cowslip</i>	<i>Daisy</i>	<i>Senega</i>
<i>Soapwort</i>	<i>Squill</i>	<i>Thuja</i>	

Relaxants (promote expectoration):

<i>Angelica</i>	<i>Aniseed</i>	<i>Coltsfoot</i>	<i>Elecampane</i>
<i>Ephedra</i>	<i>Flaxseed</i>	<i>Grindelia</i>	<i>Hyssop</i>
<i>Plantain</i>	<i>Thyme</i>	<i>Wild Cherry Bark</i>	<i>Wild Lettuce</i>

Demulcents (mucilaginous):

<i>Lungwort</i>	<i>Coltsfoot</i>	<i>Flaxseed</i>	<i>Licorice</i>
<i>Root</i>			
<i>Comfrey</i>	<i>Marshmallow Leaf</i>		<i>Mullein</i>

Adapted from: Hoffmann, D. (1998). *The new holistic herbal* (3rd ed.). Boston: Element.

NURSING CARE PLAN

The Client with Pneumonia

Case Presentation

Mrs. Johnson is a 72-year-old woman hospitalized for left lower lobe pneumonia. She complains of a persistent cough and occasional pain in her left chest associated with coughing, fever, and shortness of breath. Prior to this admission, she has been healthy and independent. Upon assessment, you find her mildly dyspneic, occasionally pausing in the middle of a sentence to breathe. Her respiratory rate is 28 breaths per minute. Her pulse is 100 per minute and regular; blood pressure is 140/90 mm Hg. Her skin is warm, dry, and pale pink with brisk capillary refill. You do not note any edema. She is receiving oxygen by nasal cannula at 6 L/min.

Assessment

- Dyspnea, tachypnea, and tachycardia
- Cough, chest pain, fever

Nursing Diagnosis #1

Impaired Gas Exchange related to presence of infectious exudate in the left lower lobe of the lung.

Expected Outcomes

The client will:

1. Report relief of dyspnea.
2. Demonstrate return of respiratory rate to 20/minute or less and heart rate to 100/minute or less.
3. Be able to speak comfortably.

Interventions/Rationales

1. Teach client effective techniques for coughing, such as sustained maximal inspiration and “huffing.”
Increases the clearance of exudate.
2. Assist with chest physiotherapy and postural drainage as indicated. *Promotes the clearance of exudate by using gravity, percussion, and vibration of the chest wall.*
3. Humidify inspired oxygen, and encourage oral fluid intake. *Promotes liquefaction of pulmonary secretions, which facilitates expectoration.*
(continues)

NURSING CARE PLAN**The Client with Pneumonia (continued)**

4. Encourage client to lie on her right side while in bed. *Positioning with the unaffected lung down provides the best match of ventilation and perfusion.*
5. When assessing for dyspnea, do so not only with the client at rest but also during activities such as talking, eating, and moving. *Clients who appear to be breathing comfortably at rest may become dyspneic with minimal activity.*

Nursing Diagnosis #2

Imbalanced Nutrition: Less Than Body Requirements related to decreased oral intake and increased metabolic requirements.

Expected Outcomes

The client will:

1. Maintain usual body weight.
2. Consume at least 50% of food provided.

Interventions/Rationales

1. Provide oral care after coughing, after respiratory treatments, and before meals. *Coughing and the expectoration of secretions can create an unpleasant taste in the mouth, which interferes with appetite.*
2. Assess food intake and provide supplements if intake is insufficient to meet caloric needs. *Dietary supplements may provide increased calories and nutrients.*
3. Encourage liberal fluid intake. *Clients with fever and dyspnea lose excess body fluids through the skin and lungs. Adequate hydration will help liquefy pulmonary secretions and prevent decreases in circulating blood volume. Always check for contraindications such as heart failure, kidney disease, or a physician-ordered fluid restriction before encouraging increased fluids.*
4. Weigh daily. Monitors progress to goal so that plan can be modified as needed. *Daily gains or losses in excess of 1 pound are often due to fluid balance alterations. Slower gains or losses may be due to nutritional alterations.*

Evaluation

Success of the nursing interventions can be measured by a visible increase in the client's comfort and ease of speaking and a decreased effort at the work of breathing. The client will report that dyspnea has been relieved and will have respiratory and heart rates within the normal range. Ongoing evaluation will be needed to monitor client's weight to ensure that intake is adequate to meet client's caloric requirements.

respiratory system. *Lobelia* (Indian tobacco) contains lobeine, a nonaddicting substance similar to nicotine, and is often used to quit smoking.

revisit the initial plan of care to determine if each expected outcome was within reasonable expectations and then to revise the goals, interventions, and plan of care to reflect truly reasonable expectations.

EVALUATION

Clients with compromised oxygenation status need careful nursing care to address both their physical and psychological needs. Evaluation will be based on the outcomes and goals that the nurse and client have established together. In many instances, the evaluation of the success of the specific interventions will be a matter of degree, that is, the degree to which the client is or can be returned to a satisfactory state of respiratory functioning. It is important when evaluating progress to

KEY CONCEPTS

- Adequate tissue oxygenation is essential to survival and may be threatened by deficits in air movement through the lungs to deliver fresh air to the alveoli (ventilation), the exchange of oxygen and carbon dioxide across the alveolar-capillary membrane (diffusion or external respiration), oxygen transport in the blood, the delivery of oxygen to the tissues (circulation), or the uptake of oxygen by the cells (internal respiration).

- Impairment of oxygen delivery to the tissues results first in compensatory efforts such as anaerobic metabolism and increased oxygen extraction; when these efforts fail, tissue ischemia and infarction will ensue.
 - Client teaching related to oxygenation impairment involves teaching about the disease process, treatments, and lifestyle alterations that may be indicated; teaching should involve not only the client but also the family.
 - Nursing care related to oxygenation focuses on maintaining a patent airway, promoting effective ventilation, promoting optimal circulation and perfusion, and meeting the client's learning, nutritional, activity, and sleep needs.
 - A holistic approach to care recognizes that each of the problems experienced by the client with oxygenation deficits is interrelated.
 - Emergency support of airway, ventilation, and circulation is achieved by instituting the Heimlich maneuver for airway obstruction and cardiopulmonary resuscitation for cardiopulmonary arrest.
4. What is the difference between intermittent positive-pressure breathing (IPPB) and incentive spirometry?
 5. List two potential complications of oxygen administration.
 6. Artificial airways such as endotracheal tubes and tracheostomies bypass the upper airways. What is the significance of this?
 7. How does heart failure cause edema?
 8. When experiencing pain related to peripheral atherosclerosis (claudication), the client should position the extremity below heart level. Why?

WEB RESOURCES

Agency for Health Care Policy and Research
www.ahrq.gov
 American Heart Association
www.americanheart.org
 American Lung Association
www.lungusa.org
 Center for Health Care Technologies
www-bio.llnl.gov
 Stroke Association
www.StrokeAssociation.org

CRITICAL THINKING ACTIVITIES

1. Which accounts for the greatest amount of oxygen carried in the arterial blood: the partial pressure of oxygen (PaO_2) or the hemoglobin saturation (SaO_2)?
2. Describe how positioning might affect the client with ineffective breathing patterns.
3. List two limitations of anaerobic metabolism.

Comfort and Sleep



“We cannot be a source of strength unless we nurture our own strength.”

—M. Scott Peck

COMPETENCIES

1. Describe types of pain.
2. Assess the nature of pain as it relates to onset, intensity, and duration.
3. Discuss the physiology of pain.
4. Describe nonpharmacologic interventions in pain control.
5. Discuss the use of pharmacologic interventions in pain control.
6. Describe the stages of sleep.
7. Discuss age-related sleep variations.
8. State the outcomes of sleep deprivation on an individual.
9. Discuss nursing interventions that promote comfort, rest, and sleep.

**KEY
TERMS**

acute pain	hyperalgesia	phantom limb pain
addiction	hypersomnia	physical dependence
adjuvant medication	hypnosis	progressive muscle relaxation
afferent pain pathway	imagery	recurrent acute pain
allodynia	insomnia	referred pain
biofeedback	ischemic pain	reframing
biological clock	lancinating	relaxation techniques
bruxism	mixed agonist-antagonist	rest
ceiling effect	myofascial pain syndromes	sleep
chronic acute pain	narcolepsy	sleep apnea
chronic nonmalignant pain	neuralgia	sleep cycle
chronic pain	neuropathic pain	sleep deprivation
chronobiology	nociception	somatic pain
circadian rhythm	nociceptor	somnambulism
colic	pain	tolerance
counterstimulation	pain threshold	transcutaneous electrical nerve stimulation (TENS)
cutaneous pain	pain tolerance	trigger point
distraction	parasomnia	visceral pain
efferent pain pathway	paresthesia	withdrawal syndrome
endorphin	patient controlled-analgesia (PCA)	
gate control pain theory		

The experience of pain and the quality of rest and sleep are both factors that can have a significant impact on a client's health. Both are personal experiences that can affect all other aspects of an individual's health, including physical well-being, mental status, and effectiveness of coping mechanisms. This chapter explores the nature of pain, the importance of rest and sleep, and nursing care to help clients maintain their optimal health when the presence of pain or rest/sleep disturbances threaten to compromise their health status.

PAIN

Pain is a universal human experience; it is defined as “a state in which an individual experiences and reports the presence of severe discomfort or an uncomfortable sensation” (Carpenito, 1999, p. 51). Pain is a subjective experience that is often difficult for clients to describe and nurses to understand, yet it is among the most common complaints that cause individuals to seek health care. McCaffery and Pasero (1999) recognize the subjective nature of pain by stating “Pain is whatever the experiencing person says it is, existing whenever he says it does” (p. 17). Until recently, pain was viewed as a symptom that required diagnosis and treatment of the underlying cause. It is now clear that pain itself can be detrimental to the health and healing of clients. “Unrelieved pain is not only detrimental, it's avoidable” (Williams-Lee, 1999, p. 9). Pain is a stressor that can trigger both physiological and psychological discomfort. Untreated pain can lead to physical disorders related to undernutrition, immobility, and immune suppression.

Nature of Pain

Pain, a response to noxious stimuli, can be a protective mechanism to prevent further injury, as is seen in clients who guard or protect an injured body part. The sensation of pain as the warning of potential tissue damage may be absent in people with nerve/spinal cord abnormalities, diabetic neuropathy, multiple sclerosis, and nerve/spinal cord injury.

Common Myths About Pain

Because pain is subjective (dependent on client's perception) and cannot be objectively measured by another individual through a laboratory test or diagnostic data, pain is often misunderstood and misjudged. A client's reports of level of pain will vary on the basis of cultural and experiential backgrounds, and the nurse's interpretations of a client's pain will be filtered through the nurse's own biases and expectations. “Pain doesn't go untreated (or under-treated) because of cruelty or apathy by the staff, but because of lack of knowledge. Just as [long-term care] residents have preconceived notions and concerns regarding pain and pain management, so do staff members” (Loeb, 1999, p. 49). Incongruence of the nurse's view and the client's perception of pain can often lead to undermedication and unnecessary suffering on the client's part. The accompanying display outlines some of the common myths about pain, along with factual statements countering those beliefs.

Types of Pain

Pain can be qualified or described in two basic ways: by its cause or origin and by its description or nature.

Pain categorized by its origin is either cutaneous, somatic, or visceral. **Cutaneous pain** is caused by stimulation of the cutaneous nerve endings in the skin and results in a well-localized “burning” or “prickling” sensation; getting a knot in the hair that is pulled out during combing may cause cutaneous pain. **Somatic pain** is nonlocalized and originates in support structures such as tendons, ligaments, and nerves; jamming a knee or finger will result in somatic pain. **Visceral pain** is discomfort in the internal organs and is less localized and more slowly transmitted than cutaneous pain. Visceral pain is often difficult to assess because the location may not be directly related to the cause.

COMMON MYTHS ABOUT PAIN

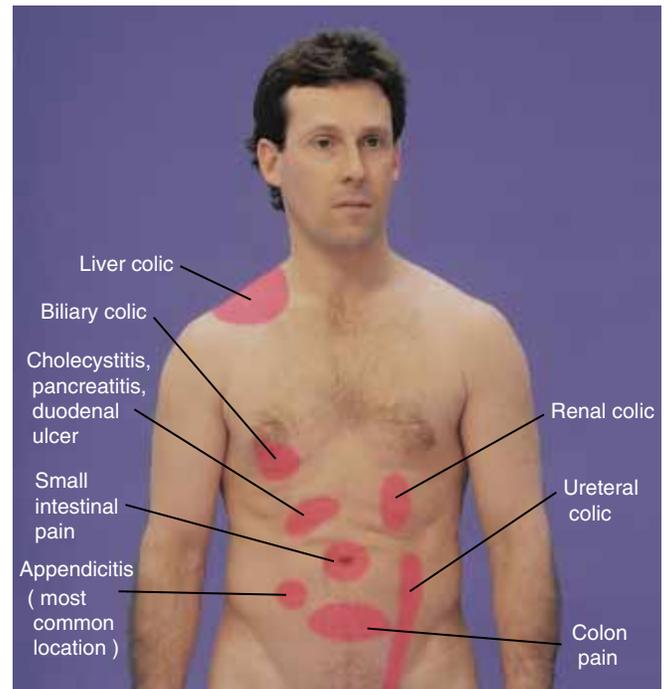
Myth

- The nurse is the best judge of a client’s pain.
- If pain is ignored, it will go away.
- Clients should not take any measures to relieve their pain until the pain is unbearable.
- Most complaints of pain are purely psychological (e.g., “it’s all in your head”); only “real” pain will manifest in obvious physical signs such as moaning or grimacing.
- Clients with severe tissue damage will experience significant pain; those with lesser damage will feel less pain.
- Clients taking pain medications will become addicted to the drug.

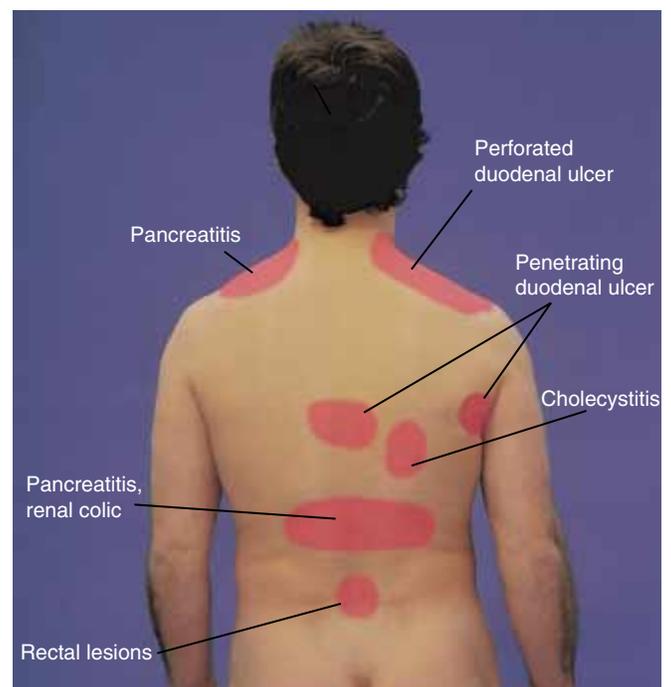
Fact

- Pain is a subjective experience; only the client can judge the level and severity of pain.
- Pain is a real experience that can be appropriately treated.
- Pain control and relief measures are effective in lowering pain levels, which will help clients function more normally and comfortably.
- Most clients honestly report their perception of pain.
- Physical responses to pain vary greatly depending on experience and cultural norms.
- Visible expressions of pain are not always reliable indicators of its severity.
- Individuals’ perceptions of pain are subjective; the extent of tissue damage is not necessarily proportional to the extent of pain experienced.
- Addiction is unlikely when analgesics are carefully administered and closely monitored.

Pain originating from the abdominal organs is often called **referred pain** because the sensation of pain is not felt in the organ itself but instead is perceived at the spot where the organs were located during fetal development. Figure 33-1 shows the cutaneous areas where visceral pain is often referred.



A.



B.

Figure 33-1 Areas of Referred Pain. A. Anterior view. B. Posterior view.

Acute pain is most frequently identified by its sudden onset and relatively short duration, mild to severe intensity, and a steady decrease in intensity over a period of days to weeks. Some forms of acute pain may have a slower onset. Once the noxious stimulus is resolved, the pain usually decreases. Examples of noxious stimuli are needle sticks, surgical incisions, burns, and fractures.

Recurrent acute pain is identified by repetitive painful episodes that may recur over a prolonged period or throughout the client's lifetime. These painful episodes alternate with pain-free intervals. Examples of recurrent pain include migraine headaches, sickle cell pain crises, and the pain of angina pectoris due to myocardial hypoxia.

Chronic pain is identified as long-term (lasting 6 months or longer), persistent, nearly constant, or recurrent pain that produces significant negative changes in the client's life. Unlike acute pain, chronic pain may last long after the pathology is resolved.

Chronic acute pain occurs almost daily over a long period, has the potential for lasting months or years, and has a high probability of ending. Severe burn injuries and cancer are examples of pathophysiology that leads to chronic acute pain, which may last for long periods before the condition is cured or controlled.

Chronic nonmalignant pain (CNP), occurs almost daily and lasts for at least 6 months, with intensity ranging from mild to severe.

Chronic pain, a primary motivator for individuals to seek health care intervention, can greatly influence a client's quality of life, including emotional, social, vocational, and financial areas.

There is a relationship between chronic conditions (including pain) and depression. Thus, the client experiencing chronic pain should always be assessed for the presence of depression. "Not only do patients with CNP have a higher rate of depression, but suicide potential is also a serious concern for this population" (McCaffery & Pasero, 1999, p. 487). Examples of pathophysiology leading to chronic nonmalignant pain include:

- Many forms of **neuralgia** (paroxysmal pain that extends along the course of one or more nerves)
- Low back pain
- Rheumatoid arthritis
- Ankylosing spondylitis
- **Phantom limb pain** (a form of neuropathic pain that occurs after amputation with pain sensations referred to an area in the missing portion of the limb)
- **Myofascial pain syndromes** (a group of muscle disorders characterized by pain, muscle spasm, tenderness, stiffness, and limited motion)

CNP may be associated with several problems, including:

- Activity intolerance, which leads to physical deconditioning

- Functional impairment with resultant changes in role performance (parent, breadwinner)
- Social isolation, which alters relationships
- Sleep deprivation
- Frustration, anxiety, anger, and depression

When CNP is severe enough to disable the client, nurses understand that in order "To improve your patient's quality of life, pain management becomes a priority" (Bral, 1998, p. 27).

Physiology of Pain

Noxious stimuli activate **nociceptors** (receptive neurons for painful sensations) that, together with the axons of neurons convey information to the spinal cord where reflexes are activated. The information is simultaneously transmitted to the brain supraspinally (Cleland & Gebhart, 1997). Long-lasting changes in cells within the spinal cord **afferent** (ascending) and **efferent** (descending) **pain pathways** may occur after a brief noxious stimulus.

Physiological responses (such as elevated blood pressure, pulse rate, and respiratory rate; dilated pupils; pallor; and perspiration) to even a brief acute pain episode will begin showing adaptation within a short period, possibly minutes to a few hours. Physiologically, the body cannot sustain the extreme stress response for other than short periods of time. The body conserves its resources by physiological adaptation (returning to normal or near normal blood pressure, pulse rate, and respiratory rate; normal pupil size, and dry skin) even in the face of continuing pain of the same intensity. Pain can be categorized into two types according to its pathophysiology; see Table 33-1.

Nociceptive Pain

The four fundamental processes involved in **nociception** (process by which individual becomes consciously aware of pain) are as follows (McCaffery & Pasero, 1999):

- **Transduction**—The changing of noxious stimuli in sensory nerve endings to energy impulses
- **Transmission**—Movement of impulses from site of origin to the brain
- **Perception**—Developing conscious awareness of pain
- **Modulation**—The changing of pain impulses

Transduction of Pain

When noxious stimuli occur, tissues are damaged. Cell damage releases the following sensitizing substances:

- Prostaglandins (PG)
- Bradykinin (BK)
- Serotonin (5HT)
- Substance P (SP)
- Histamine (H)

TABLE 33-1
Pathology-Based Pain Classification

Nociceptive Pain	Neuropathic Pain
<p><i>DESCRIPTION:</i> Normal processing of noxious stimuli May damage tissue if prolonged</p>	<p><i>DESCRIPTION:</i> Abnormal processing of stimuli by peripheral nervous system (PNS) or central nervous system (CNS)</p>
<p><i>EXAMPLES:</i> Somatic pain Visceral pain</p>	<p><i>EXAMPLES:</i> Centrally generated pain: <ul style="list-style-type: none"> • Phantom pain • Spinal cord injury Peripherally generated pain: <ul style="list-style-type: none"> • Diabetic neuropathy • Trigeminal neuralgia </p>
<p><i>THERAPY:</i> Nonsteroidal anti-inflammatory drugs (NSAIDs), opioids</p>	<p><i>THERAPY:</i> NSAIDs, opioids, adjuvant analgesics</p>
<p>(Data from McCaffery, M., & Pasero, C. [1999]. <i>Pain: Clinical manual</i> (2nd ed.). St. Louis: Mosby, p. 19.)</p>	

Release of these substances alters the electrical charge on the neuronal membrane. This change in electrical charge is a result of movement of Na⁺ and other ions into the cells. The impulse is then ready to be transmitted along the nociceptor fibers (McCaffery & Pasero, 1999).

Transmission of Pain

The specific action of pain varies depending on the type of pain. In cutaneous pain, cutaneous nerve transmissions travel through a reflex arc from the nerve ending (point of pain) to the brain at a speed of approximately 300 feet per second, with a reflex response causing an almost immediate reaction. This explains why, when a hot stove is touched, the person's hand jerks back *before* there is conscious awareness that damage is occurring (Figure 33-2). After a hot stove is touched, a sensory nerve ending in the skin of the finger initiates nerve transmission that travels through the dorsal root ganglion to the dorsal horn in the gray matter of the spinal cord. From there, the impulse travels through an interneuron that synapses with a motor neuron, which exits the spinal cord at the same level. This motor neuron, and the stimulation of the muscle it innervates, is responsible for the swift movement of the hand away from the hot stove.

In the case of the hot stove, the sensory neuron synapses not only with an interneuron but also with an afferent sensory neuron. The impulse travels up the spinal cord to the thalamus, where a final synapse conducts the impulse to the cortex of the brain. Efferent or descending motor neuron response is conducted from the brain through the spinal cord, where it synapses with a motor neuron that exits the spinal cord and innervates the muscle.

In visceral pain, transmission of pain impulses is slower and less localized than in cutaneous pain. The internal organs (including the gastrointestinal tract) have a minimal number of nociceptors, which explains why visceral pain is poorly localized and is felt as a dull aching or throbbing sensation. However, internal organs have extreme sensitivity to distension. The cramping pain of **colic** (acute abdominal pain), for example, results when:

- Flatus or constipation causes distension of the stomach or intestines
- There is hyperperistalsis, as in gastroenteritis
- Something tries to pass through a lumen (an opening) that is too small

The physiology of **ischemic pain**, or pain occurring when the blood supply of an area is restricted or cut off completely, also differs from that of cutaneous pain. The restriction of blood flow causes inadequate oxygenation of the tissue supplied by those vessels, as well as inadequate metabolic waste product removal. Ischemic pain has the most rapid onset in an active muscle and a much slower onset in a passive muscle. Examples of ischemic pain are muscle cramps, sickle cell pain crisis, angina pectoris, and myocardial infarction. When ischemic pain occurs in a muscle that continues to work, a muscle spasm (cramp) is the outcome. If the blood supply to the heart is severely restricted or completely cut off and is not restored quickly, a myocardial infarction will occur.

In acute pain episodes, substances released from injured tissue lead to stress hormone responses in the client. This causes an increased metabolic rate, enhanced breakdown of body tissue, impaired immune function, increased blood clotting and water retention,

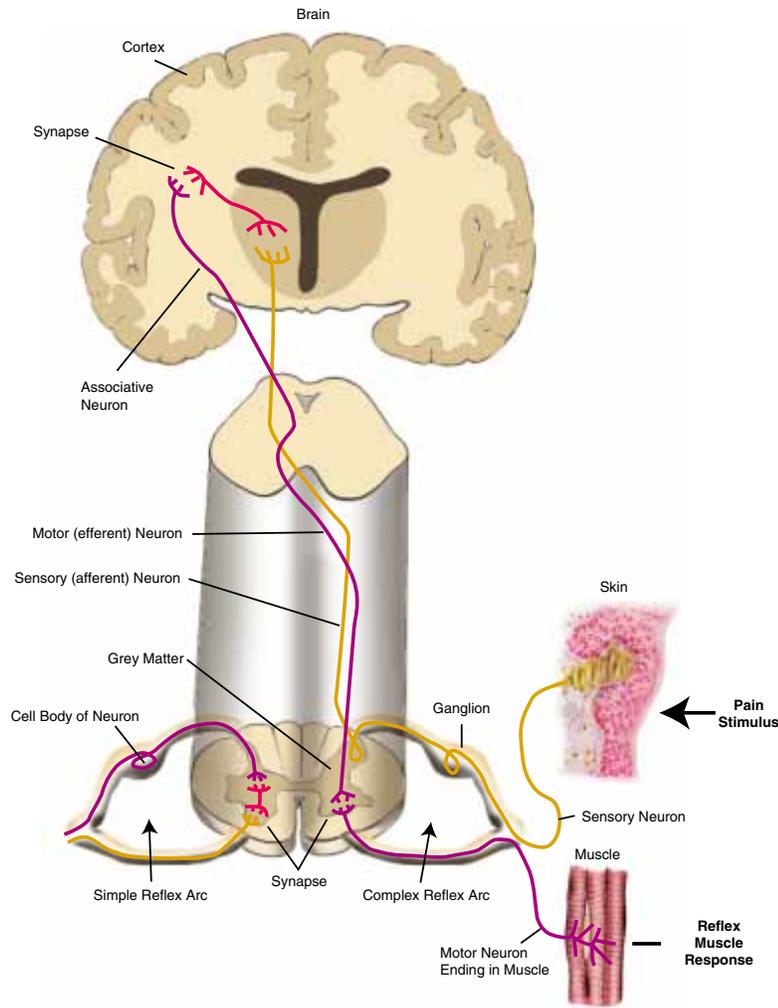


Figure 33-2 Reflex Arcs

NURSING ALERT

Ischemic Pain

Supplemental oxygen and pain medication must be administered quickly to clients with ischemic pain to minimize oxygen deprivation and prevent infarction (tissue death).

and it triggers the fight-or-flight reaction, leading to tachycardia and negative emotions.

Pain Perception

When the impulse has been transmitted to the cortex and is interpreted by the brain, the information is available on a conscious level. It is then that the person becomes aware of the intensity, location, and quality of pain. This information is interpreted in light of previous experience, adding the affective component to the pain experience.

Modulation

Modulation refers to activation of descending neural pathways that inhibit transmission of pain. “The path-

ways are described as descending because they involve neurons originating in the brain stem that descend to the dorsal horn of the spinal cord” (McCaffery & Pasero, 1999, p. 22). The descending fibers release substances that produce analgesia by blocking the transmission of noxious stimuli. Pain modulation is a result of the effects of endogenous opioids, also called enkephalins and endorphins.

Neuropathic pain arises from damage to portions of the peripheral or central nervous system. This pain is *not* nociceptive pain, nor that which is due to ongoing tissue injury or inflammation. It is important to differentiate neuropathic pain from other types of pain because the treatment differs significantly. Table 33-2 identifies some of the differences between nociceptive and neuropathic pain.

Neuropathic pain is a result of abnormal processing of sensory input by either the peripheral or central nervous system. Two types of neuropathic pain are **allodynia** (a nonpainful stimulus is felt as painful in spite of the tissue appearing normal) and **paresthesia** (abnormal sensation such as burning, prickling, or tingling).

Myofascial pain was first described by Travell and Rinzler (1952) as pain that occurs as a result of a small,

TABLE 33-2
Differences Between Nociceptive Pain and Neuropathic Pain

	Nociceptive Pain	Neuropathic Pain
Pain descriptors	Varied	Sharp, shooting, lancinating, tingling, pins and needles, strange <i>or</i> Dull, aching, burning
Pain pattern	Pain intensity decreases steadily over period of days to weeks in the absence of repeated injury or inflammation	Pain persists or even intensifies during weeks or months after injury
Response to opioids	Generally relieves pain with acceptable margin between comfort and sedation	“Resistant” to opioids, with significant pain remaining even when on opioid doses that lead to severe sedation
Response to nonsteroidal anti-inflammatory drugs (NSAIDs)	Generally effective at partial reduction of pain intensity	Rarely relieved by NSAIDs
Response to tricyclic antidepressants, anticonvulsants, local anesthetics	Generally ineffective	Often decreased significantly or relieved
Mechanical allodynia	Uncommon	Common even when no skin injury is present

(Modified from Olsson, G., & Berde, C. [1993]. Differences between nociceptive pain and neuropathic pain. In N. L. Schechter, C. B. Berde, & M. Yaster (Eds.), *Pain in infants, children, and adolescents* [p. 474]. Baltimore: Williams & Wilkins.)

hypersensitive region in a muscle, ligament, fascia, or joint capsule called a **trigger point**. The trigger point is a hypersensitive point that, when stimulated, causes a local twitch or “jump” response. Myofascial pain is often accompanied by a localized deep ache that is surrounded by a referred area of **hyperalgesia**, or extreme sensitivity to pain.

Gate Control Theory of Pain

Theories of pain transmission and interpretation attempt to describe and explain the pain experience. In 1965, Melzack and Wall proposed the **gate control pain theory**, which was the first to recognize that the psychological aspects of pain are as important as the physiological aspects. The gate control theory combines cognitive, sensory, and emotional components—in addition to the physiological aspects—and proposes that they can act on a gate control system to block the individual’s perception of pain. Bezkor and Lee (1997, p. 181) describe gate control as “regulation of pain perception through a gating mechanism at the dorsal horn of the spinal cord. Vasoconstriction and decreased nerve conduction velocity result in reduced transmission of noxious stimuli to the ‘gate.’” As a result, the level of conscious awareness of painful sensation is altered.

The gate control theory is based on the premise that pain impulses travel through either small-diameter nerve cells or large-diameter nerve cells, both of which

pass through the same gate. The large-diameter cells have the ability, when properly stimulated, to “close the gate” and thus block transmission of the pain impulse to the brain (Figure 33-3). Stimulants such as cutaneous massage, opioid release, and excessive stimulation all activate the large-diameter cells to close the gate. Clinically, the effectiveness of several nonpharmacologic modalities, such as massage, acupuncture, and acupressure, supports gate control theory.

Factors Affecting the Pain Experience

The subjective nature of pain varies from person to person and is influenced by several variables. Many factors account for the differences in a client’s individual response to pain, including age, previous experience with pain, and cultural factors.

Age

Age can greatly influence a client’s perception of the pain experience. Infants are sensitive to pain and typically exhibit discomfort through crying or physical movement. Toddlers also use crying and physical movement to indicate pain, and they begin to develop the skills needed to verbally describe pain or point to the area that is hurting. Children often do not understand why pain occurs and can therefore be frightened or

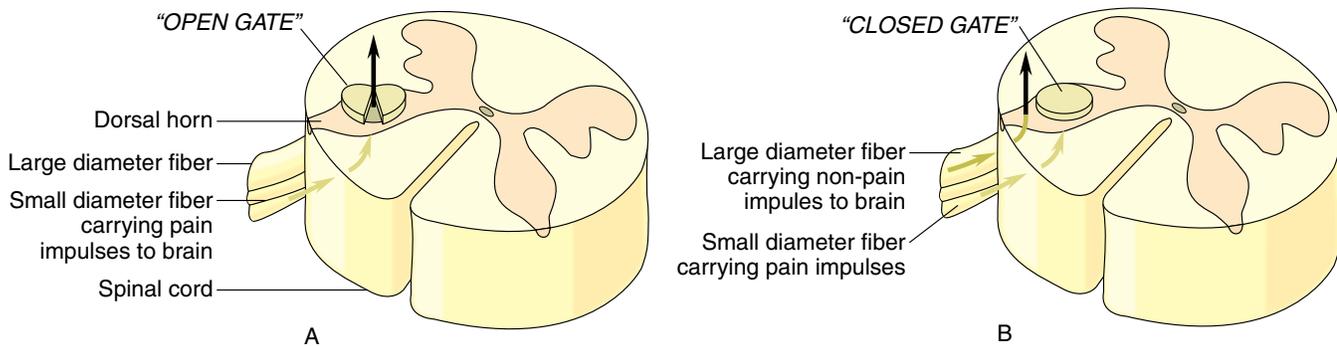


Figure 33-3 Gate Control Theory: Blocking Transmission of Pain

resentful of the pain experience; in some cases, children revert to habits of their younger years (regression) as a coping mechanism when faced with pain they cannot otherwise manage.

Adolescents often sense great peer pressure and may be reluctant to admit having pain for fear of being called weak or sensitive. Adults may continue pain behaviors they learned as children and may also be reluctant to admit pain or seek medical care because of fear of the unknown or fear of the impact that treatment may have on their lifestyle.

Older adults may often ignore their pain, viewing it as an unavoidable consequence of aging; family and health care members may inadvertently support this stereotype and be less than responsive to an older client's complaints of pain. Pain related to chronic disease is prevalent among the elderly population. Up to 70% of noninstitutionalized older adults report the occurrence of pain (Luggen, 2000, p. 281). Frequently, pain is undertreated in older people. Loeb (1999) states that there are three major factors which contribute to inadequate pain management in older clients:

1. Pain is underreported by older people who believe the myth that pain is a normal part of aging. Older adults with such misconceptions believe nothing can be done to relieve the pain.
2. Underdetection of pain may be a result of the client's cognitive-perceptual deficits.
3. Undertreatment of pain is a result of underreporting and underdetection.

Previous Experience with Pain

Clients' previous exposures to pain will often influence their reactions. Coping mechanisms that were used in the past may affect clients' judgments as to how the pain will affect their lives and what measures they can use to successfully manage the pain on their own. Client teaching about pain expectations and management methods can often allay client fears and lead to more successful pain management, especially in those clients who do not have previous pain experience or who have memories of a previous devastating pain experience that they do not wish to repeat.

Cultural Norms and Attitudes

Cultural diversity in pain responses can easily lead to problems in pain management. There are no significant differences among groups in the level of intensity at which pain becomes appreciable or perceptible. However, the level of intensity or duration of pain the client is willing to endure is culturally determined.

Expression of pain is also governed by cultural values. In some cultures, tolerance to pain, and therefore "suffering in silence," is expected; in others, full expression of pain may include animated physical and emotional responses. The nurse must be careful not to equate the level of expression of pain with the level of actual pain experienced, but to instead consider cultural influences that affect the expression of pain.

NURSING TIP

Remember that pain is not part of the normal aging process.

NURSING TIP

Recognizing Pain

Recognizing the potential for pain is the most effective step nurses can take in pain management.

Assessment

Assessment of pain includes collection of subjective and objective data through the use of various assessment tools and construction of a database to use in developing a pain management plan. Pain assessment should be performed for every client. “In the normal course of doing business, pain should be nursing’s fifth vital sign, as basic to practice as temperature, pulse, respiration, and blood pressure” (Joel, 1999, p. 9).

Data Collection

Cheever (1999) emphasizes the need to prevent pain rather than treat it. Prevention calls for accurate assessment in order to alleviate pain before it escalates. “Even if a patient fails to report pain, you must make efforts to detect it” (Loeb, 1999, p. 52). Gathering subjective information regarding the client’s pain is the first step in pain assessment. The client’s perception of the pain should cover a description of several qualifiers, including:

- Intensity
- Location
- Quality (radiating, burning, diffuse)
- Associated manifestations (factors that often accompany the pain, such as nausea, constipation, or dizziness)
- Aggravating factors (variables that worsen the pain, such as exercise, certain foods, or stress)
- Alleviating factors (measures the client can take that lessen the effect of the pain, such as lying down, avoiding certain foods, or taking medication)

Nurses must look for nonverbal signs of pain such as changes in motor activity or facial expression. It is also important to ask family members to share their observations; they may be the first ones to note subtle behavior changes indicative of pain. When assessing a client’s report of pain, the nurse should also determine a client’s pain threshold and pain tolerance level. **Pain threshold** is the level of intensity at which pain becomes appreciable or perceptible and will vary with each individual and type of pain. **Pain tolerance** is the level of intensity or duration of pain the client is willing or able to endure. A client’s perceptions and attitudes about pain are dramatically influenced by many factors, including previous experiences and cultural background.

Clients’ behavioral adaptation may yield no report of pain unless questioned specifically. **Distraction** (focusing attention on stimuli other than pain) may also be used by clients. McCaffery and Pasero (1999) recognize that clients often minimize the pain behaviors they are able to control for a number of reasons including:

- To be a “good” client and avoid making demands
- To maintain a positive self-image by not becoming a “sissy”
- By using distraction as a method of making pain more bearable (young children are particularly adept at this)
- Exhaustion

Pain is fatiguing as a significant amount of energy is used to deal with pain. The longer a person suffers from pain, the greater the level of fatigue. Although there is no conscious awareness of pain during sleep, there may be a dream-state awareness (McCaffery & Pasero, 1999). The stress response continues, and the body physiologically pays the price. Clients also wake up with considerably more pain than they had going to sleep, thereby requiring even more intervention (pharmacologic and nonpharmacologic) to reduce the pain.



NURSING CHECKLIST

Assessing the Effect of Pain on Sleep

Questioning clients about the effect pain has on their sleep habits will help clarify the intensity of the pain and its effect on the client’s patterns of daily living. Questions to ask include: Does the pain:

- Prevent you from falling asleep?
- Make finding a comfortable sleeping position difficult?
- Wake you up from a sound sleep?
- Keep you from falling back asleep once awakened?
- Leave you feeling tired and unrefreshed after a sleeping session?

Occasionally, there is a discrepancy between pain behaviors observed by the nurse and the client’s self-report of pain. Client pain behaviors (Acute Pain Management Guideline Panel, 1992) include splinting of the painful area, distorted posture, impaired mobility, insomnia, anxiety, attention seeking, and depression. Discrepancies between behaviors and the client’s self-report can be due to good coping skills (e.g., relaxation techniques or distraction), stoicism, anxiety, or cultural differences in expected pain behaviors. Whenever these discrepancies occur, they should be addressed with the client, and the pain management plan altered accordingly.

Assessment Tools

Pain assessment tools are the single most effective method of identifying the presence and intensity of pain in clients. These tools must be used, and the results must be believed. Tools used for assessing pain must be appropriate to the client’s age and cultural context. “Make sure your assessments are culturally appropriate, keeping in mind that cultural mores and personal values can affect both the patient’s beliefs and pain and her responses to it” (Acello, 2000, p. 53). See Table 33-3 for sample questions used in pain assessment.



NURSING TIP

Client self-report is the most accurate indicator of pain. Do not assume that clients who are laughing or sleeping are necessarily comfortable.

Initial Pain Assessment Tool

Figure 33-4 shows the Initial Pain Assessment Tool developed by McCaffery and Pasero (1999). This tool is particularly effective when clients have complex pain problems because it assesses location, intensity, quality, precipitating and alleviating factors, and how the pain affects function and quality of life. Once this tool is completed, another less detailed tool can be used for ongoing monitoring of the client's pain level.

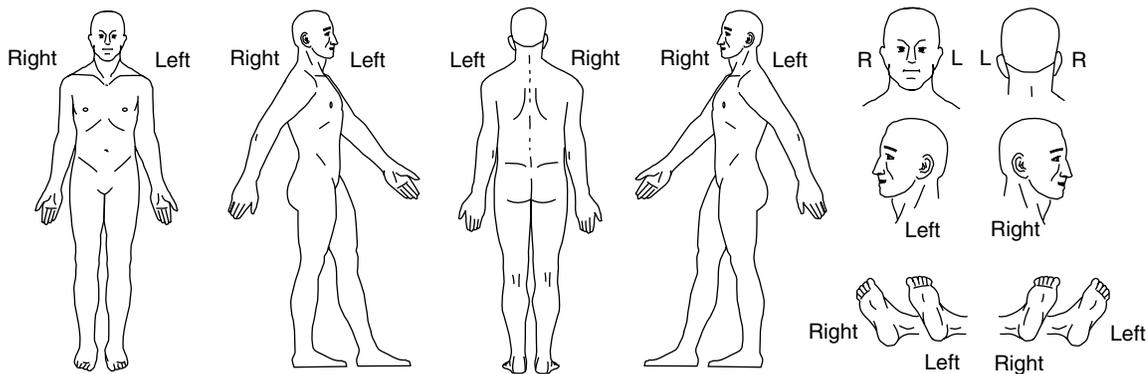
TABLE 33-3
Pain Assessment Questions

Characteristic	Question	Explanation
Quality	“How do you feel?”	Common descriptors: <ul style="list-style-type: none"> • Aching • Burning • Dull • Numb • Sharp • Throbbing
Intensity	“Using this scale, what number best describes your pain?” “Which picture best describes your pain?”	Use the Verbal Rating Scale (VRS) and the numeric rating (NRS) in combination. Use the Wong-Baker faces scale.
Location	“Where does it hurt?” “What part of your body is painful?”	Encourage client to point to the affected area. On a printed body outline, have client shade in the areas that correspond to painful areas of his or her body.
Duration	“Is the pain constant?” “Does the pain come and go?”	Instruct client to time painful episodes.
Triggers	“What makes the pain worse?” “What lessens the pain?”	Have client focus on triggers such as positions, activities, or situations.
Effects	“How has the pain affected your life?” “Do you have any symptoms in addition to pain?”	Include effects on: <ul style="list-style-type: none"> • Work/school • Relationships • Eating • Sleep • Energy level • Recreation/leisure • Moods Ask client about presence of: <ul style="list-style-type: none"> • Confusion • Constipation • Itching • Nausea/vomiting • Problems with urination • Sleepiness/drowsiness
Knowledge Level	“What do you understand about your pain and its causes?” “What have you been taught about your pain?” “Have you taken any medicine for pain? If so, what?”	Document the client's responses.

(Data adapted from Jacox, A., Carr, D. B., Payne, R., et al. [1994]. *Pain assessment methodology* [Publication No. 94-0592]. Rockville, MD: Agency for Health Care Policy and Research [AHCPR], U.S. Department of Health and Human Services.)

Date _____
 Patient's Name _____ Age _____ Room _____
 Diagnosis _____ Physician _____
 Nurse _____

I. Location: Patient or nurse marks drawing.



II. Intensity: Patient rates the pain. Scale used _____

Present: _____
 Worst pain gets: _____
 Best pain gets: _____
 Acceptable level of pain: _____

III. Quality: (Use patient's own words, eg., prick, ache, burn, throb, pull, sharp) _____

IV. Onset, duration, variations, rhythms: _____

V. Manner of expressing pain: _____

VI. What relieves the pain? _____

VII. What causes or increases the pain? _____

VIII. Effects of pain: (Note decreased function, decreased quality of life.)

Accompanying symptoms (e.g., nausea) _____
 Sleep _____
 Appetite _____
 Physical activity _____
 Relationship with others (e.g., irritability) _____
 Emotions (e.g., anger, suicidal, crying) _____
 Concentration _____
 Other _____

IX. Other comments: _____

X. Plan: _____

Figure 33-4 Initial Pain Assessment Tool (May be duplicated for use in clinical practice. Reprinted with permission from McCaffery, M., & Pasero, C. (1999). *Pain: Clinical manual for nursing practice* (2nd ed.). St. Louis, MO: Mosby.)

Nursing Process Highlight

Assessment

The client may exhibit any or all of the following indicators of pain:

- Reporting or complaining of pain
- Focusing on pain
- Crying or moaning
- Frowning or grimacing
- Rubbing or protecting painful areas
- Altering posture or movements to lessen pain
- Splinting painful areas by increasing muscle tension
- Reporting insomnia, fatigue, or depression

Pain Intensity Scales

Pain intensity scales are another quick, effective method for clients to rate the intensity of their pain (Figure 33-5). The verbal rating scale (VRS) and the numeric rating (NRS) are often used together to collect more accurate client input. The VRS uses adjectives ranging from “no pain” to “excruciating pain” in order to describe intensity. Frequent use of these tools will increase understanding of the pain severity. When using the NRS, clients are asked to assign their pain a number, with zero meaning no pain and 10 representing the worst possible pain. “On a scale of 0 to 10, with 0 being no pain at all and 10 being the worst pain you could ever have, how much do you hurt right now?” If there are multiple painful areas, this question can be asked regarding each area.

Pain Intensity Scales

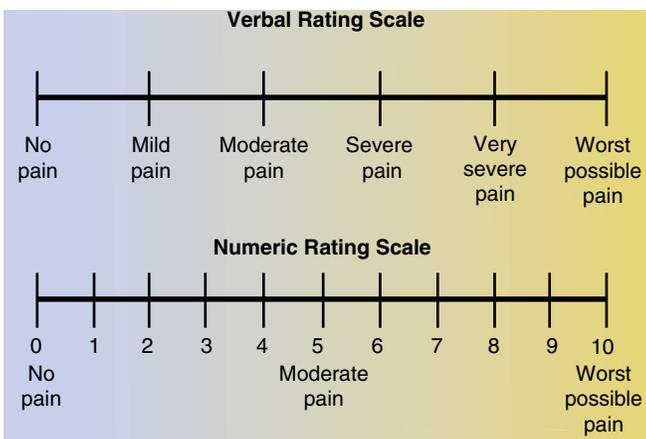


Figure 33-5 Pain Intensity Scales (From Acute Pain Management Guideline Panel. [1992]. *Acute pain management: Operative or medical procedures trauma*. Clinical practice guideline. [AHCPR Publication No. 92-0033]. Rockville, MD: Agency for Health Care Policy and Research.)

Pain Diary

Client input is essential if accurate assessment data are to be collected. Self-monitoring of symptoms can be promoted by having clients complete a pain diary; see the accompanying display.

PAIN DIARY

- Date/Time
- Intensity
- Situation
(What were you doing?)
- How did you feel?
- What were you thinking?
- What did you do to ease the pain?
- How effective was the pain control strategy?

Psychosocial Pain Assessment

Plaisance and Price (1999) state the following questions should be included on the psychosocial assessment of a client experiencing pain:

- Do the client and family/caregivers understand the diagnosis?
- How have previous experiences with pain affected the client and family?
- How does the client usually cope with pain and/or stress?
- What concerns do the client and family have about using certain medications such as opioids?
- Do the client and family understand the differences between tolerance, dependence, and addiction?

Developmental Considerations

Because pain experiences and reports can be influenced by age and developmental level, special consideration should be used to factor in those influences.

Children and Adolescents

Infants, children, and adolescents provide a special challenge in pain assessment because their pain behaviors often differ from those considered normal in the adult population. Certain myths hinder the accurate assessment and management of pain in children; see Table 33-4.

Two useful tools for assessing pain in children are the Wong/Baker Faces Rating Scale and the Poker Chip Tool. The Wong/Baker Faces Rating Scale can be used with children as young as 3 years, and it helps children express their level of pain by pointing to a cartoon face that most closely resembles how they are feeling (Figure 33-6).

The Poker Chip Tool consists of four red poker chips that can easily be carried in a pocket to be available when needed. The chips are aligned horizontally on a

TABLE 33-4
Myths About Pain and Children

Misconception	Fact
Infants do not feel pain.	Anatomic structures for pain processing reach adult maturity at 36 weeks after conception.
Children tolerate pain better than adults.	Even though children may not express pain as adults do, there are behavioral indicators of pain in children. Children as young as age 3 can use pain scales to communicate the level of pain experienced.
Children become accustomed to pain or painful procedures.	Some children show increased signs of discomfort with repeated painful procedures. Anxiety over impending procedures only exacerbates pain.
Narcotics are more dangerous for children than adults.	When used appropriately, opioids are not more dangerous for children than adults.

(Data adapted from McCaffery, M., & Pasero, C. L. [1999]. *Pain clinical manual* (2nd ed.). St. Louis, MO: Mosby, p. 627.)

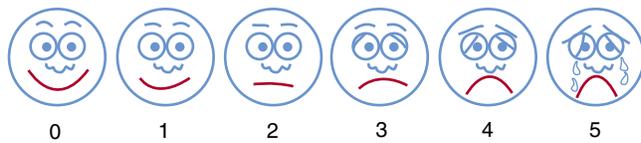


Figure 33-6 Wong/Baker Faces Pain Rating Scale (Reprinted with permission from Wong, D. L. [1998] *Whaley & Wong's nursing care of infants and children* [6th ed.]. St. Louis, MO: Mosby.)

hard surface in front of the child, and they are described as “pieces of hurt.” The chips are described from left to right as just a little bit of hurt, a little more hurt, more hurt, and the most hurt you could ever have. The child is then asked, “How many pieces of hurt do you have right now?” This tool can be used with children 4 to 13 years old.

The verbal 0 to 10 scale is also frequently used for school-age and adolescent clients in a number of settings. It is important to remember that any child under stress or with anxiety will regress, and regression may

make use of the verbal 0 to 10 scale in children under 8 to 10 years of age of questionable value.

Nursing Diagnosis

The two primary nursing diagnoses used to describe pain are *Acute Pain* and *Chronic Pain*. According to NANDA (2001), *Acute Pain* is defined as “an unpleasant sensory and emotional experience arising from actual or potential tissue damage or described in terms of such damage . . . (with) sudden or slow onset of any intensity from mild to severe, with an anticipated or predictable end and a duration of less than 6 months” (p. 72). *Chronic Pain* is defined as *Acute Pain*, with the last phrase replaced by “constant or recurring without an anticipated or predictable end and a duration of greater than 6 months.” Presenting characteristics of *Acute Pain* and *Chronic Pain* are listed in the Nursing Process Highlight.

If the client presents with problems in addition to pain, the nurse must be alert to the possibility that the pain may be the *cause* (not the effect) of another problem. For example, a client may be experiencing *Impaired Physical Mobility* or *Activity Intolerance* related to pain caused by a broken leg, as evidenced by verbal complaint, fatigue, and guarding of the affected leg.

Outcome Identification and Planning

When planning care for the client experiencing pain, mutual goal setting is of utmost importance. After assessing the client’s perception of the problem, work with the client in developing realistic outcomes. Be sure to use both nonpharmacologic and pharmacologic interventions in planning strategies to help clients achieve desired levels of functioning and pain control.

When asking about the client’s goal for pain relief, the nurse often has to state, “We can’t usually get rid of

THINK ABOUT IT

Pain Assessment Tools

After reviewing these brief case presentations, determine the type of pain assessment tool most appropriate for each:

1. A developmentally normal 42-year-old man during an overnight hospital stay after orthopedic surgery on the ankle
2. A developmentally normal 12-year-old oncology client with severe mucositis (inflammation of the mucous membrane) after chemotherapy for recurrent osteosarcoma (following an above-the-knee amputation) with metastases to multiple ribs and severe phantom limb pain

Nursing Process Highlight

Diagnosis Selected Defining Characteristics

- | | |
|---------------------|---|
| <i>Acute Pain</i> | <ul style="list-style-type: none"> • Verbalization of severe discomfort • Restlessness • Variations in vital signs indicative of autonomic responses • Guarding behavior • Sleep disturbances • Grimace • Self-focus • Distracted behavior • Changes in appetite and eating |
| <i>Chronic Pain</i> | <ul style="list-style-type: none"> • Verbalization of pain over an extended period of time • Impaired functional ability • Sleep disturbances • Guarding behavior • Irritability • Self-focus • Restlessness • Depression • Muscle atrophy of affected area • Weight changes • Fatigue • Fear of reinjury |

all your pain, but if we could get it down to a place that it didn't bother you so much, what would that be?" Thus, the family, and health care professionals involved will all be aware of a realistic goal for pain relief. "Providing the best possible pain relief to patients requires regular and consistent communication among all members of the health care team, including the patient" (Collins, Sparger, Richardson, Schriver, & Bergenstock, 1999, p. 20). Treatment goals for CNP clients include the following (McCaffery & Pasero, 1999):

1. Reduce pain level whenever possible.
2. Improve functioning.
3. Develop self-help skills for coping.
4. Alleviate psychopathology, including anxiety and depression.
5. Improve relationships with family members and health care providers in order to meet individual needs.

Terminally ill clients pose a special challenge in the area of pain management. According to Bral (1998), approximately 15% of deaths occur in people receiving hospice care. Thus, pain management is the responsibility of nurses who have no specialization in palliative

care. Joel (1999, p. 9) states "no death is a good or peaceful one if attended by suffering. Suffering can take the form of isolation, confusion, emotional deprivation, depersonalization, pain . . . All of this falls within the province of comfort and caring, and consequently becomes the work of nursing."

In its *Position Statement on Promotion of Comfort and Relief of Pain in Dying Patients*, the American Nurses Association (1991) states:

One of the major concerns of dying patients and their families is the fear of intractable pain during the dying process. Indeed, overwhelming pain can cause sleeplessness, loss of morale, fatigue, irritability, restlessness, withdrawal, and other serious problems for the dying patient. (p. 1)

The American Nurses Association (1991) advises nurses to administer doses of pain medication that are effective enough to manage pain in the dying client.

Planning of care leads to the development of an individual treatment plan for each client. When nurses understand that the existence of pain and its intensity is best defined by the client, "they acknowledge that every person with pain has a complex, multidimensional, and unique experience" (Bral, 1998, p. 7).

Implementation

The accompanying display lists AHRQ recommendations on caring for clients experiencing pain.

"Assessing and managing pain has long been a core nursing responsibility. Now, The Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) is requiring accredited facilities and organizations to develop policies and procedures that formalize this obligation" (Acello, 2000, p. 52). The

PAIN ASSESSMENT AND MANAGEMENT TIPS

- Ask about pain regularly. Assess pain systematically.
- Believe the client/family's reports of pain and what relieves it.
- Choose pain control measures appropriate for the client, family, and setting.
- Deliver interventions in a timely, logical, and coordinated manner.
- Empower clients and families by encouraging them to control their treatment regime as much as possible.

(Data adapted from Jacox, A., Carr, D. B., Payne, R., et al. (1994). *Management of cancer pain: Clinical practice guideline no. 9* [Publication No. 94-0592]. Rockville, MD: Agency for Health Care Policy and Research (AHCPR), U.S. Department of Health and Human Services, Public Health Service.)

JCAHO calls for health care providers to (Williams-Lee, 1999):

- Recognize each client's right to pain assessment and treatment
- Monitor client responses to pain management strategies
- Educate staff and clients about pain management

Some key concepts of JCAHO's standard on pain management include the following (Acello, 2000, p. 52):

- Clients have the right to appropriate pain assessment.
- Pain is to be assessed and regularly reassessed.
- Clients will be treated for pain or referred for treatment.
- Clients will be taught the importance of effective pain management.
- Clients will be taught that pain management is a part of treatment.
- Clients will be involved in making health care decisions.
- Analgesics are to be administered as needed.
- Discharge planning and teaching will include continuing needs for pain management.

Nurse-Client Relationship

Establishment of a therapeutic relationship is the foundation for effective nursing care of the client experiencing pain. Clients who trust their nurses to be there, to listen, and to act, are the clients who are most likely to be comfortable. See Chapter 12 for information on developing a therapeutic relationship.

Client Education

Client education regarding pain management begins with defining pain, identifying the probable causes, introducing clients to pain assessment tools, and allowing them to choose the tool they would like to use. The importance of talking with health care providers about their pain and of using a preventive approach to pain management must also be emphasized. Provide written information to reinforce verbal explanations. Teach the importance of around-the-clock dosing instead of PRN administration of analgesic medications. Refer to the Client Teaching Checklist for pain management information.

When a client is to be discharged from a health care facility, discharge teaching should include pain management information with specific guidelines about the need for seeking follow-up advice/treatment. The accompanying display lists content for a comprehensive pain management teaching plan.

Both nonpharmacologic and pharmacologic interventions can be effective in caring for clients with pain. In some cases of mild pain, nonpharmacologic techniques may be the primary intervention, with medication available as "backup." In cases of moder-



CLIENT TEACHING CHECKLIST *Pain Management Information*

1. Help clients understand the importance of effective pain management. Explain the outcomes of unrelieved pain.
2. Teach at the client's level of comprehension. Assess literacy level.
3. Respect client's cultural beliefs related to pain.
4. Correct any misconceptions about the use of opioid analgesics. Teach about the low risk for addiction when these medications are used for pain relief.
5. Instruct on the use of complementary methods for relieving pain, including massage, application of heat and cold, and imagery.

CONTENT FOR PAIN MANAGEMENT TEACHING PLAN

1. General overview of pain
 - Definition
 - Causes/contributing factors
 - Pain assessment, including use of assessment tools
 - Importance of preventive approach
 - Family involvement
2. Pharmacologic pain management
 - Overview of drug management
 - Addiction, dependence, and tolerance
 - Respiratory depression
 - Communicating with health care providers about pain
 - Controlling accompanying symptoms (e.g., constipation, nausea)
3. Nonpharmacologic pain management
 - Importance of strategies
 - Review of past experience with nonpharmacologic methods
 - Demonstration of specific techniques

ate to severe pain, nonpharmacologic techniques can be an effective adjunctive, or complementary treatment.

Pharmacologic Pain Management

Listed below are principles for the care of clients experiencing pain:

- Assess the pain.
- Treat the contributing factors (pathology).

- Individualize analgesic therapy to each client.
- Choose the least invasive route of administration.
- Administer analgesics at regularly scheduled intervals (around-the-clock dosing) rather than on an as-needed (PRN) basis.
- Keep clients in control of their own analgesia as much as possible.
- Titrate doses to provide maximum pain relief and minimum side effects (Bral, 1998, p. 30). Know that the right dose is “whatever it takes to relieve the pain with the fewest side effects” (Newshan, 2000, p. 83).

Other general principles that guide practice are discussed below.

Combine Analgesics

Combining analgesics on the basis of the World Health Organization’s three-step analgesic ladder is imperative to provide effective pharmacologic intervention for clients with all types of pain. The use of adjuvant medication is recommended (Management of Cancer Pain Guideline Panel, 1994). **Adjuvant medications** are those drugs used to enhance the analgesic efficacy of opioids, to treat concurrent symptoms that exacerbate pain, and

to provide independent analgesia for specific types of pain. Adjuvant medication (medications without intrinsic analgesic properties) are often helpful in treating chronic pain. Adjuvant drugs include anticonvulsants, antidepressants, and sedatives. Gabapentin (Neurontin) is one anticonvulsant useful in treating older clients experiencing chronic pain (Luggen, 2000). Education for clients taking adjuvant medication must explain the need to continue to take the analgesic drug with the adjuvant medication.

Table 33-5 lists some common adjuvant medications used in pain management.

Maintain Therapeutic Serum Levels

Establishing and maintaining a therapeutic serum level is another important pain management strategy. Peaks and valleys of drug serum levels often occur when analgesics are administered in the traditional PRN manner. When the dose is administered on an intermittent schedule, a larger dose is often required, causing the client to have a peak serum drug level in the sedation range. The client must wait for the return of pain before requesting the next dose of analgesic. Depending on the length of time it takes to obtain the medication and,

TABLE 33-5
Adjuvant Medications for Pain Management

Medication	Type of Pain	Effects
<i>Tricyclic antidepressants</i> Amitriptyline Doxepin Imipramine Trazodone	Neuropathic pain frequently described as dull, aching, or throbbing	<ul style="list-style-type: none"> • Mood elevation, enhancement of opioid analgesia, direct analgesic effects • Anticholinergic side effects: dry mouth, constipation, urinary retention
<i>Anticonvulsants</i> Carbamazepine Phenytoin Clonazepam	Neuropathic pain frequently described as sharp shooting, burning, or lancinating	<ul style="list-style-type: none"> • Suppresses the spontaneous neuronal firing as sharp, that causes this type of pain
<i>Corticosteroids</i> Dexamethasone Prednisone	Pain due to cerebral or spinal cord edema or that in peripheral nerves caused by perineural edema	<ul style="list-style-type: none"> • Mood elevation, strong anti-inflammatory activity, appetite stimulation
<i>Antihistamine</i> Hydroxyzine	Pain or nausea in the anxious client	<ul style="list-style-type: none"> • Relief of complicating symptoms including anxiety, insomnia, nausea, and pruritus
<i>Neuroleptic</i> Methotrimeprazine	Alternative analgesic for clients who are opioid-tolerant or have opioid-limiting side effects, especially constipation	<ul style="list-style-type: none"> • Antiemetic and anxiolytic. • This is the one phenothiazine to date that has demonstrated analgesic properties: methotrimeprazine 15 mg IM was found to be equivalent to morphine 10 mg IM
<i>Psychostimulants</i> Dextroamphetamine Methylphenidate	Continued pain with opioid-induced sedation	Improves opioid analgesia and decreases sedation

(Adapted from Acute Pain Management Guideline Panel. [1992]. *Acute pain management: Operative or medical procedures and trauma. Clinical practice guideline*. [AHCPR Publication No. 92-0033]. Rockville, MD: Agency for Health Care Policy and Research.)

once taken, to reestablish an adequate blood level, there could be a period of up to an hour or so with inadequate pain control.

Patient-controlled analgesia (PCA) (client self-administration of intravenous pain medication via a programmable pump), with a loading dose when first started and a booster dose if needed, is a method to obtain a smooth analgesic level (Figure 33-7). PCA also allows the client to have control over pain management. The major advantage of PCA over the traditional, nurse-administered analgesia is that clients are enabled to seek pain relief whenever they feel it is necessary: “the best advice you can give your patients is to press the PCA button whenever they feel a need for pain medication” (Van-Couwenberghe & Pasero, 1998, p. 15). Requirements for the use of PCA are the cognitive ability to understand how to use the pump and the physical ability to push the button. The method is effective if the appropriate titrations are made on the basis of reassessment and client pain report.

Clients need to be taught that complete pain relief may be an unrealistic expectation. Instead, the goal of PCA is for the client to be comfortable and alert enough to participate in therapy. “The best time to teach patients about PCA is before it has started, when they’re lucid enough to understand your instructions” (Van-Couwenberghe & Pasero, 1998, p. 14).

Choose Appropriate Routes of Administration

Available routes of administration play an important role in choice of pain management technique. In general, the oral route (PO) of administration is preferred because it is the most convenient and cost-effective (Management of Cancer Pain Guideline Panel, 1994). When the oral route is not feasible, other routes (such as rectal or transdermal) can be used to administer analgesics.

The rectal route is effective when clients are nauseated and vomiting or when they are NPO. Suppositories of morphine, hydromorphone, and oxycodone are available. Contraindications to rectal administration include diarrhea, lesions of the rectum or anus, or immunosuppressed status. The transdermal route bypasses gastrointestinal absorption but has a slow onset and a slow decline in blood level after the patch is removed.



Figure 33-7 Client is using patient-controlled analgesia (PCA).

With continuing documentation of unreliable absorption of intramuscular (IM) injections of opioids, the prudent approach is to switch to subcutaneous or intravenous administration. Continuous infusions are possible by either intravenous (IV) or subcutaneous methods.

Analgesia using epidural, intrathecal (intraspinal), or intraventricular routes are reserved for settings in which experience, expertise, extensive support systems, and sophisticated follow-up are available (Management of Cancer Pain Guideline Panel, 1994). See Table 33-6 for an overview of administration routes; see Chapter 29 for a complete discussion of medication administration routes.

Nonsteroidal Anti-Inflammatory Drugs

The nonopioid class of pharmacologic agents consists of a group of medications classified as nonsteroidal anti-inflammatory drugs (NSAIDs). NSAIDs work by inhibiting the synthesis of prostaglandin, a class of chemicals that:

- Can be found in almost every body tissue
- Cause allodynia even in low concentrations
- Are always released when cells are damaged
- Contribute to edema and erythema
- Sensitize afferent nerve endings to bradykinin (a pain substance) (McCaffery & Pasero, 1999)

NSAIDs are useful in treating mild to moderate pain, especially painful conditions involving inflammation. NSAIDs are used frequently because of the following (Cleland & Gebhart, 1997, p. 32):

- They can be administered orally.
- They do not cause CNS or respiration depression.
- Several are available over-the-counter.

The widespread use of NSAIDs makes them the culprit in many adverse drug effects. The use of some NSAIDs can result in adverse gastrointestinal, hematologic, and renal effects. Aspirin is the standard NSAID against

NURSING TIP

Injections and Children

Because children lack the cognitive ability to weigh the pain of an injection against the pain relief from the medication, oral and rectal routes are preferred over injections.

TABLE 33-6
Advantages and Disadvantages of Selected Medication Administration Routes

Intervention	Advantages	Disadvantages
Oral NSAIDs	<ol style="list-style-type: none"> Useful for a wide variety of mild to moderate pains. Widely available, some over the counter. Additive analgesia when combined with opioids and other modalities. Can be administered by patient or family. Some are inexpensive. 	<ol style="list-style-type: none"> Ceiling effect to analgesia. Side effects, especially gastritis and renal toxicity, can be serious. May risk bleeding in severely thrombocytopenic patients. Only one NSAID (ketorolac) is available now for parenteral administration. Many are expensive.
Oral opioids	<ol style="list-style-type: none"> Effective for both localized and generalized pain. Ceiling to analgesic effectiveness imposed only by side effects. Multiple drug choices in the class. Sedative and anxiolytic properties useful in some acute treatment settings. Can be administered by patient or family. Some are inexpensive. Long-acting, controlled-release forms are available. 	<ol style="list-style-type: none"> Side effects may limit analgesic effectiveness. Prescription of these substances is regulated. Stigma or fears associated with use.
Transdermal opioids (fentanyl)	<ol style="list-style-type: none"> Long duration of action (48–72 h) from single patch. Allows use of a strong opioid (fentanyl) in outpatient settings for some patients who have not tolerated morphine and related drugs. Many patients find them easy to use. Provides continuous administration of an opioid without use of needles or pumps. Can be administered by patient or family. 	<ol style="list-style-type: none"> Side effects may not be as quickly reversible as in oral administration. Difficult to modify dosage rapidly. Relatively slow onset of action. Requires additional short-acting medicine for breakthrough pain. Expensive.
Rectal opioids	<ol style="list-style-type: none"> Relatively easy-to-use alternative route when the oral route is unavailable. Other opioid suppositories available for morphine-intolerant patients. Can be administered by patient or family. Less expensive than subcutaneous or intravenous infusions. 	<ol style="list-style-type: none"> Not widely accepted by patients or families. Side effects may limit analgesic effectiveness. Relatively slow onset of action. Contraindicated if low white blood cell or platelet count (risks of infection, bleeding).

(continues)

TABLE 33-6 (continued)
Advantages and Disadvantages of Selected Medication Administration Routes

Intervention	Advantages	Disadvantages
Subcutaneous infusion	<ol style="list-style-type: none"> 1. Can provide rapid pain relief without intravenous access. 2. Morphine and hydromorphone are the preferred drugs for this route when administered in the home. 3. When used in PCA mode, allows for rapid individual dose titration and provides sense of control for patient. 	<ol style="list-style-type: none"> 1. Only a limited volume of infusate can be administered (e.g., 2–4 ml/h). 2. Induration, irritation at infusion site may be a complication. 3. Requires skilled nursing and pharmacy support. 4. Often requires expensive drug infusion pump and recurring charges for disposables.
Intravenous infusion	<ol style="list-style-type: none"> 1. Can provide rapid pain relief. 2. Almost all opioids can be given by this route. 3. Not limited to infusate volumes. 4. When used in PCA mode, allows for rapid individual dose titration and provides sense of control for patient. 	<ol style="list-style-type: none"> 1. Infection and infiltration of intravenous lines are potential complications. 2. Requires skilled nursing and pharmacy support. 3. Often requires expensive drug infusion pump and recurring charges for disposables.
Epidural, intrathecal, and intracerebral ventricular routes	<ol style="list-style-type: none"> 1. Useful for pain that has not responded to less-invasive measures. 2. Local anesthetics may be added to spinal opioids and may produce additive analgesia. 	<ol style="list-style-type: none"> 1. Tolerance may occur sooner than with oral or rectal administration. 2. Infection at catheter site can produce meningitis and/or epidural abscess. 3. Pruritus and urinary retention are more common than with oral or parenteral opioid administration. 4. Contraindicated in presence of acute spinal cord compression. 5. Requires special expertise. 6. Requires careful monitoring, especially when therapy begins and when doses are increased. 7. May require expensive drug infusion pump, intervention fees, and recurring charges for disposables.
Regional neurolytic blocks	<ol style="list-style-type: none"> 1. Effective for pain relief with certain diagnoses (e.g., pancreatic cancer). 2. May be useful for movement-related and abdominal visceral pain that is refractory to drug therapy. 3. Can allow dosage (and side effect) reduction of systemic drugs for localized pain. 	<ol style="list-style-type: none"> 1. Risk of postural hypotension, bowel and bladder incontinence, and leg weakness. 2. Procedure is irreversible. 3. Requires special expertise. 4. Expenses for specialized care and operating room costs.

(Adapted from Management of Cancer Pain Guideline Panel. [1994]. *Management of cancer pain: Clinical practice guideline*. [AHCPR Publication No. 94-0592, pp. 42–43]. Rockville, MD: Agency for Health Care Policy and Research.)

which the efficacy of all NSAIDs are measured due to its long history of relative safe usage, low cost, and availability without a prescription (Jones, 1997). In fact, aspirin is so commonly used that many individuals fail to consider it to be a drug. Clients must be taught about aspirin's adverse effects; see Table 33-7.

NSAIDs are also subject to the **ceiling effect** (as the dose of medication is increased above a certain level,

the analgesic effect remains the same), and only the adverse effects continue to increase.

For example, acetaminophen is relatively easy on the gastrointestinal tract and does not affect platelet aggregation, but large doses over time have caused liver damage, with extreme overdoses causing liver failure. The remaining NSAIDs all have significant multisystem side effects and adverse effects, with the most worrisome

TABLE 33-7
Symptoms of Aspirin Toxicity

Mild	Moderate	Severe
Tinnitus	Acne	Hallucinations
Vertigo	Diarrhea	Convulsions
Nausea and vomiting	Drowsiness	Coma
	Confusion	Cardiovascular collapse
	Hyperventilation	
	Hyperthermia	
	Electrolyte imbalances	

(Data from Jones, S. L. [1997]. *Pharmacology of pain management*. In *Expert pain management*. [p. 40] Springhouse, PA: Springhouse Corporation.)



NURSING TIP

The Ceiling Effect

Educate clients and their families regarding the ceiling effect because they may feel that “If a little helps some, then more is better.” The risk for significant side effects and adverse reactions is increased by this misunderstanding.

being severe gastric irritation, gastric bleeding, and renal problems. NSAIDs must be used cautiously in elderly clients. The risk of gastrointestinal problems (such as peptic ulcer disease and gastrointestinal bleeding) increases with the use of NSAIDs in older clients (Pasero, Reed, & McCaffery, 1998). “Given the large number of NSAID users, protection against GI complications is a priority” (Peloso, 2000, p. 36).

Opioid Analgesics

The opioids and NSAIDs exert pain relief through different mechanisms. For example, the opioids act on several sites in the central nervous system (CNS) rather than on the peripheral nervous system as do the NSAIDs. Opioids alter the release of neurotransmitters, and, therefore, pain transmission is interrupted at several sites in the CNS. The result is an altered perception of and response to pain (Plaisance & Price, 1999).

The opioid analgesics fall into three classes: pure opioid agonists, partial agonists, and **mixed agonist-antagonists** (a compound that blocks opioid effects on one receptor type while producing opioid effects on a second receptor type). Pure agonists are those that produce a maximal response from cells when they bind to

the cells’ opioid receptor sites. Morphine (the gold standard against which all other opioids are measured), fentanyl, methadone, hydromorphone, and codeine are pure agonists. Meperidine, although classified as a pure agonist, is not recommended except in clients with a true allergy to all other narcotics, because of its neurotoxicity. Meperidine produces clinical analgesia for only 2.5 to 3.5 hours when given intramuscularly in adults. In pediatric clients receiving intravenous meperidine, analgesia may last for only 1.5 to 2.0 hours. In the elderly, most of whom show decreased glomerular filtration rates, there is generally a higher peak and longer duration of action as it takes longer to excrete the opioid as well as its toxic metabolite, normeperidine.

Meperidine should be reserved for very brief courses in otherwise healthy patients who have demonstrated an unusual reaction (e.g., local histamine release at the infusion site) or allergic response during treatment with other opioids such as morphine or hydromorphone. (Acute Pain Management Guideline Panel, 1992, p. 42)

Unlike the NSAIDs, pure agonist opioids are not subject to the ceiling effect. As the dosage is increased, there is increasing pain relief, with the only limiting factor being the degree of side effects, particularly respiratory depression and constipation. Many of the analgesic medications (especially opioids) can cause the unwanted effect of constipation. The accompanying display lists measures for prevention.

OPIOID-INDUCED CONSTIPATION: PREVENTIVE APPROACHES

- Eat high-fiber foods.
- Drink 8–10 glasses of fluid per day.
- Eat foods that have helped relieve constipation previously.
- Increase physical activity, such as walking.
- Consume a hot beverage about 30 minutes prior to the planned time for a bowel movement.
- Use laxatives or stool softeners only as advised by the health care provider.

Other side effects that occur frequently in clients on opioid medications are pruritus and nausea, but the degree to which they are present from each medication varies among individuals. Clients must be instructed regarding these *normal* responses to opioids and informed that it does not mean that they are allergic to them. A true allergy to opioids would be indicated by a rash or hives that starts after receiving the opioid, a local histamine release at the site of infusion, or anaphylaxis. Clients also need to know that the pruritus and nausea generally subside after 4 to 5 days of opioid therapy. In the meantime, an antihistamine such as diphenhydramine or hydroxyzine may be used for pruritus, and an antiemetic such as metoclopramide or trimethoben-

zamide can be used to treat the nausea. Almost all medications used to treat side effects have their own side effect of sedation. Thus, there is the possibility of a cumulative effect of severe sedation.

Mixed agonist-antagonist opioids are believed to be subject to the ceiling effect for pain relief, as well as a ceiling effect for respiratory depression. Mixed agonist-antagonist opioids activate one opioid receptor type while simultaneously blocking another type. Butorphanol, pentazocine, and nalbuphine are the most frequently used in pain management.

Addiction, Tolerance, and Physical Dependence

As a result of fears of addiction, family caregivers tend to undermedicate their relative's pain. Family/client education about addiction and pain medication should be a priority for those receiving opioid therapy. McCaffery and Pasero (1999) define **addiction**, or psychological dependence, as behavior of overwhelming involvement with obtaining and using a drug for other than approved medical reasons. Therefore, a client taking opioids for an appropriate medical reason is not addicted. "The fear of addiction is perhaps the single most persistent barrier to achieving pain relief with opioid analgesics . . . it may be the most challenging aspect of educating patient, their families, and even health care professionals" (McCaffery & Pasero, 1998, p. 18). **Tolerance** can occur after repeated administration of an opioid analgesic, when a specific dose loses its effectiveness and the client requires larger and larger doses to produce the same level of analgesia. The first indication of tolerance is decreased duration of action, then decreased analgesia. If this pattern is noted in clients with continuing opioid needs, the analgesic dose needs to be titrated higher immediately. **Physical dependence** is the reaction of the body, commonly known as withdrawal syndrome, to abrupt discontinuation of an opioid after repeated use.

Respiratory Depression

Titrating opioid analgesics to obtain optimal pain management with minimal side effects is a difficult task. See Table 33-8 for a list of risk factors predisposing to respiratory depression in clients receiving appropriate dosages of sedatives or opioid analgesics. This list should be used to identify clients of all ages who require increased vigilance, possible cardiac and pulse oximetry (determination of oxygen saturation of arterial blood) monitoring, and frequent assessment when taking opioid analgesics. It is not to be construed as a reason for denying the client adequate pain management. When caring for clients receiving opioid analgesics, the nurse should periodically identify the presence and intensity of risk factors.

Local Anesthesia

Local anesthetics are effective for pain management in a variety of settings. Topical anesthetics are available for teething, sore throats, denture pain, laceration repair, and intravenous catheter insertions. EMLA® cream is a

TABLE 33-8
Risk Factors Predisposing to Respiratory Depression With Use of Sedatives or Opioid Analgesics

1. Neurological impairment
 - Cerebral palsy
 - Altered level of consciousness
2. Respiratory compromise
 - Thoracic skeletal deformities (e.g., scoliosis, kyphosis, contracture)
 - Neurodegenerative disorders (e.g., muscular dystrophy, tuberous sclerosis, Werdnig-Hoffman disease, myasthenia gravis)
 - Pulmonary disease (e.g., cystic fibrosis, reactive airway disease, bronchopulmonary dysplasia, chronic obstructive lung disease)
 - Thoracic or high abdominal incision
 - Abdominal distension
3. Metabolic alteration
 - Liver dysfunction or failure
 - Metabolic disease
 - Sepsis
4. Renal compromise
 - Kidney dysfunction or failure
 - Single kidney
 - Hypovolemia
 - Urine output <1 ml/kg/h in children, <30 ml/h in adults, or elevated blood urea nitrogen (BUN) or creatinine
5. Other
 - Obesity (when drug is ordered on actual weight rather than estimated lean body weight)
 - Increasing sedation
 - Agitation
 - Preverbal or nonverbal client
6. Concurrent administration of other narcotics or sedatives
 - Opioid analgesics
 - Sedatives/hypnotics and tranquilizers
 - Anticonvulsants
 - Antihistamines
 - Psychotropics

(Data from: Pain Consultation Service, The Children's Hospital, Denver, 1995.)

mixture of local anesthetics, combining prilocaine and lidocaine. It produces complete anesthesia for at least 60 minutes when topically applied to intact skin.

Another topical anesthetic, TAC, is available for anesthesia during closure of lacerations. It is a combination of tetracaine 0.5%, adrenaline 1:2000, and cocaine 11.8% in a normal saline solution that can be applied directly to the open wound surface in place of local anesthetic infiltration with a needle. This allows pain-free cleansing of the laceration as well as suturing. Because both adrenaline (epinephrine) and cocaine cause vasoconstriction, TAC cannot be used in areas supplied by end-arteriolar blood supply such as digits, the ear, or the nose. It also is contraindicated on burned

or abraded skin because this could lead to increased systemic absorption of cocaine and tetracaine, thus placing the client at risk for seizures. See Chapter 29 for further discussion of topical medications.

Treatment of Neuropathic Pain

Neuropathic pain is often refractory to treatment with NSAIDs and opioids. When increasing doses of opioids are ineffective in controlling postoperative pain, an immediate search for the underlying cause should begin, and the diagnosis of neuropathic pain should be considered. Once diagnosed, the focus of treatment is optimizing functional abilities. Information on pharmacologic interventions for neuropathic pain found in the *Management of Cancer Pain Guideline* (1994) includes a number of options, which are discussed in the following paragraphs.

Trial of a tricyclic antidepressant is frequently the first step in a client who describes dull, aching, or throbbing pain. Amitriptyline is often the drug of choice because it has been the most widely studied. This class of medications is useful in pain management as a result of:

- Mood elevation
- Potentiation of opioid analgesia
- Direct analgesic effects

Clients with neuropathic pain often have significant sleep deprivation. Amitriptyline's action and the side effect of drowsiness improve the client's ability to fall asleep and to sleep for longer periods. Amitriptyline must be started at very low doses especially in children, the debilitated, or elderly clients, then increased slowly. It should be administered at bedtime to promote sleep and to minimize falls resulting from orthostatic hypotension. The onset of analgesic effects occurs within 1 to 2 weeks, and maximal effect can be seen in 4 to 6 weeks.

Anticonvulsants are often tried first for clients with burning, sharp, shocking, shooting, or **lancinating** (piercing or stabbing) pain. Carbamazepine is often the drug of choice, with other possibilities being clonazepam or phenytoin. These medications suppress spontaneous neuronal firing that leads to the lancinating pain of nerve injury. Carbamazepine may cause a transient bone marrow suppression and requires regular monitoring of serum drug levels, blood counts, and liver function. It should be avoided if possible in clients with any form of bone marrow suppression (e.g., those undergoing chemotherapy, radiation therapy, or taking immunosuppressants posttransplantation).

Corticosteroid effects include mood elevation, anti-inflammatory effects, and appetite stimulation. Corticosteroids are effective in reducing the neuropathic pain caused by pressure on nerves both centrally and peripherally. The two corticosteroids most frequently used in pain management are dexamethasone and prednisone.

If muscle spasms are a major contributor to the client's discomfort, baclofen can be tried for its antispasmodic effect. This is particularly effective for clients with spinal

cord injury or upper motor neuron dysfunction, including cerebral palsy.

For many individuals, the use of nonpharmacologic methods enhances pain relief. These nonpharmacologic strategies are often used in combination with medication. Complementary/alternative methods are being used with increasing frequency to treat pain. The use of such strategies is often influenced by the client's culture. The accompanying display lists some commonly used complementary treatment approaches.

COMPLEMENTARY/ALTERNATIVE THERAPY

Application of heat or cold
Acupuncture or acupressure
Focused breathing
Herbal remedies
Humor
Hypnosis
Imagery
Massage
Meditation
Music
Progressive muscle relaxation
Tai chi
Therapeutic touch
Yoga

(Data from Luggen, A. S. [2000]. Pain. In A. G. Leckenotte (Ed.), *Gerontologic nursing* [2nd ed.]. St. Louis, MO: Mosby, p. 286.

In some cases of mild pain, nonpharmacologic techniques may be the primary intervention, with medication available as "backup." In cases of moderate to severe pain, nonpharmacologic techniques can be an effective adjunctive, or complementary treatment.

Cognitive-Behavioral Interventions

Cognitive-behavioral interventions are designed to educate clients and to modify client attitudes and



NURSING TIP

Cognitive-Behavioral Interventions

Cognitive-behavioral interventions should be introduced as early as possible so that clients can learn and practice the techniques before experiencing intense pain, which impairs learning.

behaviors. These nonpharmacologic approaches are an important part of the multimodal approach to pain management and can be used in conjunction with appropriate analgesics. A major goal of these interventions is to help the client gain a sense of control over the pain. The effectiveness of selected therapies is outlined in Table 33-9.

Distraction

Distraction is a pain management strategy that focuses the client's attention on something other than the pain and associated negative emotions. Children and adolescents seem to be particularly adept at using distraction. As many parents know, interactive games or listening to music can be powerful distraction techniques for

TABLE 33-9
Advantages and Disadvantages of Nonpharmacologic Therapies

Intervention	Advantages	Disadvantages
Relaxation, imagery, biofeedback, distraction, and reframing	<ol style="list-style-type: none"> 1. May decrease pain and anxiety without drug-related side effects. 2. Can be used as adjuvant therapy with most other modalities. 3. Can increase patient's sense of control. 4. Most are inexpensive, require no special equipment, and are easily administered. 	<ol style="list-style-type: none"> 1. Patient must be motivated to use self-management strategies. 2. Requires professional time to teach interventions.
Patient education	<ol style="list-style-type: none"> 1. Effective in improving ability to follow medical regimen and in decreasing pain. 2. Multiple teaching aids available. 3. Promotes self-care in pain treatment and management of side effects. 	<ol style="list-style-type: none"> 1. Requires professional time to teach pain management regimens.
Psychotherapy, structured support, and hypnosis	<ol style="list-style-type: none"> 1. May decrease pain and anxiety for patients who have pain that is difficult to manage. 2. May increase patient's coping skills. 	<ol style="list-style-type: none"> 1. Requires skilled therapist.
Cutaneous stimulation (superficial heat, cold, and massage)	<ol style="list-style-type: none"> 1. May reduce pain, inflammation, or muscle spasm. 2. Can be used as adjuvant therapy with most other modalities. 3. Relatively easy to use. 4. Can be administered by patients or families. 5. Relatively low cost. 	<ol style="list-style-type: none"> 1. Heat may increase bleeding and edema after acute injury. 2. Cold is contraindicated for use over ischemic tissues.
Transcutaneous electrical nerve stimulation (TENS)	<ol style="list-style-type: none"> 1. May provide pain relief without drug-related side effects. 2. Can be used as adjuvant therapy with most other modalities. 3. Gives patient sense of control over pain. 	<ol style="list-style-type: none"> 1. Requires skilled therapist to initiate therapy. 2. Potential risk of infection, bleeding.
Acupuncture	<ol style="list-style-type: none"> 1. May provide pain relief without side effects. 2. Can be used as adjuvant with most other therapies. 	<ol style="list-style-type: none"> 1. Requires skilled therapist.

(Adapted from Acute Pain Management Guideline Panel. [1992]. *Acute pain management: Operative or medical procedures and trauma. Clinical practice guideline*. [AHCPR Publication No. 92-0033]. Rockville, MD: Agency for Health Care Policy and Research.)



NURSING TIP

Using Distraction

Distraction should never be used as the *only* pain management intervention, but it can be extremely helpful while waiting for other techniques to take effect.

children; they can also be effective for adults experiencing pain.

Reframing

Reframing is a technique that teaches clients to monitor their negative thoughts and replace them with ones that are more positive. Teaching a client to view pain by expressing not, “I can’t stand this pain, it’s never going away” but instead, “I’ve had similar pain before, and it’s gotten better” is an example of effective reframing.

Relaxation Techniques

Relaxation techniques (a variety of methods used to decrease anxiety and muscle tension), **imagery** (a strategy that uses mental images to assist with relaxation), and **progressive muscle relaxation** (a strategy in which muscles are alternately tensed and relaxed) are used to achieve both mental and physical relaxation. Physical relaxation leads to reduction of skeletal muscle tension; mental relaxation is used to alleviate anxiety.

Biofeedback

Biofeedback training is another method that may be helpful for the client in pain, especially one who has difficulty relaxing muscle tension. **Biofeedback** is a process through which individuals learn to influence their physiological responses. Through the use of biofeedback, clients can alter their pain experience. See Chapter 14 for a description of the biofeedback process.

Cutaneous Stimulation

Counterstimulation is the term used to identify techniques believed to activate the endogenous opioid and monoamine analgesia systems. These interventions are effective by decreasing swelling through cryotherapy (or cold applications), decreasing stiffness (heat applications), and increasing large-diameter nerve fiber input to block small-diameter pain fiber messages (cold, heat, pressure, vibration, or massage). Therapeutic heat and cold are effective pain management tools; they are readily available and easy to use. Both heat and cold can produce analgesia for pain. Heat therapy increases blood flow, increases tissue metabolism, decreases vasomotor

tone, and increases the viscoelasticity of connective tissue, making it particularly effective in easing joint stiffness/pain (Bezkor & Lee, 1997). The use of heat as therapy should be closely monitored as it can produce increased inflammation and edema.

NURSING ALERT

Use heat therapy cautiously in clients with sensory impairment as they may experience burns. Bony prominences are especially vulnerable to the potential for burns.

Cold therapy exerts many benefits, including the following:

- Alleviates edema by reducing vascular flow
- Counteracts inflammation
- Reduces fever
- Diminishes muscle spasms
- Elevates pain threshold as a result of decreasing the velocity of nerve conduction

Application of cold is inappropriate for clients with cold intolerance, vascular insufficiency, and conditions aggravated by cold (e.g., Reynaud’s phenomenon).

Transcutaneous Stimulation

Transcutaneous stimulation is achieved through use of transcutaneous electrical nerve stimulation, acupuncture, and acupressure. **Transcutaneous electrical nerve stimulation (TENS)** is a method of applying minute amounts of electrical stimulation to large-diameter nerve fibers via electrodes placed on the skin. Placement of the electrodes is determined by identifying which nerve innervates the painful area, then determining where that nerve is superficial, or where an anesthetic block would be placed to numb that nerve. Other modalities of pain management should *not* be abandoned while a trial of TENS occurs. Although TENS can be successful, there are two major contraindications:

1. No electrodes should be placed in the area over or surrounding demand cardiac pacemakers.
2. No electrodes can be placed over the uterus of a pregnant woman.

Acupuncture is another counterstimulation technique; it is performed by a specialist and accomplished by insertion of small solid needles into the skin and musculature at specific sites and at various depths. Acupressure accomplishes the same stimulation through cutaneous pressure over the selected site. When the client seeks acupressure, acupuncture, or TENS treatment, it is important to determine the efficacy of the present treatment regime.

Acupressure has been used in TCM since the 5th century B.C. Firm pressure is applied by the fingers to specific acupuncture points on the body to unblock the *chi* (energy); see Figure 33-8.

Encourage Exercise

Exercise is an important treatment for chronic pain because it strengthens weak muscles, helps mobilize joints, and helps restore balance and coordination. Passive range of motion should not be used if it increases pain or discomfort. Immobilization is frequently used for clients with episodes of acute pain or to stabilize fractures; however, prolonged immobilization should be avoided whenever possible because it can lead to muscle atrophy and cardiovascular deconditioning.

Nutrition

Dietary practices may affect pain by inhibiting biochemical events associated inflammation. Some foods may actually trigger a painful episode; for example, red wine,

cheese, citrus fruits, and cured meats often contribute to the onset of migraine headaches (Howell, 1997).

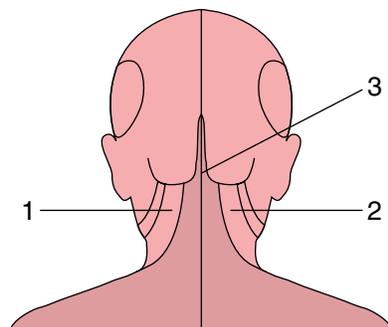
Other foods may help alleviate the pain associated with chronic diseases. For example, cherries and berries with red, blue, or black skins have high amounts of bioflavonoids, substances with antiinflammatory properties. Table 33-10 lists foods with properties that exert a pain reducing effect.

Herbals

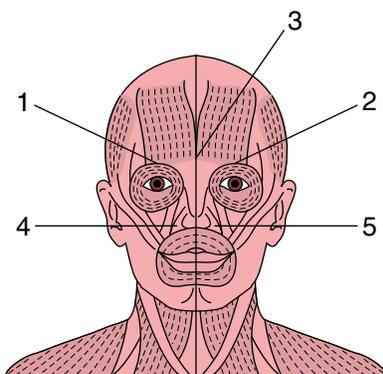
Many herbs are also useful in mediating pain; see Table 33-11. Howell (1997) reports treatment of mouth pain in cancer patients with candy that contains capsaicin.

Environment

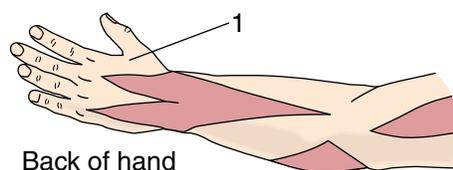
The environment can exert influence on the perception of pain; therefore, changes in one's environment may reduce pain levels. Pet therapy, consisting of interactive sessions between client and animals, is helpful for some people experiencing chronic pain.



A



B



C

Point Locations

A. Point Location: 1 & 2

In the hollow, approximately two to three inches wide, between the two large vertical neck muscles below the base of the skull.

A. Point Location: 3

In the large hollow under the base of the skull in the center of the back of the head.

B. Point Location: 1 & 2

Where the bridge of the nose meets the inner ridge of the eyebrows, at the indentation of each inner eye socket.

B. Point Location: 3

Between the eyebrows where the bridge of the nose meets the forehead.

B. Point Location: 4 & 5

At the bottom of each cheekbone adjacent to the nose and in line with the pupil of each eye.

C. Point Location: 1

At the highest spot on the muscle in the webbing between the thumb and index finger. (Do not press on pregnant individual.)

Figure 33-8 Acupressure Points for Headache Relief

TABLE 33-10
Nutrition and Therapeutic Outcomes

Food	Therapeutic Effect
Cherries and berries with black or red-blue skins (raspberries, blackberries)	<ul style="list-style-type: none"> • Rich in bioflavonoids (antiinflammatory substances) • Used in pain associated with arthritis and gout
Calcium, magnesium, zinc, and Vitamins A, B-complex, C, D, and E (found in fruits, vegetables, legumes, whole grains, sunflower seeds, nuts)	
Fatty acid eicosapentaenoic acid (EPA), a component of certain fish oils (Found in cold-water fish)	Inhibits formation of substances associated with inflammation
Amino acids (found in whole grains, starchy vegetables, dairy products, turkey)	Produces mild analgesia

(Data from Howell, S. [1997]. Complementary therapies. In Springhouse Corporation. *Expert pain management* [pp. 258–259]. Springhouse, PA: Springhouse Corporation)

TABLE 33-11
Herbal Pain Management

Name	Properties/Use	Contraindications/Side Effects
Bromelain (<i>Ananas comosus</i>)	Antiinflammatory, smooth muscle relaxant Useful in pain related to oral surgery, sports injury, menstruation	Nontoxic Well tolerated in long-term usage
Cayenne pepper (<i>Capiscum frutescens</i>)	<ul style="list-style-type: none"> • Depletes substance P • Excites C fibers (repeated application to C fibers kills them) • For pain of osteoarthritis, neuropathy, postherpetic neuralgia, shingles, fibromyalgia 	Avoid getting into eyes May cause brief burning or stinging sensation upon initial use Not for use in those allergic to ragweed
Chamomile (<i>Matricaria chamomilla</i>)	Antiinflammatory Antispasmodic Analgesic for intestinal spasms Infants' colic pain Stomachache Gastric ulcers	Not for use if allergic to ragweed, asters, or chrysanthemums
Feverfew (<i>Chrysanthemum parthenium</i>)	Prevention of migraines Rheumatoid arthritis	Not for use with prescription headache drugs Not for use by pregnant and lactating women Capsule preferred (chewing leaves may cause mouth ulcers and loss of taste)
Green tea (<i>Camellia sinensis</i>)	Produces antioxidant effects	Avoid large quantities during pregnancy Limit to 1 cup per day for those with anxiety disorders or cardiac arrhythmias
Kava	Produces relaxation Treatment of insomnia	Large amounts may be intoxicating Potential for abuse

(continues)

TABLE 33-11 (continued)
Herbal Pain Management

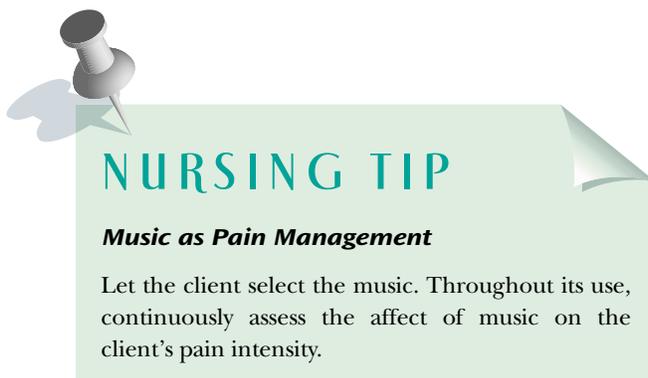
Name	Properties/Use	Contraindications/Side Effects
Lavender oil (<i>Lavandula angustifolia</i>)	Analgesic Sedative Relaxant Useful in treating headaches, muscular sprains, arthritis, menstrual cramps	Warning: May cause extreme drowsiness
Licorice (<i>Glycyrrhiza glabra</i>)	Antiinflammatory Inactivates herpes simplex (for treatment of oral and genital herpes lesions) Rheumatoid arthritis	Long-term use can cause hypertension
Valerian	Insomnia Muscle pain Menstrual cramps Intestinal cramps	Do not use with alcohol or other CNS depressants

NOTE: This information is not intended to be a guide for self-medication or the treatment of others. Consult a health care practitioner with expertise in the use of herbs before using any herb for medicinal purposes.

(Data from Cleland, C. L., & Gebhart, G. F. [1997]. Principles of nociception and pain. In Springhouse Corporation. *Expert pain management*. [p. 11] Springhouse, PA: Springhouse Corporation; Howell, S. [1997]. Complementary therapies. In Springhouse Corporation. *Expert pain management*. [p. 261]. Springhouse, PA: Springhouse Corporation; Fontaine, K. [2000]. *Healing practices: Alternative therapies for nursing*. [pp. 121–123]. Upper Saddle River, NJ: Prentice Hall; Tierra, M. (1998). *The way of herbs*. New York: Pocket Books; Walters, C. [1998]. *Aromatherapy: A basic guide*. New York: Barnes & Noble.)

Horticultural therapy (treatment that includes looking at, touching, and growing plants) has several therapeutic benefits, including pain reduction, relaxation, and improved energy level. Participation in gardening can provide distraction from chronic pain.

Music therapy may help ease pain by producing relaxation and providing distraction. See the Nursing Tips for suggestions on using music to alleviate pain.



NURSING TIP

Music as Pain Management

Let the client select the music. Throughout its use, continuously assess the affect of music on the client's pain intensity.

Pain may be manifested differently by older individuals. For example, pain may be referred (gallbladder pain is felt in the shoulder). Also, the intensity of pain in some elders may not accurately reflect the severity of the underlying pathology; (e.g., a myocardial infarction may be felt as a fluttering sensation, Eliopoulous, 1999).

Some of the outcomes of untreated pain in older adults include the following (Loeb, 1999):

- Sleep alterations
- Nutrition problems
- Impaired gait
- Cognitive impairments
- Decreased socialization
- Increased incidence of falls
- Decreasing ability to function independently

“Compared to race, site of pain, and intensity of pain, age is the most important variable influencing analgesic response” (Pasero, Reed, & McCaffery, 1998, p. 12.). The general guideline for administering analgesics to older clients is to *start low and go slow*.

Many elderly individuals receive health care in their homes. The accompanying display lists recommendations for home health nurse to use with clients experiencing pain.

Evaluation

Evaluating the efficacy of the pain management interventions is ongoing, with client input throughout the process. Evaluation focuses primarily on the client's subjective reports. Objective data used to evaluate pain management efficacy include:

- Client's facial expression and posture
- Presence (or absence) of restlessness
- Vital sign monitoring
- Ongoing use of pain assessment tools

HOME CARE: PAIN MANAGEMENT CONCEPTS

- On each visit, evaluate the client's pain.
- Assess factors influencing effective pain management (e.g., motor, cognitive, and functional alterations).
- Teach clients and family members adjunctive therapies to be used with analgesics to decrease pain.
- Identify barriers that hinder pain control.
- Encourage the homebound client to use around-the-clock dosing of analgesics.

(Data adapted from Luggen, A. S. [2000]. Pain. In A. G. Lueckenotte, (Ed.), *Gerontologic nursing* [2nd ed., p. 300.]. St. Louis, MO: Mosby)

Regular reassessment is an integral part of effective pain management. In addition to client self-report and nursing observation, family input is a valuable source of information for evaluating the effectiveness of care.

REST AND SLEEP

Rest and sleep are fundamental components of well-being. All individuals require certain periods of calm and lesser activity so that their bodies can regain energy and rebuild stamina. The need for rest and sleep varies with age, developmental level, health status, activity level, and cultural norms. Pain and impaired sleep are closely related in most people. According to Doghramji and Fredman (1999), 50–70% of clients experiencing pain also suffer sleep disturbance. On the other hand, sleep deprivation can decrease pain tolerance and, thus, may exacerbate pain (especially headaches).

Rest refers to a state of relaxation and calmness, both mental and physical. Activity during rest periods can range from lying down to reading a book to taking a quiet walk. When discussing a client's rest patterns, the nurse should try to understand what activities and environments the client defines as restful.

Sleep refers to a state of altered consciousness during which an individual experiences minimal physical activity and a general slowing of the body's physiological processes. Sleep generally occurs in a periodic cycle and usually lasts for several hours at a time; disruptions in the usual sleep routine can be distressing to clients and will most likely impair sleep further. As a restorative function, sleep is necessary for physiological and psychological healing to occur. It is important for clients, their significant others, and health care providers to understand the normal sleep-wake cycle and how sleep affects mood and healing.

Physiology of Rest and Sleep

The cycles of wakefulness and sleep are controlled by centers in the brain and influenced by routines and

environmental factors. An individual's biological clock also helps determine the specific cycles that will be followed for wakefulness and sleep.

Stages of Sleep

Electroencephalograph (EEG) patterns, eye movements, and muscle activity are used to identify stages of sleep. The stages of sleep are classified in two categories: non-rapid eye movement (NREM) and rapid eye movement (REM) sleep.

NREM Sleep

With the onset of sleep, the heart rate and respiratory rate slow slightly and remain regular. This first phase of sleep is referred to as non-rapid eye movement, or NREM, sleep. NREM sleep consists of four different stages. As the client enters *stage 1 sleep*, there is a general slowing of EEG frequency but an appearance of wave spikes; the eyes tend to roll slowly from side to side, and muscle tension remains absent except in the facial and neck muscles. In adult clients with normal sleep patterns, stage 1 sleep usually lasts only 10 minutes or so. Stage 1 NREM sleep is of a very light quality, which means that during this stage a sleeper can be easily awakened.

Stage 2 sleep is still fairly light sleep, with a further slowing of EEG patterns and loss of slow rolling eye movements. Fifty percent of normal adult sleep may be spent in stage 2. After an initial 20 minutes or so of stage 2 sleep, a deep form of sleep called stage 3 to 4 is entered.

Stage 3 and *stage 4* sleep are frequently discussed together because of the difficulty of identifying and separating the two. Stage 3 refers to medium-depth sleep, and stage 4 signals the deepest sleep. During these stages, all cortical brain cells appear to be firing at the same time, resulting in large slow waves on the EEG. When roused from stage 3 to 4 sleep, an adult can take 15 seconds or so to become fully awake. This difficulty



NURSING TIP

Night Terrors

Unlike nightmares, which occur during REM sleep, night terrors occur during NREM stage 3 to 4 sleep and are most common during childhood and adolescence. They are identified by an abrupt awakening, generally within the first hour of sleep, and the child appears to be in a panic state. The child may be only partially coherent and by the following morning typically has no memory of the event.

NURSING CARE PLAN

The Client with Chronic Pain

Case Presentation

Sally Atkinson, a 48-year-old woman, injured her back 3 years ago while lifting some boxes of paper at work. Since that time, she has had 4 epidural steroidal injections for the pain associated with 2 ruptured discs. Her pain has been intermittent with some alleviation from the epidural injections. Her last epidural was 3 months ago. She arrives at the clinic stating, “I just don’t know how I can go on like this. The pain has been tolerable until last night. I’m hurting so bad!” She is tearful and pacing, saying “It hurts too much when I sit down.”

Assessment

- Verbalization of pain (“9” on a 1 to 10 pain intensity scale)
- Anxious (as evidenced by pacing and tears)
- Blood pressure 148/90
- Pulse strong and regular at 92
- Guarded movement
- History of chronic pain

Nursing Diagnosis #1

Chronic Pain related to muscle spasm and ruptured discs.

Expected Outcomes

The client will:

1. Practice selected noninvasive pain relief measures.
2. Verbalize a decrease in pain.
3. Have increased ability to perform daily activities as evidenced by walking 1 mile every day and being able to work.

Interventions/Rationales

1. Assess the client’s level of pain, determining the intensity at its best and worst.
Determines a baseline for future assessment.
2. Listen to the client while she discusses the pain; acknowledge the presence of pain.
Acknowledging the client’s pain decreases anxiety by communicating acceptance and validating the client’s perceptions.
3. Discuss reasons why pain may be increased or decreased.
Helps the client determine a cause-and-effect relationship between pain and specific activities.
4. Teach relaxation techniques such as deep breathing, progressive muscle relaxation, and imagery.
Reduces skeletal muscle tension and anxiety, which potentiates the perception of pain.
5. Teach the client and family about treatment approaches (biofeedback, hypnosis, massage therapy, physical therapy, acupuncture, and exercise).
Makes the client and family aware of the availability of treatment options.
6. Teach the client about the use of medication for pain relief. Provide accurate information to reduce fear of addiction.
Lack of knowledge and fear may prohibit client from taking analgesic medications as prescribed.
7. Encourage the client to rest at intervals during the day.
Fatigue increases the perception of pain.
8. Explain the relationship between chronic pain and depression.
Knowledge decreases anxiety.

Evaluation

Ms. Atkinson demonstrates the use of deep breathing and progressive muscle relaxation. After practicing relaxation techniques, she rates her pain as a 2 to 3 on the pain intensity scale. Ms. Atkinson is able to walk for 1 mile, but she still has backache while sitting at her computer for extended periods of time.

(continues)

NURSING CARE PLAN**The Client with Chronic Pain (continued)****Nursing Diagnosis #2***Anxiety related to chronic pain.***Expected Outcomes**

The client will:

1. Verbalize an increase in psychological and physiological comfort level.
2. Demonstrate ability to cope with anxiety as evidenced by normal vital signs and a verbalized reduction in pain intensity.

Interventions/Rationales

1. Assess the client's level of anxiety.
To collect baseline data to be used in measuring a decrease or increase in anxiety level.
2. Speak slowly and calmly.
Avoids escalating client's anxiety level and increases the likelihood of client's comprehension.
3. Encourage Ms. Atkinson to verbalize angry feeling.
Anger is often a component of chronic conditions because of the prolonged sense of powerlessness. "Stuffing" anger can lead to increased anxiety.

Evaluation

Ms. Atkinson rates her pain as a 2 to 3 on the pain intensity scale after practicing relaxation techniques. She voices concern that the pain will soon come back. After a relaxation session, her vital signs returned to normal limits. She denies feeling angry.

in awakening is even more pronounced in children. Stage 3 to 4 sleep is where most sleepwalking, sleeptalking, enuresis, and night terrors occur.

Stage 3 to 4 sleep is felt to have restorative value, necessary for physical recovery. After sleep deprivation studies, stage 3 to 4 sleep is the first to be regained. The majority of growth hormone is secreted at night, peaking during stage 3 to 4 sleep near the beginning of a sleep period. Growth hormone is required not only for growth but also for normal tissue repair in clients of all ages. Stage 3 to 4 sleep accounts for approximately 25% of sleep in children, declines slightly in young adulthood, then gradually declines in middle age and may be absent in elderly clients.

REM Sleep

After the initial 90 minutes or so of NREM sleep in adults, the client enters rapid eye movement, or REM, sleep. The EEG pattern resembles that of the awake state; there are rapid conjugate eye movements; heart rate and respiratory rate are irregular and often higher than when awake; and muscles, including those of the face and neck, are flaccid, leaving the body immobilized. Dreams occur 80% of the time clients are in REM sleep. Unlike stage 3 to 4 sleep, which is most abundant during the early portion of a sleep period, REM sleep periods become longer as the night progresses and the individual becomes more rested. An adult typically has four to six REM sleep periods through the night, accounting for 20% to 25% of

sleep. REM sleep makes up 50% of sleep in the newborn, then gradually declines to 20% to 25% of sleep by early childhood and remains fairly constant throughout the remainder of the life span.

Sleep Cycle

A **sleep cycle** refers to the sequence of sleep that begins with the four stages of NREM sleep in order, with a return to stage 3, then 2, then passage into the first REM stage (Figure 33-9). The duration of a sleep cycle is generally between 70 and 90 minutes, and the typical sleeper will pass through four to six sleep cycles during an average sleep period of 7 to 8 hours.

The length of the NREM and REM periods of sleep will change as the overall sleep period progresses and the person becomes more relaxed and re-energized. There is less need for stage 3 to 4 sleep and more need for REM sleep as the sleep period progresses, and dreams during the REM phases of later sleep may become more vivid and intense. If the sleep cycle is broken at any point, a new sleep cycle will start, beginning again at stage 1 of NREM sleep and progressing through all the stages to REM sleep.

Biological Clock

The **biological clock** (an endogenous mechanism that measures time) controls the daily fluctuations in hun-

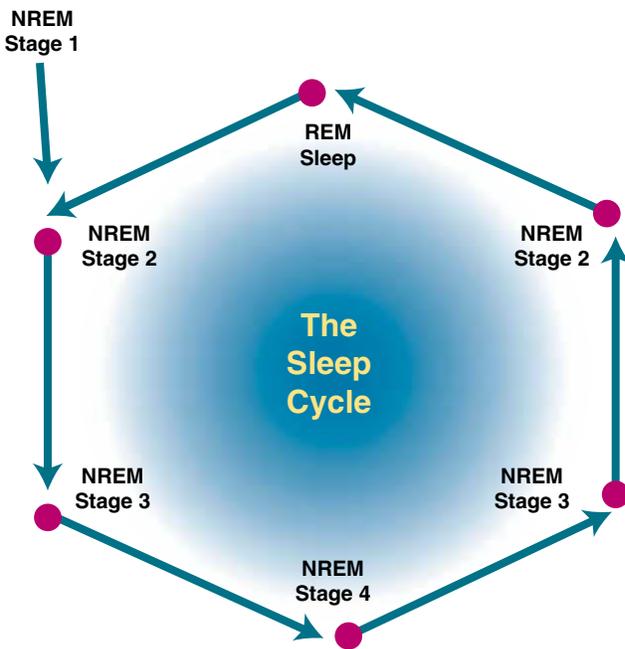


Figure 33-9 The Sleep Cycle

dreds of physiological processes, including body temperature, respiratory rate, performance, alertness, and hormone levels.

Chronobiology is a relatively new branch of science that studies these rhythms that are controlled by our biological clocks. The most widely studied are the **circadian rhythms**, or those that cycle on a daily basis. Other biological rhythms include:

- Ultradian—those much shorter than a day
- Infradian—those lasting a month or more
- Circannual—those requiring about 1 year to complete the cycle

When external time cues such as day-night, sleep-wake, and mealtimes are inconsistent, a desynchronization, or mismatching, of the circadian biological rhythms occurs. This internal desynchronization disrupts the timing of physiological and behavioral activity, which in turn causes chronic fatigue, disrupts sleep patterns, and causes decreased performance and coping abilities. An example of desynchronization is that of the newborn, whose biological rhythms are not established until 3 to 4 months of age. At this point, infants will start to develop longer sleep periods at night and become more predictable in their waking and sleeping patterns.

Factors Affecting Rest and Sleep

Several factors can influence the quality and quantity of both sleep and rest. Often, sleep problems result from a combination of many factors.

Degree of Comfort

Comfort is a highly subjective experience. The nurse must assess the degree to which the client's physical and psychological needs have been met. Whenever basic needs are unmet, the person experiences discomfort which leads to physiological tension, resultant anxiety, and potential impairments in sleep/rest.

Anxiety

A restless body and mind interfere with the ability to sleep. When trying to go to sleep, many individuals often have intrusive thoughts or muscular tension, which interfere with rest and sleep. Anxiety related to work pressures, family demands, and other stressors does not automatically cease when an individual attempts to go to sleep. Anxiety often results in difficulty falling or staying asleep.

Environment

Environmental factors can either enhance or impair sleep. Lighting, temperature, odors, ventilation, and noise level can all interrupt the sleep process when they differ from the norms of the client's usual sleep environment.

THINK ABOUT IT

Sleep Barriers in Institutions

Carefully observe a health care agency. Knowing that sleep promotes healing, identify the factors that promote rest and sleep. What are some barriers to sleep in the health care environment?

Lifestyle

A fast-paced life filled with multiple stressors can result in the person's inability to relax easily or to fall asleep quickly. Relaxation precedes healthy sleep.

Another lifestyle factor that interferes with sleep is having a work schedule that does not coincide with an individual's biological clock (e.g., working at times other than the day shift). Individuals who frequently change work shifts have a real challenge in trying to stabilize biological rhythms and rest comfortably.

Diet

The type of food consumed has an impact on the quality and quantity of sleep. Foods high in caffeine, such as coffee, colas, and chocolate, serve as stimulants and often disrupt the normal sleep cycle. Also, consuming a large, heavy, or spicy meal just before bedtime may cause indigestion, which will likely interfere with sleep.

Conversely, going to bed when hungry can also result in sleep problems because the individual may be preoccupied with food and hunger pangs instead of concentrating on sleep.

Drugs and Other Substances

Alcohol and nicotine use can impair sleep. Small amounts of alcohol may help some people fall asleep; however, in others alcohol may interfere with REM sleep, causing very restless and nonrefreshing sleep. Nicotine, which is a stimulant, can also impair the sleep cycle by stimulating the body, resulting in difficulty falling and staying asleep. Many medications (both prescription and over-the-counter) cause fatigue, sleepiness, restlessness, agitation, or insomnia, thus affecting the quality and quantity of rest and sleep.

Cultural Norms

Cultural and societal expectations also affect sleep. Some people perceive sleep as a luxury to be indulged in when they are not too busy with “important” activities. Others view sleep as an absolute necessity. The amount of sleep that a person considers to be necessary is partially determined by the attitudes of family and culture.

THINK ABOUT IT

Cultural Norms and Sleep

Which of the two descriptions of sleep (a luxury or a necessity) do you think is most congruent with our society? Which view is closest to your own? What approach would you take when discussing the rest and sleep needs of a client whose philosophy and views about sleep are in direct contrast to your own?

Life Span Considerations

A person’s need for sleep changes with age in a fairly predictable pattern. Although sleep and rest patterns are closely tied to lifestyle and other variables, there are some common variations:

- The *neonate* (birth to 1 month) sleeps in 3- to 4-hour intervals for a total of about 16 to 20 hours per day. The newborn usually is very passive, with little activity during sleep (“sleeping like a baby”), and typically sleeps very soundly. For the first few days or weeks of life, a baby’s biological clock is not attuned to regular day-night patterns, so there is often no difference in sleep patterns between day and night.
- The *infant* averages about 12 to 16 hours of sleep per day. As the infant ages, the amount of sleep needed decreases. At approximately 2 months of age, infants

can begin to sleep through the night and will typically nap two or three times during the day.

- During *toddlerhood* the daily average amount of sleep is 12 to 14 hours, which is usually broken down into 10 to 12 hours at night with one or two daytime naps. During this stage, bedtime rituals often develop and assume great importance in providing nighttime security. Repeated and predictable nighttime routines such as baths, brushing teeth, and reading books are helpful in establishing expectations and comfort.
- The *preschool* child sleeps approximately 10 to 12 hours per day. Daytime napping decreases or ceases, unless cultural norms dictate otherwise. Night sleep is often filled with vivid dreams and nightmares, which often awaken children several times during the night.
- A *school-age* child also averages about 10 to 12 hours of sleep daily. Resistance to bedtime and struggles for independence are hallmarks of the school-age child. During this time, the child may develop fear of the dark and will need reassurance and methods to handle this fear.
- *Adolescents* sleep about 8 to 10 hours per day and often decide themselves their bedtime routines and hours. High activity levels often interfere with regular sleep patterns and irregular sleeping habits often become the norm at this stage.
- The *young adult* averages about 8 hours of sleep per day. During this stage, sleep is often interrupted by young children in the home or work responsibilities. Lifestyle patterns cause many young adults to experience difficulties falling or staying asleep.
- The *middle-aged adult* sleeps about 6 to 8 hours a day. Daily stressors may continue to result in insomnia, and use of sleep-inducing medications is common.
- The sleep requirements for the *older adult* decrease to 5 to 7 hours per day, and often include a daytime nap. The quality of sleep often diminishes due to frequent waking, physical pain, and shortened REM sleep. Many elderly people misinterpret this decreased need for sleep as insomnia and are thus unduly concerned about not getting “enough” sleep.

Illness or Hospitalization

The stress imposed by illness usually disrupts sleep. Sleep is especially disrupted when a person is hospitalized. Some factors associated with hospitalization that lead to sleep impairment include:

- Physical or emotional pain
- Loss of familiar surroundings
- Loss of routine
- Fear of the unknown
- Timing of procedures and treatments
- Noise level (especially unfamiliar noises)
- Loss of privacy

Alteration in Sleep Patterns

Sleep disturbances can take many forms and are quite common. According to Carpenito (1999), sleep pattern disturbance is defined as:

The state in which an individual experiences or is at risk of experiencing a change in the quantity or quality of his or her rest pattern as related to the person's biological and emotional needs. (p. 291)

Alterations in sleep patterns are generally viewed as either primary sleep disorders (those in which the sleep alteration is the fundamental problem) or secondary sleep disorders (those in which the alteration has a medical or clinical cause that results in or contributes to the sleep alteration). The most common sleep alterations include insomnia, hypersomnia or narcolepsy, sleep apnea, sleep deprivation, and parasomnias.

Chronic insomnia is a widespread problem, affecting 10–20% of Americans; approximately 40–50% report occasional insomnia (Doghramji & Fredman, 1999). Listed below are problems associated with sleep disturbances:

- Decreased work productivity (more missed days of work)
- Increased utilization of health care services
- Greater risk of accidents
- Short-term memory problems
- Cognitive and motor performance impairments

Insomnia

Insomnia refers to the chronic inability to sleep or inadequate quality of sleep due to sleep prematurely ended or interrupted by periods of wakefulness. Insomnia is *not* a disease, but it may be a manifestation of many illnesses. The person experiencing insomnia often gets caught up in a vicious cycle of not being able to sleep, trying harder to fall asleep, increasing anxiety about not sleeping, which in turn increases the inability to fall asleep. Perception of sleep quantity can also be important; many insomniacs actually sleep significantly more than they think they do, so there is a discrepancy between perception and reality.

Sleep disturbances are common for individuals experiencing chronic pain. Sleep impairment can exacerbate pain, and, thus, a vicious cycle is established. “A poor night’s sleep contributes to depression, muscle soreness, difficulty thinking, and decreased motivation” (McCaffery & Pasero, 1999, p. 500). Treatment for insomnia is best directed at modifying those factors or behaviors that are causing it. It is impossible to force sleep.

Hypersomnia or Narcolepsy

Hypersomnia is an alteration in sleep pattern characterized by excessive sleep, especially in the daytime. Persons suffering from hypersomnia often feel that they cannot get enough sleep at night, and therefore they sleep very late into the morning and nap several times

throughout the day. Causes of hypersomnia can be physical or psychological; treatment depends on addressing the underlying cause.

Narcolepsy, another sleep alteration, manifests as sudden uncontrollable urges to fall asleep during the daytime. Individuals suffering from narcolepsy often achieve adequate sleep at night but are overwhelmed by sleepiness at unexpected and unpredictable periods during the day. Effective treatments for narcolepsy include avoiding substances or activities that cause sleepiness, taking short daytime naps, or taking prescribed stimulant medications.

Sleep Apnea

Sleep apnea refers to periods of sleep during which air-flow stops for 10 seconds or more. Sleep apnea gives rise to complications as a result of oxygen desaturation and carbon dioxide retention. Short-term consequences may include cognitive impairment (including memory changes), personality changes, and impotence. A major problem is daytime sleepiness, which may interfere with functional abilities such as driving and working. If untreated, sleep apnea can result in the following (Forth, 1998):

- Hypertension
- Cardiac arrhythmias
- Right-sided congestive heart failure
- Cerebral vascular accident (stroke)
- Cognitive dysfunction
- Death

The first line of defense against apnea is treating its cause (emotional, cardiac, or respiratory alteration). Use of a nasal continuous positive airway pressure (CPAP) device may also give relief. With some individuals, surgical intervention is required to correct the cause of the apnea.

Sleep Deprivation

Sleep deprivation is a term used to describe prolonged inadequate quality and quantity of sleep, either of the REM or the NREM type. Sleep deprivation can result from age, prolonged hospitalization, drug and substance use, illness, and frequent changes in lifestyle patterns. Sleep and dreaming have a restorative value necessary for mental and emotional recovery, and enhance the ability to cope with emotional problems. Therefore, sleep deprivation can cause symptoms ranging from irritability, hypersensitivity, and confusion to apathy, sleepiness, and diminished reflexes. Treating or minimizing the factors that cause the sleep deprivation is the most effective resolution.

Parasomnia

Parasomnias refer to sleep alterations resulting from “an activation of physiological systems at inappropriate times during the sleep-wake cycle” (American

Psychiatric Association, 1994, p. 579). **Somnambulism** (sleepwalking), sleepwalking, bed wetting, and **bruxism** (teeth grinding) are the most common parasomnias. Treatment for parasomnias varies, and care should be focused on helping the client and family understand the disorder and its potential safety risks.

Assessment

Discussion of sleep habits is included as part of the regular health history. Any client acknowledging a sleep disturbance should be thoroughly assessed to determine sleep routines, sleep alterations, type of disturbances, and impact of sleep problems. Typically the client is a reliable source for this information, but a spouse or partner who shares sleeping arrangements may be able to add valuable information to the client's report. Questions regarding the client's usual sleep patterns should include:

1. Nature of sleep (restful, uninterrupted)
2. Quality of sleep (usual sleep pattern, schedules, hours of sleep, feeling on waking)
3. Sleep environment (description of room, temperature, noise level)
4. Associated factors (bedtime routines, use of sleep medications or any other sleep inducers)
5. Opinion of sleep (adequate, restores energy adequately, inadequate, problematic)

Questions regarding altered sleep patterns are intended to discover such information as:

1. Nature of the problem (inability to fall asleep, difficulty remaining asleep, inability to fall asleep after awakening, restless sleep, daytime sleepiness)
2. Quality of the problem (number of hours of sleep versus number of hours spent trying to sleep, number of hours of sleep a night, duration and frequency of naps or other compensatory measures, number of wakings per sleep period)
3. Environmental factors (lighting, bed, noise level, surrounding stimulation, sleep partner)
4. Associated factors (relation to meals eaten, activity before retiring, life stressors, work stressors, anxiety level, pain, recent illness or surgery)
5. Alleviating factors (mild diet, warm drink before retiring, reading a book, listening to quiet music, taking a hot bath, taking sleeping pills)
6. Effect of problem (fatigue, irritability, confusion)

For clients whose sleep problems do not seem to be well defined, a daily journal of sleep patterns may prove useful. This written account can mirror the preceding outline.

Nursing Diagnosis

After information about the sleep impairment has been collected, data need to be analyzed to formulate appro-

priate nursing diagnoses. The primary diagnosis for individuals experiencing sleep problems is *Disturbed Sleep Pattern*.

According to NANDA (2001), *Disturbed Sleep Pattern* is defined as “a disruption of sleep time [that] causes discomfort or interferes with desired lifestyle” (p. 59). Alterations in sleep can manifest through verbal complaints of the client, physical signs such as yawning or dark circles under the eyes, or alterations in mood such as apathy or irritability.

If the client presents with problems in addition to the sleep disturbance, the nurse must be alert to the possibility that the sleep disturbance is the *cause* (not the effect) of another problem. For example, a client may be experiencing *Activity Intolerance* related to lack of sleep as evidenced by verbal complaint, extreme fatigue, disorientation, confusion, and lack of energy.

Outcome Identification and Planning

The plan of care for the sleep-disordered client must be individualized. For the nursing care to be effective, client input should be incorporated when developing expected outcomes. It is important to tailor the outcomes and plan of care to the true cause related to the sleep disturbance or alteration. For example, if the client is experiencing *Disturbed Sleep Pattern* because of bedwetting, then the bedwetting should be targeted for intervention.

Effective outcome identification and planning will also consider the fact that many sleep disturbances will require extended periods of time (weeks or months) to correct. Sleep patterns are by nature habitual and intertwined with lifestyle patterns, and these types of disturbances typically require interventions that have long-term goals. When planning care, the nurse should remember to perform procedures and treatments in a manner that disturbs sleep time and routines as little as possible.

Implementation

Several interventions can promote rest and sleep in clients. The interventions range from simple (e.g., correct bedmaking techniques) to complex (teaching clients about necessary lifestyle modifications). Several interventions that facilitate sleep are discussed here.

Establish a Trusting Nurse-Client Relationship

The quality of the nurse-client relationship can enhance a client's ability to rest and sleep. Knowing that the nurse is a trustworthy individual allows the client to relax and feel secure. The nursing checklist provides guidelines for communicating with the sleep-impaired



NURSING CHECKLIST

Communicating with the Sleep-Impaired Client

1. Thoroughly explain procedures before implementation.
2. Encourage client and significant others to verbalize feelings and to ask questions.
3. Answer questions honestly and completely.
4. Identify and support coping mechanisms of client and family.
5. Spend adequate time with the client to facilitate communication.
6. Ascertain and incorporate client preferences as much as possible into plan of care.

client. Anxiety can be decreased by the nurse's use of therapeutic communication skills. The *therapeutic use of self* helps allay client anxiety.

Create a Relaxing Environment

Arranging the immediate surroundings to promote sleep is important for the sleep-impaired client. A place to sleep should be inviting. Determine the type of environment the client finds relaxing, then provide this environment in the inpatient setting, or help the client establish this type of environment in the home setting.

THINK ABOUT IT

Relaxing Environment

Observe a client care area. What environmental factors encourage sleep? What factors interfere with sleep? If you were to design the ideal client care environment, how would you address the following variables:

- Colors
- Fabrics
- Lighting
- Noises
- Temperature
- Odors

Initiate Relaxation Techniques

The client's mood before sleep is of utmost importance. The *belief* that one can—and will—sleep greatly affects sleep quality and quantity. The client who is calm and relaxed is likely to fall asleep quickly and stay asleep all night. Relaxation techniques are useful sleep aids. Progressive muscle relaxation is especially therapeutic for the person who needs to lessen muscular tension and quiet the mind.

Ensure Appropriate Nutrition

Certain foods can actually enhance sleep. Tryptophan, a substance in milk, promotes sleep by stimulating the brain's production of the neurotransmitter serotonin. The old wives' tale that drinking warm milk promotes sleep is supported by scientific data. Other dietary considerations include avoiding large or heavy meals close to bedtime, refraining from eating spicy or other foods that cause gastrointestinal distress, and avoiding caffeine after noon.

COMPLEMENTARY/ALTERNATIVE MODALITIES THAT PROMOTE SLEEP

- Massage
- Imagery
- Meditation
- Herbal:
 - Chamomile
 - Hops
 - Lavender
 - Kava
 - Passion flower
 - Skullcap
- Aromatherapy:
 - Chamomile oil
 - Lavender oil

Initiate Pharmacologic Interventions

If unrelieved pain is a factor in the client's sleep disturbance, pain management should be the focus of initial interventions. Many of the nonpharmacologic relaxation and imagery interventions can be effective in clients with sleep disturbances.

Pharmacologic agents that may be therapeutic for clients with sleep disturbances include tricyclic antidepressants, antihistamines, and short-acting hypnotics (McCaffery & Pasero, 1999). The tricyclic antidepressants of choice are amitriptyline (Elavil®) or doxepin (Sinequan®). Amitriptyline improves the client's ability to fall asleep and stay asleep by causing sedation when given 1 to 3 hours before bedtime. Doses of amitriptyline for sleep disturbances are significantly lower than doses for treatment of depression, starting at 10 to 25 mg at bedtime and titrating up by 10 to 25 mg every 2 or 3 days until therapeutic effect is achieved.

Antihistamines such as hydroxyzine (Vistaril®, Atarax®) and diphenhydramine (Benadryl®) have mild sedative effects that could promote sleep if given at bedtime. If anxiety throughout the day is of concern, low doses of these medications at regular intervals throughout the day may be effective.

The final group of pharmacologic interventions for sleep disturbances are the short-acting hypnotics. These are *not* recommended for routine or long-term use, but

**CLIENT TEACHING CHECKLIST**
Managing Sleep Disturbance

To facilitate rest and sleep, the client should be encouraged to:

- Avoid stimulating activities such as strenuous exercise or demanding intellectual activity during the hour before bedtime. Use the time instead to wind down with relaxing activities such as taking a warm bath, reading a book, or sitting by the fire.
- Use bedtime rituals on a consistent basis.
- Practice relaxation techniques such as neck rolls and muscle relaxation to release tensions before going to bed.
- Do not watch television, study, or talk on the phone while lying in bed; accustom your body to using the bed only for sleeping.
- Follow dietary guidelines to avoid caffeine, spicy foods, and heavy meals in the several hours before bedtime.

they may be effective as a short-term intervention. When they are chosen, it is recommended that one with a short half-life be used.

Provide Client Education

Educating the client on sleep-promoting activities is a good investment of the nurse's time. By empowering clients to help themselves relax, the nurse helps them gain a sense of control over their sleep disturbance and boosts their confidence that they can successfully meet their sleep and rest needs.

Evaluation

The plan of care must be individualized for and negotiated with the client. It must be updated on a regular schedule and additional interventions initiated as needed. One of the strongest supportive activities nurses can perform is to make sure clients understand that there is help for sleep problems and that they are not alone in having difficulty successfully managing their sleep patterns. The Nursing Process Highlight lists

NURSING CARE PLAN**The Client Experiencing Altered Sleep Patterns****Case Presentation**

Jacques Porcheron, 6 years old, is brought to your clinic by his father, who states that Jacques has trouble sleeping at night. In the evenings after a dinner of hot dogs, corn or baked beans, and chocolate milk, Jacques reads some books, then watches his favorite superhero video. Afterward, he runs and plays, mimics the actions he sees in the video, and refuses to take a bath or cooperate when getting dressed for bed. Once put to bed at 9 PM, he is up several times for any number of reasons, and often is not asleep until midnight. When his father wakes him at 7 AM for school, Jacques is disagreeable, tired, and difficult to get moving.

Assessment

Client is experiencing:

- Inability to fall asleep
- Inability to remain asleep
- Inconsistent bedtime rituals that interfere with calm time needed before retiring

Nursing Diagnosis

Disturbed Sleep Pattern related to lack of sleep and disruption in lifestyle as evidenced by parental complaint, ineffective bedtime rituals, and insufficient hours of sleep for developmental age.

Expected Outcomes

The client will:

1. Identify behaviors that are helpful before bedtime.
2. Develop appropriate bedtime rituals to help Jacques wind down from the day.
3. Ensure that Jacques gets 10 to 12 hours of sleep per night.

Interventions/Rationales

1. Determine from the father and child what sleeping behaviors they would like to achieve.
Asking for client input in the desired outcomes will make the plan of care more effective and realistic.

(continues)

NURSING CARE PLAN

The Client Experiencing Altered Sleep Patterns (continued)

2. Teach the family about the effect that certain foods can have on digestion and sleep habits, and list with them foods that are good choices for dinners.
Educating the family about the potential adverse effects of certain foods will help them plan meals more appropriately.
3. Help client understand what bedtime activities can be detrimental to sleep induction.
Understanding which behaviors can interfere with falling asleep will help client and family identify and therefore modify prebedtime behaviors.
4. Explain why overstimulation close to bedtime, such as watching superhero movies and engaging in rowdy play, will prevent the body and mind from slowing down and preparing for sleep.
Understanding the psychological and physical implications of overstimulation before bedtime will help clients choose more appropriate bedtime activities.
5. Emphasize the importance of establishing a calming bedtime routine that is followed every night, especially for the school-age child.
Children Jacques' age are helped by ritual and knowing what is expected of them, and they need guidance in practicing routines that are appropriate for bedtime.
6. Suggest appropriate bedtime rituals, such as taking a bath, brushing the teeth, reading a book, or listening to calming music.
Focusing on quiet activities and routine will help the body and mind prepare for bedtime.
7. Help the family ensure an appropriate sleep environment for Jacques, such as a calm room at a comfortable temperature, lit only by a night light.
Promotes sleep and does not interfere with falling back asleep once awake.
8. Encourage the family through the preceding steps to work toward having Jacques get at least 10 to 12 hours of sleep a day, which is the normal requirement for a child his age.
Helping the family understand what factors may be interfering with Jacques' sleep habits, such as excessive daytime napping or repetitive waking during the night, and also ensuring that they understand what his sleep requirements are, will help them be more effective in their management of his bedtime and sleeping habits.

Evaluation

After 2 weeks, the father reports that Jacques eats the same type of meals but is no longer allowed to watch stimulating videos after 7 PM. Together they have established bedtime rituals that begin with quiet tablework (reading, arts and crafts, writing) or talks about the day, followed by a warm bath and reading three books together in the recliner in the living room. After this, they put on pajamas and brush teeth, then Jacques goes up to bed by himself. The father would like to modify Jacques' diet somewhat and is planning this as his goal for the next 2 weeks.

*Nursing Process Highlight***EVALUATION**

When evaluating the care of the sleep-disordered client, consider the following variables:

1. Client's basic needs were met.
2. Client education included the family or significant others.
3. An environment conducive to rest was maintained.
4. Therapeutic activities were balanced with the client's need for rest and sleep.
5. The client's bedtime rituals were followed as closely as possible.
6. Anxiety reduction techniques were used appropriately.

variables to be considered in evaluating the care of the sleep disturbed client.

KEY CONCEPTS

- Pain is a subjective and individualized experience.
- Pain is defined as whatever the client says it is.
- Pain is increased by anxiety and fatigue.
- Several factors influence the perception of pain, including developmental level, culture, previous experience.
- The amount of sleep required differs according to developmental stage.
- Nonpharmacologic interventions may be used in managing pain and promoting rest and sleep.
- Pharmacologic agents can be therapeutic for clients experiencing pain or sleep pattern disturbance. However, the medications should not be the only interventions used.

CRITICAL THINKING ACTIVITIES

1. Differentiate among the different types of pain (somatic, cutaneous, visceral, referred, ischemic, acute, chronic).
2. Describe nonpharmacologic interventions that would be appropriate for a 50-year-old woman suffering from arthritis; a 9-year-old oncology client; a couple going through childbirth.
3. Discuss the use of pharmacologic interventions in pain control.
4. Describe the stages of sleep and how they are related to the sleep cycle.
5. What age-related sleep variations would you need to consider when assessing the sleep habits of neonates, infants, toddlers, and the elderly?
6. State the outcomes that sleep deprivation may have on an individual.
7. Discuss nursing interventions that promote comfort, rest, and sleep.

WEB RESOURCES

Agency for Health Care Research and Quality
www.ahrq.gov
American Pain Society
www.ampainsoc.org
American Sleep Disorders Association
www.adsa.org
National Institutes of Health
www.nih.gov
National Sleep Foundation
www.sleepfoundation.org

Mobility



Worms will not eat living wood where the vital sap is flowing; rust will not hinder the opening of a gate when the hinges are used each day. Movement gives health and life. Stagnation brings disease and death.

—Ancient proverb in Traditional Chinese Medicine
(in Fontaine, 2000, p. 45)

COMPETENCIES

1. Explain the physiology of mobility.
2. Identify factors affecting mobility.
3. Identify health problems related to immobility.
4. Describe the process of activity and mobility assessment.
5. Discuss nursing diagnoses relevant to clients experiencing mobility impairments.
6. List client goals for activity and mobility in terms of lifestyle, age, and health promotion.
7. Describe specific nursing interventions that promote mobility and prevent complications due to immobility.
8. Identify evaluation procedures for client activity and mobility status.

KEY
TERMS

abduction	extension	myoneuronal junction
active range of motion	flexion	opposition
active-assistive range of motion	functional assessment	orthostatic hypotension
adduction	gait belt	passive range of motion
ambulation	hypertrophy	proprioception
atrophy	hypotonicity	range of motion
balance	incontinence	skin shear
base of support	line of gravity	spasticity
body alignment	logrolling	supination
body mechanics	mobility	thrombus
	muscle tone	

Movement is an activity most people take for granted. The ability to move and be active benefits health status, whereas immobility presents a threat to one's physical, mental, and social well-being. This chapter explores nursing responses to individuals with impaired ability to move.

OVERVIEW OF MOBILITY

Mobility refers to the ability to engage in activity and free movement which includes walking, running, sitting, standing, lifting, pushing, pulling, and performing activities of daily living (ADLs). Mobility is often considered an indicator of health status because it influences the correct functioning of many body systems, especially the respiratory, gastrointestinal, and urinary systems. Mobility enhances muscle tone, increases energy levels, and is associated with psychological benefits such as independence and freedom.

Body Alignment

Body alignment refers to the position of body parts in relation to each other. Proper body alignment (also called posture) results in **balance**, which is an individual's ability to maintain equilibrium. When the body is in good posture, the center of gravity (the center point of an object's mass) is evenly distributed over the foundation points. Good posture promotes balance, reduces strain and injury to support structures, facilitates respiratory effort, enhances gastrointestinal processes, and gives an appearance of confidence and health. A correct postural stance is maintained by a well-functioning musculoskeletal system. The normal alignment of the spine has a cervical concavity, a thoracic convexity, and a lumbar concavity; see Figure 34-1.

Proper standing body alignment (as noted in Figure 34-2) is characterized by the following:

- Head upright
- Face forward

- Shoulders squared
- Back straight
- Abdominal muscles tucked in
- Arms straight at side
- Hands palm forward
- Legs straight
- Feet forward

The sitting position in proper alignment has similar characteristics; however, the hips and knees are flexed. Figure 34-3 shows proper alignment and posture for the sitting position.

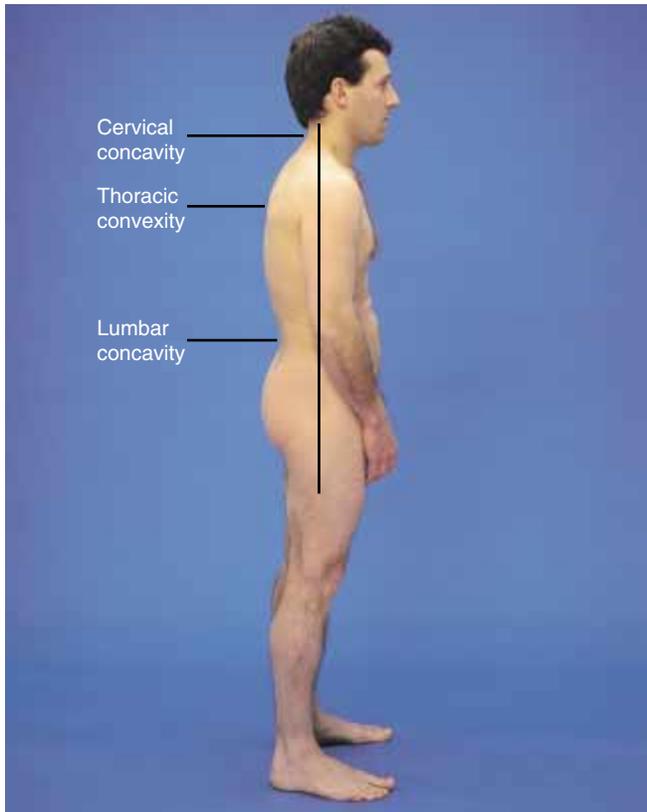
Proper alignment and posture of the client lying in bed appear similar to the standing position; however, the client is supine, as shown in Figure 34-4.

The benefits of proper alignment and posture include (1) client comfort; (2) prevention of contractures; (3) promotion of circulation; (4) less stress on muscle, tendons, nerves, and joints; and (5) prevention of foot drop (plantar flexion).

In a person standing upright, the center of gravity is located in the middle of the pelvis about halfway between the umbilicus and the symphysis pubis. The **line of gravity** (vertical line passing through the center of gravity) is shown in Figures 34-3 and 34-4. The **base of support** is the foundation on which a person or object rests. Stability of one's balance is promoted by a steady base of support and a low center of gravity.

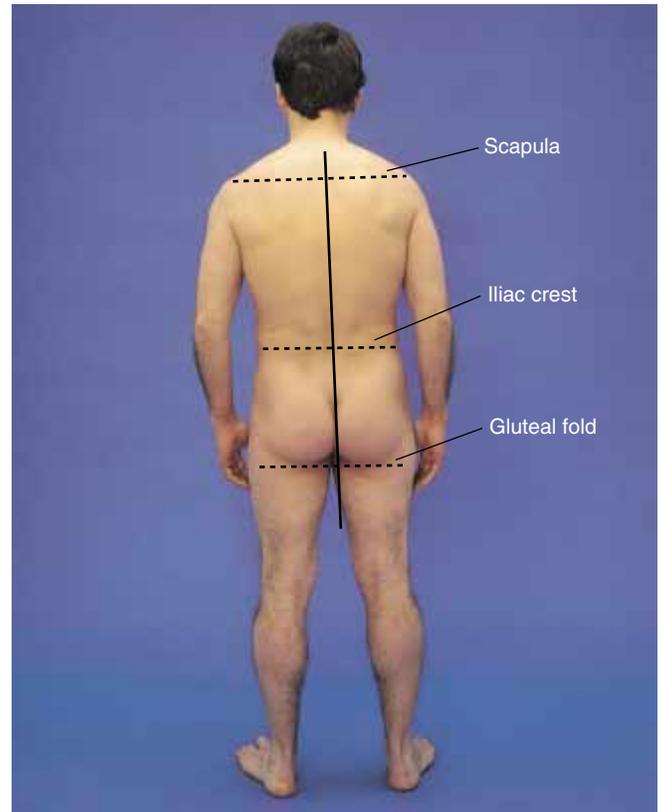
Muscle tone and bone strength allow a person to maintain an erect posture. Muscle contour is affected by the individual's exercise and activity patterns. **Muscle tone** is the normal state of balanced tension present in the body; it allows a muscle to respond quickly to stimuli. Two aberrations of muscle tone include **hypotonicity** (flaccidity), which is a decrease in muscle tone, and **spasticity**, which is an increase in muscle tension and is often noted with extreme flexion or extension.

Muscle shape should be symmetrical. There may be **hypertrophy** (increased muscle size and shape due to an increase in muscle fibers) or **atrophy** (a reduction in muscle size and shape) which manifests as thin, flabby muscles with indistinct contour; (Figure 34-5). Atrophy is usually a result of disuse, whereas hypertrophy occurs when the muscle is overworked.



A. Lateral View

Figure 34-1 Normal Spinal Concavity



B. Posterior View

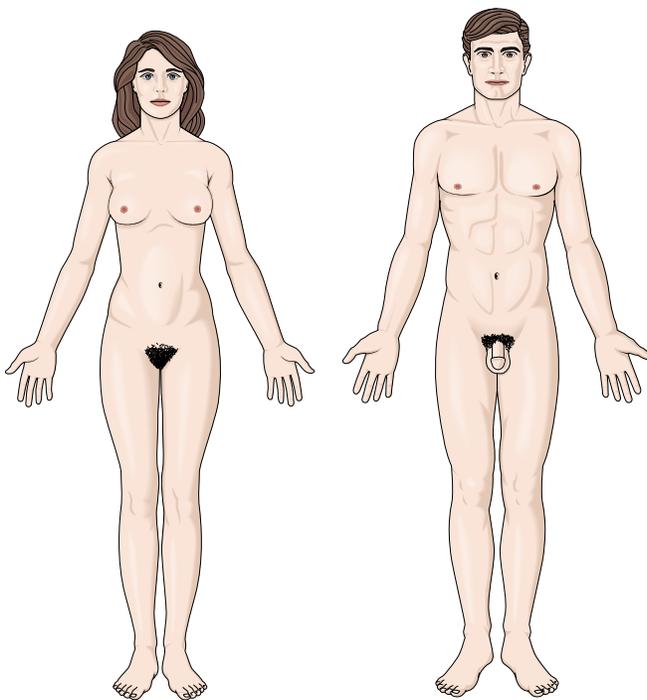


Figure 34-2 Proper Alignment and Posture: Standing Male and Female



Figure 34-3 Proper Sitting Posture and Line of Gravity

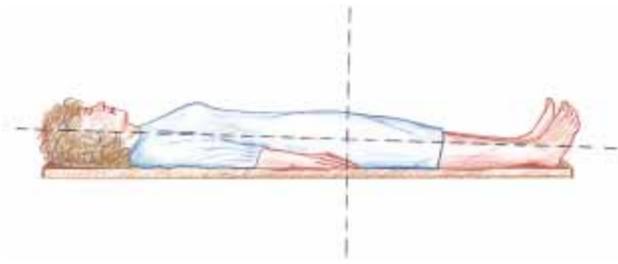


Figure 34-4 Proper Supine Posture and Line of Gravity

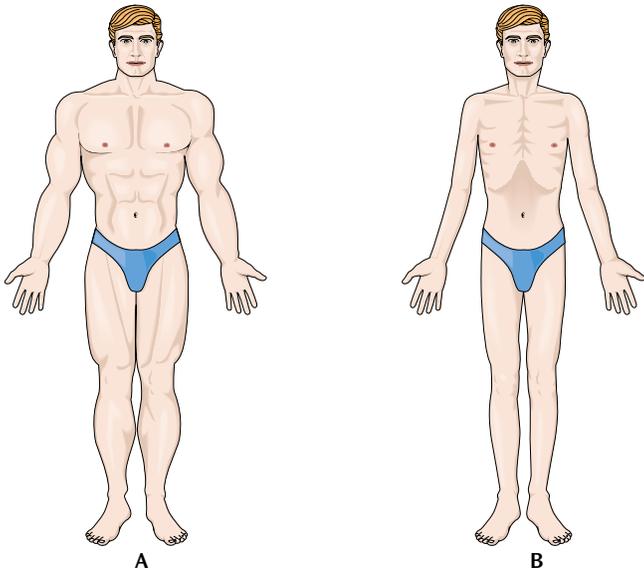


Figure 34-5 Variances of Muscle Size and Shape: A. Hypertrophy; and B. Atrophy

Body Mechanics

Functional mobility is governed by **body mechanics**, the purposeful and coordinated use of body parts and positions during activity. Use of proper body mechanics maximizes the effectiveness of the efforts of the musculoskeletal and neurological systems and reduces the body's exposure to strain or injury during movement.

Proper body mechanics are as important to the nurse as to the client. The purpose of proper body mechanics is prevention of strain and injury to the muscles, joints, and tendons.

Range of motion reflects the extent to which a joint can move. The ranges vary with each joint and are affected by several factors, including age, physical condition, and heredity. Parameters for range of motion are outlined in Tables 34-1 and 34-2.

The clinical application of body mechanics is described later in the implementation section of this chapter.

PHYSIOLOGY OF MOBILITY

Mobility is regulated by the coordinated effort of the musculoskeletal and neurological systems. The major functions of the musculoskeletal system are to maintain

body alignment and to facilitate mobility. The musculoskeletal system consists of a framework of bones, muscles, joints, tendons, ligaments, bursae, and cartilage.

The Musculoskeletal System

The musculoskeletal system (comprised of bones, cartilage, joints, tendons, ligaments, bursa, and muscles) serves several functions as described in Table 34-1.

Bone is the foundation of the musculoskeletal system. Mobility and weight-bearing capacity are directly related to the bone's size and shape. Joints work with muscles to provide motion and flexibility. Skeletal muscles overlying the joint exert opposing forces and, therefore, cause movement.

Muscles are basically machines that convert energy into mechanical work. Contractility is the common property among the three types of muscles: smooth, cardiac, and skeletal. Skeletal muscle fibers are innervated by somatic nerves, and, therefore are generally under voluntary control.

The muscles work in cooperation with the nervous system to maintain body alignment and cause movement. Muscles act in pairs to perform work. One muscle of the pair produces movement in a single direction. The other muscle of the pair produces movement in the opposite direction. When one muscle of the pair is contracted, the other is relaxed. The opposing actions of contraction and relaxation make motion possible. The position of the tendons upon the bones and the articulation of the bones make possible types of motion such as flexion, extension, circumduction, rotation, and gliding.

Muscles that maintain body alignment work together to stabilize surrounding body parts and to support the body's weight. Posture is maintained primarily by the muscles in the back, neck, trunk, and lower extremities.

Nervous System

Muscle contraction is controlled by the central nervous system (CNS) and is influenced by the transport of nutrients and oxygen and by the removal of waste products. An intact CNS is essential for coordinated movement to occur. Nerve impulses stimulate the muscles to contract. The **myoneuronal junction** is the point at which nerve endings come into contact with muscle cells. The afferent pathway conveys information from sensory receptors to the CNS; these neurons conduct impulses throughout the body. The CNS processes the sensory input and determines a response. The efferent pathway transmits the desired response to skeletal muscles via the somatic nervous system. If the nerve impulses are interrupted, the muscle is paralyzed and cannot contract.

Proprioception

Proprioception is the awareness of posture, movement, and changes in equilibrium and the knowledge of posi-

TABLE 34-1
Musculoskeletal System Components

Anatomical Structure	Description	Function
Bones	Ossified connective tissue	Facilitates mobility Protects body structures (e.g., brain, spinal cord) Produces blood cells
Joints	The site of a union between two bones	Facilitates motion Allows flexibility
Tendons	Cord or band of inelastic connective tissue	Causes movement of muscles
Ligament	Band of fibrous tissue connecting bones or cartilages	Supports and strengthens joints Facilitates mobility Protects structures (e.g., knee, hip)
Bursa	Fluid-filled sac or cavity	Prevents friction between bones and cartilage Facilitates gliding of muscles or tendons over bony surfaces
Cartilage	Dense connective tissue	Facilitates mobility

tion, weight, and resistance of objects in relation to the body. Nerve endings in muscles, tendons, and joints (proprioceptors) continuously provide input to the brain, which, in turn, regulates smooth coordinated involuntary movement.

Postural Reflexes

Postural tonus is maintained by postural or righting reflexes. Table 34-2 describes the major reflexes involved in maintaining posture.

EXERCISE

Exercise is any physical activity involving muscles that elevates the heart rate above resting levels. Exercise reduces joint pain and stiffness, and increases flexibility, muscle strength, and endurance. It also helps with weight reduction and contributes to an improved sense of well-being (National Institute of Arthritis and Musculoskeletal and Skin Diseases, 1997). Americans have become less active in recent years (Bray, 1998).

The U.S. Surgeon General's Report on Physical Health and Activity (Centers for Disease Control and Prevention, 1999) lists the following facts about exercise:

- People who are usually inactive can improve their health and well-being by becoming even moderately active on a regular basis.
- Physical activity need not be strenuous to achieve health benefits.
- Greater health benefits can be achieved by increasing the amount (duration, frequency, or intensity) of physical activity.

TABLE 34-2
Reflexes That Maintain Postural Tonus

Reflex	Description
Labyrinthine sense	Sensory organs in the inner ear activate impulses when the head is turned; impulses are transmitted to cerebellum
Tonic neck-righting reflexes	Affected by movement of head from side to side; neck muscle tonus is affected most when neck is hyperextended
Optic reflexes	Visual sensations affect posture by helping the person establish spatial relationships to surrounding objects
Proprioceptor or kinesthetic sense	Activated when nerve endings in muscles and tendons are stimulated by movements of the joints; informs the brain of the location of a body part
Antigravity (extensor) reflexes	When extensor muscles are stretched beyond a certain point, their stimulation causes a reflex contraction that counteracts the gravitational pull
Plantar reflexes	Reflexive contraction of the extensor muscles of the lower legs in response to pressure against the sole of the foot by the floor or ground

Table 20-9 in Chapter 20 describes the physiologic benefits of exercise.

Vigorous exercise stimulates an increased production of endorphins, which promote a sense of well-being. However, it is important to caution people not to overdo the exercise, especially when first starting a new regimen. The following may be signs of too much exercise: unusual or persistent fatigue, increased weakness, decreased range of motion, joint swelling, or continuing pain (pain that lasts more than 1 hour after exercising) (National Institute of Arthritis and Musculoskeletal System, 1997). Instruct clients, especially those with sedentary lifestyles, to consult their nurse practitioner or physician before beginning an exercise program.

Types of Exercise

There are several types of exercise that promote physical and psychologic health; see Table 34-3.

NURSING ALERT

Individuals with cardiovascular problems should be cautioned to exhale when performing isometric exercises to avoid increasing blood pressure.

Range-of-Motion Exercise

Active range-of-motion (ROM) activities are performed independently by the client. During active ROM exercises, the client moves various muscle groups. **Passive ROM** exercises are done by the nurse to help maintain or restore a client's mobility by achieving several outcomes; see the accompanying display.

OUTCOMES OF PASSIVE RANGE-OF-MOTION EXERCISES

- Prevention of contractures
- Improves muscle strength and tone
- Increases circulation
- Decreases vascular complications of immobility
- Facilitates client comfort

Physical Fitness

The ultimate outcome of regular physical activity is physical fitness that affects an individual's functional ability. There are four components of physical fitness: endurance and strength, joint flexibility, cardiorespiratory fitness, and body composition.

Endurance and Strength

Endurance is the ability to withstand movement in terms of duration and absence of fatigue. A physically fit

TABLE 34-3
Types of Exercise

Exercise Type	Function	Examples
Aerobic	Improve cardiovascular fitness Assist with weight control Improve general functional ability	Rowing Jumping rope Walking Running
Strengthening	Maintain or increase muscle strength	Weight training Calisthenics Physical labor
Isometric	Maintain muscle tone and strength	Quadriceps setting Gluteal setting Triceps setting
Isotonic	Increase and maintain muscle tone and strength Shape muscles Maintain joint mobility Improve cardiovascular fitness	Weight lifting Working with pulleys Range-of-motion exercises Performance of activities of daily living (ADL)
Isokinetic	Condition muscle groups	Exercise equipment Resistive water exercises
Range-of-Motion (ROM)	Maintain joint movement Maintain or increase flexibility	Adduction and abduction Flexion and contraction

individual has adequate muscular strength and endurance to accomplish one's goals.

Muscle strength is the amount of force exerted by the muscles against resistance. Good muscle strength allows an individual to lift more safely.

Joint Flexibility

The ability to use a muscle through its complete range of motion is referred to as flexibility; see Table 34-4 for a complete description of joint movement. People with limited flexibility are likely to experience shortened muscles and tendons with resultant imbalance in muscle strength and joint injury. Flexibility can be improved by stretching exercises such as yoga, tai chi, and dancing. Performance of ADLs also helps maintain flexibility. Walking, stooping, and lifting activities can promote and maintain flexibility.

Cardiorespiratory Fitness

Exercises that improve cardiorespiratory fitness are discussed in Table 34-3. To improve cardiorespiratory function, physical activity must be maintained for at least 20 minutes in order to raise the heart rate to the target level.

Body Composition

The recommended proportion of fat to lean body tissue is referred to as body composition. Having a body that falls within the normal range of body weight and percentage of body fat depends on balancing caloric intake and expenditure. Any type of physical activity can be useful in developing and maintaining physical fitness; see Table 34-5.

Fitness in Older Adults

Approximately 33% of those ages 65 and older fall each year (Lamb & Cummings, 2000). "No one is too old to enjoy the benefits of regular physical activity. Of special interest to older adults is evidence that muscle-strengthening exercises can reduce the risk of fall and fracturing bones and improve the ability to live independently" (Centers for Disease Control & Prevention, 1999, p. 5). The accompanying display lists benefits of physical exercise in older adults.

FACTORS AFFECTING MOBILITY

Mobility and activity level can be influenced by many factors, including overall health status, developmental stage, environment, attitudes, beliefs, and lifestyle.

Health Status

An individual's general health status will influence desire for exercise and activity tolerance. Compromised status of

BENEFITS OF EXERCISE

- Normalizes glucose tolerance
- Improves gait and balance
- Improves cardiovascular function
- Increases energy
- Promotes bone density
- Improves mobility
- Promotes weight loss
- Reduces blood pressure
- Lowers cholesterol
- Promotes rest and relaxation
- Improves sleep

[Data from Fleming, J. M. (2001). Successful aging. In M. O. Hogstel (Ed.), *Gerontology: Nursing care of the older adult* (p. 145). Albany, NY: Delmar Publishing.]

any of the body systems may affect an individual's mobility and may, in turn, be affected by a lack of activity. Physical conditioning will also influence mobility and stamina. Physical factors interfering with mobility or exercise include fatigue, muscle cramping, dyspnea, neuromuscular or perceptual deficits, and chest pain.

Mental status is often manifested as changes in mobility or appearance. For instance, a client who shuffles into the room, slumps down into a chair, and avoids eye contact may be sending a message of depression through low activity levels, poor posture, and a flattened affect.

Developmental Stage

An individual's developmental stage will affect the parameters of targeted mobility levels.

See Table 34-6 for examples of common age-related musculoskeletal trauma.



NURSING TIP

Some degree of physical activity is necessary regardless of age or health status.

Children

Developmental norms related to mobility have been established for the infant and toddler. Childhood development is monitored through achievement of milestones such as sitting, crawling, walking, running, and hopping. For *infants*, the mobility focus is on gross motor behavior such as posture, head balance, grasping, sitting, creeping, and standing. *Toddlers* are more active, with walking, running, jumping, kicking, and going up and down stairs. Activity

TABLE 34-4
Joint Range of Motion

Joint Movement	Range	Muscle Group(s)
1. Temporomandibular Joint (TMJ) (Synovial Joint)		
a. Open mouth.	1–2.5 in.	
b. Close mouth.	Complete closure	Masseter, temporalis
c. <i>Protrusion</i> : Push out lower jaw.	0.5 in.	Pterygoideus lateralis
d. <i>Retrusion</i> : Tuck in lower jaw.	0.5 in.	
e. <i>Lateral motion</i> : Slide jaw from side to side.	0.5 in.	Pterygoideus lateralis, pterygoideus medialis
2. Cervical Spine (Pivot Joint)		
a. <i>Flexion</i> : Rest chin on chest.	45° each side	Sternocleidomastoid
b. <i>Extension</i> : Return head to midline.	45°	Trapezius
c. <i>Hyperextension</i> : Tilt head back.	10°	Trapezius
d. <i>Lateral flexion</i> : Move head to touch ear to shoulder.	40° each side	Sternocleidomastoid
e. <i>Rotation</i> : Turn head to look to side.	90° each side	Sternocleidomastoid, trapezius
3. Shoulder (Ball-and-Socket Joint)		
a. <i>Flexion</i> : Raise straight arm forward to a position above the head.	180°	Pectoralis major, coracobrachialis, deltoid, biceps brachii
b. <i>Extension</i> : Return straight arm forward and down to side of body.	180°	Latissimus dorsi, deltoid, triceps brachii, teres major
c. <i>Hyperextension</i> : Move straight arm behind body.	50°	Latissimus dorsi, deltoid, teres major

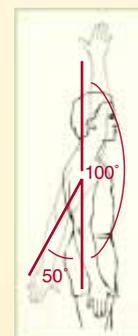
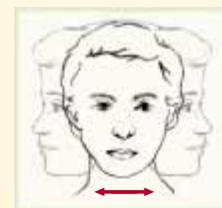
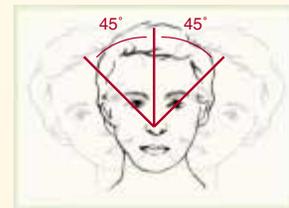
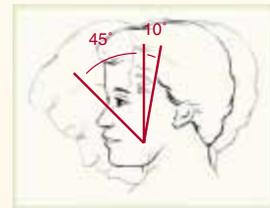
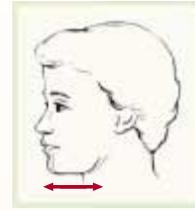
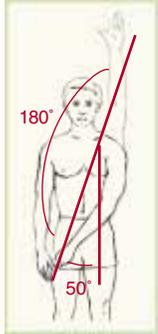
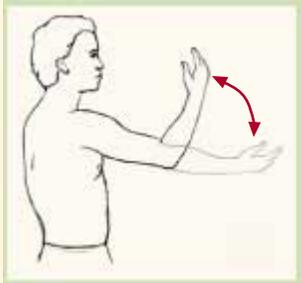


TABLE 34-4 (continued)
Joint Range of Motion

Joint Movement	Range	Muscle Group(s)	
d. <i>Abduction</i> : Move straight arm laterally from side to a position above the head, palm facing away from head.	180°	Deltoid, supraspinatus	
e. <i>Adduction</i> : Move straight arm downward laterally and across front of body as far as possible.	230°	Pectoralis major, teres major	
f. <i>Circumduction</i> : Move straight arm in a full circle.	360°	Deltoid, coracobrachialis, latissimus dorsi, teres major	
g. <i>External rotation</i> : Bent arm lateral, parallel to floor, palm down, rotate shoulder so fingers point up.	90°	Infraspinatus, teres minor, deltoid	
h. <i>Internal rotation</i> : Bent arm lateral, parallel to floor, rotate shoulder so fingers point down.	90°	Subscapularis, pectoralis major, latissimus dorsi, teres major	
4. Elbow (Hinge Joint)			
a. <i>Flexion</i> : Bend elbow, move lower arm toward shoulder, palm facing shoulder.	150°	Biceps brachii, brachialis, brachioradialis	
b. <i>Extension</i> : Straighten lower arm forward and downward.	150°	Triceps brachii	
c. <i>Rotation for supination</i> : Elbow bent, turn hand and forearm so palm is facing upward.	70°–90°	Biceps brachii, supinator	
d. <i>Rotation for pronation</i> : Elbow bent, turn hand and forearm so palm is facing downward.	70°–90°	Pronator teres, pronator quadratus	

(continues)

TABLE 34-4 (continued)
Joint Range of Motion

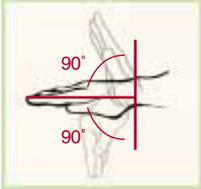
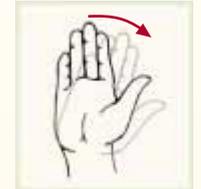
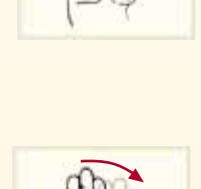
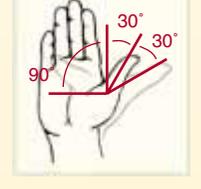
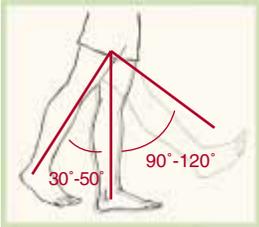
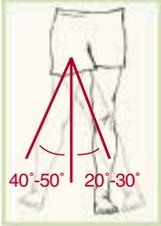
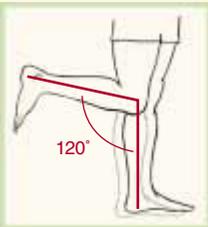
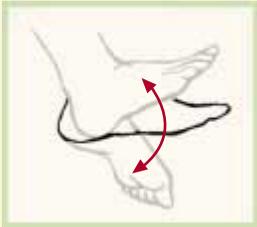
Joint Movement	Range	Muscle Group(s)	
5. Wrist (Condyloid Joint)			
a. <i>Flexion</i> : Bend wrist so fingers move toward inner aspect of forearm.	80°–90°	Flexor carpi radialis, flexor carpi ulnaris	
b. <i>Extension</i> : Straighten hand to same plane as arm.	80°–90°	Extensor carpi radialis longus, extensor carpi radialis brevis, extensor carpi ulnaris	
c. <i>Hyperextension</i> : Bend wrist so fingers move back as far as possible.	80°–90°	Extensor carpi radialis longus, extensor carpi radialis brevis, extensor carpi ulnaris	
d. <i>Radial flexion: abduction</i> —Bend wrist laterally toward thumb.	Up to 20°	Extensor carpi radialis longus, extensor carpi radialis brevis, flexor carpi radialis	
e. <i>Ulnar flexion: adduction</i> —Bend wrist laterally away from thumb.	30°–50°	Extensor carpi ulnaris, flexor carpi ulnaris	
6. Hand and Fingers (Condyloid and Hinge Joints)			
a. <i>Flexion</i> : Make a fist.	90°	Interosseus dorsales manus, flexor digitorum superficialis	
b. <i>Extension</i> : Straighten fingers.	90°	Extensor indicis, extensor digiti minimi	
c. <i>Hyperextension</i> : Bend fingers back as far as possible.	30°–50°	Extensor indicis, extensor digiti minimi	
d. <i>Abduction</i> : Spread fingers apart.	25°	Interosseus dorsales manus	
e. <i>Adduction</i> : Bring fingers together.	25°	Interosseus palmares	
7. Thumb (Saddle Joint)			
a. <i>Flexion</i> : Move thumb across palmar surface of hand.	90°	Flexor pollicis brevis, opponens pollicis	
b. <i>Extension</i> : Move thumb away from hand.	90°	Extensor pollicis brevis, extensor pollicis longus	
c. <i>Abduction</i> : Move thumb laterally.	30°	Abductor pollicis brevis, abductor pollicis longus	
d. <i>Adduction</i> : Move thumb back to hand.	30°	Adductor pollicis transversus, adductor pollicis obliquus	
e. <i>Opposition</i> : Touch thumb to tip of each finger of same hand.	Touching	Opponens pollicis, flexor pollicis brevis	

TABLE 34-4 (continued)
Joint Range of Motion

Joint Movement	Range	Muscle Group(s)	
8. Hip (Ball-and-Socket Joint)			
a. <i>Flexion</i> : Move straight leg forward and upward.	90°–120°	Psoas major, iliacus, iliopsoas	
b. <i>Extension</i> : Move leg back beside the other leg.	90°–120°	Gluteus maximus, adductor magnus, semitendinosus, semimembranosus	
c. <i>Hyperextension</i> : Move leg behind body.	30°–50°	Gluteus maximus, semitendinosus, semimembranosus	
d. <i>Abduction</i> : Move leg laterally from midline.	40°–50°	Gluteus medius, gluteus minimus	
e. <i>Adduction</i> : Move leg back past midline.	20°–30° past midline	Adductor magnus, adductor brevis, adductor longus	
f. <i>Circumduction</i> : Move leg backward in a circle.	360°	Psoas major, gluteus maximus, gluteus medius, adductor magnus	
g. <i>Internal rotation</i> : Turn foot and leg inward, pointing toes toward other leg.	90°	Gluteus minimus, gluteus medius, tensor fasciae latae	
h. <i>External rotation</i> : Turn foot and leg outward, pointing toes away from other leg.	90°	Obturator externus, obturator internus, quadratus femoris	
9. Knee (Hinge Joint)			
a. <i>Flexion</i> : Bend knee to bring heel back toward thigh.	120°–130°	Biceps femoris, semitendinosus, semimembranosus	
b. <i>Extension</i> : Straighten each leg, place foot beside other foot.	120°–130°	Rectus femoris, vastus lateralis, vastus medialis, vastus intermedius	
10. Ankle (Hinge Joint)			
a. <i>Plantar flexion</i> : Point toes downward.	45°–50°	Gastrocnemius, soleus	
b. <i>Dorsiflexion</i> : Point toes upward.	20°	Peroneus tertius, tibialis anterior	

(continues)

TABLE 34-4 (continued)
Joint Range of Motion

Joint Movement	Range	Muscle Group(s)	
11. Foot (Gliding Joint)			
a. <i>Eversion</i> : Turn sole of foot laterally.	5°	Peroneus longus, peroneus brevis	
b. <i>Inversion</i> : Turn sole of foot medially.	5°	Tibialis posterior, tibialis anterior	
12. Toes (Condyloid)			
a. <i>Flexion</i> : Curve toes downward.	35°–60°	Flexor hallucis brevis, lumbricales pedis, flexor digitorum brevis	
b. <i>Extension</i> : Straighten toes.	35°–60°	Extensor digitorum longus, extensor digitorum brevis, extensor hallucis longus	
c. <i>Abduction</i> : Spread toes apart.	Up to 15°	Interosseus dorsales pedis, abductor hallucis	
d. <i>Adduction</i> : Bring toes together.	Up to 15°	Adductor hallucis, interosseus plantares	

TABLE 34-5
Calories Burned Per Hour of Physical Activity

Activity	Calories Burned
Shopping	150
Dancing	250
House cleaning, scrubbing, vacuuming	227
Walking (4 mph)	312

(From Bray, G. A. [1998]. *Contemporary diagnosis and management of obesity*. Newtown, PA: Handbooks in Health Care Co.)

and mobility parameters for the toddler encompass gross and fine motor behaviors, manual dexterity, and exploration within environmental safety parameters. The *preschooler* increases strength and refines skills by walking, running, and jumping. During *middle childhood* (from 6 to 12 years of age) children have improved posture and locomotion abilities and increased muscle efficiency of the extremities and trunk; these children also have an increase in muscle tissue with a decrease of fat. For both preschool and middle childhood, activity and mobility expectations are centered on development of strength, coordination, and physical capacities.

Adolescents

The *adolescent* years (approximately ages 12 to 18) begin with onset of puberty and end with cessation of somatic growth. Changes are dramatic at this stage, with physical

TABLE 34-6
Common Age-related Musculoskeletal Trauma

Age Range	Common Trauma
0 to 18 months	Falls
18 months to 6 years	Falls
6 to 20 years	Sports-related injuries Motorcycle accidents High-impact falls (e.g., cycling, skiing)
20 to 50 years	Sports-related injuries Stress or overuse injuries (e.g., tendonitis) Pedestrian injuries
50 to 65+ years	Recreation-related injuries Falls Pathological fractures Pedestrian injuries

growth and development of secondary sex characteristics. Activity and mobility landmarks are development of muscles plus cardiac, respiratory, and metabolic functions through physical conditioning.

Adults

Adulthood is divided into young, middle, and elderly age groups. The *young adult* has well-developed myoskeletal and nervous systems which ideally function at peak efficiency.

The *middle-aged adult* has a gradual decrease in muscle mass, strength, and agility. The focus of activity and mobility for both these groups is on maintaining or developing tone, strength, and coordination of the musculoskeletal system.

Older adults often have progressive changes in the physiological systems. The rate of bone reabsorption (which affects bone density) increases with aging. Bone density loss accelerates in postmenopausal females due to estrogen deficiency. Decreased bone density makes a person more vulnerable to fractures, kyphosis, and a reduction in height.

Aging also negatively impacts muscles and connective tissue. The development of muscle atrophy is a gradual process in which muscle fibers deteriorate and are replaced by fibrous connective tissue. Muscle atrophy is accompanied by reduced muscle mass, a loss of muscle strength, and a reduction in overall body mass. The degree of muscle atrophy will be affected by the person's activity level. Staying physically active helps prevent disuse muscle atrophy and helps maximize muscle strength.

Cartilage ages better than bone or muscle; however, some changes occur that do affect joint flexibility. Aging leads to a loss of water content of hyaline cartilage and a reduction in the ability of cartilage to regenerate following trauma. Articulating cartilage may slightly deteriorate as a result of lifetime wear and tear.

Aging also affects the health of intervertebral disks. For example, the water content of the disks decreases which leads to less vertebral flexibility. Thinning of the disks causes older individuals to be more vulnerable to back pain and injury.

As a result of the age-related physical changes, older people often experience some functional alterations in mobility. Ambulation may be altered as a result of joint inflexibility and decreased muscle strength; such alterations are noticed as a reduction in step height and length as demonstrated in a shuffling gait. Vertebral inflexibility and reduced muscle strength may cause difficulty with client transfers in and out of a sitting position. The elderly client may need assistance in rising from a chair, ambulating, or climbing stairs. Table 34-7 provides an overview of age-related effects on mobility. Aging also affects the cardiovascular and respiratory systems, which directly affect endurance and stamina. Activity and mobility goals focus on maintenance of functional status and safety.

Environment

Environment can influence activity level in several ways. Home environments, for instance, can be considered safe and “mobility friendly” if they are free of hazards that can disrupt or endanger mobility and activity (see the accompanying display). Work environments can also affect mobility; repetitive handwork, such as key-stroking or sewing, can impair mobility and worsen arthritis. A sedentary lifestyle can lead to muscle atrophy, weakened bones, and a lack of motivation and energy to engage in physical activity.

TABLE 34-7
Effects of Aging on Musculoskeletal System

Physiological Changes	Results
Muscle cells replaced by fibrous connective tissue	Decreased muscle mass, tone, and strength
Decreased elasticity of ligaments, tendons, and cartilage	Weaker bones
Decreased bone mass	Weaker bones
Dehydration of intervertebral disks	Possible loss of height
Flattening of convex curvature of spine	Posture becomes more flexed Center of gravity shifts

(Data from Lamb, K. V. D., & Cummings, M. [2000]. Musculoskeletal function. In A. G. Luekenotte, (Ed.), *Gerontologic nursing* (2nd ed.). St. Louis, MO: Mosby.)



NURSING TIP

Ensuring Home Safety

To ensure a safe home environment, encourage clients (especially those who have an increased risk for injury in the home) to avoid:

- Loose or unsecured rugs (e.g., scatter rugs, rugs on stairways)
- Stairways without banisters or stairways with loose banisters or steps
- Stairs with a slippery surface
- Dim lighting, especially near stairways or steps
- Ill-fitting shoes, loose nonlaced shoes, shoes with high heels, or shoes with slippery soles
- Household clutter below waist level
- Electrical or phone cords that are too long and fall on the floor
- Wet or waxed floors
- Unleashed small pets
- Bathtubs or shower stalls without a nonskid surface
- Lack of grab bars in the bathroom near the toilet and tub or shower stall
- Wet or icy outdoor steps and sidewalks

Attitudes and Beliefs

Influential factors related to exercise are one's attitudes and beliefs, which are greatly affected by culture and family. Leisure activities provide a clue to the person's

value system. Individuals who engage in hiking, bicycle riding, or swimming for recreation value an active lifestyle. On the other hand, individuals who consider work to be the dominant area of life may view exercise as “a waste of time.” Does the individual go everywhere in a car, or is walking a part of normal transportation? Are elevators routinely used instead of climbing stairs? Activities enjoyed by the individual are less likely to produce fatigue than are activities that hold no interest for the person. Thus, preferences should be matched with capabilities when planning an exercise program.

Lifestyle

Modern lifestyles require little physical activity; thus, few adults in America are naturally fit. The use of many convenience items (e.g., fast food, remote controls) encourage little physical exertion. The sedentary lifestyles of many Americans result in loss of muscle strength, decreased endurance, inadequate cardiorespiratory function, and obesity. Individuals with active lifestyles value exercise and, therefore, are more likely to experience its therapeutic outcomes.

PHYSIOLOGICAL EFFECTS OF MOBILITY AND IMMOBILITY

Maintaining functional mobility and desired activity levels is important for both psychological and physiological reasons. Mobility and lack thereof will both affect the various systems of the body. Table 34-8 summarizes the major complications associated with immobility.

Neurological Effects/ Mental Status

As for mental status, mobility and activity can increase an individual's energy levels and sense of well-being. Activity and exercise are excellent means to relieve tension and reduce stress, which result in better sleep patterns and an enhanced sense of well-being.

Client inactivity and immobility are stressors that can lead to frustration, lower self-esteem, anxiety, helplessness, depression, general dissatisfaction, restlessness, unhappiness, and decreased competency self-rating. Immobility impacts cognitive abilities, affect, lifestyle, and social and family responsibilities. The fear of falls, pain, and sensory deficits such as visual problems, fatigue, and weakness are compounding factors that increase inactivity and immobility.

Cardiovascular Effects

The cardiovascular system reaps many benefits from mobility and exercise. The heart becomes more efficient as it adapts to increased demands for oxygen, and cardiac output increases. A healthy heart muscle leads

TABLE 34-8
Negative Outcomes of Immobility

Neurologic	Gastrointestinal
Sensory deprivation	Decreased appetite Stress ulcers Constipation Fecal impaction
Cardiovascular	Urinary
Increased cardiac workload Orthostatic hypotension Formation of thrombus	Urinary stasis Urinary tract infection Calculi
Respiratory	Integumentary
Increased respiratory effort Hypostatic pneumonia Altered gas exchange	Pressure ulcers Skin shearing
Musculoskeletal	Psychological
Decreased bone density (increased risk of fracture) Contractures Muscle atrophy Increased pain	Anxiety Depression Helplessness, hopelessness Increased dependency

to a decreased resting heart rate and decreased resting blood pressure, which mean that the heart does not have to work as hard in an individual who exercises regularly as it does in an individual who leads a sedentary lifestyle. Activity increases the oxygen supply to the heart and muscles and thereby benefits overall health.

Immobility increases the workload on the heart as the supine position increases the volume of blood circulating to the heart. This fluid shift increases central venous pressure along with left ventricular diastolic volume and stroke volume, and the cardiac workload increases. The cardiovascular system is prone to form **thrombi**, or blood clots, due to venous stasis related to lack of muscle contractions of the legs and pressure on veins, especially the popliteal areas (Figure 34-6). Thrombi are caused by increased coagulation of the blood due to free calcium from bone demineralization, stasis of venous blood, and intimal damage to veins (as from venipuncture).

Another cardiovascular problem related to immobility is **orthostatic hypotension**, or a decrease in blood pressure resulting from sudden position changes,

NURSING ALERT

Deep-vein Thrombosis

Deep vein thrombi have the potential of becoming pulmonary emboli, which are life-threatening.



Figure 34-6 Effect of Immobility on the Cardiovascular System

caused by decreased vessel tone. In orthostatic hypotension, the blood pressure parameters drop at least 25 mm systolic and 10 mm diastolic with the postural changes. Orthostatic hypotension is a result of several factors associated with immobility, including:

- Decreased circulating fluid volume
- Decreased autonomic nervous system response
- Blood pooling in lower extremities

These factors lead to decreased venous return which negatively affects cardiac output. Thus, the blood pressure is lowered. Orthostatic hypotension is an indication that the heart is working harder and less efficiently.

Clients who have experienced immobility (such as with bed rest) need to have blood pressure checked lying down, sitting, then standing. This is done to establish baseline parameters to assist in determining the presence of postural-related changes in blood pressure.

Respiratory Effects

The respiratory system response to activity and mobility is increased intake of oxygen, which results in increased overall respiratory capacity and an easing in the work of breathing. The effects of oxygenation to the tissues are enhanced and pooling of secretions in the bronchioles is less likely.

Immobility from sitting or lying limits chest expansion, which is compounded by the effects of respiratory muscle atrophy and ineffective cough (Figure 34-7). Stasis of respiratory secretions can be worsened by the use of CNS-depressant medications and dehydration, and can lead to hypostatic pneumonia and atelectasis.

Musculoskeletal Effects

Musculoskeletal responses to activity are numerous, including stronger and better-defined muscles, stronger bones, and increased mobility and range of motion of

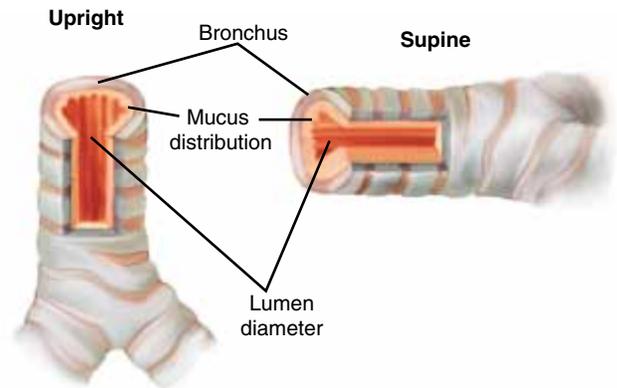


Figure 34-7 Effect of Immobility on the Respiratory System

the joints. Exercise can enhance endurance and tolerance of the muscle groups. Weight-bearing exercises such as walking (as opposed to swimming) are especially beneficial in preventing osteoporosis, or loss of strength and minerals in the bones.

Decreased physical mobility results in gross musculoskeletal impairment, especially when muscular atrophy occurs. Decreased mobilization alters muscle structure by reducing muscle mass and decreasing muscle cell diameter and the actual number of muscle cells. Clients experience rapid fatigue, decreased muscle strength and tone, decreased endurance, decreased mobility of joints, muscle stiffness, joint contracture, and negative nitrogen balance due to protein catabolism. Loss of calcium is a response to immobility and indicates an imbalance between bone formation and breakdown. The lack of pressure (e.g., weight bearing) on bones triggers calcium loss. Bone demineralization occurs as early as 2 or 3 days after onset of immobility and may lead to pathological fractures, renal calculi, and osteoporosis.

Digestive Effects

Digestive responses to activity include increased appetite and thirst, which indicate that the body's rate of processing nutritional intake is increased.

Loss of appetite is commonly related to lack of activity, negative nitrogen balance, and altered elimination patterns. Negative nitrogen balance occurs when the nitrogen output exceeds nitrogen intake. The causes of negative nitrogen balance include the increased need for protein in situations of extensive tissue damage, such as following surgery, and extended immobility. Extended periods of immobility cause muscle atrophy or muscle wasting; thus there is a need for extra protein intake to provide for muscle repair.

Elimination Effects

Elimination patterns are facilitated by mobility in that retention of wastes is usually prevented and the risk of constipation is reduced or avoided. The muscles become stronger and more efficient, thus enhancing the overall efficiency of elimination.

Constipation and fecal impaction are frequent complications of immobility. Variables contributing to these elimination problems are:

- Lack of activity, which decreases peristalsis
- Lack of privacy
- Inability to sit upright
- Improper diet
- Inadequate fluid intake
- Use of some medications, especially narcotics

Urinary stasis and urinary infections are related to the recumbent position of the immobile person. Decreased peristalsis of the ureters leads to stasis of urine, which is the etiology of urinary calculi (stones) and infection. Bladder distention occurs due to difficult relaxation of the external sphincter and decreased intra-abdominal pressure, thus causing overflow **incontinence** (loss of bladder control) and infection. The combination of increased urinary calcium, urinary stasis, and urinary infection leads to calculi formation.

Integumentary Effects

The integumentary system benefits from activity and exercise in that increased circulation and blood flow enhance oxygenation of tissues, maintaining the turgor and luster of the skin and hair.

Pressure ulcers are serious problems related to immobility. Prolonged pressure, shearing force, friction (rubbing), and moisture lead to tissue ischemia (impaired blood circulation), causing skin breakdown and decubiti. Moisture in the form of urine, feces, perspiration, and wound drainage can also lead to skin softening, which increases decubiti risk. Secondary factors contributing to pressure sore development are decreased nutrition, decreased arterial pressure, increased age, and edema. Refer to Chapter 35 for a discussion of pressure ulcers.

ASSESSMENT

During the assessment phase of the nursing process, data regarding activity and mobility of the client are gathered. Assessment data are used to initiate, individualize, plan, evaluate, and modify care on the basis of the client's strengths and limitations. Assessment of mobility status includes a health history and physical examination.

Health History

Taking a client's health history is the first step in determining the mobility needs and concerns of a client. Basic information about ADL, exercise patterns (type, frequency), lifestyle (active, sedentary), activity tolerance, and use of medications should be discussed. If an alteration or recent change in status is noted, then a detailed health history is in order. The nurse should ask what impact the mobility

Nursing Process Highlight

ASSESSING MUSCULOSKELETAL STATUS

1. Wash hands.
2. Provide an explanation to the client of the assessment procedure.
3. Assist the client to a comfortable position.
4. Use pillows or folded blankets to support painful body parts.
5. Provide assistance with disrobing as needed.
6. Adjust room temperature for client comfort.
7. Provide clear instructions to client (e.g., assuming a certain body position or performing a certain body movement).
8. Inform client before touching or moving a painful body part.
9. Assess skeletal muscles and joints in a cephalocaudal, proximal-to-distal manner. Always compare paired muscles and joints.
10. Examine nonaffected body parts before examining affected ones.
11. Avoid unnecessary or excessive manipulation of a painful body part. If the client verbalizes pain, stop the aggravating motion.
12. If needed, assist client in dressing after the physical examination is completed.

(Data adapted from Estes, M. E. Z. [2002]. *Health assessment and physical examination*. Albany, NY: Delmar Thomson Learning.)

impairment has had on the client's ADL and should have the client describe the exact nature of the problem (onset, duration, associated factors, aggravating factors, alleviating factors). The nurse should ask clients about the use (past and current) of medications, both prescription and over-the-counter, with the explanation that many drugs negatively affect the musculoskeletal system; see Table 34-9. It is also important to ask about the use of calcium supplements and estrogen replacement medication.

Physical Examination

The physical examination of mobility status typically covers three basic areas: musculoskeletal assessment, neurological assessment, and functional assessment.

Musculoskeletal Assessment

The nurse observes musculoskeletal functioning during every interaction with the client. Specific factors for objective assessment include the following:

- Body alignment
- Body mechanics

TABLE 34-9
Musculoskeletal Side Effects of Medications/Substances

Medication	Musculoskeletal Effect
Amphetamines	Muscle hyperactivity
Anticoagulants	Bleeding into the joints
Antipsychotics	Dystonic movements, altered gait
Caffeine	Muscle hyperactivity
Corticosteroids	Necrosis of femur head
Diuretics	Muscle weakness and cramping
Phenothiazines	Gait disturbances

(Data from Davison, M. A. [1998]. Antipsychotic medications. In M. E. Kuhn [Ed.], *Pharmacotherapeutics: A nursing process approach* [4th ed., p. 393]. Philadelphia: F. A. Davis; O'Hanlon-Nichols, T. [1998]. A review of the adult musculoskeletal system. *American Journal of Nursing*, 98[6], 49.)

- Posture (sitting and standing)
- Range of motion of joints
- Strength of muscles
- Endurance
- Muscle tone
- Size and contour of joints
- Inspection of the skin
- Palpation of skin, muscles, and joints

Subjective data include assessment of client's pain, joint stiffness, muscle cramping, fatigue, weakness, exercise habits, and environmental variables. Children should be evaluated by comparing physical development and abilities with normal values for the age. The elderly should be evaluated on functional abilities, strengths, weaknesses, joint limitations, and use of assistive devices such as canes or walkers to assist the client in ADLs.

A complete musculoskeletal assessment needs to include data related to client weakness, stiffness, and pain related to movement. A 0–10 intensity scale can be used to assess these subjective factors. When assessing weakness, zero represents complete absence of weakness and 10 represents weakness requiring complete bed rest. For determining stiffness, zero represents com-

plete absence of stiffness and 10 represents total inflexibility. See Chapter 32 for directions on using the 1–10 scale for measuring pain intensity.

Movement and Gait

Gait, the way that one walks, is assessed to determine a baseline. Normal gait is characterized by a smooth rhythmic movement of muscles when walking. Step height and length are symmetrical for each foot and the arms swing freely at each side of the torso in opposite movement of the legs. Normally, the lower limbs are able to bear full body weight during standing and ambulation. Gait is described in terms of smoothness, balance, arm movement, effectiveness, and the length and width of the step.

Alignment

When assessing body alignment, the nurse seeks to determine whether the movement results in fatigue, muscle stress, or strain. Structural deformities may interfere with body alignment and functional ability; see Table 34-10.

Endurance

When assessing a client's endurance during physical activity, look for reactions such as mood changes, indicators of pain, presence of fatigue, and changes in respiratory and circulatory status. Oxygen consumption increases during muscle activity, thus, assessment of vital signs is essential. The time required for vital signs to return to the normal (baseline) resting values is a significant factor to include in the assessment of mobility.

Pathological Alterations

Assessment to determine the presence of pathological alterations—such as bone disorders, joint impairment, impaired muscle development, postural abnormalities, musculoskeletal trauma, and neurological damage—can offer important data for the determination of mobility limitations.

Muscle Impairments

Overuse injuries are a common type of musculoskeletal problem, especially in people who exercise too much and/or incorrectly. Common overuse injuries are listed in Table 34-11.

Postural Abnormalities

In addition to the postural abnormalities described in Table 34-11, contractures may also affect body alignment.

Contractures

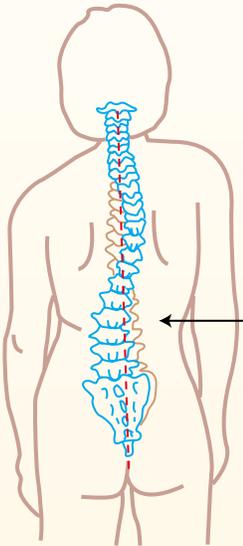
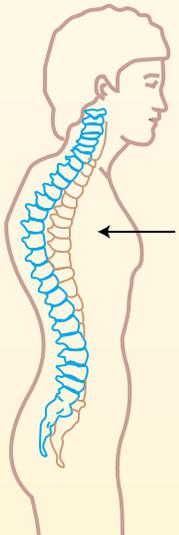
A contracture develops when the muscle fibers become unable to flex; see Figure 34-8. Each muscle has an antagonist that works in the opposite direction. If a muscle group is not moved for a period of time or if proper body alignment is not maintained, the stronger muscle will predominate, causing contracture deformities.



NURSING TIP

When assessing a client's musculoskeletal status, always warn the client if you think your action may cause discomfort.

TABLE 34-10
Spinal Misalignment

Anomaly	Description	Clinical Implications
<p>Scoliosis</p> <ul style="list-style-type: none"> • <i>Postural scoliosis</i>: no fixed rotation of vertebrae; can be corrected with exercise. • <i>Structural scoliosis</i>: fixed rotation of the vertebrae in the direction of the convexity of the curve. 	<ul style="list-style-type: none"> • Lateral deviation in the normally straight vertical line of the spine • More common in females, especially during adolescence • Some indicators: <ul style="list-style-type: none"> • One side higher than the other or one shoulder blade more prominent • Abnormal waistline tilt with more indentation on one side • Tilting of the hips with one hip more prominent • A prominence of the posterior chest or the shoulder when bending over. 	<ul style="list-style-type: none"> • Can progress to a severe curvature in a short period of time if untreated.
<p>Kyphosis</p> 	<ul style="list-style-type: none"> • Abnormally increased convexity in the curvature of the spine • Chin tilts downward onto chest with abdominal protrusion • Decreased interval between lower rib cage and iliac crests 	<ul style="list-style-type: none"> • In advanced stages, can interfere with lung expansion • Commonly seen: <ul style="list-style-type: none"> — elderly clients — osteoporosis • Paget's disease

(continues)

TABLE 34-10 (continued)
Spinal Misalignment

Anomaly	Description	Clinical Implications
Lordosis	<ul style="list-style-type: none"> • Forward curvature of the lumbar spine 	<ul style="list-style-type: none"> • More pronounced in obesity and pregnancy (due to change in center of gravity)
List	<ul style="list-style-type: none"> • Lateral lean of the spine • Iliac crests are unequal in height • Decreased ROM, usually accompanied by pain 	<ul style="list-style-type: none"> • Commonly present in: <ul style="list-style-type: none"> —back injury —osteoarthritis —herniated vertebral disc

TABLE 34-11
Musculoskeletal Trauma, Common Overuse Injuries

Strain	Commonly referred to as “pulled muscles” Caused by overstretching, tearing, or ripping of a muscle and/or its tendon
Tendonitis	Inflammation of a tendon caused by chronic, low-grade strain of a muscle-tendon unit
Bursitis	Inflammation of the bursa (lubricating sac surrounding a joint) Caused by repeated low-grade strains of the joint’s supporting tissues
Sprain	Overstretching or tearing of ligaments



Figure 34-8 Hand-Wrist Contracture

Once a contracture occurs, the only corrective action is surgery to release the fibrous tissue. Prevention of contractures is a major nursing focus with immobile clients. Nursing interventions to prevent a muscle contracture include:

- Encouraging clients to be as active as possible
- Performing ROM exercises
- Positioning to maintain proper body alignment
- Repositioning every 2 hours or more often as needed

Musculoskeletal Trauma

Trauma to musculoskeletal tissues can result in many types of impairments (such as those described in the display on overuse disorders). Another common type of musculoskeletal trauma is a fracture (broken bone). The second type of trauma discussed below is surgical amputation.

Fractures

According to Lamb and Cummings (2000), hip fractures are the most disabling for older people. Hip fractures are usually a result of falls and approximately 24% of those with hip fracture die from complications within 1 year after the injury. Hip fracture complications result from immobility and include pressure ulcers, pneumonia, and sepsis from urinary tract infections.

When a fracture is suspected, the nurse should assess the area for mobility, pain, color, temperature, pulse, and sensation.

Amputation

Any condition in which circulation is inadequate to maintain cellular function can necessitate amputation.



NURSING TIP

The acronym RICE can be helpful in remembering the principles for emergency treatment of musculoskeletal injuries: **R**est, **I**ce, **C**ompression, and **E**levation.

For example, lower limb amputations are often required as a result of infection, peripheral vascular disease (PVD), neoplasm, and trauma. Pressure ulcers, if inadequately treated, can also lead to the loss of a limb. When the decubiti do not heal, infection and gangrene develop. Gangrene first manifests as a blackened area and is often accompanied by pain.

Lower limb amputation is either above the knee or below the knee; the level of amputation depends on the extent of the disease process. Below-the-knee amputation is the most commonly performed type. The goal of the surgery is to preserve the length of the extremity in order to assist with prosthetic fitting. Therefore, as much limb as possible is salvaged.

Central Nervous System Damage

As movement is a result of coordination between muscles and nerves, an intact central nervous system is necessary for mobility. Any disruption in the CNS, such as those occurring with spinal cord injury, can impair mobility. Spinal cord injury can lead to partial paralysis or complete loss of mobility.

Spinal Cord Injury

There are 15,000 to 20,000 traumatic spinal cord injuries each year in the United States (Huston, 1998). Damage to the spinal cord can be a result of hyperextension and/or compression. With hyperextension, the spinal cord is overstretched, leading to dislocation of the vertebrae or discs and possible compression of the spinal cord. Hyperextension can also completely dissect the spinal cord. In a complete spinal cord injury, voluntary motor activity, sensory function, and proprioception below the level of the injury are lacking.

Compression injuries occur when the force of impact fractures the vertebrae or ruptures the discs, forcing bony fragments or discs into the spinal canal. These particles can lacerate or compress the spinal cord, resulting in paralysis below the level of the injury. Prevention of spinal cord injuries is a major concern of nurses and may be addressed through educating the public on safety precautions related to driving, participation in sports, and leisure activities.

Neurological Assessment

An intact neurological system is essential for activity and mobility. Objective neurological assessment includes

(1) cranial nerves, (2) motor system, (3) sensory system, and (4) reflexes. The nurse assesses the motor system for the following variables:

- Size, strength, and tone of muscles
- Presence of involuntary movements
- Balance
- Gait
- Coordination
- Proprioception
- Fine motor function
- Gross motor function

The sensory system is assessed for integrity of peripheral nerves, pain, tactile discrimination (fine touch), and sensation of vibration. Assessment of deep tendon or stretch reflexes focuses on the biceps, triceps, brachioradialis, quadriceps, and Achilles reflexes. Refer to Chapter 27 for further details on physical assessment.

Functional Assessment

Functional assessment focuses on the client's abilities to perform ADL. The client's functional status is assessed in terms of the ability to feed, dress, toilet, move, transfer, and ambulate self independently or with some degree of required assistance; see Figure 34-9. Functional assessment data are used for initial planning, for discharge planning, for planning continuity of care in a nursing home or private home, and to provide baseline and ongoing data for rehabilitation.

Clients at high-risk for falls include those with prolonged hospitalization, those taking sedatives or tranquilizers, confused clients, or those with a history of physical restraint use. A great majority of falls:



Figure 34-9 Some mobility impairments significantly limit a person's ability to perform ADL.

- Occur in the evening
- Occur in the client's room
- Involve wheelchairs
- Involve unattended clients
- Involve clients with poor footwear
- Occur with poor lighting
- Involve clients with poor vision
- Occur with clients experiencing neuromuscular impairment

Awareness of these risk factors for falls allows the nurse to prevent many client injuries.

The nurse continually evaluates the client's strength and endurance during the entire ambulation process. The Risk Assessment Tool (RAT) for falls was developed to identify clients at high risk for falls and to individualize care (Brians, Alexander, Grota, Chen, & Dumas, 1991). See the accompanying Nursing Checklist for the RAT and Chapter 31 for further discussion of fall prevention.

NURSING DIAGNOSIS

Nursing diagnoses related to mobility focus primarily on activity and mobility levels, and the psychosocial impact that alterations in mobility can have on a client and the client's family. Common NANDA nursing diagnoses related to the physical adaptations or risks resulting from altered mobility include:

- *Activity Intolerance* related to bed rest and immobility, generalized weakness, sedentary lifestyle, and imbalance between oxygen supply and demand; see the Nursing Process Highlight.
- *Impaired Physical Mobility* related to intolerance to activity or decreased strength and endurance, pain, perceptual or cognitive impairment, neuromuscular impairment, musculoskeletal impairment, and depression or severe anxiety; see the Nursing Process Highlight.
- *Risk for Disuse Syndrome* per risk factors of paralysis, mechanical immobilization, prescribed immobilization, and severe pain
- *Self-Care Deficits* related to inability to wash body or body parts, inability to obtain or get to water source, activity intolerance, decreased strength and endurance, pain, and impaired transfer ability
- *Ineffective Health Maintenance* related to lack of or significant alteration in communication skills (written, nonverbal)
- *Risk for Falls* related to impaired mobility.

Alterations in family and social processes may also result from immobility and inactivity. Disruption in activity and mobility leads to impairment of the ability to perform one's usual social, vocational, educational, and family roles. There are often changes in the client's perception of role. *Disturbed Body Image* and *Situational Low Self-Esteem* can result from:

1. Changes in physical abilities
2. Changes in family responsibilities
3. Lack of knowledge regarding rehabilitation



NURSING CHECKLIST

Risk Management Tool (RAT) for Falls

Directions: Place a check mark in front of elements that apply to your patient. The decision of whether or not a patient is at risk for falls is based on your nursing judgment. **GUIDELINE:** A patient who has a check mark in front of an element with an asterisk (*) or four or more of the other elements would be identified as at risk for falls.

General Data

- Age over 60
- History of falls prior to admission*
- Postoperative/admit for operation
- Smoker

Physical Condition

- Dizziness/imbalance
- Unsteady gait
- Diseases/problems affecting weight-bearing joints
- Weakness
- Paresis
- Seizure disorder
- Impairment of vision
- Impairment of hearing
- Diarrhea
- Urinary frequency

Mental Status

- Confusion/disorientation*
- Impaired memory or judgment
- Inability to understand or follow directions

Medications

- Diuretics or diuretic effects
- Hypotensive or CNS suppressants (narcotic, sedative, psychotropic, hypnotic, tranquilizer, antihypertensive, antidepressant)
- Medication that increases GI motility (laxative, enema)

Ambulatory Devices Used

- Cane
- Crutches
- Walker
- Wheelchair
- Geri chair
- Braces

(From The development of the RISK for fall prevention, by L. K. Brians, K. Alexander, P. Grotta, R. W. H. Chen, & V. Dumas. [1991]. Reprinted from *Rehabilitation Nursing*, 16(2), pp. 67–69. With permission of the Association of Rehabilitation Nurses. Copyright 1991 by the Association of Rehabilitation Nurses.)

Nursing Process Highlight

DIAGNOSIS

Nursing Diagnosis: *Activity intolerance*—a state in which an individual has insufficient physiologic or psychologic energy to endure or complete required or desired daily activities.

Defining Characteristics

- Verbalization of weakness or fatigue
- Abnormal physiologic responses to activity (e.g., heart rate or blood pressure changes)
- Discomfort or dyspnea upon exertion

Related Factors

- Immobility, bed rest
- Generalized weakness
- Sedentary lifestyle
- Imbalance between oxygen supply and demand

Nursing Diagnosis: *Impaired physical mobility*—state in which the person experiences a limitation of ability for independent physical movement.

Defining Characteristics

- Inability to move purposefully
- Hesitant to attempt movement
- Limited range of motion
- Impaired coordination
- Decreased muscle mass, strength, and/or control

Related Factors

- Decreased strength and endurance
- Discomfort/pain
- Perceptual/cognitive impairment
- Musculoskeletal impairment
- Depression, marked anxiety

(Data from Carpenito, L. J. [1999]. *Handbook of nursing diagnosis* [8th ed. pp. 159–161]. Philadelphia: Lippincott; North American Nursing Diagnosis Association. [2001]. *Nursing diagnoses: Diagnoses and classification: 2001–2002*. [pp. 13, 117–118]. Philadelphia: Author)

4. Denial of abilities and strengths
5. Social insecurity
6. Feelings of worthlessness, hopelessness, or depression

PLANNING AND OUTCOME IDENTIFICATION

In the development of outcomes for clients with mobility needs, client involvement is essential. Realistic outcomes can be targeted by considering the client's (1) understanding of mobility status; (2) values, thoughts,

and concerns regarding mobility problems; (3) general health status; and (4) ability to solve problems.

The goal of the interdisciplinary health team during acute hospitalization and rehabilitation is to restore function, thus maximizing the level of the client's independence. Maximal independence includes the ability to function in ADL (eating, dressing, bathing, and moving). Independence in these activities contributes to self-reliance, self-care, self-determination, self-direction, and personal control. Personal client variables determining the maximal level of independence include extent of disability, competence, age, self-confidence, cognitive ability, knowledge level, and mood state. It is important to develop short-term goals that encourage clients to gain a sense of accomplishment. The nurse should recognize and praise the client's accomplishments that increase mobility.

The level of independence and ability for performance of ADL is enhanced or inhibited by the physical environment. Collaboration of the client, family, caregivers, nurses, physical therapists, and occupational therapists is essential for individualizing the physical environment to permit optimal activity and mobilization. Adaptive devices, such as those that follow, enhance independence for personal activities:

- Eating (e.g., plate guards and hand splints to hold utensils)
- Bathing (e.g., shower chairs and long-handled sponges)
- Dressing (e.g., Velcro closures and zipper pulls)
- Toileting (e.g., elevated toilet seats)
- Mobility (e.g., walkers)

Continued practice in self-care activities with adaptive devices promotes confidence. Interdisciplinary cooperation can be used to plan modifications for the home for activity and mobility, especially in the bathroom and kitchen. Physical modifications with adaptive equipment in home environments maximize client activity and mobility.

Bed Rest

Bed rest is a therapeutic intervention that achieves several objectives, including the following:

- Provide rest for clients who are exhausted.
- Decrease the body's oxygen consumption.
- Reduce pain and discomfort.

The planned duration of bed rest depends on the client's physical condition and ability to move.

Even though implemented for therapeutic reasons, bed rest can be counterproductive to a client's recovery. The inactivity imposed by bed rest causes structural changes in joints and shortens muscles. Such changes, which may lead to decreased range of motion and contractures, can occur within 48 hours of bed rest (Lamb

& Cummings, 2000). To prevent such complications, bed rest should be avoided as much as possible. For clients whose medical condition necessitates bed rest, range-of-motion exercises must be implemented. When planning care, it is important to "prevent immobility if possible; approximately 7 days are needed for the client to regain the function lost during 1 day of bedrest" (Eliopoulos, 1999, p. 278).

Restorative Nursing Care

Being able to move about independently is an important part of the recovery process and can determine whether the client is cared for at home or in a health care facility. Environmental evaluation is particularly important, with the focus on ease and safety of mobility. Promotion of activity through environmental modification increases the quality of life for the client whether injured, ill, or aging. Efforts by the client and the rehabilitation team to promote activity and mobility can be negated quickly by environmental barriers such as stairs and narrow passageways.

Clients who have limited mobility may be at risk for falls. To decrease the probability of falls at home, client education should focus on creating a safe environment for ambulation; see Client Teaching Checklist. The accompanying display lists some assistive devices for clients receiving care in the home setting. Other types of assistive devices are available to help clients perform ADL; see Figure 34-10.



CLIENT TEACHING CHECKLIST

Promoting Safety at Home

1. Avoid unsecured rugs or loose rugs.
2. Use banisters on stairways.
3. Install bright lights near steps and stairways.
4. Avoid wearing shoes that are ill-fitting, unlaced, or high-heeled, or have slippery soles.
5. Keep all walkways unobstructed (remove clutter).
6. Use caution with telephone lines; use a cordless phone if available to avoid tripping danger.
7. Do not walk on wet or waxed floors.
8. Use nonskid mats in shower/bathtub.
9. Use grab bars near toilet and shower/bathtub.
10. Keep commonly used objects within easy reach.

Health Promotion and Fitness

The client's long-term goals include the promotion of activity, mobility, and fitness. Therapeutic exercises maintain flexibility, strength of muscles, range of motion, and energy and increase endurance and sense

HOME HEALTH CARE: ASSISTIVE DEVICES IN THE HOME

The following devices may be rented and may qualify for reimbursement from Medicare or private insurance.

- Electric hospital bed with overhead trapeze (give client more control of environment)
- Portable commode (extend client's independence in elimination)
- Lifting device (assist with transferring dependent client from bed to chair)
- Portable telephone (for client safety and convenience)
- Shower chair and hand-held shower for bathtub (promote client independence and safety)
- Special mattresses for bed and cushions for chairs (promote comfort and help maintain skin integrity)
- Overbed table for eating or hand activities (promote client's ability to perform ADL)
- Comfortable chairs close to the bed (promote socialization by facilitating visits of family and friends)
- Remote control for client who enjoys television (provide leisure/diversion activity)

APPLICATION: HOME CARE

Increased accessibility and mobility can be achieved through planning home modifications such as:

1. Ramps (paths to freedom)
2. Wide doorways
3. Open-ended door handles replacing doorknobs
4. Remote-controlled lighting
5. Spacious room arrangements
6. Bare floor or low-level pile carpeting
7. Grab bars for bathrooms



Figure 34-10 Assistive devices, such as those shown here, help clients dress independently.

of well-being. Health promotion models stress the importance of cognitive and perceptual factors on exercise participation. Factors affecting targeted health promotion outcomes include perceived health status, perceived benefits of exercise, perceived barriers to exercise, and attitudes toward exercise. Perceived benefits of exercise and exercise attitudes held by the client have been identified as critical in goal setting for a program of health promotion and fitness.

IMPLEMENTATION

Interventions for clients with impaired mobility include meeting psychosocial needs, using body mechanics, maintaining body alignment, performing ROM exercises, transferring clients, assisting with ambulation, promoting wellness, using complementary treatment approaches, and documentation.

Meeting Psychosocial Needs

Nursing interventions for role change due to deficits in activity and mobility include (1) fostering open family communication, (2) providing opportunities for family role resumption, (3) prioritizing family roles and responsibilities, and (4) modifying family roles and responsibilities. The accompanying Nursing Process Highlight lists nursing interventions that encourage socialization.

Nursing Process Highlight

IMPLEMENTATION: PROMOTING SOCIALIZATION

- Foster client autonomy
- Encourage activities in collaboration with recreational therapist
- Involve client with successful role models
- Inform client of vocational, educational, recreational, and social resources
- Involve client and family in support groups
- Facilitate transportation resources

Applying Principles of Body Mechanics

Often nurses are required to have physical strength in order to assist clients in achieving mobility. Carrying, pulling, pushing, or lifting clients and/or equipment are all activities involved in the delivery of nursing care.

Nurses' implementation of correct body mechanics help minimize the following:

- Client injury
- Nurse work-related musculoskeletal injury
- Nurse fatigue

“Back injury is mainly caused by lifting unreasonable loads . . . the most stressful tasks involve the transferring of patients (from a bed to a chair, for example)” (Owen, 1999, p. 76). The following variables can increase the risk of nurse injury:

- Client weight
- Client weight-bearing ability
- Client combativeness and unpredictability
- Height of bed
- Confined work space
- Wheelchairs without adjustable arms



NURSING TIP

Body Mechanics

Think ahead to eliminate hazards and injuries.

- Consider the weight and bulk of a client or object before lifting.
- Take your time and lift properly.
- Watch your footing.
- Teach proper body mechanics to others.
- Ask for help as needed.

Educating staff about the use of proper body mechanics is essential in preventing injury; see Procedure 34-1. The U.S. Department of Labor Occupational Safety & Health Administration (OSHA) has implemented new standards for the prevention of musculoskeletal injuries. OSHA (2000) defines musculoskeletal disorders (MSDs) as injuries and disorders of the muscles, nerves, tendons, ligaments, joints, cartilage, and spinal discs. Examples of MSDs include carpal tunnel syndrome, tendonitis, sciatica, herniated disc, and low back pain. Work-related MSDs account for more than one-third of all occupational injuries and illnesses that are serious enough to result in days away from work (OSHA, 2000).

MSDs are preventable by educating the workers and modifying the work environment. The following recommendations are made by OSHA (2000) to prevent MSDs:

- Adjust the height of working surfaces to reduce long reaches and awkward postures.

- Reduce the weight and size of items that workers must lift.
- Provide mechanical lifting equipment.



NURSING TIP

Application of Body Mechanics

- When lifting objects from the floor, bend at the hips and knees while keeping the back straight and maintaining a wide base of support.
- Avoid bending from the waist as this will strain muscles of the lower back.
- Adjust the height of the client's bed to avoid back strain.
- Carry objects close to the midline of the body.
- Avoid stretching to reach objects.

Maintaining Body Alignment: Positioning

Clients cannot always move independently and reposition themselves in bed. In such instances, nurses must use proper turning and positioning techniques in order to achieve the following outcomes:

- Increase client comfort
- Prevent contractures
- Prevent decubiti (pressure sores)
- Make portions of the client's body accessible for procedures
- Help clients access their environment

Clients who cannot move independently must be repositioned every 2 hours. Repositioning must be done more often for clients who are uncomfortable or incontinent, or who have fragile skin, poor circulation, fragile skin, decreased sensation, poor nutritional status, or impaired mental status.

Nurses need to be aware of three essential concepts when positioning clients: pressure, friction, and skin shear. A pressure site is any skin surface area on which the client is lying or sitting. The force of the pressure

NURSING ALERT

To prevent the development of contractures and decubiti, change the client's position every 2 hours.

PROCEDURE 34-1

Practicing Proper Body Mechanics

Equipment

None required

Action

1. Get a firm footing by keeping your feet apart.
2. Bend at the knees; avoid bending at the waist. Hold the load close to your body (Figure 34-11).



Figure 34-11 Bend knees to lift.

3. Lift with the leg muscles.
4. Tighten abdominal muscles to lift.
5. Turn by pivoting your feet, not your trunk, while lifting (Figure 34-12).
6. If the load is heavy, get help or use a mechanical lift.
7. Push, do not pull.
8. Use wheeled objects (e.g., a wheelchair).
9. Perform health-promoting activities.

Rationale

1. Develops and maintains a stable base.
2. Provides greater leverage for lifting.



Figure 34-12 Pivot with feet.

3. Uses the strongest muscles, thereby reducing risk of injury.
4. Provides greater support to the back.
5. Maintains proper body alignment.
6. Avoids strain and possible injury.
7. Prevents back injury.
8. Eases mobility.
9. Exercising, maintaining normal weight for height, pacing activities, and relaxation promote good body conditioning.

can compromise circulation and lead to skin breakdown and ulceration. Tissue areas over bony prominences are more likely to experience impaired skin integrity. It is important to always inspect the skin and tissue areas under increased pressure for signs of irritation (i.e., redness).

Friction is caused when the skin is dragged across a rough surface such as bedsheets or stretcher surfaces. Friction causes heat, which damages the skin and may lead to decreased skin integrity with resultant infection and/or skin breakdown.

Skin shear is the result of dragging skin across a hard surface. The force of resistance to being dragged tears the deep layers of skin which can lead to skin ulceration.

NURSING ALERT

To prevent skin shear, avoid dragging a client across the bed or stretcher. Instead, lift the client or use assistive devices such as turning sheets or transfer boards.

For clients in bed, limit the number of pillows under the head in order to avoid neck flexion. Arms should be abducted from the body and straight with slight flexion. Hands should rest comfortably in a flat position with fingers open. The knees and hips should be aligned; use sandbags or pillows to prevent external hip rotation. Avoid flexing the knees by the use of pillows placed behind the knees. Ankles should be flexed at 90 degrees; use pillows or footboard if necessary.

To maintain proper positioning for a client seated in a chair, be sure the head is straight without bending the neck or head dangling. The trunk should be upright without bending or curving. Arms and hands are to be supported on armrests or the tabletop; avoid dangling the arms. The hands should be in a flat position with the fingers open. Hips and knees should be flexed. The feet are to be flat on the floor or footrest with the ankles at a 90 degree angle. If the legs are supported on leg rests and are straight, keep the ankles flexed at a 90 degree angle.

Table 34-12 provides a description of the most commonly used positions: Fowler's (elevated head and trunk), dorsal recumbent (back-lying with slight elevation of head and shoulders), prone (face down), lateral (side-lying), and Sim's (semi-prone).

Assisting clients to comfortable therapeutic positions requires much skill; see Procedure 34-2. Often the client is unable to assist in repositioning; in such cases, it is best to use two or more staff members to reposition the client in order to prevent injury.

Specialized equipment used for client positioning includes pillows, foam wedges, trochanter rolls, footboards, bed boards, hand-wrist splints, traction, side rails, restraints, and trapeze bars. Table 34-13 describes devices

NURSING ALERT

Before and after repositioning, assess the status of a client's skin and provide skin care as needed.

used to help maintain proper positioning.

Hand-wrist splints can facilitate extension of the wrist-hand-fingers, prevent contracture, and reduce spasticity. The goal for splint use is to maintain a functional hand for the client. Figure 34-13 shows hand-wrist splints. Clients must be taught the correct way to put on the

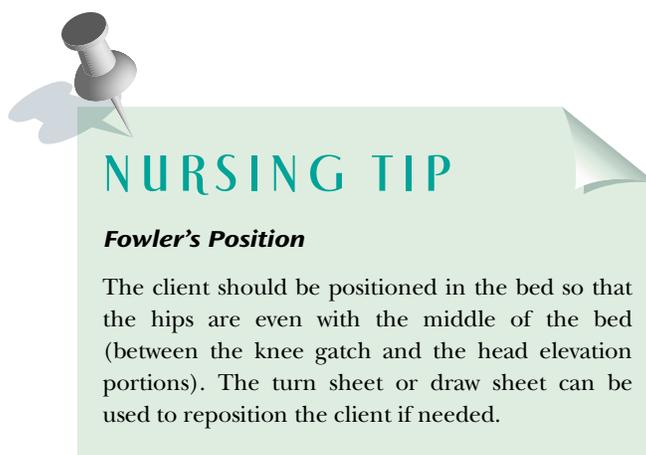
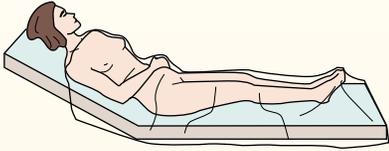
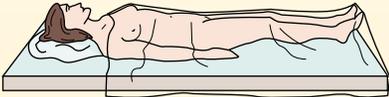


Figure 34-13 Hand-wrist Splints

TABLE 34-12
Positioning

Position	Description	Indications	Potential Complications	Corrective Measures
Fowler's	Semi-sitting position. Head of bed elevated to 45–60 degrees. Knees slightly elevated.	Promote comfort Improve respiratory problems (i.e., dyspnea, pneumonia) Encourage postoperative drainage	Flexion contracture of cervical spine Exaggerated flexion of lumbar spine Dislocation of shoulder Flexion contracture of wrist Finger contractures and thumb abduction External hip rotation Hyperextension of knees Foot drop (plantar flexion)	Rest head directly on mattress or support with small pillow only Firm support to back Pillow to support lower back Elevate forearms on pillows to avoid tension on shoulders Support hands on pillows to maintain natural alignment Hand-wrist splints Trochanter roll Flex knees with small pillow under the thighs Maintain dorsal flexion with footboard or high-top tennis shoes
				
Dorsal recumbent (Supine)	Back-lying position. Head and shoulders may be slightly raised.	Promote comfort NOTE: Head and shoulders are kept flat after procedures involving spinal anesthetics	Cervical hyperextension Posterior flexion of lumbar spine Clawhand deformities (extension of fingers and abduction of thumbs) Hyperextension of knees Footdrop (plantar flexion)	Maintain correct alignment with pillows under upper shoulders, neck, and head Small pillow or roll under lumbar curvature Hand-wrist splints Pillow under lower legs from below the knees to ankles or small pillow under thighs to slightly flex knees Maintain dorsal flexion with footboard or high-top tennis shoes
				

(continues)

TABLE 34-12 (continued)
Positioning

Position	Description	Indications	Potential Complications	Corrective Measures
Prone	Face-down position. Head is turned to one side.	Helps prevent contractures of hips and knees Promotes drainage from mouth	Cervical spine flexion Hyperextension of spine; respiratory impairment Footdrop	Small pillow under head Small pillow just below the diaphragm Allow feet to dangle over end of mattress Place lower legs on pillow to keep toes from resting on bed
Lateral	Side-lying position. Lateral aspects of lower scapula and lower ilium support most of body weight.	Promote comfort Relieves pressure on sacrum and heels	Lateral flexion of neck Internal rotation of arm; limited chest expansion leading to respiratory impairment Extension of fingers and abduction of thumbs Internal rotation and abduction of femur Twisting of spine	Pillow under head and neck Maintain alignment of upper arm with pillow underneath Slightly flex lower arm Hand-wrist splints Pillows to support leg from groin to foot Align both shoulders with both hips
Sim's	Semiprone position. Upper arm is flexed at shoulder and elbow; lower arm is positioned behind client. Both legs flexed in front of client with more flexion in upper leg. Promotes comfort especially in pregnant clients	Promotes drainage from mouth Prevents aspiration Reduces pressure on sacrum and greater trochanter of hip	Lateral flexion of cervical spine Damaged nerves and blood vessels of lower arm axillae Internal shoulder rotation and abduction Internal rotation and adduction of hip and leg; lumbar lordosis Footdrop	Support head with pillow unless drainage from mouth is necessary Position lower arm behind and away from the back Pillow between chest and upper arm Pillow under upper flexed leg from groin to foot Sandbag to dorsiflex lower foot

PROCEDURE 34-2

Positioning a Client in Bed

Equipment

- | | |
|--------------------------------|----------------------------|
| ■ Hospital bed with side rails | ■ Turn sheet or draw sheet |
| ■ Pillows or foam wedges | ■ Hand cones |
| ■ Foot board | ■ High-top tennis shoes |

Action

Rationale

1. Inform client of reason for the move and how to assist (if able).
2. Elevate bed to highest position.
3. Using two nurses, place turn (or draw) sheet under client's back and head.

1. Reduces anxiety; helps increase comprehension and cooperation; promotes client autonomy.
2. Avoids strain on nurse's back muscles.
3. Decreases shearing, which can lead to formation of pressure ulcers.

Fowler's Position

4. Place bed in a 15° to 30° angle for low-Fowler's position, 45° to 60° angle for Fowler's position, or 70° to 90° angle for high-Fowler's position.
5. Place pillows at small of back, under ankles, under the arms, and under head of client.
6. Slightly elevate the gatch of the lower portion of the bed.
7. Assess client for comfort.
8. Lower height of bed and elevate side rails.

4. The height of the head of the bed is determined by physician's order, client preference, client tolerance, or client's activity (e.g., eating).
5. Promotes client comfort. Pillows under ankles elevate heels to help prevent pressure ulcer formation. Pillows under the arms can assist with lung expansion.
6. Assists in maintaining correct client positioning.
7. Comfort is subjective.
8. Promotes client safety.

Supine Position

9. Repeat steps 1–3.
10. Place bed in a flat position.
11. Place small pillows at small of back, under head, and under ankles.
12. Assess client's comfort level.
13. Lower height of bed and elevate side rails.

11. Adds to client comfort; relieves pressure on heels.
12. Comfort is subjective.
13. Promotes client safety.

Side-Lying Position

14. Repeat steps 1–3.
15. Logroll client to side (Procedure 34-5).
16. Place a small pillow under client's head. Place pillow or foam wedges behind client's back. Place a pillow between client's legs. Put a pillow tucked by the client's abdomen.

15. Places client on side for the proper positioning; reduces flexion of neck and spine.
16. Pillows at back and abdomen help maintain side-lying positioning. Small pillow under head is for comfort. Pillow between legs is for back alignment, comfort, and pressure relief. Pillow at abdomen supports upper arm, thus protecting the upper arm-shoulder joint positioning.

(continues)

PROCEDURE 34-2

Positioning a Client in Bed (continued)

<i>Action</i>	<i>Rationale</i>
17. Run your hand under the client's dependent shoulder and move the shoulder slightly forward.	17. Removes pressure on upper arm-shoulder joint, promoting comfort.
18. Assess the client for comfort.	
19. Lower the bed and elevate the side rails.	19. Promotes client safety.
Prone Position	
20. Repeat steps 1–3.	
21. Assist the client to lie on abdomen.	21. Prepares client to assume prone position.
22. Place a small pillow under client's head; turn head to side. The client's arms can be extended near side or flexed toward head. Place a small pillow under chest for female clients and for clients with barrel chest.	22. Pillows at head and chest are for comfort. The arms are positioned according to client preference and flexibility. Pillow under chest protects breasts and promotes comfort.
23. Place a small pillow under ankles or allow toes to rest in space between foot of bed and the mattress.	23. Relieves pressure on toes.
24. Assess client for comfort.	
25. Lower the bed and elevate the side rails.	25. Promotes client safety.
General Guidelines for Client Positioning	
26. Use a hand cone for positioning the hand if needed. Place the cone in hand, with the wider portion near the little finger and the narrow portion nearer the index finger.	26. Helps prevent hand flexion contractures.
27. Assess the client's skin frequently (at least every 2 hours) for pressure marks.	27. Immobile clients are prone to tissue ischemia with subsequent development of pressure ulcers.
28. Turn client frequently, at least every 2 hours.	28. Promotes blood circulation and prevents skin breakdown.
29. Use a footboard or high-top tennis shoes for clients in Fowler's and supine position.	29. Assists in prevention of foot drop.
30. Prepare a turn schedule for each client. Place sign at head of client's bed.	30. Stresses to all nursing personnel the importance of turning client frequently.

device, as incorrect use of a splint or brace can cause joint damage, stiffness, or pain.

Falls are common types of injuries in hospitals and long-term care facilities. Side rails, which are placed on the sides of beds and stretchers to prevent falls, can be raised, lowered, and locked into place; see Figure 34-14. For clients who are at risk for falls, side rails should always be used; however, they should not give nurses a sense of security. Beds must still be placed in the lowest

position to reduce the force of a possible fall, should one occur. Also, clients identified as being at-risk for falls should be closely monitored.

Some clients resist the use of side rails because they feel their independence is altered. It is important that the nurse teach clients and families the purpose of side rails, focusing on safety promotion. Note that some health care agencies require signed notification consenting to the use of raised side rails.

TABLE 34-13
Maintaining Proper Position: Assistive Devices

Bed board	Plywood board placed under entire mattress; improves spinal alignment by providing support
Footboard	Board placed at end of bed to provide support for feet to maintain dorsiflexion
Hand-wrist splint	Individually contoured for each client; maintains thumb adduction and opposition to fingers
Pillow	Available in various thicknesses; provides support; elevates body parts
Restraint	Variety of types available (jacket or vest, wrist belt, ankle belt, waist belt); provides immobilization
Side rails	Bars attached to the sides of the bed. Assist with mobility and prevents falls
Trochanter roll	Folded blanket placed under client's buttocks and rolled inward toward client to place thigh in a neutral position; used when client is supine to avoid external rotation of hips and legs
Traction	Used for immobilization and to promote healing of fractures
Trapeze bar	Triangular device hanging from above-bed bar that is secured to bed frame; used by clients with upper extremity function to assist in repositioning and transferring



Figure 34-14 The use of side rails promotes safety.

Restraints are protective devices used to limit physical activity or to immobilize a client or body part. Restraints are used for the following purposes: to protect the client from falls; to protect a body part; to prevent the client from interfering with therapies (i.e., pulling out tubes or catheters); and to reduce the risk of injury to others. See Chapter 31 for a complete discussion of restraints and the procedure for applying restraints.

Traction may be used to maintain alignment, especially following injury or surgery. There are several traction techniques, including manual, skin, and skeletal; Figure 34-15. See Table 34-14 for a listing of key assessment data for clients using skeletal and skin trac-

tion. In addition to assessing, the nurse also documents the findings.

Performing Range-of-Motion Exercises

Range-of-motion exercises are performed several times a day by placing each joint through its full functional motion. The purposes of ROM exercises are to maintain full flexibility, maintain muscle tone and strength, prevent contractures, and improve circulation. Refer to Procedure 34-3.

Transfer Techniques

Planning plays a major role in safe effective client transfers; the nurse must determine to what extent the client

NURSING TIP

ROM Exercises

- Assess the motion of joints for every client.
- Do not flex, extend, rotate, abduct, or adduct a joint if the client complains of discomfort or stiffness.
- Encourage the client to perform range-of-motion exercises with as much independence as possible.
- Teach family members or caregivers to perform range-of-motion exercises with the client.

NURSING ALERT

Restraints are never to be used for staff convenience but instead to prevent injury to clients or others.

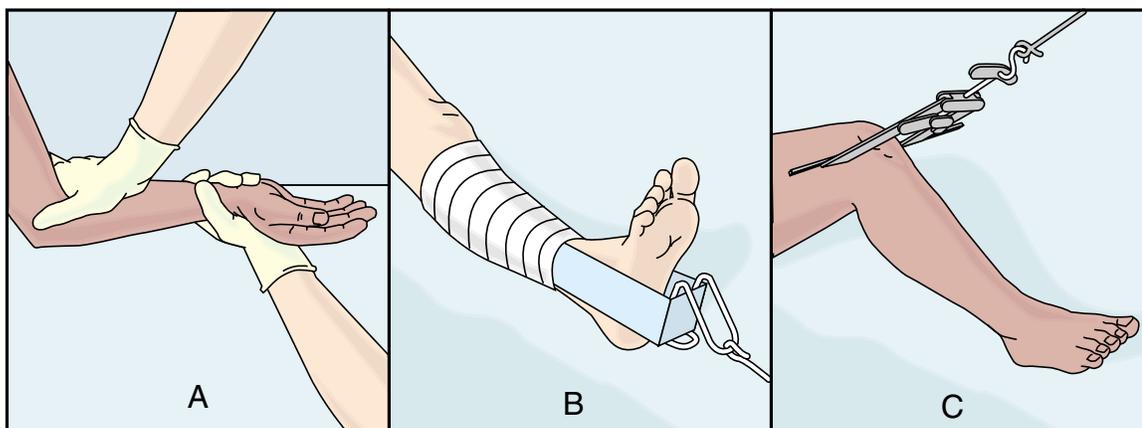


Figure 34-15 Traction Techniques: A. Manual; B. Skin; and C. Skeletal

TABLE 34-14
Skeletal and Skin Traction: Assessment Factors

Skeletal Traction	Skin Traction
Location of traction	Location of traction
Amount of traction being applied	Type of traction (e.g., cervical, Buck’s, Russell’s)
Countertraction applied	Amount of traction weight being applied to the affected body part
Body position to be maintained	Body position to be maintained
Duration of application (continuous, intermittent, or as-needed basis)	Duration of application (continuous, intermittent, or as needed basis)
Traction weights free falling	Traction weights free falling
Traction rope intact, taut, and unobstructed through the pulley	Traction rope intact, taut, and unobstructed through the pulley
Immobilized body part in alignment with rest of body	Immobilized body part in alignment with rest of body
Appearance of the skeletal pin or wire sites (e.g., dry, encrusted, reddened, edematous)	
Presence of drainage from the skeletal pin or wire sites	
Evidence of skin breakdown	

PROCEDURE 34-3

Performing Range-of-Motion (ROM) Exercises

Equipment

- Bed with side rails

Action

1. Explain the purposes of range-of-motion (ROM) exercises.
2. Elevate the bed.
3. Assist client to supine position in a warm, comfortable environment.
4. Start at head of client and perform ROM exercises down each side of the body.

Rationale

1. Reduces client anxiety and increases cooperation.
2. Decreases nurse’s muscle strain.
3. Promotes client’s comfort level.
4. Provides a systematic method to ensure that all body parts are exercised.

(continues)

PROCEDURE 34-3

Performing Range-of-Motion (ROM) Exercises (continued)

Action

- Repeat each range-of-motion exercise 5 times in a slow, firm manner.
- Cradle client's head with palms of hand while holding the extremities by the long bone areas.

Head: Rotation—Turn the head from side to side. Flexion and extension—Tilt the head toward the chest and then tilt slightly upward (Figure 34-16). Lateral flexion—Tilt the head on each side so as to almost touch the ear to the shoulder.



A.



B.

Figure 34-16 Passive ROM Exercises of Head. A. Flexion of Neck; and B. Extension of Neck

Neck: Rotation—Place the client in a sitting position and rotate the neck in a semicircle while supporting the head.

Trunk: Flexion and extension—Bend the trunk forward, straighten the trunk, and then extend slightly backward. Rotation—Turn the shoulders forward and return to normal position. Lateral flexion—Tip trunk to left side, straighten trunk, tip to right side.

Have the client resume a supine position.

Arm: Flexion and extension—Extend the arm in a straight position upward toward the head, then downward along the side. Adduction and abduction—Extend the arm in a straight position toward the midline (**adduction**) and away from the midline (**abduction**).

Shoulder: Internal and external rotation—Bend the elbow at a 90° angle with the upper arm parallel to the shoulder; rotate the shoulder by moving the lower arm upward and downward.

Elbow: Flexion and extension—Supporting the arm, flex and extend the elbow (Figure 34-17). Pronation and supination—Flex elbow, move the hand in palm-up and palm-down position.

Rationale

- Provides support to each body part, thus reducing strain on muscles and joints.

(continues)

PROCEDURE 34-3

Performing Range-of-Motion (ROM) Exercises (continued)

Action



A.

Rationale



B.

Figure 34-17 Passive ROM Exercises of Elbow. A. Flexion of Elbow; and B. Extension of Elbow

Wrist: Flexion and extension—Supporting the wrist, flex and extend the wrist. Adduction and abduction—Supporting the lower arm, turn wrist right to left, left to right, then rotate the wrist in a circular motion.

Hand: Flexion and extension—Supporting the wrist, flex and extend the fingers. Adduction and abduction—Supporting the wrist, spread fingers apart and then bring them close together. Opposition—Supporting the wrist, touch each finger with the tip of the thumb.

Thumb: Rotation—Supporting the wrist, rotate the thumb in a circular manner.

Hip and Leg: Flexion and extension—Supporting the lower leg, flex the leg toward the chest and then extend the leg (Figure 34-18). Internal and external rotation—Supporting the lower leg, angle the foot inward and outward.

Knee: Flexion and extension—Supporting the lower leg, flex and extend the knee.

Ankle: Flexion and extension—Supporting the lower leg, flex and extend the ankle.

Foot: Adduction and abduction—Supporting the ankle, spread the toes apart and then bring them close together. Flexion and extension—Supporting the ankle, extend the toes upward and then flex the toes downward.



A.



B.

Figure 34-18 Passive ROM Exercises of Hip and Leg. A. Flexion of Hip and Leg; and B. Extension of Hip and Leg

is able to help with the transfer. If the client is totally dependent or is heavy, the nurse will need other staff members to help. Table 34-15 lists potential hazards involved in client transfers with corresponding nursing interventions to promote safety.

Moving Clients

Prolonged immobility can cause discomfort, muscle wasting, clot formation, and skin breakdown. Also, the client who slides down toward the foot of the bed while the head is elevated can experience reduced lung capacity and impaired respiratory effort. Nurses often must move clients up in the bed or reposition them. Moving a client may sometimes be done by one person, but often requires two staff members to ensure safe transfer; see Procedure 34-4.

Logrolling the Client

Logrolling is a technique for moving a client whose body must remain in straight alignment. Situations requiring total alignment of the spine include spinal injury or recovery from spinal surgery. Logrolling is

TABLE 34-15
Client Transfer: Hazards and Safety Measures

Potential Hazard	Preventive Measures
Falling	<ul style="list-style-type: none"> Assess client's size and ability to assist Ask for help from other staff members if needed If client starts to fall, lower gently to the floor while protecting the head If client has fallen, assess thoroughly for signs of injury
Skin damage	<ul style="list-style-type: none"> Use a transfer board or draw sheet Lift client instead of sliding across surfaces Pad surfaces that may cause injury (e.g., bed rails)
Foot injury	<ul style="list-style-type: none"> Place nonskid slippers on client Do not tuck sheets/blankets tightly over feet Ensure that feet do not become tangled in side rails, chair legs, or other equipment
Dislodging client care equipment	<ul style="list-style-type: none"> Assess for presence of all tubes and lines (e.g., catheters, IV lines) Determine if equipment must be temporarily disconnected during the transfer Reconnect equipment promptly when transfer is completed Keep the urinary drainage bag at a level lower than the bladder

NURSING ALERT

Safety During Logrolling

For a very weak or immobile client, use extra personnel for logrolling. Two nurses should stand on each side of the client.

accomplished by two or three nurses working in a coordinated fashion; see Procedure 34-5.

Transferring from Bed to Chair

A client may need to be moved from the bed to a chair, commode, or wheelchair. Procedure 34-6 describes the steps involved in safely assisting a client from bed to chair. This procedure discusses moving a client to a wheelchair; however, the process is the same for transferring to a regular chair or bedside commode.

NURSING ALERT

Wheelchair Safety

Caution client to avoid leaning forward in the wheelchair because leaning forward can cause tipping and falling.



NURSING TIP

Wheelchair Technique

- When pushing a wheelchair, back into and out of elevators.
- Back slowly down wheelchair ramps.
- Push the wheelchair ahead of you when going up ramps.
- If going through a self-closing door, back the wheelchair out of the room. You can keep the door open by backing against the door. The wheelchair can then be guided out of the room.
- Lock brakes when the wheelchair is standing still.
- Intravenous infusion bags can be placed on portable IV poles attached to the wheelchair during transport.
- Urinary drainage bags can be placed on the lower body of the wheelchair during transport. Coil the drainage tubing so the catheter is not tugged during transport. Empty urinary drainage bag prior to wheelchair transfer. Keep the urinary drainage bag below the level of the client's urinary bladder.

PROCEDURE 34-4

Moving a Client in Bed

Equipment

■ Hospital bed with side rails

■ Turn sheet or draw sheet

*Action**Rationale*

1. Inform client of reason for the move and how to assist (if able).
2. Elevate bed to high position. Lower head of bed.
3. With two nurses, place draw sheet under client's back and head.
4. Nurses stand on each side of client. Position client with knees flexed to push with feet if able to assist with move (Figure 34-19).

1. Reduces anxiety; helps increase comprehension and cooperation; promotes client autonomy.
2. Lessens strain on nurse's back muscles.
3. Reduces shearing force, which can precipitate pressure sores.
4. Client assistance lessens strain on nurse's back muscles; promotes client autonomy.



Figure 34-19 Moving Client in Bed: Client Positioned with Knees Flexed

5. Have client use a bed trapeze, if available.
 6. The lead nurse gives the signal to move. Nurses lift up on the draw sheet. The move is coordinated to transfer the client up toward the head of the bed.
 7. Position in bed can be maintained using bed gatch, if tolerated by client.
 8. Elevate head of bed, if tolerated by client.
 9. Assess client for comfort.
 10. Lower bed and elevate side rails.
5. Lessens shearing force; decreases strain on both client and nurses.
 6. Lessens strain on client and nurses. Reduces shearing force.
 7. Elevated bed gatch maintains position by preventing client from sliding downward.
 8. Promotes comfort; facilitates eating and drinking; facilitates communication.
 9. Comfort is subjective.
 10. Promotes client safety.

PROCEDURE 34-5

Logrolling a Client

Equipment

- Hospital bed with side rails
- Pillows
- Turn sheet or draw sheet

Action

1. Inform client of reason for the move and how to assist (if able).
2. Elevate hospital bed to high position.
3. Using one or more staff members, place a turn/draw sheet under the client's back and head.
4. The lead nurse tells the client and other personnel the direction of the move.
5. One person stands on each side of bed. The lead nurse gives the signal for the move. The staff member on side of the bed in the direction of the move holds the turn/draw sheet to guide the move. The second staff member applies gentle pressure on client's back toward the direction of the move, assisting client to roll (Figure 34-20).



Figure 34-20 Logrolling: Two-Person Move

Rationale

- | | |
|---|--|
| <ol style="list-style-type: none"> 6. Tuck pillows at client's back and abdomen. 7. Assess the client for comfort and proper alignment. 8. Elevate side rails and lower the bed height. 9. This procedure can be reversed to reposition clients on their backs. | <ol style="list-style-type: none"> 1. Reduces anxiety; helps increase comprehension and cooperation; promotes client autonomy. 2. Avoids strain on nurse's back muscles. 3. Reduces shearing force, which can precipitate pressure ulcer formation. 4. Cooperation and coordination place less strain on client and personnel. 5. Two persons give more support to client than one person could and are better able to maintain proper alignment of client's spine and neck. 6. Maintains side-lying position. 7. Comfort is subjective. 8. Promotes client safety. 9. Repositioning can prevent development of pressure sores and promote circulation. |
|---|--|

A wheelchair is a means of transportation for clients unable to support their weight while standing; see Figure 34-21. Safety instructions for use of a wheelchair include the need to keep the wheels locked when not deliberately moving and to move the footrests out of the way when getting in and out of the wheelchair; see the previous Nursing Tip for other recommendations for wheelchair usage.

Transferring from Bed to Stretcher

Some clients (e.g., those who are too weak to sit upright, those who are unconscious, or those with injuries prohibiting the erect position) must lie flat during transfers. In such situations, a stretcher (gurney) is used to facilitate client transfer. Stretchers have several safety features, including side rails, safety belts/straps, and locking wheels. The nurse should caution clients to move carefully while on the stretcher as it is more narrow than the bed. Reassure the client that side rails will be used to prevent falls. Refer to Procedures 34-7 and 34-8 for instructions on moving clients who need minimal and maximal assistance.



Figure 34-21 Client education regarding wheelchair safety includes client and family.

PROCEDURE 34-6

Transferring a Client from Bed to Chair

Equipment

Bed

Action

1. Inform client about desired purpose and destination.
2. Assess client's ability to assist with the transfer and for presence of cognitive or sensory deficits.
3. Lower the bed.
4. Allow client to dangle for a few minutes.
5. Bring wheelchair close to the side of the bed, toward the foot of the bed.
6. Lock wheelchair brakes and elevate the foot pedals.
7. Assist client to side of bed until feet touch the floor.
8. Assess client for dizziness. Remain in front of client until dizziness has subsided.

Wheelchair

Rationale

1. Reduces client anxiety and increases cooperation.
2. Promotes safety.
3. Reduces distance client has to step down, thus decreasing risk of injury.
4. Allows time for assessing client's response to sitting; reduces possibility of orthostatic hypotension.
5. Minimizes transfer distance.
6. Provides stability.
7. Provides guidance and helps client maintain balance.
8. Reduces risk of falling.

(continues)

PROCEDURE 34-6

Transferring a Client from Bed to Chair (continued)

Action

9. Apply gait belt if necessary.
10. Reach under client's axillae and place hands on client's scapulae (or grasp gait belt).
11. Assist the client to a standing position and provide support.
12. Pivot client so client's back is toward the wheelchair (Figure 34-22).



Figure 34-22 Pivot client so back is toward wheelchair.

13. Instruct client to place hands on the arm supports of the wheelchair.
14. Bend at the knees, easing the client into a sitting position (Figure 34-23).



Figure 34-23 Ease client into wheelchair.

15. Assist client to maintain proper posture.
16. Secure the safety belt, place client's feet on feet pedals, and release brakes.

Rationale

9. Reduces risk of falling by maintaining client stability during transfer.
10. Maintains client stability and reduces pressure on axillae.
11. Helps client stand safely and gives time to assess status.
12. Moves client into proper position to be seated.

13. Allows client to gain balance and judge distance to seat.
14. Increases stability and minimizes strain on back.

15. Broadest, and therefore safest, base of support is with client seated as far back on the seat as possible.
16. Ensures client safety; prepares client for movement.

PROCEDURE 34-7

Transferring a Client from Bed to Stretcher with Minimum Assistance

Equipment

■ Bed

■ Stretcher

Action

1. Inform client about desired purpose and destination.
2. Raise the height of bed and lock brakes of bed.
3. Instruct client to move to side of bed close to stretcher. Have client use trapeze bar if available. Lower side rails of bed and stretcher.
4. Stand at outer side of stretcher and push it toward bed. Lock wheels of stretcher.
5. Instruct client to move onto stretcher with assistance as needed.
6. Cover client with sheet or bath blanket.
7. Elevate side rails on stretcher and secure safety belts about client. Release brakes of stretcher.
8. Stand at head of stretcher to guide it when pushing.

Rationale

1. Reduces client anxiety and increases cooperation.
2. Reduces distance nurse must bend, thus preventing back strain; prevents bed from moving.
3. Decreases risk of client falling.
4. Diminishes the gap between bed and stretcher; secures the stretcher position.
5. Promotes client independence.
6. Promotes comfort; protects privacy.
7. Prevents falls.
8. Pushing, not pulling, ensures proper body mechanics.

PROCEDURE 34-8

Transferring a Client from Bed to Stretcher with Maximum Assistance

Equipment

■ Bed

■ Stretcher

■ Pillows

■ Lift sheet

Action

1. Inform client about desired purpose and destination.
2. Elevate height of bed.
3. Assess amount of assistance required for transfer. Usually two to four staff members are required for the maximum assisted transfer.
4. Lock wheels of bed and stretcher (Figure 34-24).
5. Have one nurse stand close to client's head.
6. Logroll the client (see Procedure 34-5) and place a lift sheet under the client's back, trunk,

Rationale

1. Reduces client anxiety and increases cooperation.
2. Decreases amount of bending for nurse, thus reducing risk of back injury.
3. Promotes client independence; assures that enough staff are present before beginning transfer.
4. Prevents falls.
5. Supports client's head during the move.
6. Prevents flexion and rotation of client's hips and spine; maintains correct body alignment.

(continues)

PROCEDURE 34-8

Transferring a Client from Bed to Stretcher with Maximum Assistance (continued)

Action



Figure 34-24 Lock wheels on the stretcher.

and upper legs. The lift sheet can extend under the head if client lacks head control abilities.

7. If urinary drainage bag is present, empty it and move it to side of bed closest to stretcher.
8. Move client to edge of bed near stretcher.
9. Nurse on nonstretcher side of bed holds the lift sheet across the client's chest (Figure 34-25).



Figure 34-25 Transferring Client with Maximum Assistance: Grasping Lift Sheet

10. Place pillow overlapping the bed and stretcher.
11. Position client on stretcher and cover with a sheet or bath blanket (Figure 34-26).
12. Secure safety belts and elevate side rails of stretcher.
13. If IV pole is present, move it from bed IV pole to stretcher IV pole after client transfer.
14. Empty all drainage bags (e.g., T-tube, Hemovac, Jackson-Pratt). Secure drainage system to client's gown prior to transfer.

Rationale

7. Prevents risk of urinary infection.
8. Prevents dragging, which causes shearing force.
9. Protects the client from falling.



Figure 34-26 Transferring Client with Maximum Assistance: Moving Client from Bed to the Stretcher

10. Protects head from injury.
11. Promotes comfort and provides for privacy.
12. Prevents falls.
13. Prevents tubing from being pulled and IV from being dislodged.
14. Decreases possibility of spills; prevents dislodging of tubes.

NURSING TIP

Stretcher Transport Safety

- Use hall ceiling mirrors at intersections before turning corners.
- Lock elevator door open when entering or exiting.
- Stand at head of stretcher to push stretcher up a ramp.
- Back down a steep ramp while positioned at head of stretcher.
- Lock stretcher brakes when standing still.

NURSING ALERT

Transfers and Closed Chest Drainage System

The closed chest drainage system must remain vertical at all times, including during transfers, to maintain the water seal.

Assistive Devices

There are several devices available for helping with client transfers. Slide boards or transfer boards assist the bed-wheelchair transfer by bridging the same level space between the bed and the wheelchair. Note that specialized wheelchairs with removable armrests are used with

slide boards. As the client becomes more independent, the slide board can be used to transfer from wheelchair to car. Figure 34-27 shows a slide board transfer to a car.

Other transfer appliances include stretchers (gurneys) and hydraulic lifts. The hydraulic (Hoyer, mechanical) lift is used for moving immobile clients who are obese; see Procedure 34-9. A client may be transferred to a chair, wheelchair, bedside commode, stretcher, or scale using a hydraulic lift. The manufacturer's equipment instructions should be followed and the weight limits must not exceed the manufacturer's specifications. Two staff members are needed to safely operate a hydraulic lift. Hydraulic lifts are not for use with clients who have spinal cord injury as spinal alignment is not maintained during use of the lift.



Figure 34-27 Slide Board Transfer

PROCEDURE 34-9

Using a Hydraulic (Mechanical) Lift

Equipment

- Hydraulic lift with canvas sheet and bars
- Gloves (when applicable)

- Protective disposable cover or disinfectant

Action

1. Wash hands.
2. Check the written order to determine the length of time the client may sit.
3. Check the client's health status, including medical diagnosis and condition.
4. Ask the client how long ago he last sat.

Rationale

1. Reduces transmission of organisms.
2. The physician or other qualified practitioner may want the client to sit only for a specified time or for as long as possible.
3. Assists in determining any problems that sitting may cause or any necessary restrictions.
4. If the client has been bedridden for several days, dizziness or faintness may occur.

(continues)

PROCEDURE 34-9

Using a Hydraulic (Mechanical) Lift (continued)

Action

5. Lock the wheels of the bed.
6. Position the chair close to the bed.
7. Position all tubing (i.e., urine drainage, NG, and IV) on the side of the bed where the chair will be placed. Ensure slack in the tubing.
8. Clamp and disconnect any tubing permitted.
9. Roll the client onto side and position the sling on the bed behind the client (Figure 34-28).



Figure 34-28 Adjust the sling so it is smooth and flat under the client.

10. Roll the client onto his opposite side, pull the sling through, and position the sling smoothly on the bed.
11. Roll the client back onto the sling and fold his arms over his chest (Figure 34-29).



Figure 34-29 Roll the client back onto the sling. Position the client's arms across his chest.

Rationale

5. Prevents the bed from rolling when the client is moved.
6. Always transfer the client the shortest possible distance to minimize fatigue and possibility of injury.
7. Prevents the tubing from being dislodged.
8. NG suction tubing and tube-feeding tubing are often allowed to be clamped. This facilitates moving the client.
9. The sling is positioned behind the client to ease turning to the opposite direction so that the sling can be pulled through.

10. Prevents skin breakdown.
11. Protects client's arms during the transfer.

(continues)

PROCEDURE 34-9

Using a Hydraulic (Mechanical) Lift (continued)

Action

12. Make sure the sling is centered.
13. Lower the side rail and position the lift on the side of the bed with the chair. Be sure to spread the base of the hydraulic lift as indicated in manufacturer's instructions to provide stability (Figure 34-30). Protect client from falls while the side rail is down.



Figure 34-30 Spread the base of the hydraulic lift to provide stability.

14. Lift the frame and pass it over the client. Carefully lower the frame and attach the hooks to the sling (Figures 34-31 and 34-32).



Figure 34-31 Locate the correct hook for each corner of the sling.

Rationale

12. Evenly distributes the clients' weight.
13. The side rail must be down to use the lift. Always transfer the client the shortest possible distance. The wheels and base of the lift should be spread to provide a wide, stable base to prevent the lift from tipping.

14. Safely attaches sling to frame to facilitate safe transfer.



Figure 34-32 Attach the hooks to the sling.

(continues)

PROCEDURE 34-9

Using a Hydraulic (Mechanical) Lift (continued)

Action	Rationale
15. Raise the client from the bed by pumping the lift's handle.	15. Read the manufacturer's directions to determine the mechanism for raising the lift. Various models do not operate in the same way.
16. Secure the client with a safety belt and cover the client with a blanket.	16. Provides safety, comfort, and privacy.
17. Steer the client away from the bed and slide a chair through the base of the lift.	17. It is safer to slide the chair through the base than to slide the base around the chair.
18. The sling can be disconnected and the lift can be moved out of the way while the client is sitting in the chair. If the lift will be used to return the client to bed, leave the sling in place beneath the client.	18. Promotes comfort.
19. Reposition, reconnect, and unclamp any necessary tubing.	19. Tubing should not be left disconnected. The client may sit for a while and will need all the equipment to function properly.
20. Assess the client's tolerance of the move, determining whether dizziness was experienced.	20. The data are necessary for charting/reporting presence of any problems.
21. Place call light, appropriate covers, and padding as needed for comfort and position maintenance. Place protective restraints as needed. Cover feet with slippers/socks if in sitting position.	21. Ensures privacy, protection, and comfort.
22. Reverse the procedure to return the client to the bed.	22. Transfers client safely and comfortably.
23. Wash hands.	23. Reduces transmission of organisms.

(From G. B. Altman, [2000]. Using a hydraulic lift. In G. B. Altman, P. Buchsel, & V. Coxon. [Eds.], *Delmar's fundamental and advanced nursing skills*. Albany, NY: Delmar Thomson Learning.)

Assisting with Ambulation

Client **ambulation** (assisted or unassisted walking) is encouraged soon after the onset of illness or surgery to prevent the complications of immobility. In planning ambulation, the nurse assesses the client's strength, endurance, and mobility status. Can the client walk alone, or is assistance needed? The presence of equipment (e.g., urinary catheters, IV infusions, drainage tubes) requires assistance; see the Nursing Checklist.

In order to maintain client safety, ambulation must occur in progressive stages. First the client should be able to tolerate sitting on the bedside and dangling the feet. The next step is client tolerance of standing at the side of the bed. Then progressive ambulation can be initiated; see Procedure 34-10.

As ambulation activities are initiated, it is important to assess the client's blood pressure, respiratory rate, pulse, skin color and moisture, and subjective responses. While the client is walking, observe for signs



NURSING CHECKLIST

Assisting with Client Ambulation

- Determine the client's activity level and tolerance for physical exertion.
- Assess for factors that may negatively affect ambulation (e.g., mental status, fatigue, pain, medications).
- Evaluate the environment for safety (e.g., presence of obstacles in walkway, adequate lighting, nonslip floor, handrails; see Figure 34-33).
- Check assistive devices for safety hazards.
- Check client's clothing (e.g., nonslip shoes, adequate covering for privacy and warmth).
- During ambulation, assess client's tolerance of activity.
- Postambulation, assess client's recovery from the activity.



Figure 34-33 The use of handrails promotes safety and independence in ambulating.

of exertion, including diaphoresis, shortness of breath, or weakness. It is also important to assess for the presence of orthostatic hypotension in order to prevent falls. Depending on the client's physical conditioning and the effects of orthostatic hypotension, the client may need to slowly progress to independent ambulation. Once the activity is completed, the nurse evaluates the client evaluation focusing on progression of activity. Continuous evaluation of the client's strength and endurance is performed by the nurse.

Preparing the Client to Walk

One of the best ways to encourage ambulation is to help the client become and remain as independent as possible while lying in bed. This includes urging clients to participate in ROM exercises and perform self-care activities as much as possible.

Independent mobility, the goal of most clients, is the ability to walk, run, sit, and turn without mechanical or personal aid. Progressive exercises and activities that promote independent mobility include:

1. *Turning.* The client can turn in bed using side rails for stabilization and leverage.
2. *Sitting.* The client can raise the head of the bed and lower the height of the bed. Then the client turns to

PROCEDURE 34-10

Assisting a Client with Ambulation

Equipment

None required

Action

1. Inform client of the purposes and distance of the walking exercise.
2. Elevate the head of the bed and wait several minutes.
3. Lower the bed height.
4. With one arm under the client's back and one arm under the client's upper legs, move the client into the dangling position (Figure 34-34).
5. Encourage client to dangle at side of bed for several minutes.
6. Stand in front of client with your knees touching client's knees.
7. Place arms under client's axillae (Figure 34-35).
8. Assist client to a standing position, allowing client time to balance.

Rationale

1. Reduces client anxiety and increases cooperation.
2. Prevents orthostatic hypotension.
3. Reduces distance client has to step down, thus decreasing risk of injury.
4. Provides client support and reduces risk of fall.
5. Prevents orthostatic hypotension. Allows for assessing tolerance for the sitting position.
6. Prevents client from sliding forward if dizziness or faintness occurs.
7. Supports client's trunk.
8. Reduces risk of fall.

(continues)

PROCEDURE 34-10

Assisting a Client with Ambulation (continued)

Action

A.

Rationale

B.

Figure 34-34 Assist the client from a supine to a seated position. A. Place one arm under the client's back and one arm under the client's legs. B. Help the client move into the dangling position.



Figure 34-35 Assist client to a standing position by supporting the client's trunk with your arms under the client's axillae.



Figure 34-36 Assisting a Client with Ambulation

9. Help client ambulate desired distance or distance of tolerance by placing your hand under the client's forearm and ambulating close to the client (Figure 34-36).

9. Provides assistance in achieving ambulatory goals.

the side of the bed and swings legs over the side of the bed to assume the dangling position. Arms held in the tripod position give balance to the sitting position.

3. *Standing.* The client dangles for a few minutes to assure balance and then bears weight with both feet at the side of the bed. For additional stability and balance, the client can perch on the edge of the bed for several minutes.
4. *Walking.* The client assesses strength and balance while walking, thus allowing a gradual progression of

the duration of walking. Instruct clients to rest by sitting or standing still stabilized with a guide rail if fatigued.

Client Education

Prior to ambulation, clients who have been immobile need to be prepared adequately in order to prevent injury. Listing the therapeutic outcomes of ambulation is one way to teach clients the importance of ambulation. Clients should also be taught to sit down or use side rails if dizziness occurs.

Teach clients the technique for safe falling in order to minimize risk of injury; see Figure 34-37. Clients should be told that if they begin to feel faint they should fall toward the affected side of the body and to use the unaffected side to raise self from the floor or chair.

Preambulatory Exercise

Helping immobile clients to prepare for ambulation includes instruction of preambulatory exercises in order to strengthen and tone muscles. The quadriceps femoris is the major muscle used for walking, thus, clients should be directed to gently contract and release the leg muscles several times a day. Clients who will be walking with the assistance of walkers and crutches need upper body strength. Instruction in the safe use of ambulatory assistive devices is also necessary for many clients with impaired mobility.

Assistive Devices

Clients who are unable to ambulate independently can use devices designed to help them walk safely. Determination of which device to use is based on the following:

- Upper arm strength
- Endurance (stamina)
- Presence or absence of one-sided weakness
- Weight-bearing ability; see Table 34-16

See Table 34-17 for a comparison of the three most common devices used to assist in walking: canes, walkers, and crutches.



Figure 34-37 Support for Fainting Client

TABLE 34-16
Weight-bearing Status

Degree of Weight Bearing	Description
Non-weight bearing	Patient does not bear weight on the affected extremity. The affected extremity does not touch the floor.
Touchdown weight bearing	Patient's foot of the affected extremity may rest on the floor, but no weight is distributed through that extremity.
Partial weight bearing	Patient bears 30%–50% of his or her weight on the affected extremity.
Weight bearing as tolerated	Patient bears as much weight as can be tolerated on the affected extremity without undue strain or pain.
Full weight bearing	Patient bears weight fully on the affected extremity.

(Reprinted with permission from Maher, A. [1994]. *Orthopedic nursing*. Philadelphia: Saunders)

Canes

A cane is to be used by clients who can bear weight on both legs but have some weakness in one leg or hip. The straight (standard) cane is used most often; canes with three or four legs are used with clients who need more stability than provided by the straight cane. Quad canes provide more stability but are sometimes more awkward to use than the straight cane; see Figure 34-38.

NURSING ALERT

To promote safe ambulation using a cane, be sure that:

- the cane is appropriate for the client's height and that the cane has suction grips to prevent falls
- client is wearing flat shoes with nonskid soles

Walkers

A walker is a waist-high metal tubular device with a handgrip and four legs. Some walkers have rubber tips on all four legs, whereas others have wheels on the two front legs. The advantages of using a walker include provision of extra support, provision of a sense of security, and independence. The client first moves the walker forward and then takes a step while balancing his or her weight on the walker.

TABLE 34-17
Assistive Devices for Ambulation

Equipment Description		Directions for Use
Cane	<p>Widens base of support</p> <p>Various styles:</p> <p>(1) Regular (straight)—gives minimal support for balance</p> <p>(2) Three-point—provides broader base of support; more cumbersome</p> <p>(3) Four-point (quad)—broader base of support; more cumbersome</p>	<p>Use on unaffected side</p> <p>Advance cane simultaneously with affected limb</p> <p>Hold close to body; do not move cane forward beyond toes of affected foot</p>
Walker	<p>Provides more stability than canes due to broader base of support</p> <p>Various styles:</p> <p>(1) Pickup—assists with weight bearing; lifting may cause some strain for client</p> <p>(2) Rolling—pushed on wheels thus reduces physical strain on client</p>	<p>For clients with weight-bearing status: Advance walker and step normally</p> <p>For partial or non-weight bearing on one limb: Thrust weight forward, then lift walker and replace all four legs on floor</p>
Crutches	<p>Less stable than canes and walkers</p> <p>Requires upper body strength and ability to maintain balance</p>	<p>Use good posture</p> <p>Maintain proper foot position on affected side (footdrop can result from walking on toes or ball of foot)</p> <p>Eliminate obstacles in ambulatory path</p>

(Data adapted from Eliopoulos, C. [1999]. *Manual of gerontologic nursing* [2nd ed. pp. 286–287]. St. Louis, MO: Mosby.)



Figure 34-38 Nurse promotes safety of a client using a quad cane. Note the use of gait belt for added stability.

A walker is used by clients who need more support than that provided by a cane. Walkers are available with and without wheels. The walker without wheels provides more stability but also requires more client stamina in order to lift the walker. Walkers with wheels are intended for use by clients with limited upper body strength. The nurse should determine the following for clients using walkers:

1. Amount of weight bearing allowed on lower limb
2. Appropriateness for client's height
3. Type of walker (pick-up or rolling)
4. With pick-up walker: client's ability to grip, lift, and propel the walker forward
5. With rolling walker: client's ability to grip and propel the walker forward

When educating clients about the use of walkers, inform them when transferring from chair or commode they should back the walker to the toilet seat and use arms of chair or commode to assist in standing. Teach clients to always use both hands when using a walker to transfer from standing to sitting; see Figure 34-39.

Crutches

A crutch is a wooden or metal staff used to increase client mobility. There are two types of crutches: axillary and forearm. The most commonly used type, the axillary crutch, fits under the axilla with the weight being placed on the handgrips. The forearm crutch, which



Figure 34-39 Client Using a Walker

has a handgrip and a metal cuff that fits around the arm, is more convenient but provides less stability than the axillary crutch.

To prevent slipping, crutches have rubber tips, which must be kept dry. If the tips are worn or loose, they must be replaced. The crutch must be regularly inspected; if cracks or bends are present, the person's weight will not be properly supported.

Crutches can be used by clients who are unable to bear any weight on one leg, clients who can bear partial weight on one leg, as well as clients who have full weight bearing on both legs.

Several gaits are used with crutches: the four-point gait, three-point gait, two-point gait, and swing-through gait.

The *four-point gait* for weight bearing with both legs follows the pattern of right crutch forward, left foot forward, left crutch forward, then right foot forward. The four-point gait with crutches is very stable but slow. The *two-point gait* for weight bearing with both legs has the pattern of right crutch and left foot forward together, then left crutch and right foot forward together. The two-point gait requires more balance but is a faster gait. The *three-point gait* for weight bearing with one leg has the pattern of crutches and weak leg forward together, then weight-bearing leg forward. The *swing-through gait* has the pattern of crutches forward, then legs swing forward together. The swing-through gait has the advantage of speed; however, it requires good balance. See Procedure 34-11 for a description of crutch-walking techniques.



CLIENT TEACHING CHECKLIST

Crutch Walking

Climbing Stairs

This method of climbing stairs provides a broad base of support and stability for the weaker leg:

- Climb stairs using the stronger leg first.
- Bring the crutches to the level of the stronger leg.
- Bring the weaker leg to the level of the crutches and the stronger leg.
- Repeat to climb stairs. *This requires time, balance, and strength.*

Descending Stairs

This method of descending stairs provides a broad base of support and stability for the weaker leg:

- Support the body with the stronger leg.
- Move the crutches down to the first descending step.
- Move the stronger leg to the first descending step.
- Repeat to descend the staircase. *This requires time, balance, and strength.*

Sitting in a Chair

The client has greater stability using the stronger leg and chair arm for support:

- Stand in front of a chair.
- Hold the crutches on the side with the weaker leg.
- Grasp the chair arm using the arm on the side of the stronger leg.
- Flex knees and hips to sit in chair.
- Reposition self in chair using arms and stronger leg while sitting.

Rising from the Chair

The client has greater strength using the stronger leg to rise. More stability is provided by the chair arm and crutches for support. Rising requires more strength than sitting:

- Move forward in chair, placing strongest leg on the floor.
- Grasp the chair arm on the same side of the stronger leg.
- Hold the crutches with the hand on the side of the weaker leg.
- Use the chair arm and crutches for support while rising.
- Once standing, place the crutches in the position for ambulation.
- Weak clients may need assistance. The gait belt is useful in such situations.

PROCEDURE 34-11

Assisting a Client with Crutch Walking

Equipment

- One pair of crutches
- Gait belt (optional)

- Measuring tape

Action

1. Inform client that you will be assisting with ambulation using crutches.
2. Assess client for strength, mobility, range of motion, visual acuity, perceptual difficulties, and balance.
3. Adjust crutches to fit the client. With the client supine, measure from the heel to the axilla. With the client standing, set the crutch position at a point 4 to 5 in. lateral to the client and 4 to 6 in. in front of the client. The crutch pad should fit 1.5 to 2 in. below the axilla (Figure 34-40). The hand grip should be adjusted to allow for the client to have elbows bent at 30° flexion.

Rationale

1. Reduces anxiety; helps increase comprehension and cooperation; promotes client autonomy.
2. Helps determine the capabilities of client and amount of assistance required.
3. Provides broad base of support for client. Space between the crutch pad and the axilla prevents pressure on radial nerves. The elbow flexion allows for space between the crutch pad and axilla.



Figure 34-40 Adjusting Crutches to Fit Client

4. Lower the height of the bed.
 5. Dangle the client at the side of bed for several minutes. Assess for vertigo.
 6. Instruct client on method to hold the crutches; that is, with elbows bent 30° and pad 1.5 to 2 in. below the axilla. Instruct client to position crutches lateral to and forward of feet. Demonstrate correct positioning.
 7. Apply the gait belt around the client's waist if balance and stability are impaired.
4. Allows client to sit with feet on floor for stability.
 5. Allows for stabilization of blood pressure, thus preventing orthostatic hypotension.
 6. Increase client comprehension and cooperation.
 7. Provides support; promotes client safety.

(continues)

PROCEDURE 34-11

Assisting a Client with Crutch Walking (continued)

Action

8. Assist the client to a standing position with crutches. Support as needed.

Four-Point Gait

9. Position the crutches 4.5 to 6 in. to the side and in front of each foot. Move the right crutch forward 4 to 6 in. and move the left foot forward, even with the left crutch (Figure 34-41A). Move the left crutch forward 4 to 6 in. and move the right foot forward, even with the right crutch (Figure 34-41B). Repeat the four-point gait.



A.



B.

Figure 34-41 Four-Point Gait. A. Moving Right Crutch Forward and Left Foot Forward; and B. Moving Left Crutch Forward and Right Foot Forward, Even with Right Crutch

Rationale

8. Standing for a few minutes will assist in preventing orthostatic hypotension.
9. The four-point gait (used for partial or full weight bearing) provides greater stability. Weight bearing is on three points (two crutches and one foot or two feet and one crutch) at all times. The client must be able to bear weight with both legs.

Three-Point Gait

10. Advance both crutches and the weaker leg forward together 4 to 6 in. (Figure 34-42). Move the stronger leg forward, even with the crutches. Repeat the three-point gait.
10. The three-point gait (used for partial or non-weight bearing) provides a strong base of support. This gait can be used if the client has a weak or non-weight-bearing leg.



Figure 34-42 Crutch Walking: Three-Point Gait, Advancing Both Crutches and Weaker Leg Forward Together

(continues)

PROCEDURE 34-11

Assisting a Client with Crutch Walking (continued)

*Rationale***Two-Point Gait**

11. Move the left crutch and right leg forward 4 to 6 in. Move the right crutch and left leg forward 4 to 6 in. Repeat the two-point gait.

Swing-Through Gait

12. Move both crutches forward together 4 to 6 in. Move both legs forward together in a swinging motion, even with the crutches (Figure 34-43). Repeat the swing-through gait.



Figure 34-43 Crutch Walking: Swing-Through Gait

13. Set realistic goals and opportunities for progressive ambulation using crutches.
14. Consult with a physical therapist for clients learning to walk with crutches.

Rationale

11. The two-point gait (used for partial weight bearing) provides a strong base of support. The client must be able to bear weight on both legs. This gait is faster than the four-point gait.
12. The swing-through gait permits a faster pace. This gait requires weight bearing on both legs, greater balance, and more strength.

13. Crutch walking takes up to 10 times the energy required for unassisted ambulation.
14. The physical therapist is the expert on the health care team for crutch-walking techniques.

Wellness Promotion

Wellness promotion emphasizes the need for physical fitness, which increases well-being, increases sympathetic nervous system activity, improves cardiovascular functioning, and produces and maintains weight loss. “Increasing physical activity is beneficial for all ages and all groups” (Bray, 1998, p. 238). The nurse should identify activities enjoyed by the client and encourage increased participation. When planning an exercise program, the following elements should be considered:

- Health status (existing medical conditions)
- Physical condition
- Age
- Preferences for types of activities

NURSING ALERT

Exercise and Climate

Caution clients to consider the climate when exercising and replenish fluids accordingly.

Complementary Treatment Modalities

There are numerous complementary modalities that help improve musculoskeletal health; see the accompanying display. Also, physical activity and relaxation exercises help reduce muscular tension and improve functional abilities.

COMPLEMENTARY/ALTERNATIVE THERAPY

- The herb *Ginkgo biloba* may be used to promote circulation (Eliopoulous, 1999).
- Yoga increases circulation as a result of postural changes on the endocrine glands and nerve plexus (Eliopoulous, 1999).
- Acupuncture is a traditional Chinese medicine (TCM) method of pain relief in which a qualified practitioner inserts needles in certain body sites to promote the release of endorphins, (i.e., natural painkillers, National Institutes of Arthritis and Musculoskeletal and Skin Diseases, 1997).
- Acupressure is a technique similar to acupuncture; pressure instead of needles is applied to the acupuncture sites to relieve pain.
- Massage protects skin integrity by promoting circulation.
- Moist heat (warm towels, hot packs, bath/shower) promotes circulation.
- Cold (ice bag) helps reduce swelling.
- Transcutaneous electrical nerve stimulation (TENS) is used to decrease pain.
- Biofeedback is used to help clients decrease muscular tension.

EVALUATION

Family support for a client with activity or mobility deficits is a delicate balance between independence and dependence that is necessary for positive self-esteem and confidence. This healthy balance can be influenced by the client's family and friends. Healthy balance is fostered through support of the client as requested and needed, and through encouragement and positive acceptance and affection.

Family members are often unaware of the client's potential to improve. Thus, they give unnecessary assistance in activities and mobility rather than allow the client to function independently. The client then becomes resentful because there is a loss of self-control. Resentment can also occur with the family who has accepted the heavy responsibilities of caregiving.

For the client who overestimates his or her own cognitive and physical capabilities and energy level, safety becomes an important issue.

Actual long-term activity and mobility are the foci of evaluation as the client transfers skills and knowledge from the acute-care hospital or rehabilitation facility to home. Common areas of concern regarding activity include:

- Mobility status
- Activities of daily living capacity
- Use of appropriate adaptive devices



Title of Study

"Clinical Decision-Making Process in Perioperative Nursing"

Authors

Davis, G. C., and White, T. L.

Purpose

To develop and test an osteoporosis education program for older adults. The project was conducted to provide direction for developing a model program.

Methods

The study was conducted using a convenience sample of adults aged 65 and older living in a group residential setting. The pilot Osteoporosis Education Program (OEP) was advertised with mailed and posted flyers. A total of 26 residents participated in at least one session. The participants were tested for general knowledge of osteoporosis at the beginning of the program and at the end of the fourth session.

Findings

The OEP evaluation study suggests the use of the following in planning education for older adults:

- Sessions not to exceed 1 hour
- A minimum of four program sessions
- Use of prepared educational materials
- Use of an experiential activity (game) to reinforce learning
- Meeting time that does not conflict with other planned activities
- An informal teaching-learning environment

Implications

The pilot study provided direction for developing both the program format and content. The participant's interest in the program indicated that this type of intervention could be useful to help older adults, who are at greatest risk for osteoporosis, to adopt self-care behaviors. Such behaviors may help decrease the risk of fractures and help maintain the greatest possible level of independence.

Davis, G. C., & White, T. L. (2000). Planning an osteoporosis education program for older adults in a residential setting. *Journal of Gerontological Nursing*, 26(1), 16–23.

- Expansion of client activities
- Use of activities as a basis for building areas of competence and achievement

NURSING CARE PLAN**The Client with a Fractured Leg****Case Presentation**

Magda Constantin is a 15-year-old high school student who is recovering from a closed fracture of her right tibia suffered in a soccer game. She states that she is having trouble using crutches and getting around school, especially up and down the stairs. She is unhappy about not being able to play soccer and states, “People stare at me when I walk down the hall.”

Assessment

- Difficulty ambulating due to cast and crutches
- Verbalizations of discomfort about altered mobility and body image

Nursing Diagnoses

Impaired physical mobility related to inability to use legs normally and difficulty using crutches.

Disturbed body image related to change in lifestyle and appearance and fear of rejection by others.

Expected Outcomes

Client will:

1. Understand and demonstrate proper crutch technique.
2. Verbalize a more positive self-image and acceptance of her temporary condition.

Interventions/Rationales

1. Measure crutch height and fit for client. *Determines proper fit, which will relieve pressure, if any, and facilitate ambulation.*
2. Watch client as she walks across the room using the crutches. *Provides baseline assessment of crutch-walking skills.*
3. Demonstrate correct mechanics of crutch walking using three-point gait. *Allows for partial or non-weight-bearing ambulation.*
4. Ask client to return demonstrate crutch-walking technique. *Demonstrates client’s understanding and ability to execute technique.*
5. Suggest ways that crutch walking can be facilitated, such as wearing soft-soled flat shoes, carrying a backpack strapped over both shoulders, wearing nonbulky shirts to minimize clothing under arms, and taking frequent rest stops while walking. *Tips on facilitating crutch gait will remove barriers to effective walking and increase client comfort and confidence in technique.*
6. Help client understand that cast and crutches are a temporary measure to promote proper healing and are not a reflection of overall body health. *Client should learn to view situation as temporary and keep in mind that the broken leg is only one part of the whole person and need not detract from other positive qualities.*

Evaluation

Magda successfully demonstrates correct crutch-walking technique and decides to purchase a backpack to replace her shoulder bag. She is still somewhat shy about “people staring at me” but seems to be starting to accept the fact that the cast and crutches are temporary. She even jokes that “maybe this is an easy way to get noticed at school.”

Measures of physical assessment, functional assessment, and performance of ADLs are used for follow-up evaluation of the client’s status for activity and mobility. Ongoing assessment of the client’s activity and mobility is important because compliance with home exercise

programs may lessen over time after discharge. When evaluating long-term activity and mobility goal achievement, the nurse should observe the client in the home setting to note the client’s ability to function within his or her own environment.

KEY CONCEPTS

- The nurse must assess the client on an ongoing basis for activity and mobility during acute hospitalization, rehabilitation, and postdischarge.
- Collaboration between client, family, and members of the interdisciplinary health care team is essential for establishing and modifying goals for activity and mobility.
- Nursing interventions are individualized to maximize activity, mobility, and independence for the client and family.
- The nurse should be aware of the home environment and lifestyle of the client.
- Continuity of care among nurses and the interdisciplinary health care team is facilitated.
- The family or caregivers should be included in educational sessions regarding activity and mobility. Practice sessions of activities and mobility by client, family, and caregivers under the direction of the nurse are essential.
- The need for adaptive equipment should be assessed and acquisition of equipment facilitated.
- The client, family, and caregiver should be provided instructions in many forms: demonstrations, videos, pamphlets, handouts.
- The client and family should be informed of community resources to maximize activity, mobility, and independence.
- The nurse should be available to assist the client with problem solving after discharge.

CRITICAL THINKING ACTIVITIES

1. What factors would help the client ambulate independently 20 feet with the use of a walker within 2 days? What factors would hinder the client?
2. Think about persons of various age groups functioning normally in activities. Note the difference in the stages of growth and development.
3. Assess clients of various ages within the acute-care hospital setting. What are the alterations of activity and mobility of these clients as compared with normal expectations?
4. Evaluate your mobility and lifting habits. Do you have a backache or feel strained after work?
5. What equipment is available in your clinical setting to promote safe body mechanics?

WEB RESOURCES

American Association of Spinal Cord Nurses

www.aascn.org

National Easter Seal Society, Inc.

www.easter-seals.org

National Institute of Arthritis and Musculoskeletal and Skin Diseases, National Institute of Health

www.nih.gov/niams

Occupational Safety and Health Administration, U.S. Department of Labor

www.osha.gov

Skin Integrity and Wound Healing



In dwelling upon the vital importance of sound observation, it must never be lost sight of what observation is for. It is not for the sake of piling up miscellaneous information or curious facts, but for the sake of saving life and increasing health and comfort.

—Nightingale (in Skretkowicz, 1992)

COMPETENCIES

1. Describe the normal process of tissue healing.
2. Differentiate between primary, secondary, and tertiary wound healing.
3. Discuss factors that may impair or promote wound healing.
4. Discuss common complications of wound healing.
5. Discuss the risk factors and pathogenesis of pressure ulcers.
6. Identify preventive and early treatment measures in clients at risk for pressure ulcer development.
7. Utilize the nursing process for a client with impaired skin integrity by:
 - a. Identifying appropriate assessment data
 - b. Formulating relevant nursing diagnoses
 - c. Developing a plan of care and identifying outcome criteria
 - d. Implementing appropriate nursing interventions
 - e. Evaluating a plan of care according to outcome criteria
8. Describe the principles of wound assessment and care.
9. Outline dressing products used to treat wounds.
10. Discuss the therapeutic uses of heat and cold therapy and their methods of application.

KEY
TERMS

angiogenesis	full-thickness wound	pyogenic bacteria
black wound	hematoma	red wound
blanching	hemorrhage	secondary intention healing
clean-contaminated wound	hemorrhagic exudate	serous exudate
clean wound	hemostasis	shearing
closed suction drainage system	homeostasis	superficial wound
collagen	inflammation	suppuration
contaminated wound	intentional wound	suture
dehiscence	ischemia	tertiary intention healing
dirty and infected wound	partial-thickness wound	unintentional wound
epithelialization	penrose drain	vasoconstriction
evisceration	phagocytosis	vasodilation
exudate	pressure ulcer	wound
friction	primary intention healing	yellow wound
	purulent exudate	

Maintaining skin integrity is an important aspect of nursing care. Impaired skin integrity, such as wounds, may occur as a result of trauma or surgery. The potential for skin breakdown and eventual pressure ulcer formation also exists whenever factors such as prolonged pressure, constant irritation of the skin, and immobility are present. Nurses, through constant and timely observations and interventions, can prevent or minimize skin breakdown.

WOUNDS

The skin is the body's largest organ and is the primary defense against infection. A disruption in the integrity of body tissue is called a **wound**.

Physiology of Wound Healing

When an injury is sustained, a complex set of responses is set into motion, and the body begins a three-phase process of wound healing. Understanding these physiological responses will assist the nurse in caring for clients with impaired skin integrity and promoting optimal wound healing.

Defensive (Inflammatory) Phase

The defensive phase occurs immediately after injury and lasts about 3 to 4 days. The major events that occur in this phase are hemostasis and inflammation. **Hemostasis**, or cessation of bleeding, occurs by vasoconstriction of large blood vessels in the affected area. Platelets, activated by the injury, aggregate to form a platelet plug and stop the bleeding. Activation of the clotting cascade results in the eventual formation of fibrin and a fibrinous meshwork, which further entraps platelets and other cells. The result is fibrin clot formation, which provides initial wound closure, prevents

excessive loss of blood and body fluids, and inhibits contamination of the wound by microorganisms.

Inflammation is the body's defensive adaptation to tissue injury and involves both vascular and cellular responses. During the vascular response, tissue injury and activation of plasma protein systems stimulate the release of various chemical mediators, such as histamine (from mast cells), serotonin (from platelets), complement, and kinins. These vasoactive substances cause blood vessels to dilate and become more permeable, resulting in increased blood flow and leakage of serous fluid into the surrounding tissues. The increased blood supply carries nutrients and oxygen, which are essential for wound healing, and transports leukocytes to the area to participate in **phagocytosis**, or the envelopment and disposal of microorganisms. The increased blood supply also removes the "debris of battle," which includes dead cells, bacteria, and **exudate**, or material and cells discharged from blood vessels. The area is red, edematous, and warm to touch, and it has varying amounts of exudate as a result.

During the cellular response, leukocytes move out of the blood vessel into the interstitial space. Neutrophils are the first cells to arrive at the injured site and begin phagocytosis. They subsequently die and are replaced by macrophages, which arise from blood monocytes. Macrophages perform the same function as neutrophils but remain for a longer time. In addition to being the primary phagocyte of debridement, macrophages are important cells in wound healing because they secrete several factors, including fibroblast activating factor (FAF) and angiogenesis factor (AGF). FAF attracts fibroblasts, which form collagen or collagen precursors. AGF stimulates the formation of new blood vessels. The development of this new microcirculation supports and sustains the wound and the healing process.

Reconstructive (Proliferative) Phase

The reconstructive phase begins on the third or fourth day after injury and lasts for 2 to 3 weeks. This phase con-

tains the process of collagen deposition, angiogenesis, granulation tissue development, and wound contraction.

Fibroblasts, normally found in connective tissue, migrate into the wound because of various cellular mediators. They are the most important cells in this phase because they synthesize and secrete collagen. **Collagen** is the most abundant protein in the body and is the material of tissue repair. Initially, collagen is gel-like, but within several months it cross-links to form collagen fibrils and adds tensile strength to the wound. As the wound gains strength, the risk of wound separation or rupture is less likely. The wound can resist normal stress such as tension or twisting after 15 to 20 days. During this time, a raised “healing ridge” may be visible under the injury or suture line.

Angiogenesis (formation of new blood vessels) begins within hours after the injury. The endothelial cells in preexisting vessels begin to produce enzymes that break down the basement membrane. The membrane opens, and new endothelial cells build a new vessel. These capillaries grow across the wound, increasing blood flow, which increases the supply of nutrients and oxygen needed for wound healing.

Repair begins as granulation tissue, or new tissue, grows inward from surrounding healthy connective tissue. Granulation tissue is filled with new capillaries that are fragile and bleed easily, thus giving the healing area a red, translucent, granular appearance. As granulation tissue is formed, **epithelialization**, or growth of epithelial tissue, begins. Epithelial cells migrate into the wound from the wound margins. Eventually, the migrating cells contact similar cells that have migrated from the outer edges. Contact stops migration. The cells then begin to differentiate into the various cells that compose the different layers of epidermis.

Wound contraction is the final step of the reconstructive phase of wound healing. Contraction is noticeable 6 to 12 days after injury and is necessary for closure of all wounds. The edges of the wound are drawn together by the action of myofibroblasts, specialized cells that contain bundles of parallel fibers in their cytoplasm. These myofibroblasts bridge across a wound and then contract to pull the wound closed.

Maturation Phase

Maturation, the final stage of healing, begins about the twenty-first day and may continue for up to 2 years or more, depending on the depth and extent of the wound. During this phase, the scar tissue is remodeled (reshaped or reconstructed by collagen deposition and lysis and debridement of wound edges). Although the scar tissue continues to gain strength, it remains weaker than the tissue it replaces. Capillaries eventually disappear, leaving an avascular scar (a scar that is white because it lacks a blood supply).

Types of Healing

Tissue may heal by one of three methods, which are characterized by the degree of tissue loss. **Primary intention healing** occurs in wounds that have minimal tissue

loss and edges that are well approximated (closed). If there are no complications, such as infection, necrosis, or abnormal scar formation, wound healing occurs with minimal granulation tissue and scarring.

Secondary intention healing is seen in wounds with extensive tissue loss and wounds in which the edges cannot be approximated. The wound is left open, and granulation tissue gradually fills in the deficit. Repair time is longer, tissue replacement and scarring are greater, and the susceptibility to infection is increased because of the lack of an epidermal barrier to microorganisms.

Tertiary intention healing, also known as delayed or secondary closure, is indicated when primary closure of a wound is undesirable. Conditions in which healing by tertiary intention may occur include poor circulation or infection. Suturing of the wound is delayed until the problems resolve and more-favorable conditions exist for wound healing.

Kinds of Wound Drainage

Chemical mediators released during the inflammatory response cause vascular changes and exudation of fluid and cells from blood vessels into tissues. Exudates may vary in composition but all have similar functions. These functions include:

1. Dilution of toxins produced by bacteria and dying cells
2. Transport of leukocytes and plasma proteins, including antibodies, to the site
3. Transport of bacterial toxins, dead cells, debris, and other products of inflammation away from the site

The nature and amount of exudate vary depending on the tissue involved, the intensity and duration of the inflammation, and the presence of microorganisms.

Serous exudate is composed primarily of serum (the clear portion of blood), is watery in appearance, and has a low protein count. This type of exudate is seen with mild inflammation resulting in minimal capillary permeability changes and minimal protein molecule escape (e.g., seen in blister formation after a burn).

Purulent exudate is also called pus. It generally occurs with severe inflammation accompanied by infection. Purulent exudate is thicker than serous exudate because of the presence of leukocytes (particularly neutrophils), liquefied dead tissue debris, and dead and living bacteria. The process of pus formation is called **suppuration**, and bacteria that produce pus are referred to as **pyogenic bacteria**. Purulent exudates may vary in color (e.g., yellow, green, brown) depending on the causative organism.

Hemorrhagic exudate has a large component of red blood cells (RBCs) due to capillary damage, which allows RBCs to escape. This type of exudate is usually present with severe inflammation. The color of the exudate (bright red versus dark red) reflects whether the bleeding is fresh or old.

Mixed types of exudates may also be seen, depending on the type of wound. For example, a serosanguineous exudate is clear with some blood tinge and is seen with surgical incisions.

Factors Affecting Wound Healing

Wound healing is dependent on multiple influences, both intrinsic and extrinsic. Wounds may fail to heal or may require a longer healing period when unfavorable conditions exist. Factors that may negatively influence healing include age, nutrition, oxygenation, smoking, drug therapy, and diseases such as diabetes. Such factors reduce local blood supply and, therefore, impair wound healing. Nutrition and diet can also have an impact on the healing process. See Tables 35-1 and 35-2 for a summary of factors that affect wound healing (these tables are compiled from information found in Cooper, 1990; Hottler, 1990; Jones & Millman, 1990; Levenson & Seifter, 1977; Schumann, 1979; and Sieggreen, 1987).

Hemorrhage

Some bleeding from a wound is normal during and immediately after initial trauma and surgery, but hemo-

stasis usually occurs within a few minutes. **Hemorrhage** (persistent bleeding) is abnormal and may indicate a slipped surgical suture, a dislodged clot, or erosion of a blood vessel. Swelling in the area around the wound or affected body part and the presence of sanguineous drainage from the surgical drain may indicate internal bleeding. Other evidence of bleeding may include the signs and symptoms seen in hypovolemic shock (decreased blood pressure, rapid thready pulse, increased respiratory rate, diaphoresis, restlessness, and cool clammy skin). A **hematoma** (localized collection of blood underneath the tissues) may also be seen and appear as a reddish blue swelling or mass. External hemorrhaging is detected when the surgical dressing becomes saturated with sanguineous drainage. It is also important to assess the linen under the client's wound site because it is possible for the blood to seep out from under the sides of the dressing and pool under the client. The risk for hemorrhage is greatest during the first 24 to 48 hours after surgery.

Infection

Bacterial wound contamination is one of the most common causes of altered wound healing. A wound can become infected with microorganisms preoperatively,

TABLE 35-1
Factors Affecting Wound Healing

Factor	Effect
Age	Blood circulation and oxygen delivery to the wound, clotting, inflammatory response, and phagocytosis may be impaired in the very young and the elderly; thus, the risk of infection is greater. Rate of cell growth and epithelialization of open wounds is lower with advancing age, so wound healing is slowed.
Nutrition	A balanced diet with adequate amounts of protein, carbohydrates, fats, vitamins, and minerals is needed to increase the body's resistance to pathogens and to decrease the susceptibility of skin and mucous membranes to infection and trauma. Surgery, severe wounds and infections, stress from burns and trauma, and preexisting nutritional deficits increase nutritional requirements. Malnutrition reduces humoral and cell-mediated factors, leading to immunocompromise, thus impairing wound healing and increasing the risk for infection. Obesity leads to fatty tissue, which has a decreased supply of blood vessels, that impairs delivery of nutrients and other elements needed for healing; also, suturing of fatty tissue is more difficult, and complications such as dehiscence or evisceration with subsequent infection may occur.
Oxygenation	Decreased arterial oxygen tension alters the synthesis of collagen and the formation of epithelial cells, causing wounds to heal more slowly. Reduced hemoglobin levels (anemia) decrease oxygen delivery to the tissues and interfere with tissue repair.
Smoking	Functional hemoglobin levels decrease, impairing oxygenation to tissues.
Drug therapy	Steroids reduce inflammatory response and slow collagen synthesis. Anti-inflammatory drugs suppress protein synthesis, wound contraction, epithelialization, and inflammation. Prolonged antibiotic use, with development of resistant strains of bacteria, may increase the risk of superinfection.
Diabetes mellitus	Small-vessel disease (microvascular changes) can impair tissue perfusion and oxygen delivery. Hemoglobin in poorly controlled diabetes has an increased affinity for oxygen, allowing less to be released to the wound bed. Elevated blood glucose levels impair leukocyte function and phagocytosis. The high-glucose environment is an excellent medium for the growth of bacterial, fungal, and yeast infections.

TABLE 35-2
Nutrients That Enhance Wound Healing

Nutrient	Function in Wound Repair
Proteins	
Amino acids	Neovascularization Lymphocyte formation Fibroblast proliferation Collagen synthesis Wound remodeling Cell-mediated responses (phagocytosis)
Albumin	Osmotic equilibrium control Edema prevention
Carbohydrates	
	Cellular energy Protein sparing
Fats	
	Cellular energy Component of cell membrane Prostaglandin production
Minerals	
Copper	Collagen cross-linking for scar strength
Iron	Collagen synthesis and enhanced leukocytic bacterial activity
Zinc	Cell proliferation and cell membrane stabilization
Vitamins	
A	Collagen synthesis Epithelialization
Pyridoxine, riboflavin, thiamine	Antibody and WBC formation Cofactors of enzyme systems
C	Resistance to infection Collagen synthesis Capillary formation and stabilization
K	Coagulation

intraoperatively, or postoperatively. During the preoperative period, the wound may become exposed to pathogens because of the manner in which the wound was inflicted, such as in traumatic injuries. Nicks or abrasions created during preoperative shaving may also be a source of pathogens. The risk for intraoperative exposure to pathogens increases when the respiratory, gastrointestinal, genitourinary, and oropharyngeal tracts are opened.

If the amount of bacteria in the wound is sufficient or the client's immune defenses are compromised, clinical infection may result and become apparent 2 to 11 days postoperatively. Infection slows healing by prolonging the inflammatory phase of healing, competing for nutri-

ents, and producing chemicals and enzymes that are damaging to the tissues.

Dehiscence and Evisceration

Wound healing may be disrupted by **dehiscence**, the partial or complete separation of the wound edges and the layers below the skin. **Evisceration** occurs when the client's viscera protrude through the disrupted wound. Factors that may predispose a wound to dehiscence include obesity, poor nutrition, problems with suturing, excessive coughing, vomiting, straining, and infection. Wound dehiscence is most likely to occur 4 to 5 days postoperatively, before extensive collagen is deposited in the wound. It may be preceded by sudden straining, such as that associated with coughing, sneezing, or sitting up in bed. Signs of impending dehiscence may include the sensation of "something giving way" and an increased flow of serosanguineous drainage on the wound dressing.

Wound Classification

A variety of terms are used to describe and classify wounds. Wounds are usually described based on their etiology since the treatment for the wound varies depending on the underlying disease process. Wound classification systems describe the cause of the wound, the status of skin integrity, the extent of tissue damage, cleanliness of wounds, or descriptive qualities of the wound such as color. The following are commonly used classification systems.

Cause of Wound

- **Intentional wounds** occur during treatment or therapy. These wounds are usually made under aseptic conditions. Examples include surgical incisions and venipunctures.
- **Unintentional wounds** are unanticipated and are often the result of trauma or an accident. These wounds are created in an unsterile environment and therefore pose a greater risk of infection.

Cleanliness of Wound

This classification system ranks the wound according to its contamination by bacteria and risk for infection (Sussman & Bates-Jensen, 1998).

- **Clean wounds** are intentional wounds that were created under conditions in which no inflammation was encountered and the respiratory, alimentary, genitourinary, and oropharyngeal tracts were not entered.
- **Clean-contaminated wounds** are intentional wounds that were created by entry into the alimentary,

respiratory, genitourinary, or oropharyngeal tract under controlled conditions.

- **Contaminated wounds** are open, traumatic wounds or intentional wounds in which there was a major break in aseptic technique, spillage from the gastrointestinal tract, or incision into infected urinary or biliary tracts. These wounds have acute nonpurulent inflammation present.
- **Dirty and infected wounds** are traumatic wounds with retained dead tissue or intentional wounds created in situations where purulent drainage was present.

Examples of classification systems that describe wound severity for different wound etiology are the National Pressure Ulcer Advisory Panel (NPUAP), discussed later in this chapter, the Wagner staging system, the partial-thickness and full-thickness skin loss criteria, and Marion Laboratories red/yellow/black (RYB) color system.

Wagner Ulcer Grade Classification

The Wagner staging system measures the depth and infection in a wound, mainly a dysvascular foot. It is the primary assessment tool used to evaluate diabetic foot ulcers. The classification ranges from 0 to 5, with 0 identifying the predisposing factors that may lead to grades 1 to 3 (superficial ulcer, deep ulcer, abscess osteitis). Grade 4 and 5, respectively, describe gangrene of the forefoot and gangrene of the whole foot.

Classification by Thickness of Skin Loss

The thickness classification system is based on the depth of the wound (Figure 35-1) and is used for wounds whose etiology is other than pressure wounds such as skin tears, donor sites, vascular ulcers, surgical wounds, or burns.

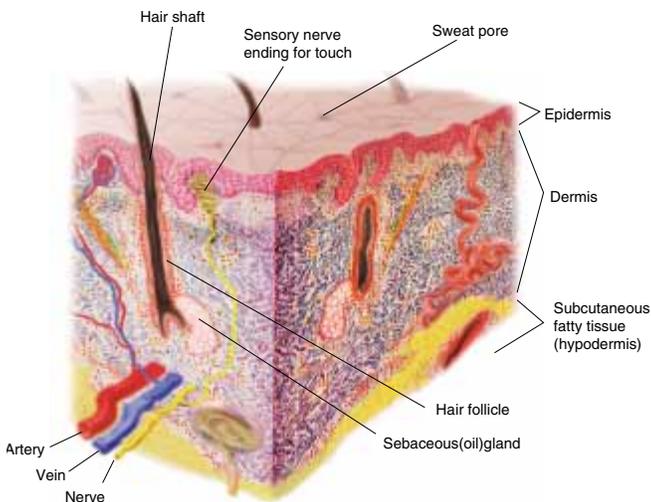


Figure 35-1 Structures of the Skin (From Estes, M. E. Z. [2002]. *Health assessment and physical examination*. Albany, NY: Delmar Publishers.)

THINK ABOUT IT

Impaired Skin Integrity Resulting from Abuse

A woman presents to your clinic with multiple bruises on her breasts, thighs, and abdomen; fresh abrasions on her hands and knees with gravel mixed in; and two puncture wounds on her left shoulder blade, surrounded by streaks of blue ink. Her injuries are highly suggestive of abuse, especially the puncture wounds, because these could not have been self-inflicted. How do you feel about caring for this client? What are the skin care priorities? What other issues should be addressed with this client once her wounds have been evaluated and any immediate physical needs attended to? What are the procedures for reporting suspected abuse at your clinical agency?

Superficial epidermal (first degree) are confined to the epidermis layer, which comprises the four outermost layers of skin. Partial-thickness (first to second degree) involves the epidermis and upper dermis, which is the layer of skin beneath the epidermis. Deep (second degree) involves the epidermis and deep dermis. Full-thickness (third degree) refers to skin loss that extends through the epidermis and the dermis, and into subcutaneous fat and deeper structures. Fourth degree are deeper than full-thickness loss, extending into the muscle and bone.

Types of wounds are described and illustrated in Figure 35-2, and burns are shown in Figure 35-3.

The RYB Wound Classification System

In 1988, the RYB classification system was introduced for use in conjunction with the other classification systems to assist the nurse in assessing the wound surface color. The three-color system is a tool to direct treatment of open wounds, with each color corresponding to specific therapy needs.

Red wounds are the color of normal granulation tissue and are in the proliferative phase of wound repair. These wounds need to be protected and kept moist and clean. **Yellow wounds** have either fibrinous slough or purulent exudate from bacteria. These wounds need to be cleansed of the purulent exudate, and nonviable slough needs to be removed. **Black wounds** contain necrotic tissue (eschar). Eschar may be either black, gray, brown, or tan. These wounds need debridement, which is the removal of nonviable necrotic tissue. Mixed color wounds often occur. The rule for treatment is to treat the worst color first. For example, a red and black wound would be debrided first. Then moisture and protection would be provided for the red portion.



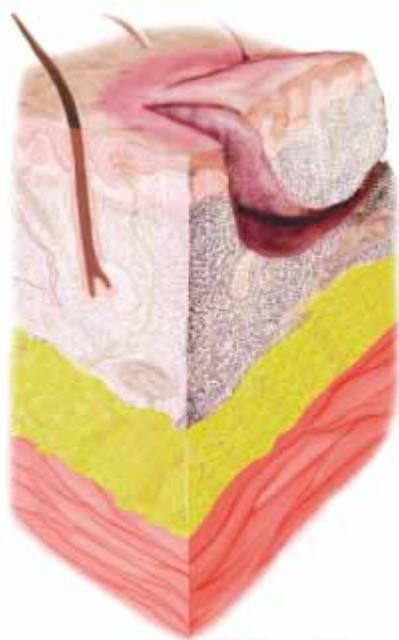
A. **Bruise**, also known as a contusion, results from damage to the soft tissues and blood vessels, which causes bleeding beneath the skin surface. A bruise in a light-skinned individual will change from red to purple to greenish yellow before fading; in a dark-skinned person, the bruise will first look dark red then darker red, brown, or purple, and slowly fade.



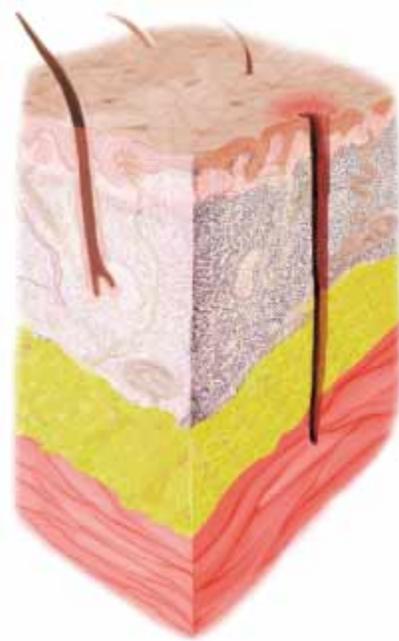
B. **Abrasion**, also known as a scrape or rug burn, results when the outer layer of skin is scraped or rubbed away. Exposure of nerve endings makes this type of wound painful, and the presence of debris from the scraped surface (rug fibers, gravel, sand) makes abrasions highly susceptible to infection.



C. **Laceration**, cut, or incision, is caused by sharp objects such as knives or glass: or from trauma due to a strike from a blunt object that opens the skin, such as a baseball bat. If the wound is deep, the cut may bleed profusely; if nerve endings are exposed, it may also be painful.

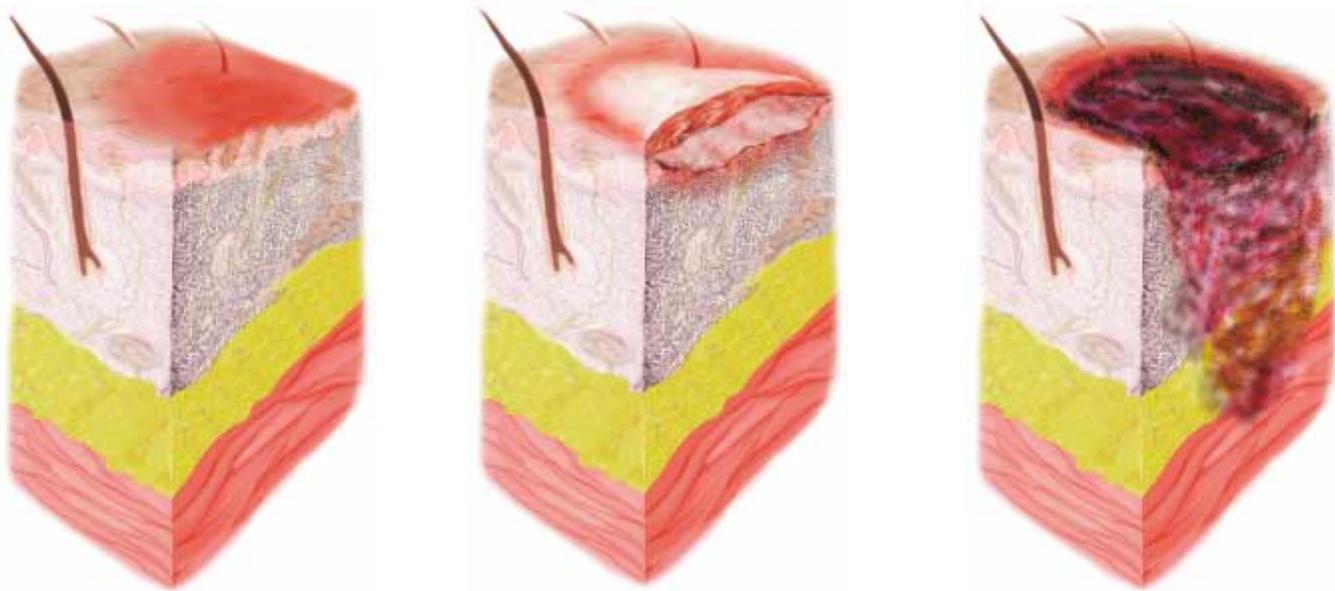


D. **Avulsion**, results when the skin or tissue is torn away from the body, either partially or completely. The bleeding and pain will depend on the depth of tissue affected.



E. **Puncture** results when the skin is pierced by a sharp object such as a pencil, nail, or bullet. If a piece of the object remains in the skin, or if there is little bleeding due to the depth and location of the puncture, infection is likely.

Figure 35-2 Types of Wounds. A. Bruise. B. Abrasion. C. Laceration. D. Avulsion. E. Puncture.



A. Superficial epidermal (first degree burn): Injury to the epidermis; skin is red, dry, and painful.

B. Deep (second degree burn): Injury to the epidermis and upper layers of the dermis, skin is red, moist or dry blisters, and extremely painful; exudate and swelling usually occur.

C. Full-thickness (third degree burn): Injury is to the epidermis, dermis, and subcutaneous tissue; skin is dry, pearly white to charred, inelastic, and leathery.

Figure 35-3 Types of Burns

Assessment

When it comes to wound care, the nurse is confronted with wounds that are extremely diverse. The wound may have occurred traumatically just before the client presents to the emergency room, or the wound may be a slow-healing chronic ulcer. Despite all this diversity, the nurse should approach assessment of the wound in a systematic manner, evaluating the wound's stage in the healing process. The nurse also needs to show sensitivity to the client's pain and tolerance levels during assessment and must always follow Standard Precautions to prevent transfer of pathogens. Following are some basic criteria for wound assessment.

Health History

The health history is conducted to elicit information regarding medical conditions or disease processes that are often associated with delayed or disrupted healing such as cardiovascular disease, diabetes, renal failure, immunosuppression, gastrointestinal disorders, collagen disorders, malignancy, septic shock, trauma, infection, liver disease, pulmonary disease, musculoskeletal disease, and depression/psychosis. It is important to obtain the data in chronological order: when and how the wound occurred, the initial location and size, and all associated symptoms such as pain and itching. The history should include aggravating and alleviating factors, such as radiation at the site of the wound, which can influence the healing process. The nurse should document allergies to tape, latex, medications, or other substances.

A personal and social history and a functional ability assessment is done to determine the client's ability to provide self-care and to identify support systems present in the home. A risk assessment tool, such as the Braden or Norton scale to assess the risk for pressure ulcers, is a part of the history.

Physical Examination

Although the focus of the assessment will be to accurately describe and/or stage the wound, the physical effects of any existing concurrent condition are evaluated. Stotts and Cavanaugh (1999) identify the defining physical areas to be assessed for three common types of ulcers:

Vascular ulcers—Evaluate the skin, nails, hair, color, capillary refill, temperature, pulses, edema of the extremity, and hemosiderin (an iron pigment that is a product of red blood cell hemolysis) in the peri-ulcer area

Arterial ulcers—Weak or absent pulses, thin skin, and lack of hair on the affected extremity

Neuropathic ulcers—Use of the Wagner scale previously discussed to evaluate diabetic ulcers

Wound Assessment

The following discussion will describe how to assess a wound, documenting location and size, noting length, width, and depth in centimeters. The appearance of the wound bed and surrounding skin are assessed for sinus tracts, undermining, tunneling, exudate, drainage,

necrotic tissue, and signs of infection. Some agencies may require a photograph of the wound on admission and documentation of the client’s response to therapy.

Location

Assessment begins with a description of the anatomical location of the wound; for example, “5-inch suture line on the right lower quadrant of the abdomen.” This task often becomes difficult if the client has multiple wounds close to each other, as is common in burn or multiple trauma victims. Use of a skin documentation form that incorporates drawings of the body (Figure 35-4) allows the nurse to draw circles and write numbers to depict the location of the various wounds.

Size

The length (head to toe), width (side to side), and depth of a wound are measured in centimeters. Single-use measurement guides (tape measures) often come with dressing supplies. To determine the depth of a wound, insert a sterile cotton swab into the deepest point of the wound and mark it at the skin surface level. Then the swab can be measured and the wound depth in centimeters can be documented. Tunneling, also called undermining, can be measured by using a cotton swab to gently probe the wound margins. If tunneling is noted, the location and depth are documented. For

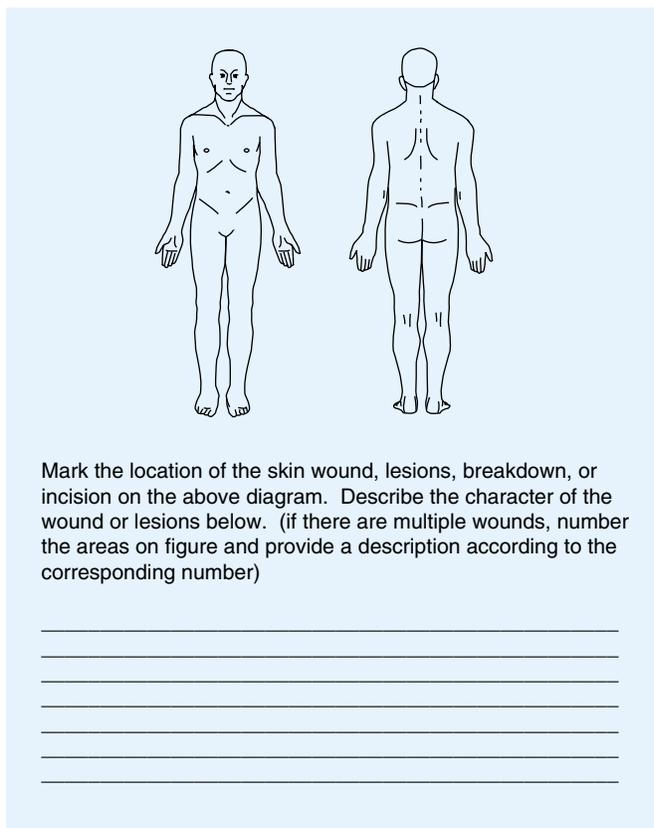
clarity in describing the location of the tunneling, refer to the tunnel location, using the hands of the clock as a guide, with 12 o’clock pointing at the client’s head. Example: “Tunneling occurs at 1 o’clock and its depth is 2 cm.”

For extremely irregularly shaped wounds, the wound edges can be traced on a plastic surface. A plastic bag or piece of plastic sheeting folded in half is placed on the wound, and the wound margins are traced. The side of the plastic that has been placed against the skin is cut off and discarded. The rest of the plastic can be placed in the chart.

General Appearance and Drainage

A general description of the color of the wound and surrounding area helps to determine the wound’s present phase of healing. Gently palpate the edges of the wound for swelling. Document the amount, color, location, odor, and consistency of any drainage.

Nurses who care for the client in the home must demonstrate the need for skilled nursing services by accurately describing all wounds (see the accompanying display). For example, for Medicare to reimburse nursing care, the care must be reasonable, necessary, and reflect a plan of care appropriate for the client’s diagnoses, prognosis, and rehabilitative potential (Baranoski, 1999).



DOCUMENTATION: HOME CARE

Document a clear, concise, and accurate picture of the client’s wound:

- Size, depth, and location of the wound
- Nature of drainage
- Condition and appearance of surrounding skin
- Specific individualized instructions for treatment

Pain

Document and notify the physician of any pain or tenderness at the wound site. Pain may indicate infection or bleeding. It is normal to experience pain at the incision site of a surgical wound for approximately 3 days. If there is any sudden increase in pain accompanied by changes in the appearance of the wound, be sure to notify the physician immediately. See Chapter 33 for more information on assessing pain.

Laboratory Data

Cultures of the wound drainage are used to determine the presence of infection and to identify the causative organism. The sensitivity results list the antibiotics that will effectively treat the infection. An elevated WBC

Figure 35-4 Documenting the Location and Character of Wounds

count is indicative of an infectious process. A decreased leukocyte count may indicate that the client is at increased risk for developing an infection related to decreased defense mechanisms. Albumin is a measure of the client's protein reserves; if decreased, there are decreased resources of protein for wound healing. Procedure 35-1 outlines the correct techniques for culturing a wound.

Nursing Diagnoses

Nursing diagnoses for clients with wounds focus on prevention of complications and promotion of the healing process through proper wound care and client teaching. Following are NANDA(2001)-approved nursing diagnoses with a partial list of related factors:

1. *Impaired Tissue Integrity* related to surgical incision, pressure, shearing forces, decreased blood flow, immobility, mechanical irritants, mechanical (pressure, shear, friction), radiation, nutritional deficit or excess, thermal, irritants, including body excretions, secretions, and medications.
2. *Risk for Infection* related to malnutrition, decreased defense mechanisms
3. *Pain* related to inflammation, infection
4. *Disturbed Body Image* related to changes in body appearance secondary to scars, drains, removal of body parts
5. *Deficient Knowledge* (wound care) related to lack of exposure to information, misinterpretation, lack of interest in learning.

Outcome Identification and Planning

After identifying the nursing diagnoses, the nurse establishes targeted outcomes for wound healing. When formulating outcomes, keep in mind that they should be based on the client's identified needs and should be individualized on the basis of the client's condition. Changes in the health care delivery system have brought about early discharge from the hospital, so clients are often sent home with wounds that need continued care. The goals for clients with wounds generally focus on promoting wound healing, preventing

PROCEDURE 35-1

Culturing a Wound

Equipment

- Disposable gloves
- Normal saline and irrigation tray
- Moisture-proof container or bag
- Sterile gloves and dressing supplies
- Culture tube and swab

Action

1. Wash hands, apply disposable gloves, and remove old dressing. Place old dressing in moisture-proof container, and remove and discard gloves. Wash hands again.
2. Open the dressing supplies using sterile technique, and apply gloves.
3. Assess the wound's appearance; note quality, quantity, color, and odor of discharge.
4. Irrigate the wound with normal saline prior to culturing the wound; do not irrigate with antiseptic.
5. Using a sterile gauze pad, absorb the excess saline, then discard the pad.

Rationale

1. Reduces the transmission of microorganisms. Makes the wound accessible for obtaining the culture.
2. Maintains sterile environment.
3. Provides assessment of the amount and character of the wound's drainage prior to irrigation. Reddened areas and heavy drainage suggest infection.
4. Irrigation decreases the risk of culturing normal flora and other exudates such as protein; irrigating with an antiseptic prior to culturing may destroy the bacteria.
5. Removal of excess irrigant prevents maceration of tissue due to excess moisture.

(continues)

PROCEDURE 35-1

Culturing a Wound (continued)

Action

6. Remove the culture tube from the packaging (see Figure 35-5). Remove the culture swab from the culture tube and gently roll the swab over the granulation tissue. Avoid eschar and wound edges (see Figure 35-6).



Figure 35-5 Remove culture tube from the packaging.



Figure 35-6 Roll the swab over the area to be cultural.

Rationale

6. Decreases the chance of collecting superficial skin microorganisms.
7. Replace the swab into the culture tube, being careful not to touch the swab to the outside of the tube. Recap the tube. Crush the ampule of medium located in the bottom or cap of the tube (see Figure 35-7).
8. Remove gloves, wash hands, and apply sterile gloves. Dress the wound with sterile dressing.
9. Label the specimen and arrange to transport the specimen to the laboratory according to agency policy.
7. Avoids contamination with microorganisms. Releases the medium to surround the swab.
8. Prevents contamination of the wound.
9. Ensures proper handling of specimen.

(continues)

PROCEDURE 35-1

Culturing a Wound (continued)

Action

Figure 35-7 Crush the ampule to release the medium inside the culture tube.

10. Remove gloves and wash hands.
11. Document all assessment findings and actions taken. Document that a specimen was obtained.

Rationale

10. Reduces the transmission of microorganisms.
11. Records information for evaluation and promotes continuity of care.

infection, and educating the client. An example of a goal for debilitated clients would be demonstrating no signs of infection and preventing pressure to certain skin areas for extended periods of time.

Implementation

Nursing interventions to promote wound healing and prevent infection include emergency measures to maintain **homeostasis** (state of internal constancy of the body), and cleansing and dressing of the wound.

Initiate Emergency Measures

The nurse assesses the type and extent of injury that the client has sustained. If hemorrhage is detected, sterile dressings and pressure should be applied to stop the bleeding. Standard Precautions are always implemented. The client's vital signs should be monitored frequently and the physician notified immediately.

When dehiscence or evisceration occurs, the client should be instructed to remain quiet and to avoid coughing or straining. The client should be positioned to prevent further stress on the wound. Sterile dressings, such as ABD pads soaked with sterile normal saline, should be used to cover the wound and abdominal contents. This will reduce the risk of bacterial contamination and drying of the viscera. The surgeon should be notified immediately and the client prepared for surgical repair of the area.

Cleanse the Wound

The goal of cleansing the wound is to remove debris and bacteria from the wound bed with as little trauma to the healthy granulation tissue as possible. Choice of cleansing agent depends on the physician's prescription as well as agency protocol. It is recommended that isotonic solutions such as normal saline or lactated Ringers be used to preserve healthy tissue. Much research has been conducted on the proper use of antiseptic solutions in open wounds. The results remain debatable, and continued research is needed to investigate the effects of antiseptic agents on leukocytes and fibroblasts. Many of the studies do show that commonly used agents such as povidone-iodine 10%, hydrogen peroxide 3%, sodium hypochlorite (Dakin's solution), and acetic acid are effective in destroying bacteria but at the same time destroy fibroblasts and healthy granulation tissue (Lineaweaver, Howard, & Saucy, 1985). Studies suggest that some of these antiseptic solutions at dilute concentrations remain bactericidal yet not cytotoxic to healthy fibroblasts (Doughty, 1994).

The major principles to keep in mind when cleansing a wound are:

1. Use Standard Precautions at all times.
2. When using a swab or gauze to cleanse a wound, work from the clean area out toward the dirtier area. (Example: When cleaning a surgical incision, start

Nursing Process Highlight

NURSING DIAGNOSIS

It is important to remember that, in addition to the physical risks of infection and further tissue damage, clients with wounds, pressure ulcers, and burns often have significant psychosocial needs that could benefit from your competent nursing attention. *Disturbed Body Image* is a common reaction to a severe alteration in one's appearance and needs to be managed sensitively and effectively through honest evaluation and prognosis. You may want to encourage a client to look at the wound and learn to accept it as only one part of the body; if that is too upsetting, encourage the client not to look at the wound until it is in more advanced stages of healing.

If *Deficient Knowledge* is a primary diagnosis, as is usually the case in first-time wound sufferers, then educating the client about wound care and health promotion is among your priorities. Make sure the client understands the healing process and the stages of recovery the wound will go through and what to expect in terms of pain and regrowth. Encourage the client to follow a healthy diet to provide the body with maximum ammunition for wound repair and to get plenty of rest, to allow the body's recuperative elements to do their work.

over the incision line, and swab downward from top to bottom. Change the swab and proceed again on either side of the incision, using a new swab each time (Figure 35-8).

3. When irrigating a wound, warm the solution to room temperature, preferably to body temperature, to prevent lowering of the tissue temperature. Be sure to allow the irrigant to flow from the cleanest area to the contaminated area to avoid spreading pathogens (Procedure 35-2).

Dressing the Wound

The three purposes of a wound dressing are to:

1. Keep the wound moist and therefore enhance epithelialization
2. Clean the wound or keep it clean
3. Protect the wound from physical trauma or bacterial invasion

Keeping these three purposes in mind, the nurse and physician are confronted with the daunting task of determining the appropriate dressing for the client's

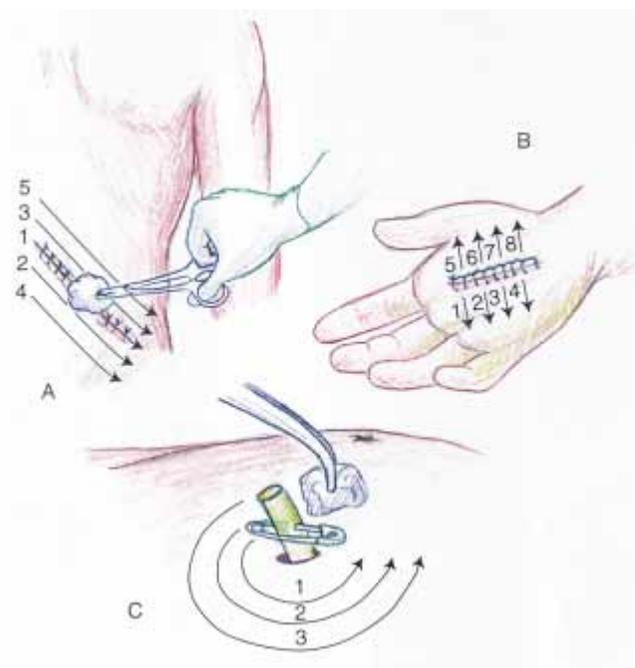


Figure 35-8 Cleaning a wound or surgical incision; use a clean sterile swab for each stroke. A. Begin in the center of the wound. B. Gently stroke the swab outward, away from the incision line. C. Clean around a drain site in a circular motion.

wound. There are literally thousands of different wound care products on the market, which fall into eight basic categories. In order to make an appropriate dressing choice, the nurse needs to be familiar with the proper use and indications for each of these categories and to select the one that meets the client's wound healing needs (Table 35-3). In addition, it is important to remember that the dressing plans must be modified as the wound changes. An excellent guide to help the nurse in the decision-making process is the RYB color code. Procedures 35-3 and 35-4 explain the proper technique for dry sterile dressing and wet to dry dressing changes.

Monitor Drainage of Wounds

During the inflammatory response, exudates develop within a wound. When excessive drainage accumulates in the wound bed, tissue healing is delayed. If the outer surface is allowed to heal while the drainage remains entrapped within the wound, infection and abscess formation may occur. To facilitate drainage of any excess fluid, the physician may insert a tube or drain.

When the drain is inserted by the surgeon at the time of surgery, one end of the drain is placed in the operative site and the other end is usually passed through a separate small stab wound near the main incision. Various types of drains exist on the market. Some flexible drains such as **Penrose drains** function by gravity and have an open end that drains onto dressings. **Closed suction drainage systems** commonly have a

PROCEDURE 35-2

Irrigating a Wound

Equipment

- | | |
|--|---|
| <ul style="list-style-type: none"> ■ Sterile gloves ■ Sterile irrigation kit (basin, piston irrigation syringe, solution container) ■ Sterile dressing material to redress the wound after the irrigation procedure | <ul style="list-style-type: none"> ■ Disposable gloves ■ Irrigation solution (per physician's order) ■ Waterproof pad ■ Moisture-proof container or bag |
|--|---|

*Action**Rationale*

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Confirm the physician's order for wound irrigation, note the type and strength of the ordered irrigation solution. 2. Assess the client's pain level and medicate with analgesic 30 minutes before procedure if the medication is to be given PO or IM. 3. Explain the procedure to the client. 4. Place a waterproof pad on the bed. Assist the client onto the pad. Then assist the client into a position that will allow the irrigant to flow through the wound and into the basin. 5. Wash hands and don the disposable gloves; remove and discard the old dressing. 6. Assess the wound's appearance and note quality, quantity, color, and odor of drainage. 7. Remove and discard the disposable gloves, and wash hands. 8. Prepare the sterile irrigation tray and dressing supplies. Pour the room-temperature irrigation solution into the solution container. 9. Don sterile gloves. 10. Position the sterile basin against the lower edge of the wound to "catch" the irrigant. 11. Fill the piston or bulb syringe with irrigant and gently flush the wound. Refill the syringe and continue to flush the wound until the solution returns clear and no exudate is noted. 12. Dry the edges of the wound. 13. Assess the wound's appearance and drainage. 14. Apply a sterile dressing. Remove sterile gloves and wash hands. 15. Document all assessment findings and actions taken. | <ol style="list-style-type: none"> 1. Wound irrigation is a dependent nursing action. 2. Allows time for medication to be absorbed to increase the analgesic effect. 3. Helps to decrease the client's anxiety and increase the client's cooperation. 4. Positioning of the client and placement of a waterproof pad will decrease contamination of bed linen. 5. Prevents transmission of organisms. 6. Provides assessment of the status of the wound. 7. Prevents transmission of organisms. 8. Aseptic technique is used to prevent introduction of microorganisms into the wound. Room-temperature solution reduces client discomfort. 9. Promotes sterile environment. 10. Decreases possibility of wound contamination. 11. Gently irrigating the wound decreases trauma to granulation tissue. 12. Drying the edges of the wound prevents maceration of tissues due to excess moisture. 13. Provides indication of change in wound status. 14. Application of a sterile dressing protects the wound from microorganisms and trauma. 15. Records information for evaluation. |
|--|--|

TABLE 35-3
Wound Dressing Guidelines

Dressing Type	Examples*	Indications	Advantages	Disadvantages	Tips for Using
Transparent adhesive films	ACU-Derm	Minor burns, lacerations	Impermeable to external fluids and bacteria	Nonabsorptive	Defat surrounding skin with acetone or alcohol as needed
	Bioclusive	Skin donor sites	Conformable	Application can be difficult	
	OpSite	Transparent	Don't require secondary dressing	Can't be used on wounds with fragile surrounding skin, infected wounds or draining wounds	Shave surrounding hair
	Tegaderm	Pressure ulcers: stage I and some stage II (partial thickness, lightly exuding)	Promote autolytic debridement		Allow 1- to 2-inch margin around wound bed
	Transeal	Secondary dressing in certain situations	Reduce surface friction		Dressing change schedule varies with wound condition and location
	UniFlex	Dry necrotic wounds that need autolytic debridement			
	Polyskin				
Hydrocolloids	Comfeel	Partial-thickness wounds	Conformable	Not recommended for wounds with heavy exudate, sinus tracts, infections; wounds that expose bone or tendon; or wounds with fragile surrounding skin	Characteristic odor as well as yellow exudate that looks similar to pus is normal when dressing is removed from wound
	Cutinova hydro	Pressure ulcers: superficial stage III and some approved clean stage IV	Impermeable to external bacteria and contaminants		
	DuoDERM	Wounds with necrosis or slough	Support autolytic debridement	Not transparent	Allow 1- to 1 1/2-inch margin of healthy tissue around wound edges
	IntraSite	Wounds with mild to moderate exudate	Minimally to moderately absorptive	May curl or "seep" under edge	Taping edges will help prevent curling
	Restore		Can be used with compression (treatment of venous stasis ulcers)		Contour dressing to area to increase adhesion
	Tegasorb				Change every three to seven days and as needed with leakage
	Hydrocol				
	Ultec		"Thin" forms diminish friction Reduces pain		

(continues)

TABLE 35-3 (continued)
Wound Dressing Guidelines

Dressing Type	Examples*	Indications	Advantages	Disadvantages	Tips for Using
Collagens	Fibracol	Partial- and full thickness wounds	Comfortable	Contraindicated: sensitive to bovine products and third degree burns	Requires secondary dressing to secure
	Medifil	Pressure ulcers	Absorbent, nonadherent		
	Particles/Gel/Pads	Stage III and some IV	May be used in combination with topical agents	May require rehydration	
	Skin temp sheets	Dermal ulcers	necrotic wounds	Not recommended for	
		Donor sites			
		Surgical wounds			
Hydrogels	Aquasorb	Partial- and full-thickness wounds	Soothing, cooling	Most require secondary dressing	Sheet forms work best on superficial wounds
	Carrasyn Hydrogel Wound Dressing	Wounds with necrosis or slough	Fill dead space	Not used for heavily exuding wounds	Dressing change schedule varies from every eight to 48 hours
	ClearSite	Burns and tissue damaged by radiation	Rehydrate dry wound beds	May dry out, then adhere to wound bed (sheet form in particular)	Use skin barrier wipe on surrounding intact skin to decrease risk of maceration
	Elaso-Gel	Dermal ulcers	Promote autolytic debridement	May macerate surrounding skin	
	IntraSite Gel	Painful wounds	Provide minimal to moderate absorption		
	Normlgel		Conform to wound bed		
	Transorb		Transparent to translucent		
	Vigilon		Many are nonadherent		
		Can be used when infection is present			
Exudate absorbers	AlgiDERM	Wounds with moderate to large amounts of exudate	Absorb up to 20 times their weight in drainage	Require secondary dressing	Can use gauze pad or transparent film as secondary dressing
	Bard Absorption Dressing	Wounds with combination exudate and necrosis	Fill dead space	Not recommended for dry or lightly exuding wounds	Change schedule varies

TABLE 35-3 (continued)
Wound Dressing Guidelines

Dressing Type	Examples*	Indications	Advantages	Disadvantages	Tips for Using
Exudate absorbers (continued)	Debrisan	Wounds that require packing and absorption	Support debridement in presence of exudate	Can dry wound bed	(with type of product used and amount of exudate) from every eight hours to every three to
	DermaSORB Spiral Dressing	Easy to apply four days			
	Mesalt	Infected, exuding wounds			
	Kaltrostat				
	Sorbsan				
Polyurethane foams	Allevyn	Partial- and full-thickness wounds with minimal to moderate exudate	Nonadherent	Require secondary dressing, tape, or net to hold in place	Protect intact surrounding skin with skin sealant to prevent maceration
	Epi-Lock		Conformable		
	Hydrosorb	Secondary dressing for wounds with packing to provide additional absorption	Manage light to moderate amounts of exudate	Not for use with dry eschar, wounds with no exudate, or wounds with sinus tracts unless packed	Change schedule varies from one to five days
	Lyof foam		Easy to apply and remove		
	Mitraflex	Around draining tubes	May be used under compression		
			Can be used on wounds that have surrounding body hair		
			Can be used on infected wounds		
Lubricating sprays of emollients	Dermagran	Partial-thickness wounds	Easy to use	Apply two to three times daily to maintain moist wound environment	May stain clothing or sheets
	Granulex	Saturate gauze packing for use in full-thickness wounds	Inexpensive		
	Proderm	Moisturize wound and stimulate local circulation	Nonadhesive	May require secondary dressing	

(continues)

TABLE 35-3 (continued)
Wound Dressing Guidelines

Dressing Type	Examples*	Indications	Advantages	Disadvantages	Tips for Using
Enzymatic debriders	Accuzyme	Debride full thickness necrotic wounds, pressure ulcers, dermal ulcers, post-op wounds, infected wounds	Non-surgical debridement	Inactivated by soaps, detergents, acidic solutions, metallic ions	Requires daily or twice daily dressing changes
	Collagenase/Santyl				
	Elastase				
Nonadherent dressings	Adaptic	Skin donor sites	Readily available	Limited moisture retention	Change schedule varies from eight- to 24-hour intervals
	Exu-Dry	Abrasions, skin tears	Don't adhere	Require secondary dressing to retain moisture, protect from outside contaminants, and keep in place	
	Sofisorb	Lacerations	Cover partial- and full-thickness wounds without exudate		
	Telfa	Infected wounds, partial- and full-thickness wounds that require packing		May stick to wound if dressing dries out, causing wound damage with removal	
	Vaseline Gauze Xeroform		Can be used with topical antimicrobials, ointments, or creams		
Gauze dressings	Numerous products available	Exudative wounds	Readily available	Will disrupt wound healing if allowed to dry	Change schedule varies with amount of exudate
		Wounds with dead space, tunneling, or sinus tracts	Can be used with appropriate solutions such as gels, normal saline, or topical anti-microbials to keep wounds moist	Require secondary dressing	Pack loosely into wound; tight packing compromises blood flow and delays wound closure
		Wounds with combination exudate or necrotic debris	Can be used on infected wounds		If too wet, dressing will macerate surrounding skin; protect surrounding skin with moisture barrier ointment or skin sealant as needed

(Adapted from: Baranoski, S. (1999) Wound dressing: challenging decisions. *Home Healthcare Nurse*, 17(1), 19–26 and Thompson, J. (2000). A practical guide to wound care. *RN*, 63(1), 48–53.)

*The products listed are representative of type; this list is not meant to be all-inclusive. Refer to manufacturer's directions for product usage.

RESEARCH FOCUS

Title of Study

“A Study to Compare the Effects of a Thin Polyurethane Foam Dressing, a Hydrocolloid Dressing and a Nonadherent Dressing on the Healing Skin Tears in the Elderly”

Authors

Hart, D., Payne, R. L., Knox, D. M., & Neiheisel, M. B.

Purpose

The effects on the rate of wound healing in skin tears of three dressings were compared: thin polyurethane foam dressing; hydrocolloid dressing; nonadherent dressing.

Methods

This experimental design study used a convenience sample of 26 nursing home residents who had sustained a total of 45 skin tears. One of the three dressings were randomly assigned to the skin tears, and the rate of healing was measured by the number of days required to achieve a healed wound.

Findings

Although all skin tears showed evidence of healing, the thin polyurethane foam dressing and the hydrocolloid dressing healed faster than the nonadherent dressing and required less time to complete dressing changes.

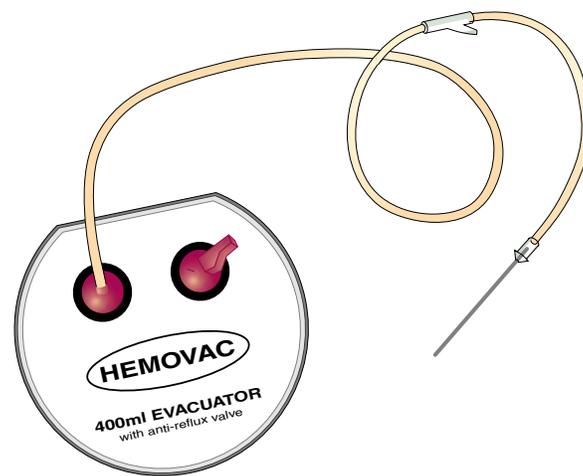
Implications

Choosing the type of dressing that supports healing for the specific type of wound decreases the client’s risk for infection as well as the cost to provide the care.

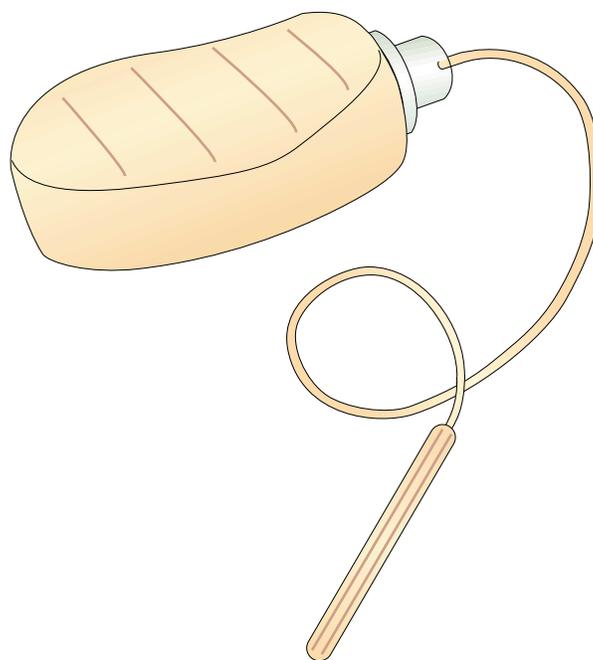
Hart, D., Payne, R. L., Knox, D. M., & Neiheisel, M. B. (1997). A study to compare the effects of a thin polyurethane foam dressing, a hydrocolloid dressing and a nonadherent dressing on the healing skin tears in the elderly. *Ostomy/Wound Management: The Journal for Extended Patient Care Management*, 43(3), 74.

reservoir that is capable of creating negative pressure or a vacuum. The gentle suction that is created draws exudate from the wound into the reservoir. As fluid enters the reservoir, suction is lost; therefore, the nurse must empty the reservoir when it is half full. Hemovac and Jackson-Pratt drains are examples of closed suction drainage systems (Figure 35-9).

Nurses are responsible for maintaining the patency of the system and for assessing the amount, type, and color of the drainage. It is important for the nurse to be



A. Closed System (Hemovac)



B. Tube and Reservoir System (Jackson-Pratt)

Figure 35-9 Drainage Systems

cautious when changing wound dressings to prevent accidental removal or dislodgement of drains.

Provide Suture Care

Sutures are a surgical means of closing a wound by sewing, wiring, or stapling the edges of the wound together. When placed deep within the tissue layers, sutures made of absorbable material are used so that the sutures will not need to be removed but rather can dissolve into the tissue. For surface closures, steel staples or sutures made of wire, nylon, cotton, or other materials are used; these need to be removed as the wound heals.

Nurses are often responsible for removing sutures and should therefore be familiar with different suturing

PROCEDURE 35-3

Applying a Dry Sterile Dressing

Equipment

- | | |
|---|---|
| <ul style="list-style-type: none"> ■ Clean disposable gloves ■ Moisture-proof bag ■ Sterile dressing set (if not available, gather the following): <ul style="list-style-type: none"> Sterile drape Gauze dressing and ABD pads (surgipads) Sterile container for cleansing solution Precut gauze if a drain is present | <ul style="list-style-type: none"> ■ Sterile gloves ■ Bath blanket ■ Cleansing solution (per MD order or agency protocol) ■ Adhesive remover ■ Tape or Montgomery straps |
|---|---|

Action

1. Review medical and nursing orders for dressing change procedure and list of needed supplies.
2. Prepare the client. Assess the client's comfort level and medicate as needed for pain.
3. Explain the procedure to the client. Wash hands, provide for privacy.
4. Position the client. Using a bath blanket, drape the client so that only the wound is exposed.
5. Place the moisture-proof bag within easy reach. Make a cuff on the bag by folding the top over.
6. Wash hands and don disposable gloves. Remove the soiled dressing.
 - a. If Montgomery straps or a binder were used, untie the tapes. If tape was used, gently remove tape by pulling up small sections at a time while holding down the skin in front of the tape (provides countertraction on the skin). If resistance is met, you may need to use adhesive remover (if skin is torn during tape removal, you have created another wound).
 - b. Carefully remove the outer protective dressing. Then remove the inner layers of gauze. If there is a drain present, use caution so that drains are not accidentally removed or dislodged.
 - c. Place the soiled dressings and disposable gloves in the moisture-proof bag.
7. Assess the wound; note the odor and presence of any drainage.

Rationale

1. A physician's order is needed to prescribe a cleansing solution. Nursing orders will describe individualized client needs, such as type and amount of dressing supplies needed.
2. Dressing changes may cause the client pain.
3. Client cooperation is necessary to avoid contamination of the wound. Explanation decreases anxiety and increases cooperation.
4. Provides privacy and prevents chilling.
5. Provides a receptacle for proper disposal of contaminated dressings.
6. Prevents transmission of microorganisms.
 - a. Careful removal of adhesive tapes prevents skin breakdown.
 - b. Exposes the wound.
 - c. Provides proper disposal and prevents contamination.
7. The wound needs to be assessed for signs of complications and healing.

(continues)

PROCEDURE 35-3

Applying a Dry Sterile Dressing (continued)

<i>Action</i>	<i>Rationale</i>
8. Open sterile dressing tray or set up sterile supplies and cleansing solution.	8. Maintains sterile technique.
9. Pour solution into sterile basin.	9. Keeps supplies sterile.
10. Don sterile gloves.	10. Sterile gloves are needed if the wound is open and if drains are present to prevent introduction of microorganisms.
11. Clean the wound with the cleaning solution and gauze. Gauze may be held with the forceps, or swabs may be used. Be sure to cleanse from the area least contaminated to the area more contaminated, and use a new swab for each stroke. If there is a drain present, cleanse this area last.	11. Always clean from the center of the wound to the outer area to avoid contamination of the wound by pathogens present on surrounding skin surfaces.
12. If a drain is present, apply precut dressing around the drain. Apply a thick second layer of gauze over the drain.	12. To absorb exudate and isolate drainage from the wound.
13. Apply sterile dressing over wound (Figure 35-10). Then cover with the surgipad.	13. Provides protection of the wound.
14. Secure the dressing with either tape or the ties from the Montgomery straps (Figure 35-11). Tape should be placed at the edges of the dressing so that the edges cannot be lifted to expose the wound. Paper tape should be used on clients with thin fragile skin and clients who have sensitive skin.	14. Montgomery straps are used when a wound needs to have frequent dressing changes to prevent skin breakdown.



Figure 35-10 Applying a Sterile Dressing

(continues)

PROCEDURE 35-3

Applying a Dry Sterile Dressing (continued)

Action*Rationale*

Figure 35-11 Montgomery Straps

- | | |
|--|--|
| <ul style="list-style-type: none"> 15. Remove gloves, dispose, and wash hands. 16. Reassess client following dressing change to determine status and comfort level. 17. Document all assessment findings and actions taken. | <ul style="list-style-type: none"> 15. Prevents transfer of pathogens. 16. Determines effect of dressing change; alerts to any client needs. 17. Records information for evaluation of progress of wound healing. |
|--|--|

NURSING ALERT

Removing Sutures

When removing sutures, never pull a suture back through the skin. Sutures beneath tissue are sterile, but those that are visible are considered contaminated, and pulling them through the tissue introduces a risk of infection. Instead, cut the suture as close to the skin as possible on one side, then pull it through the skin from the other side.

methods (Figure 35-12). Continuous sutures are made with one thread, tied at the beginning and end of the suture line. Intermittent sutures are each tied individually. In blanket continuous sutures, the single thread is grounded again in the last suture exit.

Checking Bandages, Binders, and Slings

Bandages and binders are applied over wound dressing sites: to secure, immobilize, or support a body part; to hold a dressing in place; or to prevent or minimize

PROCEDURE 35-4

Applying a Wet to Dry Dressing

Equipment

- Gather the equipment outlined in Procedure 35-3, plus:
- Sterile solution
- Fine mesh gauze
- Sterile forceps or sterile cotton swabs.

Action

Rationale

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Review medical and nursing orders for dressing change procedure and list of needed supplies. 2. Prepare the client. Assess the client's comfort level and medicate as needed for pain. 3. Explain the procedure to the client. Wash hands and provide for privacy. 4. Position the client. Using a bath blanket, drape the client so that only the wound is exposed. 5. Place the moisture-proof bag within easy reach. Make a cuff on the bag by folding the top over. 6. Remove the soiled dressing and assess the wound as outlined in Procedure 35-3, steps 6 and 7. 7. Open sterile dressing tray. Using aseptic technique, place fine mesh gauze in sterile container. Pour enough cleansing solution into the container to soak gauze. Don sterile gloves. 8. Clean the wound as described in Procedure 35-3, step 11. 9. Take one piece of fine mesh gauze and gently squeeze out the solution until the gauze is only slightly moist. 10. Open the gauze and <i>gently</i> pack the gauze into the wound, using either forceps or the top of a cotton swab stick. Continue until all surfaces of the wound are in contact with gauze. <i>Do not</i> pack the wound too tightly and <i>do not</i> overlap wound edges with wet packing. 11. Apply a layer of dry gauze over the wet gauze. Then cover with the ABD or surgipads. 12. Secure the dressing with either tape or Montgomery straps (see Procedure 35-3, actions 14–17). | <ol style="list-style-type: none"> 1. A physician's order is needed to prescribe a cleansing solution. Nursing orders will describe individualized client needs such as type and amount of dressing supplies needed. 2. Dressing changes may cause the client pain. 3. Client cooperation is necessary to avoid contamination of the wound. Explanation increases cooperation by decreasing anxiety. 4. Provides privacy and prevents chilling. 5. Provides a receptacle for proper disposal of contaminated dressings. 7. Sterile technique is used to prevent introduction of pathogens into the wound. 9. If the gauze is too moist, the wound bed can get too soupy, increasing the chance of bacterial growth (Wound-Care Update 91, [1991], p. 50). 10. If the wound is packed too tightly, capillaries can get compressed. If the wet packing overlaps the wound edges, it can cause maceration (softening and breakdown of tissue) (Wound-Care Update 91, [1991], p. 50). 11. Protects wound. |
|---|--|

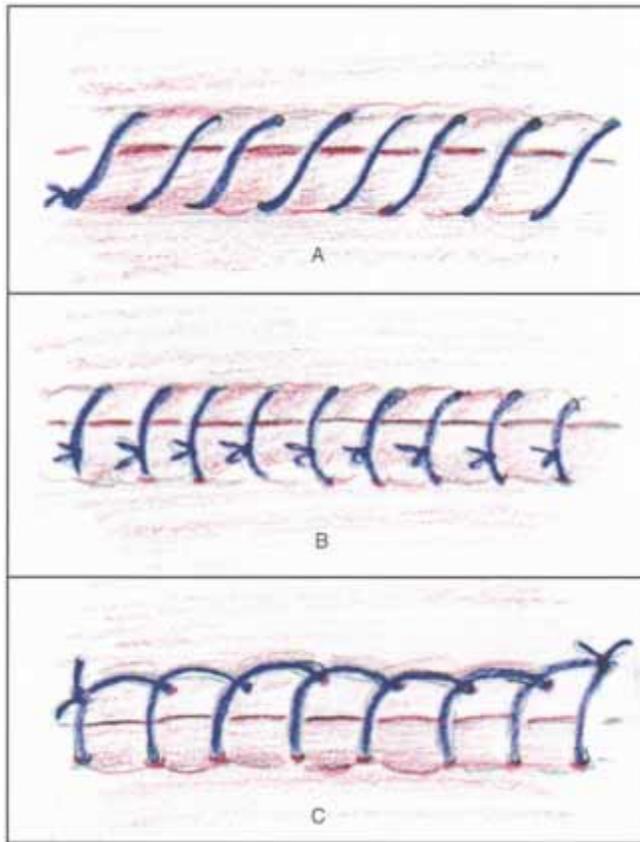


Figure 35-12 Selected Suturing Methods. A. Continuous. B. Intermittent. C. Blanket Continuous.

swelling of a body part. Bandages are long rolls of material, such as gauze, webbing, or muslin, designed to be wrapped around body parts. Figure 35-13 illustrates several different methods of bandaging.

Binders are bandages made for specific body parts, usually the abdomen, perineal area, or arm (sling)

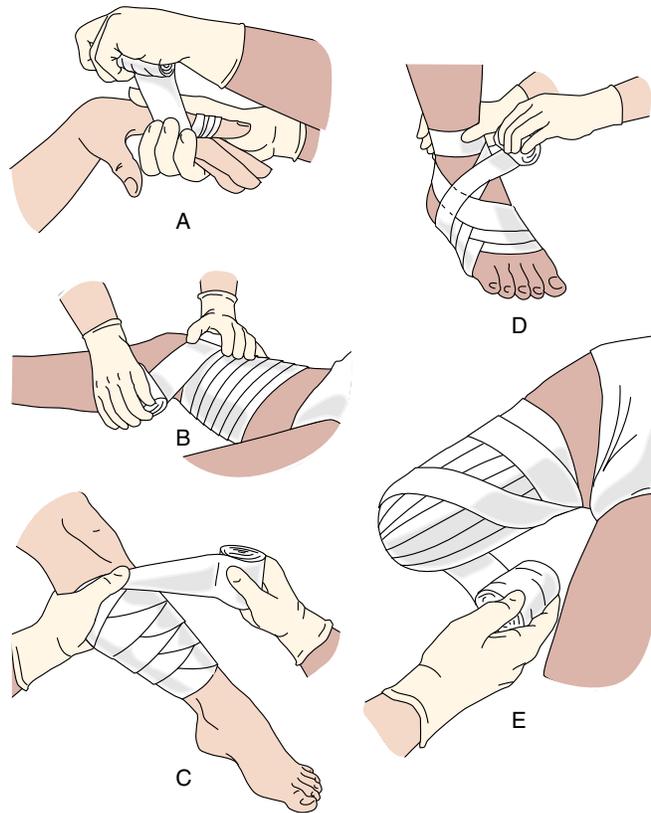


Figure 35-13 Common Bandaging Methods. A. *Circular turns* are wrapped around a body part several times to anchor the bandage or supply support; B. *Spiral turns* begin with a circular turn, then proceed up the body part, with each turn covering two-thirds the width of the preceding turn; C. *Spiral reverse turns* begin with a circular turn. Then the bandage is reversed, or twisted, once each turn to accommodate a limb that gets larger as the bandaging progresses; D. *Figure-eight turns* criss-cross in the shape of a figure eight and are used on a joint that requires movement. E. *Recurrent turns* are anchored with circular turns and follow a back-and-forth motion, and are completed with circular turns; used to cover a fingertip, head, or amputated stump.

APPLICATION: HOME CARE

Early discharge is one of the latest trends in health care. Clients are often being sent home with wounds that need special dressings. To facilitate an easy transition for the client from the hospital to the home, the nurse begins discharge planning during the admission assessment. At this time, the nurse determines the client's support system and availability to assist as caregivers, the home environment, and resources available to the client. Ongoing assessments provide the data for the identification of physical care and home environment needs. At times, a referral for home care nursing is necessary. Common areas for health teaching include:

- Wound care
- Diet therapy
- Medications
- Signs and symptoms of complications of wound healing

(Figure 35-14). Abdominal binders support the abdomen and are used following abdominal surgery or childbirth. Perineal binders, called T binders, are used to hold pads or dressings in the perineal area. Because of urination and defecation needs of clients, T binders must be changed regularly. A sling is a cloth support for an injured arm that wraps around the back of the neck to maintain the arm in a set position.

ADMINISTER HEAT AND COLD THERAPY

Cells in the hypothalamus act as a thermostat to regulate body temperature. When the hypothalamic thermostat detects that the body temperature is either too high or too low, it responds systemically by instituting appropriate temperature-decreasing (vasodilation, sweating) or temperature-increasing (vasoconstriction,

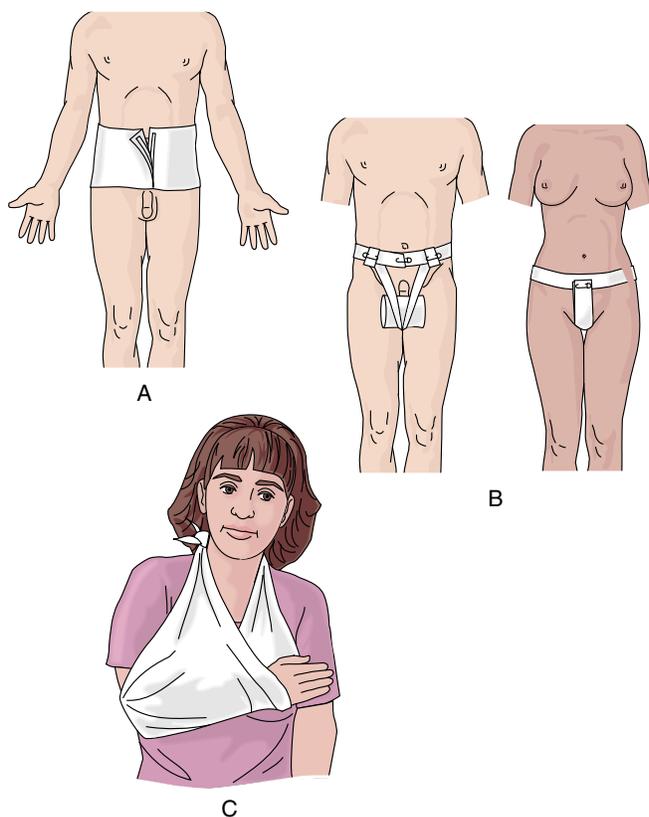


Figure 35-14 Common Binders. A. Abdominal. B. T binders: male and female. C. Arm sling.



NURSING CHECKLIST

Applying Bandages and Binders

When applying bandages and binders:

- Determine what type of support is needed for the wound and dressing.
- Note the appearance and condition of the skin and surrounding area, especially swelling, redness, excessive warmth, exudate, irritation, or uncovered wound areas.
- Ensure that the wound has a fresh sterile dressing *before* applying a bandage or binder to minimize intrusion and discomfort of the client for unnecessary dressing changes.
- Document the appearance of the skin that will be outside the bandage or binder, to monitor changes in circulation, temperature, color, or swelling that occur once the bandage or binder is in place.
- Replace soiled or damp bandages and binders promptly.

shivering) mechanisms to restore body temperature to the normal level.

Local responses to heat and cold occur through stimulation of temperature-sensitive receptors in the skin.

Impulses travel from the periphery to the hypothalamus and the cerebral cortex. The hypothalamus then initiates heat-producing or heat-reducing reactions of the body. The conscious sensations of temperature are aroused in the cerebral cortex.

Heat and cold receptors adapt to changes in temperature. On initial exposure, receptors are strongly stimulated by extremes in temperature, but, within a short time, this response declines as the receptors adapt to the new temperature variations. This adaptive ability of the body to temperature variations can be dangerous to clients insensitive to heat and cold extremes and may predispose them to serious injury. Nurses and clients need to understand this adaptive response when applying heat and cold.

Heat is one of the oldest nursing measures used to reduce pain and promote healing. Heat causes **vasodilation** and increases blood flow to the affected area, producing skin redness and warmth. Heat produces maximum vasodilation in 20 to 30 minutes; after this period, reflex vasoconstriction occurs along with tissue congestion. Periodic removal and reapplication of heat will restore vasodilation. Prolonged exposure to heat damages epithelial cells and results in redness, tenderness, and even blister formation.

The application of cold lowers the temperature of the skin and underlying tissues and causes **vasoconstriction**. Vasoconstriction reduces blood flow to the affected area and produces skin pallor or a bluish discoloration and coolness. Maximum vasoconstriction is achieved at 15°C (60°F); at temperatures below 15°C, the vessels begin to dilate. Prolonged exposure to cold results in a reflex vasodilation. Initially the skin is reddened, but later it takes on a bluish purple mottled appearance with numbness and pain because of impaired circulation and tissue ischemia. Vasodilation and vasoconstriction of the blood vessels in the skin result primarily from increased sensitivity of the vessels to nerve stimulation but also from a protective reflex response that passes to the spinal cord and then back to the vessels. The therapeutic effects of heat and cold applications are outlined in Table 35-4.

The body's response to the application of heat and cold is influenced by a number of factors. See the accompanying display for a discussion of the factors that affect tolerance to heat and cold.

The following conditions necessitate precautions in the use of heat and cold applications:

- **Neurosensory impairment:** Clients with reduced perception of sensory or painful stimuli (e.g., spinal cord injuries) are at an increased risk for tissue injury.
- **Impaired mental status:** Clients who are confused or unconscious need to be monitored and assessed frequently to ensure safety.
- **Impaired circulation:** Clients with cardiovascular and peripheral vascular problems or diabetes may not have the ability to dissipate heat through dilation of

TABLE 35-4
Therapeutic Effects of Heat and Cold Applications

Physiological Responses	Therapeutic Benefits
Heat Therapy	
Promotes vasodilation. Decreases blood viscosity. Increases tissue metabolism. Increases capillary permeability. Reduces muscle tension.	Improves blood flow. Increases delivery of oxygen and nutrients, leukocytes, antibodies to facilitate the inflammatory process. Facilitates removal of wastes and toxins. Produces a local warming effect. Decreases venous congestion in injured tissues. Increases absorption of fluid by capillaries and promotes removal of excess fluid from interstitial spaces, thereby reducing edema. Promotes muscle relaxation and decreases pain from spasm or stiffness.
Cold Therapy	
Promotes vasoconstriction. Increases blood viscosity. Decreases tissue metabolism. Has a local anesthetic effect. Decreases muscle tension.	Decreases blood flow to site of injury, thereby decreasing inflammation and edema formation. Decreases blood flow, facilitating clotting and control of bleeding. Reduces the tissues' oxygen consumption. Raises the threshold of pain receptors, thereby decreasing pain.

blood vessels and are at an increased risk for tissue injury.

- Skin and tissue integrity (open wounds, broken skin, scar formation, edema): Subcutaneous tissues are more sensitive to temperature variations than are superficial tissues (e.g., cold can decrease blood flow to an open wound, thereby inhibiting healing).

Heat and cold can be applied in dry and moist forms (Figure 35-15). The type of wound or injury, location, and presence of drainage or inflammation are considered when selecting moist or dry applications. See Table 35-5 for a discussion on the various forms of dry and moist heat and cold, their therapeutic effects, and general guidelines for their application.

FACTORS AFFECTING HEAT AND COLD TOLERANCE

- Body part: Certain areas of the skin have a sensitivity to temperature variations. The inner aspect of the wrist and forearm, the neck, and the perineal area are temperature-sensitive, while the back of the hand and the foot are not as sensitive.
- Duration of application: Therapeutic benefits of heat and cold applications are achieved with short periods of exposure to temperature variations. Tolerance increases as the length of exposure increases.
- Area of body exposed: The larger the area exposed to heat and cold, the lower the tolerance to temperature changes.
- Damage to body surface area: Injured skin areas are more sensitive than intact areas to temperature variations.
- Individual tolerance: Tolerance to temperature variations is affected by age and physical condition. The young and the aged are especially susceptible to heat and cold. Neurosensory impairments may interfere with the reception and perception of stimuli, increasing the risk of injury.
- Age: Thinner skin layers in children and elderly people increase the risk for burns from the heat and cold applications. Older adults have a decreased sensitivity to pain.



A.



B.

Figure 35-15 Types of Heat and Cold Applications. A. Aquathermal Heating Unit. B. Cold Packs.

TABLE 35-5
Overview of Heat and Cold Applications

DRY	
Heat	Cold
<p>Hot water bag</p> <ul style="list-style-type: none"> • Fill two-thirds full with warm water and remove air at the top so the bag is easier to mold over the body part. • Cover bag with a towel or pillowcase (never apply directly on the skin surface). • Keep bag in place for 20–30 minutes and then remove. • Do not allow the client to lie on the hot water bag. <p>Hot packs</p> <ul style="list-style-type: none"> • Commercially prepared, disposable hot packs supply warm dry heat to an injured area. • Striking or squeezing the pack will release chemicals that create the heat. <p>Aquathermia pads</p> <ul style="list-style-type: none"> • Are useful in treating muscle sprains and for areas with mild inflammation or edema. • Unit consists of a waterproof plastic or rubber pad connected by two hoses to an electrical control unit that has a heating element and a motor. The reservoir of the unit is filled two-thirds full with distilled water. • The desired temperature is usually set with a key at 45°C for adults. • Cover the pad with a thin cloth or pillowcase prior to application. • Treatment usually continues for 20–30 minutes. • Do not have client lie on pad. <p>Electrical heating pads</p> <ul style="list-style-type: none"> • Provide constant, even heat, are lightweight, and can easily be molded to a body part. • Unit composed of electrical coil enclosed within a waterproof pad covered with cotton or flannel cloth. • Instruct the client to avoid using high setting, to prevent burns. • Do not insert sharp objects into the pad. • Do not allow the client to lie directly on the pad, because heat will not dissipate and the client may be burned. 	<p>Ice bag, ice collar</p> <ul style="list-style-type: none"> • Fill two-thirds full with crushed ice so bag is easier to mold over body part. • Cover bag with towel or pillowcase and apply to affected area for 30 minutes. • Provides cold to localized area (e.g., muscle sprain, hematoma) to prevent edema formation, control bleeding, and anesthetize body part. <p>Cold packs</p> <ul style="list-style-type: none"> • Commercially prepared single-use ice packs provide cold for designated period of time. • When the pack is squeezed or kneaded, an alcohol-based solution is released, creating the cold temperature.
MOIST	
Heat	Cold
<p>Warm compresses (gauze dressing moistened in a prescribed warmed solution)</p> <ul style="list-style-type: none"> • Applied to improve circulation, relieve edema, and hasten the suppurative process and healing. • For an open wound, use sterile technique. • Solution to moisten the gauze can be heated first to 40.5°C (105°F) or according to agency protocol, or procedure is similar to application of a wet to dry dressing and the use of a hot water bag or a heating pad to cover the dressing. • Remove compress after 20–30 minutes and redress wound. 	<p>Cold compresses</p> <ul style="list-style-type: none"> • Applied to either decrease or prevent bleeding and to reduce inflammation. • Procedure similar to that for warm compresses except cold compresses applied for 20 minutes at a temperature of 15°C (59°F). • Technique may be clean or sterile. • Observe for signs and symptoms of burning or numbness, mottling of the skin, redness, extreme paleness, or a bluish skin discoloration. <p style="text-align: right;"><i>(continues)</i></p>

TABLE 35-5 (continued)
Overview of Heat and Cold Applications

Heat	Cold
<p>Warm soaks</p> <ul style="list-style-type: none"> • Immersion of body part in warmed solution promotes circulation, decreases edema, increases muscle relaxation, and provides a means to debride wounds and apply medicated solution. • Can also be accomplished by wrapping body part in dressings and saturating them with warmed solution. • Position client comfortably, place waterproof pads under the area to be treated. • Sterile technique is generally indicated for open wounds, such as a burn. Check agency protocol regarding the temperature of the solution. <p>Sitz bath</p> <ul style="list-style-type: none"> • Used for clients who have had rectal surgeries, an episiotomy during childbirth, painful hemorrhoids, or vaginal inflammation. • Only the client's pelvic area is immersed in warm fluid; the client sits in a special tub or chair or in a basin placed on the toilet seat so that the legs and feet remain out of the water (immersing the entire body causes widespread vasodilation, negating the effect of local heat to the perineum or pelvic area). • Water temperature should be from 40° to 43°C (105° to 110°F). • Duration of the bath is usually 15–20 minutes. • Prevent overexposure and chilling by draping a bath blanket over the client's shoulders and thighs, and prevent drafts. • Assess the client during the bath for extensive vasodilation, faintness, dizziness, weakness, increased pulse rate, and pallor. 	<p>Cold soaks</p> <ul style="list-style-type: none"> • Procedure similar to that for warm soaks. • Desired temperature for a 20-minute soak is 15°C (59°F). • Take precautions (such as preventing drafts and draping shoulders) to prevent client from chilling.

(From Lehmann, J. F. [Ed.]. [1982]. *Therapeutic heat and cold* [3rd ed.]. Baltimore, MD: Williams & Wilkins.)

Evaluation

The nurse needs to evaluate the client's achievement of the goals established during the planning phase to achieve or maintain skin integrity. Goals for clients with wounds generally focus on wound healing, prevention of infection, and client education. If the goals are not achieved, the nurse will need to examine the nursing interventions and strategies that were employed and revise the nursing care plan accordingly. Reviewing techniques and procedures, especially those performed by the client or other caregivers in the client's support system, is especially important.

PRESSURE ULCERS

Pressure ulcers, also known as bedsores or decubitus ulcers, are localized areas of tissue necrosis that tend to develop when soft tissue is compressed between a bony prominence and an external surface for a prolonged period of time (National Pressure Ulcer Advisory Panel,



NURSING CHECKLIST *Heat and Cold Applications*

General guidelines to follow when using heat and cold applications include:

1. Obtain a physician's order that details the site to be treated, the type of therapy, and the frequency and duration of application.
2. Select temperature on the basis of client status and agency policy.
3. Thoroughly explain procedure and expected benefits to client.
4. Assess client's status before, during, and after treatment is performed to prevent injury.
5. Document effects of therapy.

1989). Pressure ulcers are due to **ischemia**, or decreased blood supply, and commonly occur in areas subject to high pressure from body weight on bony prominences.

Physiology of Pressure Ulcers

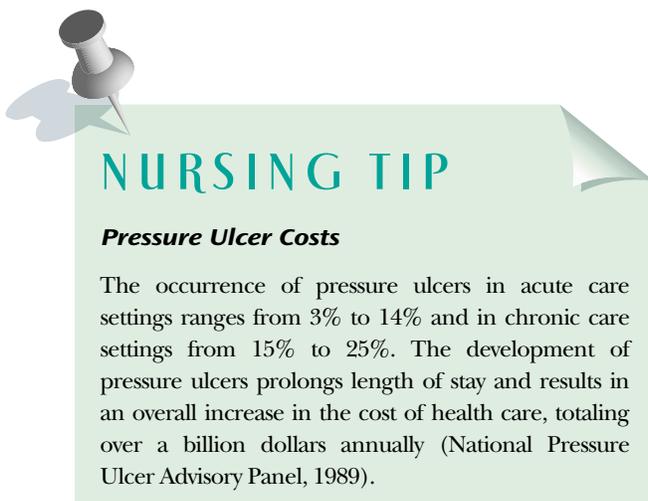
The reduction of blood flow causes **blanching** (white color) of the skin when pressure is applied. When pressure is relieved, the skin takes on a brighter color (reactive hyperemia) due to vasodilation, the body's normal compensatory response to the absence of blood flow. If this area blanches with fingertip pressure or if the redness disappears within an hour, no tissue damage is anticipated. If, however, the redness persists and no blanching occurs, then tissue damage is present.

Other forces acting in conjunction with pressure contribute to pressure ulcer formation. **Shearing** is the force exerted against the skin when a client is moved or repositioned in bed by being pulled or allowed to slide down in bed. The skin and subcutaneous tissue tend to adhere to the bed surface and remain stationary while deeper underlying tissues pull away and slide in the direction of movement. This action results in stretching and tearing of blood vessels, reduced blood flow, and necrosis. Shearing forces account for the high incidence of sacral ulcers.

Friction is the force of two surfaces moving across one another. When a client moves or is pulled up in bed, rubbing of the skin against the sheets creates friction. Friction can remove the superficial layers of the skin, making it more prone to breakdown.

Risk Factors for Pressure Ulcers

Pressure ulcers can be prevented if at-risk individuals and the specific factors placing them at risk can be identified. Many risk factors have been associated with pressure ulcer formation, including immobility and inactivity, incontinence, malnutrition, decreased mental status, diminished sensation, and age-related changes. Individuals should be assessed for pressure ulcer risk on admission to acute care hospitals, nursing homes, and other health care facilities (USDHHS, 1992). Validated risk assessment tools such as the Braden Scale (Braden, 1989) or the Norton Scale (Norton, 1989) can be used to predict who will or will not develop pressure ulcers (Tables 35-6 and 35-7).



NURSING TIP

Pressure Ulcer Costs

The occurrence of pressure ulcers in acute care settings ranges from 3% to 14% and in chronic care settings from 15% to 25%. The development of pressure ulcers prolongs length of stay and results in an overall increase in the cost of health care, totaling over a billion dollars annually (National Pressure Ulcer Advisory Panel, 1989).

Assessment

Pressure ulcers are staged to classify the degree of tissue damage (Figure 35-16). The revised National Pressure Ulcer Advisory Panel (USDHHS, 1998) recommends the following staging system:

- **Stage I.** Nonblanchable erythema of intact skin; the heralding lesion of skin ulceration. In individuals with darker skin, discoloration of the skin, warmth, edema, induration, or hardness may also be indicators.
- **Stage II.** Partial thickness skin loss involving epidermis or dermis. The ulcer is superficial and presents clinically as an abrasion, blister, or shallow crater.
- **Stage III.** Full-thickness skin loss involving damage or necrosis of subcutaneous tissue that may extend down to, but not through, underlying fascia. The ulcer presents clinically as a deep crater with or without undermining of adjacent tissue.
- **Stage IV.** Full-thickness skin loss with extensive destruction, tissue necrosis, or damage to muscle, bone, or supporting structures. Undermining and sinus tracts may also be associated with Stage IV pressure ulcers.

Nursing Diagnoses

Nursing diagnoses for clients with pressure ulcers will be similar to those for clients with wounds, because the type of injury and its consequences are similar. The emphasis is on gentle client care and client teaching to promote healing of the ulcer and to prevent its recurrence. Identifying the client's psychological needs as well, in terms of diagnoses such as *Disturbed Body Image* and *Anxiety*, will ensure that the client's symptoms are addressed holistically.

Outcome Identification and Planning

As with nursing diagnoses, the outcome identification and planning phase of the nursing process for relieving pressure ulcers is similar to that for clients with wounds. Individualized outcomes based on the client's overall physical condition, the stage of the wound, and the client's risk factors will help in identifying priority interventions. Client teaching should be included as an integral part of the planning process; if the client desires, family and support persons should be brought into the learning circle as well.

Implementation

Pressure ulcers can be prevented through a variety of measures. Early identification of high-risk individuals and contributing risk factors and an ongoing assessment of risk

TABLE 35-6
Braden Scale Risk Predictors for Skin Breakdown

Patient's Name _____		Evaluator's Name _____						
		Date of Assessment _____						
Sensory perception Ability to respond to discomfort	1. Completely limited: Unresponsive to painful stimuli, either because of state of unconsciousness or severe sensory impairment, which limits ability to feel pain over most of body surface.	2. Very limited: Responds only to painful stimuli (but not verbal commands) by opening eyes or flexing extremities. Cannot communicate discomfort verbally, OR has a sensory impairment which limits the ability to feel pain or discomfort over one-half of body surface.	3. Slightly limited: Responds to verbal commands by opening eyes and obeying some commands, but cannot always communicate discomfort or need to be turned, OR has some sensory impairment that limits ability to feel pain or discomfort in one or two extremities.	4. No impairment: Responds to verbal commands by obeying. Can communicate needs accurately. Has no sensory deficit that would limit ability to feel pain or discomfort.				
Moisture Degree to which skin is exposed to moisture	1. Very moist: Skin is kept moist almost constantly by perspiration and urine. Dampness is detected every time patient is moved or turned. Linen must be changed more than one time each shift.	2. Occasionally moist: Skin is frequently, but not always, kept moist; linen must be changed two to three times every 24 hours.	3. Rarely moist: Skin is rarely moist more than three to four times a week, but linen does require changing at that time.	4. Never moist: Perspiration and incontinence are never a problem; linen changed at routine intervals only.				
Activity Degree of physical activity	1. Bedfast: Confined to bed.	2. Chairfast: Ability to walk severely impaired or nonexistent and must be assisted into chair or wheelchair. Is confined to chair or wheelchair when not in bed.	3. Walks occasionally: Walks occasionally during day, but for very short distances, with or without assistance. Spends majority of each shift in bed or chair.	4. Walks frequently: Walks a moderate distance at least once every 1 to 2 hours during waking hours.				

(continues)

TABLE 35-6 (continued)
Braden Scale Risk Predictors for Skin Breakdown

Mobility Ability to change and control body position	1. Completely immobile: Unable to make even slight changes in position without assistance.	2. Very limited: Makes occasional slight changes in position without help but unable to make frequent or significant changes in position independently.	3. Slightly limited: Makes frequent though slight changes in position without assistance but unable to make or maintain major changes in position independently.	4. No limitations: Makes major and frequent changes in position without assistance.				
Nutrition Usual food intake pattern	1. Very poor: Never eats a complete meal. Rarely eats more than one-third of any food offered. Intake of protein is negligible. Takes even fluids poorly. Does not take a liquid dietary supplement, OR is NPO and/or maintained on clear liquids or IV for more than 5 days.	2. Probably inadequate: Rarely eats a complete meal and generally eats only about one-half of any food offered. Protein intake is poor. Occasionally will take a liquid dietary supplement, OR receiving less than optimum amount of liquid diet or tube feeding.	3. Adequate: Eats over half of most meals. Eats moderate amount of protein source one to two times daily. Occasionally will refuse a meal. Will usually take a dietary supplement if offered, OR is on a tube feeding or TPN regimen that probably meets most of nutritional needs.	4. Excellent: Eats most of every meal. Never refuses a meal. Frequently eats between meals. Does not require a dietary supplementation.				
Friction and shear	1. Problem: Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Either spasticity, contractures, or agitation leads to almost constant friction.	2. Potential problem: Moves feebly independently or requires minimum assistance. Skin probably slides against bedsheets or chair to some extent when movement occurs. Maintains relatively good position in chair or bed most of time but occasionally slides down.	3. No apparent problem: Moves in bed and in chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair at all times.					
				Total Score				

Key: 16, minimum risk; 13–14, moderate risk; 12 or less, high risk; NPO nothing by mouth; IV, intravenously; TPN, total parenteral nutrition.

(From Braden, B. J. [1989]. Clinical utility of the Braden Scale for predicting pressure sore risk. *Decubitus*, 2 (3), 44–46, 50–51. Copyright 1988 by Barbara Braden and Nancy Bergstrom. Reprinted with permission of the authors.)

TABLE 35-7
Norton Scale for Pressure Ulcer Risk

	PHYSICAL CONDITION		MENTAL CONDITION		ACTIVITY		MOBILITY		INCONTINENT		TOTAL SCORE
Good	4	Alert	4	Ambulant	4	Full	4	Not	4		
Fair	3	Apathetic	3	Walk/help	3	Slightly limited	3	Occasional	3		
Poor	2	Confused	2	Chairbound	2	Very limited	2	Usually/urine	2		
Very bad	1	Stupor	1	Bed	1	Immobile	1	Doubly	1		
Date											

(From Norton, D., McLaren, R., & Exton-Smith, A. N. [1962]. *An investigation of geriatric nursing problems in the hospital*. London: National Corporation for the Care of Old People [now the Centre for Policy on Aging]. Reprinted with permission.)

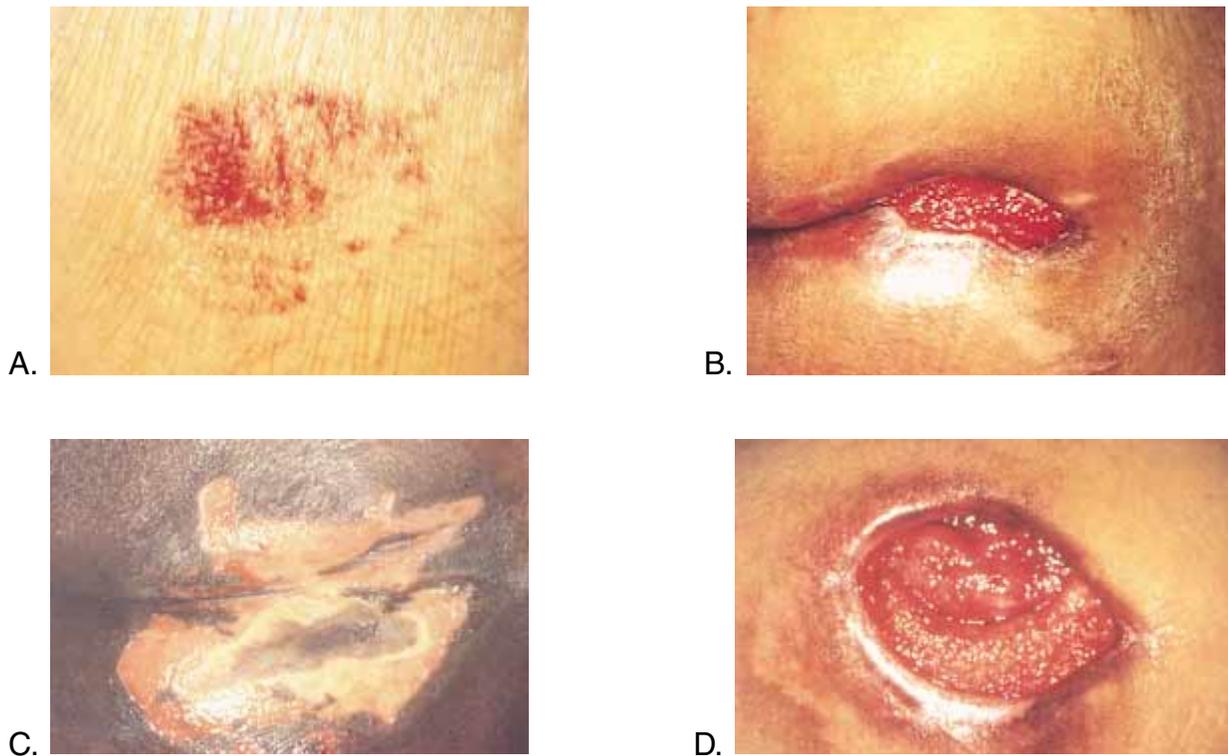


Figure 35-16 Four Stages of Pressure Ulcers. A. Stage I. B. Stage II. C. Stage III. D. Stage IV. (Permission to reproduce this copyrighted material has been granted by the owner, Hollister Incorporated.)

factors and skin integrity should be done to decrease the possibility of pressure ulcer formation. Other areas to focus on in the prevention of pressure ulcers include hygiene and skin care, positioning, and the use of support surface therapy. The following interventions may be used as guidelines by the nurse in caring for adult clients at risk for pressure ulcer development. They are based on recommendations developed by the Agency for Health Care Policy and Research (USDHHS, 1992).

Ensure Proper Hygiene and Skin Care

Proper skin care is essential to preventing skin breakdown. To maintain and improve tissue tolerance to pressure, the nurse should perform the following interventions:

- Assess the skin at least once a day, paying particular attention to bony prominences.

THINK ABOUT IT

Caring for Clients with Pressure Ulcers

Advanced-stage pressure ulcers can have extensive necrotic tissue, significant drainage, and very strong odor. Have you ever seen skin in an advanced stage of tissue deterioration? How would you feel about caring for a client with a stage IV pressure ulcer? Would your opinion be different if the client were an 8-year-old comatose child or an 80-year-old bedridden client?

- Cleanse the skin at routine intervals and at time of soiling. Keep the client's skin clean, dry, and free of irritation and maceration by urine, feces, and sweat. A moisture barrier cream can also be applied to the perineal area to protect the skin from moisture and toxins from urine and stool.
- Use warm water and mild cleansing agents so as not to irritate and dry the skin. Avoid the use of soaps and alcohol-based lotions, which may cause drying and leave an alkaline residue that discourages normal skin bacteria, leading to growth of opportunistic bacteria. Minimize the force and friction applied to the skin during cleansing so as not to disrupt the "natural barrier" to the skin.
- If the skin is dry, use moisturizing lotions and minimize exposure to cold and low humidity, which can cause dryness of the skin.
- Avoid massage over bony prominences. Current evidence suggests that massage may be harmful and cause deep tissue trauma (Maklebust, 1991; USDHHS, 1992).

Provide Proper Positioning

Positioning interventions prevent the adverse effects of pressure, friction, and shear. For most clients, maintaining current activity levels, mobility, and range of motion is sufficient to prevent pressure ulcers. For the immobilized client, the following interventions may help prevent the development of pressure ulcers:

- Turn and reposition client at least every 2 hours so that ischemic areas can recover. If a reddened area does not blanch when you press it, turn the client more often.
- When positioning, pay attention to body alignment. The position shown in Figure 35-17 relieves pressure on the sacrum and trochanters. There should be a 30° angle between the client's trochanters and the surface of the bed. The hips and knees should be flexed. To maintain this position, support the client's back with a pillow or foam wedge, and put a pillow between the knees.
- When turning the client, remove the pillows and wedges, lower the head of the bed, and use a draw

sheet to lift, not drag, the client to a new position. Maintain the head of the bed at 30° or less to prevent shearing.

- If the client is supine, make sure the heels are not resting on the mattress. Suspend them by placing a pillow or foam pad lengthwise under the lower legs.
- Place at-risk clients on pressure-reducing surfaces.
- Have clients who are able to sit up shift their weight every 15 minutes; those who can not do so need to be repositioned at least every hour.
- Use a pressure-reducing device such as a foam overlay on the seating surface to reduce pressure on the ischial tuberosities by redistributing weight over a much larger surface area. Do not use donut-shaped cushions, which reduce blood supply to the affected area, leading to even more ischemia.

Employ Support Surfaces

A variety of support surfaces are available to support the entire body and evenly distribute pressure. These devices can be used as adjunct therapy to help reduce pressure and prevent ulcers, but they are no substitute for frequent positioning and there is no scientific evidence that any one support surface works consistently better than any other (USDHHS, 1992).

In addition to pressure reduction or relief, many support surfaces reduce shear and friction and control moisture. Pressure-reducing support surfaces include overlays filled with foam, gel, or water (e.g., eggcrate mattresses, alternating air-filled mattresses) and replacement mattresses (replace standard mattresses). Pressure-relieving devices include specialty beds that replace hospital beds. Examples are low-air-loss (LAL) beds (e.g., Flexicair), air-fluidized beds (e.g., Clinitron), and beds that provide kinetic therapy. Kinetic beds (e.g., Rotorest) provide continuous passive motion or oscillation to counteract the effects of immobility. See Chapter 34 for a complete discussion of beds used to counteract the effects of immobility. See Table 35-8 for a list of selected support devices.

Complementary Therapies

Nature is rich in plants that promote healing of cuts, burns, and wounds. Herbalists recognize that skin problems may reflect a variety of internal conditions; therefore herbs used to treat wounds are selected based on

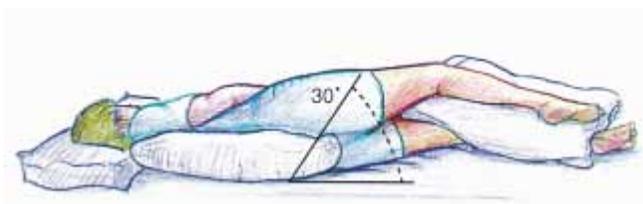


Figure 35-17 Avoiding Pressure Points with the 30° Lateral Position

TABLE 35-8
Support Surfaces

Type	Examples	Manufacturer	Indications	Advantages	Disadvantages
Foam overlay	Biogard Geo-mat High Float	Bio Clinic Spon-America Pre-Foam	Pressure reduction, comfort	Low cost. Easy to use.	Hot, traps moisture, pressure reduction lost with continued use.
Static air mattress (air overlay)	Saf-Care Roho First Step	Gaymar Industries Roho Kinetic Concepts	Pressure relief		Damaged by sharp objects. Inflation has to be monitored.
Fluid overlay (water mattress)	Lotus Water Flotation Mattress	Lotus	Pressure reduction, comfort	Easy to clean. Multiple-use.	Leaks with puncture.
Static, low air loss	Flexicair Kin Air Mediscus	Support Systems International Kinetic Concepts Mediscus Group	Pressure relief when repositioning is difficult or contraindicated	Bed adjusts to a variety of positions. Filter reduces risk of air-borne contamination. Cushions provide pressure relief.	Bed does not absorb fluid.
Active, low air loss (oscillating)	Bodyne TheraPulse Restcue	Kinetic Concepts Kinetic Concepts Support Systems International	Patients who are unstable and cannot tolerate sudden changes in position Patients with pneumonia requiring frequent position changes to mobilize secretions	Protects skin integrity. Promotes removal of pulmonary secretions.	Limited motion.

(continues)

TABLE 35-8
Support Surfaces

Type	Examples	Manufacturer	Indications	Advantages	Disadvantages
Air fluidized	Clinitron Fluid Air Skytron	Support Systems International Kinetic Concepts Skytron	Patients who require minimal movement to prevent skin damage by shearing forces Pressure relief	Minimum pressure on bony prominences; fluidization makes turning easy. Facilitates drainage and substance in beads reduces risk of infection.	Heavy, transport difficult. Foam backrest provides limited head elevation. Drying effect may inhibit cough and may dehydrate.
Rotation	Tilt and Turn Paragon Keone Mobility Rotorest	SMI Patient Care Mediscus Group Kinetic Concepts	Patients who require frequent turning but have unstable spines Movement, skeletal stability	Skeletal stability. Mobilizes secretions. Supports traction.	Movement increases risk of friction and shearing and may cause motion sickness.
Bariatric	Burke	Kinetic Concepts	Management of morbidly obese	Supports independence; converts to chair.	Not wide enough to facilitate repositioning.

NURSING CARE PLAN**Client with Impaired Skin Integrity****Case Presentation**

Mr. Short is a 48-year-old client who was involved in a motor vehicle accident. Three days after abdominal surgery he develops fever, tenderness around incision, and purulent drainage from the wound. The physician opens the incision and orders normal saline wet to dry dressing changes three times a day.

Assessment

- Temperature 101.8°F
- Pulse 110
- Respirations 20
- BP 130/70
- Incision—red, tender, to touch, yellow purulent drainage
- Labs—WBC ↑

Nursing Diagnosis #1

Impaired Skin Integrity related to presence of contaminants.

Expected Outcomes

1. Within 1 week the client's wound will be free of infection as evidenced by:
 - a. Absence of fever
 - b. Absence of redness, exudate
 - c. Normal WBC count
2. Within 1–2 weeks the client's wound will exhibit signs of healing as evidenced by:
 - a. Presence of granulation tissue
 - b. Wound's being closed and without drainage

Interventions/Rationales

- 1a. Assess and document the wound for presence of redness, pain, exudate with every dressing change.
Exudate indicates infection.
- 1b. Assess VS q4h.
VS reflect client's overall condition.
- 1c. Assess WBC count.
WBC counts show progression of infection.
- 2a. Apply wet to dry dressing changes tid utilizing sterile technique.
Promotes clean environment, which encourages wound healing.
- 2b. Ensure good handwashing before and after all dressing changes.
Limits exposure of incision to pathogens.

Evaluation

The client should be free of infection, with no evidence of fever, redness, or exudate. WBC and VS should be within normal range within one week. The wound should exhibit beefy red granulation tissue, and the wound edges should be contracting 1 week after admission.

their internal and external actions (Hoffmann, 1998). Herbs that create the following actions are particularly useful for wound healing: vulneraries (promote healing of wounds and ulcers), alteratives (restore proper bodily function), diaphoretics (promote sweating and capillary dilation), antimicrobial (resist pathogenic microorganisms, usually by strengthening the immune system), and nervines (act on the nervous system as

either tonics, relaxants, or stimulants). Some of the vulnerary herbs discussed below also work as an astringent (bind to skin and mucous tissue, reduce irritation and inflammation, protect against infections) to arrest bleeding and to condense tissue.

Chickweed, a common garden weed, is a vulnerary and anti-microbial. It may be applied directly to an insect bite to relieve itching and irritation or used as an

ointment in combination with marshmallow for cuts and wounds (Tierra, 1998).

Comfrey contains a chemical, allantoin, that stimulates cell proliferation and promotes wound healing both inside and out. Although it can be used internally to treat gastric and duodenal ulcers, comfrey is often used externally as a compress or poultice to speed healing of wounds and fractures and reduce scarring. *Caution is given when using comfrey to treat deep wounds since it can lead to tissue forming over the wound before the wound heals from within, creating a risk for an abscess to form* (Goldberg, 1999). The anticancer action of this herb has been reputed and it should be used with caution in anyone with a family history of cancer.

Aloe vera is a common household plant. The juice from the plant is used externally to treat minor cuts and burns, sunburn, and insect bites. It has been used effectively to decrease the scarring from acne. Aloe is primarily a vulnerary herb that promotes wound healing and has an antimicrobial action. Internally this herb is used as a cathartic and emmenagogue (normalize and tone the female reproductive system) and should be used with *caution during pregnancy and should be avoided during breastfeeding since it is excreted in the mother's milk. Caution is given when taking dieter's teas containing aloe and other substances; they act as laxatives when consumed in large quantities, can disrupt potassium levels and contribute to cardiac arrhythmias* (Fontaine, 2000).

Woundwort is a vulnerary, antiseptic, antispasmodic, and astringent used primarily as a wound healer. It is equivalent to comfrey as a wound healer and may be used directly on the wound or as a ointment or compress (Hoffmann, 1998).

Other herbs that may be used to promote wound healing and relieve irritation and pain associated with an ulcer or wound are tea tree oil, lavender oil, colloid silver, *echinacea*, golden seal (refer to Chapter 31 for a complete discussion of their antimicrobial action), slippery elm, knitbone, and self-heal.

Although most wounds heal with a well-balanced diet, special attention should be given to the diet when wounds are at risk for infection. Avoid stressor foods such as refined sugars, excess caffeine, and alcoholic beverages because they may decrease the body's immune function and healing (Goldberg, 1999). The diet should be rich in essential fatty acids, vitamin A, zinc, and vitamin C to promote the skin's healing. Foods rich in these essential elements are: green and yellow vegetables, eggs, cold water fish, raw seeds and nuts, oysters.

Evaluation

Evaluation of the plan of care for a client with a pressure ulcer will consider the physical signs of healing and the status of the pressure ulcer, as well as the client's adapta-

tion to the altered skin integrity. Each intervention should be evaluated for its effectiveness, and the plan of care revised to reflect those actions that have proven the most beneficial in realizing the expected outcomes of care.

KEY CONCEPTS

- A wound is a disruption in the integrity of the body tissue that puts an individual at risk for infection.
- Wounds go through a three-step healing process that includes a defensive (inflammatory) phase, a reconstructive (proliferative) phase, and a maturation phase.
- The type of exudate from a wound can help determine the pathology of the infectious process.
- Wounds are often classified by their cause, level of cleanliness, depth, or color.
- Nursing diagnoses for clients with wounds and pressure ulcers focus on both the physical (pain, infection, impaired tissue integrity) and the psychosocial (anxiety, deficient knowledge, disturbed body image) aspects.
- A significant nursing intervention in all cases of impaired skin integrity is client education on wound care and promotion of healing; the client's support people are often included in this teaching.
- Heat and cold applications help the body's own systems respond to and therefore relieve the pain that accompanies wounds.
- Pressure ulcers, or bedsores, are a common problem in acute and chronic care settings, resulting in longer stays for clients and increased costs of health care.
- Pressure ulcers are classified into four stages, depending on the depth of tissue damage.
- Proper positioning is the most effective preventive measure for pressure ulcers.

CRITICAL THINKING ACTIVITIES

1. Describe the similarities and differences between wounds and pressure ulcers in terms of their formation, physiology, and care.
2. Define each of the three phases of wound healing, and outline the process that each represents.
3. Differentiate among primary, secondary, and tertiary intention healing.
4. What are the different types of exudate, and what does each indicate?
5. Describe measures the nurse and client can take to promote wound healing and to prevent complications that often hinder the wound-healing process.
6. Explain to a colleague the process of hot and cold therapeutic applications and the mechanics of how and why they work.
7. What steps should a nurse take to ensure that a comatose client will not develop pressure ulcers?

WEB RESOURCES

American Diabetes Association

<http://www.diabetes.org>

Podiatry Today Journal

<http://www.podiatrytoday.com>

The Nursing Institute

<http://www.springnet.com/ce.htm>

Wound Care Information Network

<http://www.medicaledu.com/wndguide.htm>

Chapter 36

Sensation, Perception, and Cognition



The question is not what you look at, but what you see.

—Henry David Thoreau

COMPETENCIES

1. Describe normal cognitive and sensory perceptual functioning.
2. Identify responses to sensory deprivation and overload.
3. Describe cognitive development across the lifespan.
4. Identify nursing diagnoses pertinent to clients experiencing cognitive and sensory perceptual impairments.
5. Describe the learning needs of clients experiencing alterations in cognition and sensory perception.
6. Explain the use of the nursing process with clients experiencing alterations in cognition and sensory perception.

KEY
TERMS

affect
afferent nerve pathway
aphasia
arousal
awareness
cognition
consciousness
crystallized intelligence
disorientation

efferent nerve pathway
fluency
fluid intelligence
hallucination
illusion
immediate memory
judgment
orientation
perception

prosody
recent memory
remote memory
sensation
sensory deficit
sensory deprivation
sensory overload
sensory perception

Sensation is the ability to receive and process stimuli received through the sensory organs. There are two types of stimuli: external and internal. External stimuli are received and processed through the sight (visual), hearing (auditory), smell (olfactory), taste (gustatory), and touch (tactile) modes. Internal stimuli are received and processed through kinesthetic (an awareness of the position of the body) and visceral (feelings originating from large organs within the body) modes.

Perception is the ability to experience, recognize, organize, and interpret sensory stimuli. **Sensory perception** is the ability to receive sensory impressions and, through cortical association, relate the stimuli to past experiences and to form an impression of the nature of the stimulus.

Perception is closely associated with **cognition**, the intellectual ability to think. The processes of organizing and interpreting stimuli are dependent on a person's level of intellectual functioning. Cognition includes the elements of memory, judgment, and orientation. The well-being of an individual is dependent on the functions of sensation, perception, and cognition because it is through these mechanisms that the person fully experiences and interacts with his or her environment.

Sensory, perceptual, and cognitive alterations can be either temporary or progressive in their manifestations and can result from disease or trauma. Whatever the status or cause of the alterations, these conditions usually lead to social isolation and increased dependence on others. In addition, impairment in sensory, perceptual, and cognitive functions can place the individual at risk for injury to self or to others.

This chapter discusses the physiology of sensation, perception, and cognition and the common alterations in each functional area. Information on the nurse's role in caring for individuals with sensory, perceptual, or cognitive alterations is presented.

PHYSIOLOGY OF SENSATION, PERCEPTION, AND COGNITION

Sensation, perception, and cognition are neurological functions. The nervous system is composed of two major subsystems: the central nervous system (CNS) and the

peripheral nervous system (PNS), which consists of the somatic and autonomic nervous systems (Figure 36-1).

The CNS and PNS act in unison to accomplish three purposes: collection of stimuli from the receptors at the end of the peripheral nerves; transport of the stimuli to the brain for integration and cognition processing; and conduction of responses to the stimuli from the brain to responsive motor centers in the body.

The CNS is composed of the brain and spinal cord, which are protected by the bony structures of the skull and vertebral column. The brain, the most complex of the body's organs, is composed of three basic structures: the cerebrum (which consists of the temporal, frontal, parietal, and occipital lobes); the cerebellum, and the brain stem (Figure 36-2). Table 36-1 describes each of these structures. The structures of the brain serve as both receptors and reactors by collecting stimuli and effecting responses to those stimuli. The spinal cord links the advanced neurosensory mechanisms that occur in the brain to the rest of the body via a coordinated pathway of neurons.

Sensory perception involves the function of both the cranial and peripheral nerves. The cranial nerves arise from the three structures of the brain and govern the movement and function of various muscles and nerves throughout the body (Figure 36-3). The peripheral nerves connect the CNS to other parts of the body (Figure 36-4).

Components of Sensation and Perception

The sensory system is a complex network that consists of **afferent nerve pathways** (ascending pathways that trans-

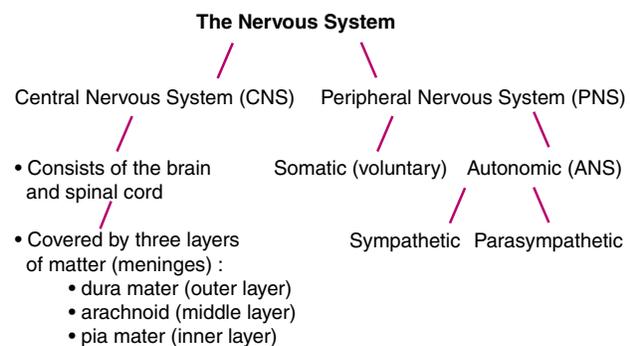


Figure 36-1 The Nervous System

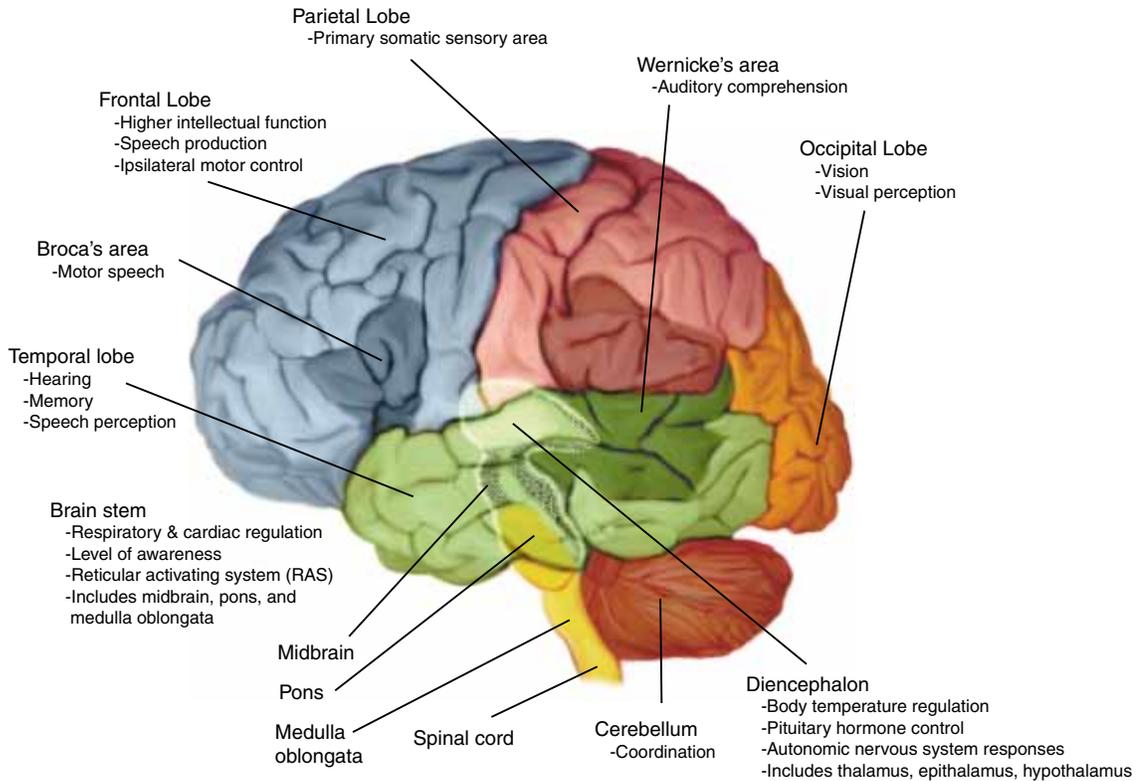


Figure 36-2 Cross-section of the Brain

TABLE 36-1
Structures and Functions of the Brain

Structure	Description	Primary Functions
Cerebrum	Composed of gray matter and white matter. Basal ganglia (masses of gray matter) are part of the extrapyramidal system.	Is responsible for: <ul style="list-style-type: none"> • Thinking • Memory • Learning. • Receives and interprets sensory input (stimuli); responds to sensory stimuli. • Helps control motor function.
Cerebellum	Located behind and under the cerebrum. Is a fissured mass consisting of a body that includes a narrow middle strip and two lateral lobes.	<ul style="list-style-type: none"> • Is concerned with unconscious functions. • Is responsible for smooth-muscle functioning. • Maintains equilibrium.
Brain stem	Composed of three structures: <ul style="list-style-type: none"> • The midbrain • The <i>pons</i> • The <i>medulla oblongata</i> 	Influences visual and auditory senses. Connects the upper and lower levels of the CNS. Affects respiratory rate. Prevents coma by maintaining wakefulness. Controls vital functions: <ul style="list-style-type: none"> • Heart rate • Respiratory rate • Swallowing • Coughing Processes sensory input from spinal tract

(From Guyton, A. C., & Hall, J. [2000]. *Textbook of medical physiology* [10th ed.]. Philadelphia: Saunders.)

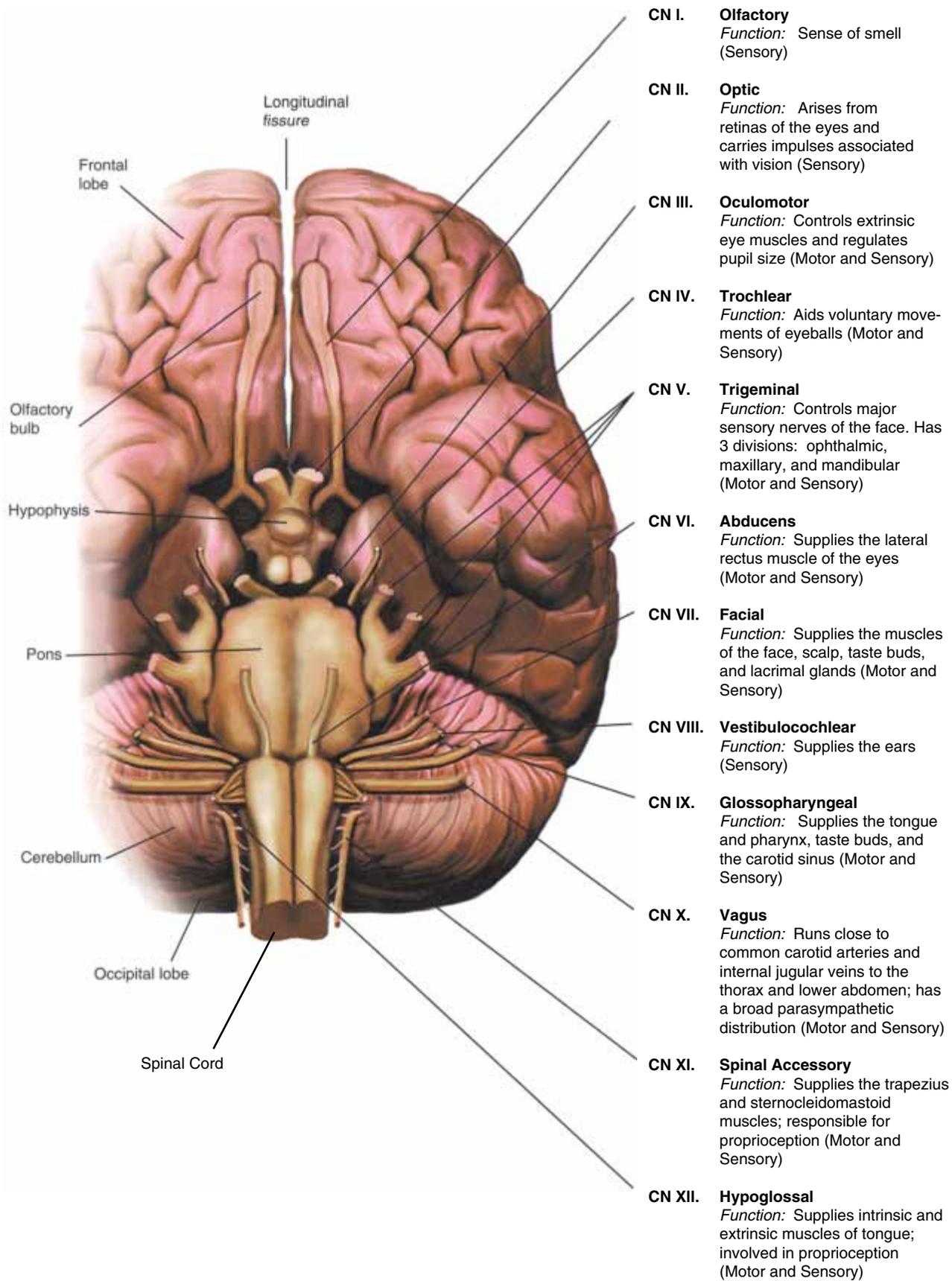


Figure 36-3 The Cranial Nerves

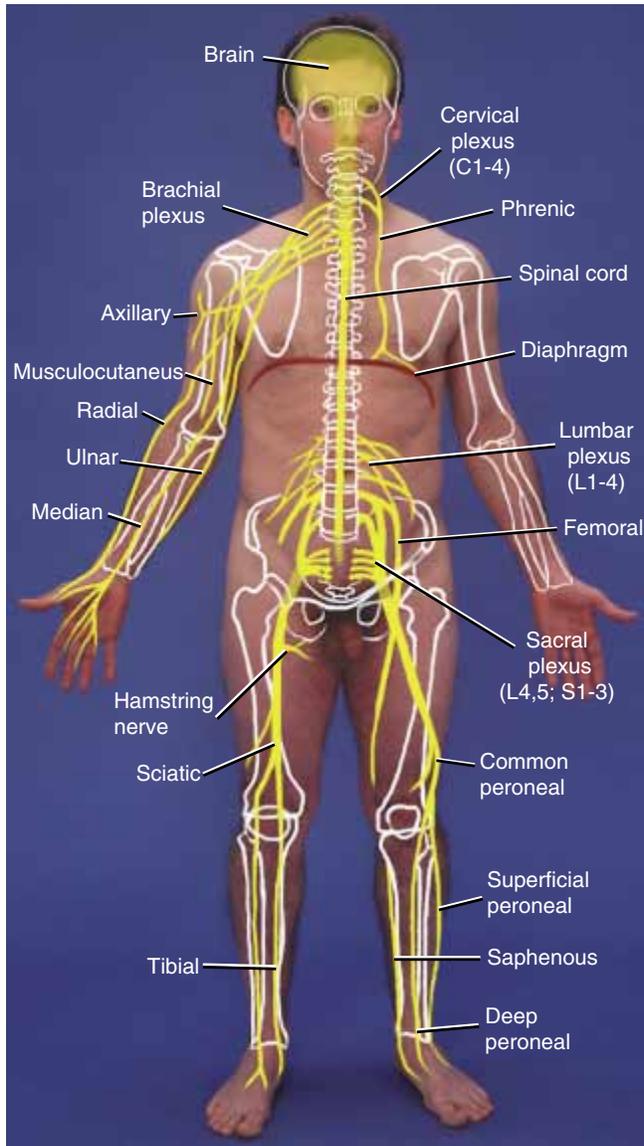


Figure 36-4 The Peripheral Nerves

mit sensory impulses to the brain), **effluent nerve pathways** (descending pathways that send sensory impulses from the brain), the spinal cord, the brainstem, and the higher cortex (cerebral lobes). Figure 36-5 shows the major sensory pathways.

Components of Cognition

Cognition includes the cerebral functions of memory, judgment, and emotion. In order for higher functions (such as memory, affect, judgment, perception, and language to occur) consciousness must be present.

Consciousness

Consciousness is a state of awareness of self, others, and the surrounding environment. It affects both cognitive (intellectual) and affective (emotional) functions. An

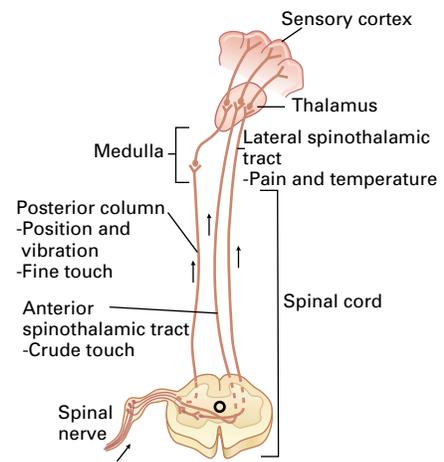


Figure 36-5 Major Sensory Pathways

alert individual (one who is aware of self and stimuli) is able to perceive reality accurately and to base behavior on those perceptions. The components of consciousness provide a foundation for behavior and emotional expression, thereby contributing to the uniqueness of each individual's personality.

Consciousness depends on the functioning of the reticular activating system (RAS), which is located within the midbrain and thalamus, as well as connective fibers between these structures and areas within the cerebral cortex. The RAS controls activities such as sleep and wakefulness and monitors the selective transmission of stimuli to other parts of the neurosensory system. Consciousness may be altered by various metabolic, traumatic, or other factors such as the pharmacological actions of drugs that affect mental status. The primary components of consciousness are arousal and awareness, both of which must be present before higher cognitive functioning occurs. "The reticular formation is the arousal or alerting system for the cerebral cortex; its functioning is crucial for maintaining consciousness" (Kuhn, Herlihy, & Herlihy, 1998, p. 208).

Arousal

The degree of **arousal** (a component linked closely to the appearance of wakefulness and alertness) is indicated by a person's general response and reaction to the environment.

People exhibit arousal, the state of being prepared to act, by behaving in an alert and aware manner and by experiencing periods of wakefulness. The degree of an individual's arousal is indicated by the general response and reaction to the environment. Impaired arousal can exist when a sleep pattern deficit is experienced; there may be an inability to take advantage of opportunities for activity because of limited periods of rest.

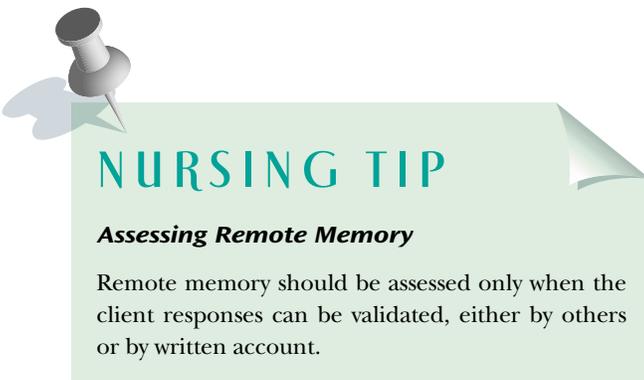
Awareness

Awareness is the capacity to perceive sensory impressions and react appropriately through thoughts and actions. An essential element in awareness is **orientation**

(perception of self in relation to the surrounding environment). According to Roy (1988), orientation is a person's ability to be cognitively aroused, to attend to the environment, and to recognize patterns. When awareness is impaired, orientation to time is frequently the first area affected. The degree of disorientation is worse when the individual loses awareness of place and self (person). Changes in a client's orientation to time, place, and person are often early indicators of an altered level of consciousness. Several tools have been developed to measure level of consciousness, which includes a measure of orientation.

Memory

There are three types of memory: immediate, recent, and remote. **Immediate memory** is the retention of information for a specified and usually short period of time. An example of this function is the recall of a telephone number long enough to dial it. **Recent memory** is the result of events that have occurred over the past 24 hours. An example of recent memory is the remembrance of foods eaten for dinner the previous night. **Remote memory** is the retention of experiences that occurred during earlier periods of life, such as an adult's memories of childhood or school days. The ability to learn is dependent on remote memory.



Affect

Affect (mood or feeling) is an important component of cognition, in that variations of mood can affect one's thinking ability. For example, depression may affect the client's concentration and attention. Also, anxiety narrows the perceptual field and interferes with the ability to concentrate by decreasing attention span.

Judgment

Judgment, the ability to compare or evaluate alternatives to life situations and arrive at an appropriate course of action, is closely related to reality testing and depends on effective cognitive functioning. When assessing logic and judgment, it is important to decide whether the client is

answering questions appropriately. The goal is to determine the use of reasoning and decision-making ability. It may be assessed by asking a question such as "What would you do if you were inside a burning building?" Answers that indicate impaired judgment may be given by clients experiencing frontal lobe damage, dementia, mental retardation, or psychosis. Behaviors indicative of impaired judgment include impulsiveness, unrealistic decision-making, and inadequate problem-solving ability.

Perception

Cognitive perceptions are considered in the context of the individual's awareness of reality. Misperceptions of reality can occur in the form of an **illusion** (an inaccurate perception or misinterpretation of sensory stimuli) or a **hallucination** (a sensory perception that occurs in the absence of external stimuli and is not based on reality).

Clients who are anxious and fearful or who are on therapeutic regimens involving the use of certain medications may experience misperceptions of environmental stimuli. For example, a postoperative client, after receiving analgesic medication for pain, sees a belt from his bathrobe lying on the floor and becomes terrified because he thinks there is a snake in the room. Once the nurse determines that the client is experiencing an illusion, appropriate reassurance and reality orientation can be implemented to reduce the client's anxiety.

Language

Language is one of the most complex cognitive functions, involving not only the spoken word but also reading, writing, and comprehension. Each of these skills is controlled by specific areas located in the cerebral cortex (Figure 36-6).

Characteristics of speech are **fluency** (ability to talk in a steady manner), **prosody** (melody of speech that conveys meaning through changes in the tempo, rhythm, and intonation), and content.

FACTORS AFFECTING SENSATION, PERCEPTION, AND COGNITION

The functions of sensation, perception, and cognition are influenced by many factors, including age, environment, lifestyle, stress, illness, and medications.

Age

Neurosensory pathways in infants and children are immature and do not allow for sophisticated discrimination among stimuli. As children mature they learn to apply their perceptions of the environment to different

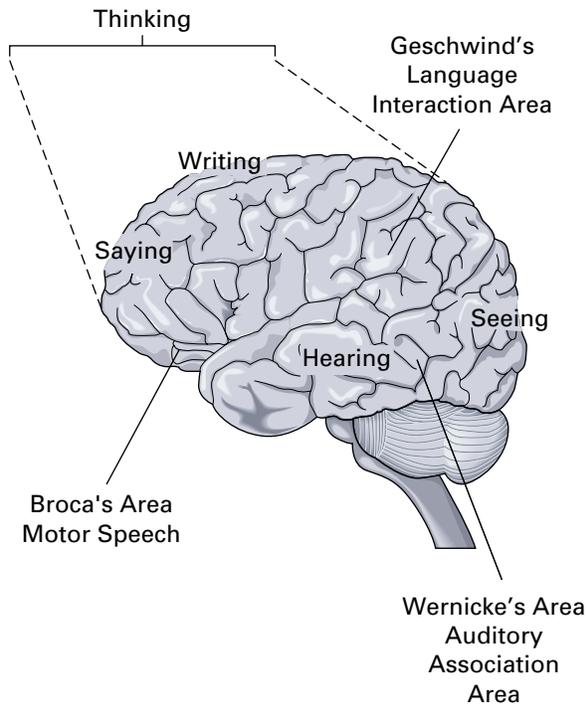


Figure 36-6 Language Perception Areas of the Brain. Note Broca's motor speech area in the frontal lobe, Wernicke's auditory association area in the temporal lobe, and Geschwind's language interaction area in the parietal lobe.

situations and can thus modify their behaviors accordingly. This process continues throughout the life cycle. For young adults, cognitive functioning is generally more advanced than during adolescence. According to Miller (1999):

The young adult uses systematic and sophisticated problem-solving techniques and achieves new levels of creative thought with less egocentrism than is seen in younger individuals. Thinking is more reality based and mental activities are proficient. (p. 386)

Intelligence is difficult to measure; intelligence quotient (IQ) tests (which are intended to predict academic achievement) are not very reliable indicators of adult intelligence. The measurement of intelligence in middle-aged adults is affected by several variables, including motivation, risk-taking and/or caution, and anxiety. "Middle age is considered . . . to be the height of intellectual endowment, as memory and problem solving are maintained and learning continues" (Miller, 1999, p. 391).

Intellectual functioning is maintained in part by a stimulating environment. **Crystallized intelligence** (the application of life experiences and learned skills to solve problems; also called acquired knowledge) generally increases with age as **fluid intelligence** (ability to acquire new concepts and adapt to unfamiliar situations; mental activities based on organizing information) decreases over time (Miller, 1999).

Cognitive development in older adults shows no decline in intellectual function. Memory loss is an area

of concern for many older adults. "The older person who is mentally active and well educated will not show the same problems with memory as will those adults without similar opportunities to use their minds" (Miller, 1999, p. 397). Memory impairments that occur in the elderly are usually the result of pathophysiological processes and are not a part of normal aging. Strategies such as list making and posting reminder notes can be helpful in compensating for minor memory losses. Some activities that encourage cognitive development in older people are reading, studying a new topic (such as language or computer skills), solving mathematical problems, and working word puzzles.



NURSING TIP

When assessing an older client's cognitive functioning, remember that aging does not occur in the same way in every individual.

Environment

The amount and type of environmental stimuli affects sensation, perception, and cognition. Excessive stimuli in the form of visual impressions and noise can create feelings of anxiety and disorientation within clients. Too few relevant stimuli decrease the client's response to people and the environment, thus leading to isolation.

Crowded living conditions, traffic congestion, or living where sound levels are high are stressors associated with negative physical and psychological health outcomes. "Environmental noise has been associated with delayed healing and other physical effects, as well as cognitive effects, including a diminished efficiency of prefrontal cortical regions of the brain resulting in a decrease in the variety and speed of cognitive responses" (Holmberg & Coon, 1999, p. 117).

Lifestyle

The amount and quality of sensory information that people feel comfortable in processing are based on their work and leisure habits. Some people may prefer quiet environments in which to think, whereas others derive energy and productivity from the activity around them.

Stress

Stress and anxiety can have a negative influence on a person's behavior and thought patterns. Depending on

the type and degree of stress, the person either finds ways to cope with the situation or becomes overwhelmed with the stimuli being received and can possibly become disoriented.

Illness

Specific conditions, such as diabetes mellitus and atherosclerosis, can impair neurosensory pathways and result in deficits in sensation, perception, and cognition. Diseases of the CNS can result in loss of sensory function and paralysis.

Medications

Certain medications have the potential to alter or depress the neurosensory system. For example, sedatives and narcotics can alter the perception of sensory stimuli. Medications such as analgesics can alter level of consciousness; see the accompanying display.

MEDICATIONS THAT ALTER LEVEL OF CONSCIOUSNESS: A PARTIAL LIST

- Analgesics
- Antidepressants
- Antidiuretics
- Antihypertensives
- Benzodiazepines (especially long-acting agents)
- Sedatives

SENSORY, PERCEPTUAL, AND COGNITIVE ALTERATIONS

An individual usually experiences discomfort and/or anxiety when subjected to a change in the type or amount of incoming stimuli. A person can become confused as a result of either overstimulation or understimulation. According to the individual's ability to process the stimuli, confusion (or disorientation) may occur. **Disorientation** is a mentally confused state in which the person's awareness of time, place, self, and/or situation is impaired; when awareness of these four factors is accurate, a person is said to be "oriented \times 4."

Sensory over-stimulation and sensory deprivation can lead to cognitive alterations in healthy adults. Such alterations include physical symptoms (i.e., nausea), altered time perceptions, paranoid ideation, and visual, auditory, and olfactory distortions (similar to hallucinations). A person admitted to a health care agency experiences stimuli that are different from those usually encountered. A change in environment can overwhelm one's ability to perceive and interpret sensory input. As a result, the treatment milieu itself can become a stressor

that negatively affects sensory, perceptual, and cognitive functions. If one or more of the factors just discussed causes an alteration in sensation, perception, or cognition, the client may experience problems with perceiving and interpreting stimuli. These problems are manifested by three types of alterations: sensory deficits, sensory deprivation, and sensory overload.

Sensory Deficits

A **sensory deficit** is a change in the perception of sensory stimuli. These deficits can affect all five senses. Examples of sensory deficits are vision and hearing losses such as those caused by cataracts, glaucoma, and presbycusis (steady loss of hearing acuity that occurs with aging).

The client's response to these losses usually depends on the time of onset and severity of the condition. If the problem occurs suddenly and without warning, the client may have difficulty in adjusting to the loss of sensory and perceptual function. If these alterations occur gradually, the client may be able to accommodate the change and actually compensate for it by strengthening one or more of the other senses.

The effects of hospitalization or intensive medical treatments can exacerbate the problems related to sensory deficits. For example, a client with acute hearing loss can feel alone and vulnerable when faced with an environment that does not provide an effective means (such as interpreters who sign) through which communication can occur. Because of these responses, clients with sensory deficits are at serious risk of experiencing either sensory deprivation or sensory overload.

Sensory Deprivation

Sensory deprivation is a state of reduced sensory input from the internal or external environment, manifested by alterations in sensory perception. Individuals can experience sensory deprivation as a result of illness, trauma, or isolation. A person experiencing sensory deprivation misinterprets the limited stimuli with a resultant impairment of thoughts and feelings. The following are factors contributing to sensory deprivation:

- Visual or auditory impairments that limit or prohibit perception of stimuli
- Drugs that produce a sedative effect on the CNS and interfere with the interpretation of stimuli
- Trauma that results in brain damage and decreased cognitive function
- Isolation (either physical or social) that results in the creation of a nonstimulating environment

Some contributing factors (such as brain damage or blindness) result in chronic sensory deprivation,

whereas others lead to acute, transient states of deprivation (e.g., an individual receiving analgesic medications).

Individuals who are sensory-deprived may exhibit any of the following characteristics:

- Inability to concentrate
- Poor memory
- Impaired problem-solving ability
- Confusion
- Irritability
- Emotional lability (mood swings)
- Depression
- Boredom and apathy
- Drowsiness
- Hallucinations (see accompanying display)

Sensory Overload

Sensory overload is a state of excessive and sustained multisensory stimulation manifested by behavior change and perceptual distortion. The individual experiencing this alteration is unable to process the amount or intensity of stimuli being received. The accompanying display lists factors contributing to sensory overload. Individuals experiencing sensory overload may exhibit any of the following characteristics:

- Anxiety and restlessness
- Irritability
- Disorientation
- Insomnia
- Fatigue
- Impaired problem-solving ability

A common type of stimulus that clients often experience is excessive noise; exposure to high noise levels interferes with the following:

FACTORS CONTRIBUTING TO SENSORY OVERLOAD

- Pain originating from a heightened quality or quantity of internal stimuli
- Invasive procedures that result in an increased amount of external stimuli
- Activity-filled, busy environment that contributes to the amount of stimuli being perceived
- Medications that stimulate the CNS and prohibit client from ignoring selective stimuli
- Presence of strangers (both health care professionals and others) who contribute to the quantity of stimuli
- Diseases that affect the CNS and that maximize the perception of stimuli

- Ability to shift attention
- Ability to perform complex tasks requiring sustained attention
- Verbal learning and memory
- Ability to make verbal associations

“Excessive sound affects cognitive processing activity in the prefrontal cortex” (Holmberg & Coon, 1999, p. 120).

ASSESSMENT

When caring for clients with sensory, perceptual, and cognitive alterations, the nurse must conduct a thorough health history and perform a complete physical examination of the client in order to identify existing or potential problems in this area of functioning. See

TYPES OF HALLUCINATIONS

Hallucination	Definition	Example
Visual	Perception of sights that are not actually present in the environment	“Do you see that little pink elephant at the foot of my bed?”
Auditory	Perception of sounds that are not present in the environment	“I hear the space aliens telling me that I’ll be in outer space soon.”
Tactile	Perception of being touched by things not actually present in the environment	“I feel bugs crawling underneath my skin.”
Olfactory	Perception of odors not present in the environment	“I can smell old rubber tires burning all the time.”
Gustatory	Perception of tastes that do not actually correspond to the foods being eaten	“That bitter taste is in all the food.”

Table 36-2 for an overview of assessing cognition and sensory perception.

Health History

In order to collect data that are used to develop the plan of care, the nurse collects the health history of the client experiencing alterations in sensation, perception, and cognition. Elements of the health history include the client's usual level of functioning, current sensory problems, and potential alterations. The nurse should also explore issues such as the client's current occupation, home environment, and ability to perform both daily routines and self-care activities. The accompanying display presents examples of questions that the nurse can ask the client during this part of the assessment process.

Physical Examination

During the physical examination, the nurse evaluates the client's visual, auditory, gustatory, olfactory, and tactile status. Physical examination focuses specifically on the client's ability to see, hear, taste, smell, perceive heat

HEALTH HISTORY: SAMPLE QUESTIONS

- Are you experiencing any difficulty in seeing objects, either near or far from you?
- Do you currently wear eyeglasses, bifocals, or contacts?
- Have you recently experienced any changes in your vision—for example, blurred vision, pain, sensitivity to light, or eye fatigue?
- Are you experiencing any changes in your hearing?
- Do you currently wear a hearing aid?
- Have you experienced any unusual sensations in the ears, such as a buzzing or ringing noise?
- Has your appetite or preference for certain foods changed recently?
- Are you experiencing any difficulty in your ability to smell particular odors?
- Do you experience unusual heat or cold in any of your extremities?
- Are you having any problems performing activities such as eating, brushing your hair, bathing, or toileting?
- Have you been exposed to loud noises or chemicals in your work environment or neighborhood?

TABLE 36-2
Neurological Screening Assessment

Assessment Parameter	Assessment Skill	Comments
Mental status/level of consciousness	Note general appearance, speech content, memory, logic, judgment, and speech patterns during history-taking Perform Glasgow Coma Scale (GCS) with motor assessment component and pupil assessment	If any abnormalities or inconsistencies are evident, perform full mental status assessment. If GCS is <15, perform full assessment of mental status and consciousness. If motor assessment is abnormal or asymmetrical, perform complete motor and sensory assessment.
Sensation	Assess pain and vibration in the hands and feet, light touch on the limbs	If deficits are identified, perform a complete sensory assessment.
Cranial nerves	Assess CN II, III, IV, VI: visual acuity, gross visual fields, fundoscopic examination, pupillary reactions, and extraocular movements. Assess CN VII, VIII, IX, X, XII: facial expression, gross hearing, voice, and tongue.	If any abnormalities exist, perform complete assessment of all 12 cranial nerves.
Cerebellar function	Observe the client's: <ul style="list-style-type: none"> • Initial gait • Ability to: (a) walk heel-to-toe, (b) walk on toes, (c) walk on heels, (d) hop in place, and (e) perform shallow knee bends 	If any abnormalities exist, perform complete cerebellar assessment.
Reflexes	Assess the muscle stretch reflexes and the plantar response.	If an abnormal response is elicited, perform a complete reflex assessment.

(Adapted from Estes, M. E. Z. [2002]. *Health assessment and physical examination*. Albany, NY: Delmar Thomson Learning.)

and cold, and perceive pain. See Chapter 27 for a complete discussion of assessing sensory and neurological status. Table 36-3 provides some guidelines helpful in assessing sensory perceptual status.

Assessment of Cranial Nerves

As stated earlier, there are 12 pairs of cranial nerves. Most of the cranial nerves have both sensory and motor functions (refer to Figure 36-3). Assessment of the cranial nerves is done to determine the presence of any neurological deficits. Chapter 27 provides a detailed discussion on assessing the cranial nerves.

TABLE 36-3
Assessing Sensory Perceptual Status

Sensation Being Assessed	Assessment Focus
Visual	Presence of visual problems, including: <ul style="list-style-type: none"> • Blurred vision • Double vision • Blind spots • Rainbows or halos around objects • Photosensitivity Difficulty seeing far or near Family history of visual problems (such as glaucoma, cataracts) Use of contact lenses or eyeglasses Date of last eye examination
Auditory	Presence of hearing problems Recent changes in hearing ability Ability to distinguish sounds (tone and pitch) Presence of buzzing or ringing noises Use of a hearing aid
Gustatory	Changes in ability to taste Difficulty in differentiating salty, sweet, sour, and bitter tastes Changes in appetite
Olfactory	Changes in ability to smell Ability to distinguish common smells (such as food, perfume, flowers)
Tactile	Difficulty in feeling temperature changes in extremities Impairment of pain perception in extremities Presence of unusual sensations in extremities (such as tingling or numbness)

NURSING ALERT

Level of Consciousness and Respiratory Function

Deterioration in a client's level of consciousness may indicate that intracranial pressure is increasing. This is a life-threatening condition that requires immediate intervention because it depresses respirations.

Mental-Status Assessment

A thorough mental-status examination includes a systematic assessment of all the emotional and cognitive functions. Mental status is usually assessed during the health history interview. See the Nursing Process Highlight for general guidelines on conducting a mental-status assessment.

The Mini-Mental Status Examination (MMSE) (Folstein, Folstein, & McHugh, 1975) was developed to determine one's baseline mental status; it includes several questions to assess orientation. The MMSE can be administered as a screening tool in acute, community-based, and long-term care settings. It is not intended to be used as a

Nursing Process Highlight

ASSESSMENT: MENTAL STATUS

1. Assessment begins as the client approaches. Observe gait, posture, mode of dress, involuntary movements, and voice to refine assessment priorities.
2. The history should be holistic because neurological disorders can affect all body systems.
3. The history should be age-sensitive:
 - Utilize other family members when client is a child.
 - Acknowledge adolescents' ability to speak for themselves.
 - Do not make assumptions regarding elderly clients' ability to relate their own health history.
4. Allow the client to remain clothed during the history and mental-status assessment.
5. Consider language and cultural norms when obtaining the history and performing the mental-status assessment.

(Adapted from Estes, M. E. Z. [2002]. *Health assessment and physical examination*. Albany, NY: Delmar Thomson Learning.)

diagnostic tool but rather to screen clients for the cognitive aspects of mental functioning: orientation, registration, attention and recall, and language (Folstein, Folstein, & McHugh, 1975). The highest possible score is 30, with a score of 21 or less usually indicating cognitive impairment (Figure 36-7). A more detailed mental-status assessment is warranted if the client presents with any of the following: memory deficit, confusion, aphasia (impairment in language functioning), mood swings, irritability, excessive headaches, behavioral changes, or seizures.

Levels of Consciousness

When assessing clients for sensory, perceptual, and cognitive alterations, the nurse should evaluate the level of consciousness (LOC). When describing assessment data relative to LOC, the nurse should include a brief description of the type of stimuli used to test LOC and the client's response. The accompanying display gives a list of terms commonly used in describing LOC.

The Glasgow Coma Scale (GCS) was developed as a standardized tool to assess LOC objectively (Table 36-4). The tool may be used in a variety of clinical situations and is meant to be used in conjunction with a complete neurological assessment.

TABLE 36-4
Glasgow Coma Scale

Behavior	Response	Score
Eye opening response	Spontaneous	4
	To verbal command	3
	To pain	2
	No response	1
Best verbal response	Oriented, conversing	5
	Disoriented, conversing	4
	Use of inappropriate words	3
	Incomprehensible sounds	2
	No response	1
Best motor response	Obeys verbal commands	6
	Moves to localized pain	5
	Flexion withdrawal to pain	4
	Abnormal posturing—decorticate	3
	Abnormal posturing—decerebrate	2
	No response	1
Total		3 to 15

With the GCS, a score of 15 indicates a fully oriented person. A score of 7 or less is considered a state of coma. A score of 3 is the lowest possible score and is indicative of deep coma.

DESCRIPTIVE TERMS FOR LEVELS OF CONSCIOUSNESS

Alert. Oriented and aware of stimuli; responds appropriately.

Lethargic. Responds appropriately to stimuli but may be slow to respond; may be drowsy and may drift off to sleep when not stimulated.

Obtunded. Sleeps most of the time; difficult to arouse with minimal response; requires constant stimulation; inconsistently follows commands.

Semicomatose. Responds with purposeful movements when stimulated, but does not follow commands and is nonverbal.

Comatose. Unconscious with no meaningful response to stimuli. Light coma may include reflex motor response to painful stimuli (decorticate or decerebrate posturing); deep coma includes no motor response to any stimuli.

Functional Abilities

The nurse needs to have an understanding of the client's ability to conduct self-care activities. Any sensory, perceptual, or cognitive impairments may interfere with the client's ability to perform activities of daily living (ADL). Also, such impairments can interfere with the client's ability to keep the home environment clean and safe. A thorough assessment of self-care abilities includes assessment of skills related to dressing, grooming, bathing, feeding, and toileting.

Environment

A person's environment can affect sensory, perceptual, and cognitive status in a variety of ways. For example, a nonstimulating environment can lead to sensory deprivation, whereas an environment that is excessively stimulating can result in sensory overload.

People who are at increased risk for sensory perceptual deficits include:

- The older adult
- Those who live alone
- Those who are institutionalized
- The homebound
- Those with chronic illness or physical handicaps
- Those who are mentally ill
- Those who have a developmental delay

The nurse assesses the type and quantity of stimuli in the client's environment (the health care facility or the home). See the accompanying display for information on assessing the client's home environment.

SCORE SHEET – MINI-MENTAL STATE

Name _____ Unit _____

Date _____

<u>Maximum Score</u>	<u>Score</u>									
<i>Orientation</i>										
5	()	What is the year (season, date, day, month)?								
5	()	Where are we: (state, county, town, hospital, floor)?								
<i>Registration</i>										
3	()	Name 3 objects: 1 second to say each. Then ask the patient all 3 after you have said them. Give 1 point for each correct answer. Then repeat them until he learns all 3. Count trials and record. Trials:								
<i>Attention and Calculation</i>										
5	()	Serial 7's. 1 point for each correct. Stop after 5 answers. Alternatively spell "world" backwards.								
<i>Recall</i>										
3	()	Ask for the 3 objects repeated above. Give 1 point for each correct.								
<i>Language</i>										
9	()	Name a pencil, and watch (2 points). Repeat the following: "No ifs, ands, or buts" (1 point). Follow a 3-stage command: "Take a paper in your right hand, fold it in half, and put it on the floor" (3 points). Read and obey the following: CLOSE YOUR EYES (1 point). Write a sentence (1 point). Copy design (1 point). Total score Assess level of consciousness along a continuum.								
<table border="0" style="width: 100%;"> <tr> <td style="border-top: 1px solid black; border-bottom: 1px solid black;">Alert</td> <td style="border-top: 1px solid black; border-bottom: 1px solid black;">Drowsy</td> <td style="border-top: 1px solid black; border-bottom: 1px solid black;">Stupor</td> <td style="border-top: 1px solid black; border-bottom: 1px solid black;">Coma</td> </tr> <tr> <td colspan="4">Examiner _____</td> </tr> </table>			Alert	Drowsy	Stupor	Coma	Examiner _____			
Alert	Drowsy	Stupor	Coma							
Examiner _____										

INSTRUCTIONS FOR ADMINISTERING MINI-MENTAL STATE EXAMINATION

Orientation

Ask for the date. Then ask specifically for parts omitted (e.g., "Can you also tell me what season it is?"). One point for each correct.
Ask in turn "Can you tell me the name of this hospital (town, county, etc)?" One point for each correct answer.

Registration

Ask the patient if you may test his memory. Then say the names of 3 unrelated objects (for example, car, house, book) clearly and slowly, about 1 second for each. After you have said all 3, ask him to repeat them. This first repetition determines his score (0-3), but keep saying them until he can repeat all 3, up to 6 trials. If he does not eventually learn all 3 recall cannot be meaningfully tested.

Attention and Calculation

Ask the patient to begin with 100 and count backwards by 7's. Stop after 5 subtractions (93, 86, 79, 72, 65). Score the total number of correct answers.
If the patient cannot or will not perform this task, ask him to spell "world" backwards. The score is the number of letters in correct order (e.g., dlrow = 5, dlrow = 3).

Recall

Ask the patient if he can recall the 3 words you previously asked him to remember. Score 0-3.

Language

Naming – Show the patient a wristwatch and ask him what it is. Repeat for pencil. Score 0-2.
Repetition – Ask the patient to repeat the sentence after you. Allow only one trial. Score 0-1.
3-Stage command – Give the patient a piece of plain, blank paper and repeat the command. Score 1 point for each part correctly executed.
Reading – On a blank piece of paper print the sentence "Close your eyes" in letters large enough for the patient to see clearly. Ask him to read it and do what it says. Score 1 point only if he actually closes his eyes.
Writing – Give the patient a blank piece of paper and ask him to write a sentence for you. Do not dictate a sentence: it is to be written spontaneously. It must contain a subject and verb and be sensible. Correct grammar and punctuation are not necessary.
Copying – On a clean piece of paper, draw intersecting pentagons, each side about 1 in. and ask him to copy it exactly to score 1 point. Tremor and rotation are ignored.
Estimate the patient's level of sensorium along a continuum, from alert on the left to coma on the right.

ASSESSING THE CLIENT'S HOME FOR ENVIRONMENTAL STIMULI

To determine the presence of sensory stimuli, the nurse assesses the presence of the following in the home:

- Adequate lighting
- Clock and calendar
- Odors
- Noise
- Other people (family members or frequency of visitors)
- Television, radio, or cassette player
- Books, magazines, newspapers

People with sensory, perceptual, and cognitive alterations are at increased risk of injury. Impairment of sensory perceptual and cognitive abilities can present the following hazards:

- Visual: Risk of tripping, falling
- Auditory: Lack of awareness of warning sounds (such as automobile horns, sirens, smoke alarms)
- Olfactory: Inability to perceive warning odors (such as burning food, escaping gas)
- Gustatory: Unawareness of spoiled or contaminated food or beverages
- Tactile: Lack of awareness of excessive pressure on a body part; at risk for exposure to extreme temperatures (frostbite, burns)

THINK ABOUT IT

Safety of the General Public versus Individual Liberty

Your 72-year-old neighbor, Mrs. Stafford, confides in you one afternoon at her home that she is becoming “more deaf by the minute.” She tells you, “Next week when I go in for my driver’s license renewal, I am not going to tell them about my little problem.” Your neighborhood has several small children who run into and out of the street playing. How do you respond to Mrs. Stafford?

DIAGNOSIS

Several nursing diagnoses are applicable to clients experiencing sensory, perceptual, and cognitive alterations. The nurse needs to establish a diagnosis that is most closely related to the client’s priority needs. The North American Nursing Diagnosis Association (NANDA) diagnostic label that is applicable for many clients experiencing altered sensory perception and cognition is *Disturbed Sensory Perception (specify)* (*visual, auditory, kinesthetic, gustatory, tactile, olfactory*). This condition is defined as “a state in which an individual

experiences a change in the amount or patterning of incoming stimuli accompanied by a diminished, exaggerated, distorted, or impaired response to such stimuli” (NANDA, 2001, p. 70). See Table 36-5 for other relevant diagnoses, with defining characteristics and related factors.

PLANNING AND OUTCOME IDENTIFICATION

Nurses understand the importance of promoting optimal sensory stimulation for clients in every area of care. The following goals will promote supportive, restorative care for clients experiencing sensory, perceptual, or cognitive alterations:

The client will:

- Remain safe and free from injury
- Experience a level of arousal that promotes the meaningful perception of stimuli
- Remain oriented to time, place, person, and situation
- Demonstrate intact functioning of senses (using assistive devices if necessary)
- Perform self-care activities appropriate to own functional capability

The current trend is to provide care for individuals experiencing cognitive deficits at home. “The goal of using creative strategies to manage dementia is to slow the rate of deterioration in order to prevent institutionalization for as long as possible” (Cacchione, 2000, p. 631). See the accompanying display for guidelines on planning the delivery of care in a long-term care facility.

APPLICATION: LONG-TERM CARE FACILITY: PROMOTING SENSORY STIMULATION

- Call the client by name.
- Introduce self by name.
- On every shift, inform the client of the year, month, day of month, day of week, name of facility, and name of health care provider.
- Have a calendar and clock that are easy to see near the client’s bed.
- Explain all procedures prior to implementation.
- Name and state the purpose of medications before administration.
- Have all necessary assistive devices (eyeglasses, dentures, hearing aid) accessible.
- Encourage client and family to personalize immediate environment with personal items (clothing, family photos, and personal possessions, such as quilts or furniture from home, if feasible).

TABLE 36-5
Nursing Diagnoses Related to Sensory, Perceptual, and Cognitive Impairments

Diagnosis	Defining Characteristics	Related Factors
<i>Disturbed Sensory Perception</i> (specify)	<p><i>Major</i></p> <ul style="list-style-type: none"> • Inaccurate interpretation of environmental stimuli • Negative change in amount or pattern of incoming stimuli <p><i>Minor</i></p> <ul style="list-style-type: none"> • Disoriented to time, place, or people • Impaired problem-solving ability • Changes in behavior or communication pattern • Restlessness • Disturbed sleep patterns • Hallucinations • Fear • Anxiety 	<ul style="list-style-type: none"> • Cerebrovascular accident • Meningitis or encephalitis • Fluid and electrolyte imbalance • Decreased oxygen transport • Medications • Physical isolation • Immobility • Social isolation • Stress
<i>Disturbed Thought Processes</i>	<p><i>Major</i></p> <ul style="list-style-type: none"> • Inaccurate interpretation of stimuli, internal and/or external <p><i>Minor</i></p> <ul style="list-style-type: none"> • Cognitive deficits, including memory deficits • Suspiciousness • Delusions • Hallucinations • Distractibility • Confusion, disorientation • Impulsivity 	<ul style="list-style-type: none"> • Mental disorders or personality changes resulting from biochemical changes • Hormonal changes • Depression • Anxiety • Fear • Loss • Isolation • Ambiguous communication • Abuse • Social isolation
<i>Social Isolation</i>	<p><i>Major</i></p> <ul style="list-style-type: none"> • Expressed feelings of aloneness and/or desire for more social contact <p><i>Minor</i></p> <ul style="list-style-type: none"> • Verbalization that time is passing slowly • Inability to concentrate • Impaired decision making • Expressed feelings of uselessness • Feelings of rejection • Increased irritability • Restlessness • Failure to interact with others nearby • Feelings of hopelessness 	<ul style="list-style-type: none"> • Communicable disease • Psychiatric illness • Death of a significant other • Divorce • Terminal illness • Hospitalization • Institutionalization • Loss of means of transportation • Unemployment
<i>Risk for Injury</i>	<p><i>Major</i></p> <ul style="list-style-type: none"> • Developmental age • Altered mobility • Confusion • Disorientation <p><i>Minor</i></p> <ul style="list-style-type: none"> • Malnutrition 	<ul style="list-style-type: none"> • Sensory dysfunction (decreased sensation, impaired vision, diminished sense of smell)

(From Carpenito, L. J. [1999]. *Handbook of nursing diagnosis: Application to practice* [8th ed., pp. 283–284, 299–300, 304–306]. Philadelphia: Lippincott; North American Nursing Diagnosis Association (2001). *Nursing diagnoses: Definitions and classification. 2001–2002* [pp. 38, 70, 74]. Philadelphia: Author.)

TABLE 36-6
Nursing Interventions to Promote Cognitive Function

Intervention	Examples
Memory retraining	Reality orientation
Social skills therapy	Reinforcing behaviors to be used when interacting with others
Communication therapy	Improving speech patterns or words to complete a thought Minimizing sensory deprivation
Stress management therapy	Identifying and using factors that minimize stress
Reminiscence therapy	Using story telling and memory recall to identify with past experiences
Behavioral therapy	Maintaining consistency and stability to specify expected behaviors Recognizing and controlling environmental stressors Using written schedules and directions to assist with activities
Medication administration	Using pharmacologic agents to manage disruptive behaviors

(From American Psychiatric Association. [1994]. *Diagnostic and statistical manual of mental disorders* [4th ed., rev.]. Washington, DC: Author.)

The American Psychiatric Association (1994) has identified the following as skills to be encouraged in order to promote cognitive functioning: stability, consistency, self-identification, and active participation. Table 36-6 lists nursing interventions that enhance the development of these four essential skills.

IMPLEMENTATION

A major concern of nurses caring for clients with sensory, perceptual, and cognitive alterations is safety. Actions must be taken to ensure that the client's environment is hazard-free and, at the same time, that it provides adequate stimulation. This section describes nursing interventions that promote appropriate sensory, perceptual, and cognitive functioning. Care of clients with visual and hearing impairments is discussed. Also presented is information on communicating with a confused client and a client who is unconscious.

Managing Sensory Deficits

Clients with sensory deficits, including tactile, auditory, and visual impairments, need sensitive nursing care to best adapt to their environments and specific challenges.

Tactile Alterations

The client with impaired tactile sensation is placed at an increased risk for development of skin breakdown. Therefore, it is important to encourage a safe living environment and to educate the individual and significant others in injury prevention measures. For more information on preventing tissue and skin breakdown, refer to

NURSING ALERT

Sensory Alterations and Safety

The client with impaired level of consciousness, weak memory, altered judgment, or confusion is at high risk for injury. It is essential to create a living environment that is safe for people with sensory, perceptual, and cognitive deficits.

Chapter 35. The following Client Teaching Checklist describes therapeutic approaches for maintaining skin integrity of clients with altered touch sensation.

Hearing Deficit/Loss

In addition to safety hazards, individuals with impaired hearing are also at risk for social isolation because of the difficulty in communicating with others. Nurses must ensure that they spend time with hearing-impaired clients, focus on nonverbal communication, and face the client when speaking. Check all assistive devices used by clients to ensure that they are working properly (Figure 36-8). Use an interpreter when one is available for signing; often the client's family can serve as interpreters. If an interpreter is available, the nurse must talk to the *client*, not to the interpreter; see the accompanying display for more information on communicating through an interpreter. Other communication aids include finger spelling, communication boards, and the use of paper and pen for writing messages. Refer to Chapters 12 and 13 for more information on communicating with clients who are hearing impaired.



CLIENT TEACHING CHECKLIST

The Client with a Tactile Deficit

Teach the client and family that burns can occur not only from heat but also from friction, chemicals, or tape. It is important for the client to inspect his skin daily and to avoid the following:

- Sun exposure (use sunblock)
- Hot bath water (use a bath thermometer)
- Hot water bottles, heating pads
- Placing containers of hot food or liquids in lap
- Eating hot foods, such as pizza, or other items that maintain heat for extended periods, without first testing the temperature
- Sitting on objects that may be hot (heaters, concrete, or rocks in sunlight)
- Walking on hot surfaces (pavement or concrete) without shoes
- Contact with items in or on automobile that are hot from exhaust or sunlight (for instance, tailpipe, heater vents directed at feet, seatbelt buckles, steering wheel, or leather or vinyl upholstery)
- Overexposure to very low temperatures (cold weather or ice packs) without proper protection

COMMUNICATING THROUGH AN INTERPRETER

- Use short sentences and questions.
- Avoid the use of ambiguous statements and questions.
- Plan what you intend to say ahead of time; this avoids confusing the interpreter by having to back up, restate, or revise previous statements.
- Avoid the use of technical jargon.

(Data from Kneisl, C. R. [1996]. Therapeutic communication. In H. S. Wilson & C. R. Kneisl [Eds.], *Psychiatric Nursing* [5th ed., p. 129]. Menlo Park, CA: Addison-Wesley.)

Visual Impairment

Clients with visual impairments often have developed the other senses to a high degree. The nurse can, therefore, use a variety of ways to enhance communication with such clients. For example, the nurse should do the following:

- Ask client to explain what is helpful (such as preferred means of communicating, usual routine).
- Look directly at the client while speaking.
- Encourage the client to handle items and objects; use objects that can be identified by other senses.
- Keep furniture and other items in their usual place; orient the client to the environment by using clock



Figure 36-8 The use of hearing aids helps to compensate for hearing loss experienced by some clients.

hours to indicate position of items in relation to the client.

- Use your normal tone, volume, and rate of speaking.
- Inform client when you are entering or leaving the room.
- Ask for permission before touching the client.

See Chapters 12 and 13 for discussion of communicating with visually impaired clients.

Managing Sensory Deprivation

It is important to provide an adequate amount of sensory stimulation to those clients who are understimulated or at risk for developing sensory deprivation. See the accompanying Nursing Process Highlight for guidelines.

Managing Sensory Overload

Caring for clients experiencing sensory overload can be very challenging for nurses, especially in critical care areas (such as the emergency department or intensive care unit). It is important to reduce environmental stimuli as much as possible. The Nursing Checklist provides guidelines for nursing interventions for clients experiencing sensory overload.

Assisting the Confused Client

Nurses need to be extra-supportive when communicating with a client who is confused. Many clients are aware of their cognitive deficit and become frustrated about their inability to process environmental stimuli correctly. The nurse must ask about the client's pre-

Nursing Process Highlight

IMPLEMENTATION: CARING FOR CLIENTS WITH SENSORY DEPRIVATION

Provide multisensory stimuli for 5–10-minute intervals throughout the day. Examples of appropriate stimuli are:

- Taped voices of family or friends
- Music (familiar to clients)
- Television
- Touch (applying lotions, different textures to skin)
- Frequent position changes
- Familiar visual stimuli (pictures, personal items)

Allow rest periods with no stimulation (e.g., 30 minutes to 1 hour uninterrupted sleep every 2–4 hours) to avoid sensory overload.

Reorient clients frequently by talking to them, stating their names, informing them of the day, time, weather outside.

Encourage social stimulation by encouraging visitors as appropriate to clients' health needs.



NURSING CHECKLIST

Care of the Client Experiencing Sensory Overload

- Address the client by name.
- Provide explanations of all procedures prior to implementation.
- Modify environment to reduce excessive multisensory stimulation; reduce distractions, loud noise, excessive light.
- Use a calm, unhurried manner when communicating with the client.
- Provide a private room whenever feasible.
- Plan the delivery of care to allow for rest periods with no stimulation.
- Use soft background music.
- Keep the environment free of strong odors (including perfume or after-shave lotion).
- Limit the number and frequency of visitors.

ferred means of communication, and tailor the interaction accordingly. Sensitive nursing care includes allowing additional time for the client to respond to questions, speaking directly to the client in uncomplicated language, repeating information as needed, and

using visual clues and body language to reinforce verbal messages. It is also important to address only one topic at a time and to give simple directions in sequence. For example, “First, sit up in bed. Then slide your legs over the edge of the bed.” Other interventions that are therapeutic for confused clients include the following:

- Written schedule of activities
- Written checklists for performing ADL
- Written directions for medication self-administration
- Active participation in activities
- Prevent social withdrawal

The following Client Teaching Checklist provides information to share with significant others caring for a confused client.



CLIENT TEACHING CHECKLIST

The Confused Client

- Keep clutter in traffic areas at a minimum; remove small rugs that can cause tripping.
- Make sure bed is low, and that there is proper lighting to help prevent falls.
- Keep dangerous objects from client's reach (including matches, firearms, knives).
- Keep medications out of client's reach.
- Lock doors to areas that could be potentially dangerous if client wanders there.
- Assist in dressing appropriately for the season.
- Do not allow the client to stay alone; have a responsible adult provide supervision.
- Try to keep daily activities as routine as possible.
- Keep activities simple and uncomplicated.
- Provide signs, posters, clocks, and calendars as memory aids.
- Encourage client to be independent while providing assistance as needed.
- Always treat the client with respect and dignity.

Caring for the Unconscious Client

Individuals who are unconscious can often hear what is spoken even though they are unable to respond. Thus, it is important for the nurse to be cautious of what is said in the presence of an unconscious client. Nurses should talk in a normal conversational tone while providing care. Also, remember the value of nonverbal communication, and touch the unconscious client. See the accompanying display for additional guidelines in communicating with a client who is unconscious. See

COMMUNICATING WITH AN UNCONSCIOUS CLIENT

- Orient the client to self, situation, place, and time.
- Address the client by name and explain all procedures prior to implementation.
- Maintain a routine to increase the client's sense of security.
- Use touch deliberately.
- Actively listen to significant others.
- Encourage significant others to talk to and touch the client often.
- Treat the client with the same respect and dignity you display to all clients.

Chapter 12 for additional information on communicating with unconscious clients.

Use of Restraints

Restraints, both physical and chemical, are sometimes used with clients experiencing cognitive and/or sensory perceptual alterations. Cognitively impaired residents of long-term care facilities are the most frequently restrained (Mayhew et al., 1999).

There are many risks associated with the use of restraints, including strangulation, impaired circulation, increased risk of falls, the stigma of being “tied down,” and perception that one is being punished. Minimizing the use of restraints must be done in order to respect client dignity while, at the same time, promoting safety of clients and staff members. See Chapter 31 for a guidelines on the safe use of restraints.

NURSING ALERT

The only therapeutic rationale for the use of restraints is promotion of safety.

Complementary/Alternative Therapies

Natural therapies can play an essential role in maintaining a healthy CNS. This section discusses the use of herbs and aromatherapy as methods for enhancing mental well-being. Refer to Chapter 14 for a complete discussion of complementary/alternative treatment approaches.

Herbals

There are four groups of herbs that especially benefit the nervous system: tonics, sedatives, demulcents, stimulants; see Table 36-7.

RESEARCH FOCUS

Title of Study

“Consequences of Not Recognizing Delirium Superimposed on Dementia in Hospitalized Elderly Individuals”

Authors

Fick, D., & Foreman, M.

Purpose

To describe the recognition and management of delirium in hospitalized clients with and without dementia.

Methods

A descriptive, exploratory design was used with a convenience sample of 20 hospitalized older individuals. The clients were observed using qualitative interviews and observations by hospital staff and family members.

Findings

The prevalence of delirium in this study was 60%. The incidence (new onset) of delirium was 30%. The presence of delirium was associated with lower baseline MMSE scores, depression, incontinence, and weight loss. Delirium superimposed on dementia was less likely to be recognized by nurses and physicians.

Implications

Clients with dementia should be routinely assessed for signs of delirium in order to treat the reversible processes and avoid long-term sequelae. The small sample of 20 clients is a drawback to this study, which should be replicated with larger numbers of participants.

Fick, D., & Foreman, M. (2000). Consequences of not recognizing delirium superimposed on dementia in hospitalized elderly individuals. *Journal of Gerontological Nursing*, 26(1), 30–40.

Aromatherapy

Aromatherapy can be used to relax or stimulate the CNS. Aromatic molecules give off signals that travel to the limbic system (the so-called “emotional switchboard” of the brain). “Because the limbic system is directly connected to those parts of the brain that control heart rate, blood pressure, breathing, memory, stress levels, and hormone balance, scientists have

TABLE 36-7
Herbs for the Nervous System

Classification	Functions	Herbs
Nerve Tonics	<ul style="list-style-type: none"> • Feed, tone, and strengthen the nervous tissues and cells • High in calcium, magnesium, B vitamins, and protein content • To be most effective, should be taken over long period of time. 	Chamomile (<i>Anthemis nobilis</i>) *Ginkgo (<i>Ginkgo biloba</i>) Hops (<i>Humulus lupulus</i>) Skullcap (<i>Scutellaria lactiflora</i>) *NOTE: Ginkgo has vasoconstrictive properties that help improve cerebral blood flow (Tierra, 1998); is licensed in Germany for treatment of cerebral dysfunction (Goldberg, 1999).
Nerve Demulcents	<ul style="list-style-type: none"> • Soothe and heal irritated, inflamed nerve endings. • Gel-like consistency coats and protects nerve endings. 	Barley (<i>Hordeum vulgare</i>) Flax seed Marsh mallow root (<i>Althea officinalis</i>) Oats (<i>Avena sativa</i>) Slippery elm (<i>Ulmus rubra</i>)
Nerve Sedatives	<ul style="list-style-type: none"> • Relax the nervous • Help reduce pain and tension • Promote sleep • Many exert anti-spasmodic effects. 	Catnip (<i>Catnip cataria</i>) Passion flower (<i>Passiflora incarnata</i>) St. John's wort (<i>Hypericum perforatum</i>)
Nerve Stimulants	<ul style="list-style-type: none"> • Activate nerve endings by increasing circulation • Provide nutrients • Revitalize the nervous system 	Cayenne (<i>Capsicum annum</i>) Ginger (<i>Zingiber officinalis</i>) Ginseng (<i>Panax quinquefolius</i> ; <i>Eleutherococcus senticosus</i>) Lemon balm (<i>Melissa officinalis</i>) Peppermint (<i>Mentha piperita</i>) Rosemary (<i>Rosmarinus officinalis</i>) Sage (<i>Salvia officinalis</i>)

ESSENTIAL OILS AND CNS HEALTH

Chamomile (<i>Anthemis nobilis</i>)	Alleviates physical and mental stress
Lavender (<i>Lavandula angustifolia</i>)	Calming, sedative effect
Mandarin (<i>Citrus reticulata</i>)	Relieves anxiety
Peppermint (<i>Mentha piperita</i>)	Stimulant; strengthens adrenal cortex
Yarrow (<i>Achillea millefolium</i>)	Promotes sleep

(Data from Goldberg, B. [1999]. *Alternative medicine: The definitive guide*. Tiburon, CA: Future Medicine Publishing; Tierra, M. [1998]. *The way of herbs*. New York: Pocket Books; Walters, C. [1998]. *Aromatherapy: A basic guide*. New York: Barnes & Noble.)

learned that oil fragrances may be one of the fastest ways to achieve physiological and psychological effects” (Goldberg, 1999, p. 54). The accompanying display lists some essential oils used to promote a healthy CNS.

EVALUATION

Evaluating the care of the client with sensory, perceptual, and cognitive alterations is dependent on the specific expected outcomes for each client. Evaluation of outcome achievement is performed through the nurse's use of observation and communication skills. An important component of evaluation is determination of the client's need for continued assistance in meeting needs. Evaluation of the client's self-care abilities provides information for discharge planning, including follow-up care or placement in a long-term care facility, if necessary.

KEY CONCEPTS

- The well-being of an individual is dependent upon the functions of sensation, perception, and cognition, which are controlled by the central nervous system.

NURSING CARE PLAN**The Client with Impaired Memory****Case Presentation**

Mr. Brown, a 53-year-old contract worker, arrives at the clinic with his son, who had found Mr. Brown wandering aimlessly along a road in his community. The son is worried that his father is becoming “more and more forgetful every day.” This was first noticed one month ago, when Mr. Brown forgot his phone number when completing a job application. Since then, the memory lapses have become more frequent and are now interfering with daily routines (he forgets to take his blood pressure medicine and gets lost returning home). Mr. Brown is currently unemployed and has no health care insurance. He denies that there is any problem and reluctantly agreed to come in today after hearing on the radio about free blood-pressure screenings offered by the clinic.

Assessment

- Impaired memory
- Disorientation (occasionally)
- Impaired judgment
- Impaired problem solving or decision making

Nursing Diagnosis #1

Acute Confusion related to unknown etiology as evidenced by fluctuations in cognition and level of consciousness, and memory disturbances.

Expected Outcome

The client will maintain current level of consciousness with no demonstrated deterioration.

Interventions/Rationales

1. Assess level of consciousness.
Establishes a baseline of data in order to intervene quickly if mental status changes.
2. Tell Mr. Brown your name and why you are meeting with him.
Keeps client oriented to reality.
3. Talk to Mr. Brown while providing care.
Maintains reality orientation.
4. Whenever possible, avoid the use of drugs that may cause drowsiness or sedation.
Increased drowsiness or sedation will make it difficult to determine changes in neurological function.
5. Encourage physical and mental activity, daily exercise, and interaction (e.g., with family or friends, newspaper, TV, etc.)
Improves memory, attention, and orientation.
6. Prepare the client for changes in activity or routines.
Reduces confusion and creates a routine to improve orientation.

Evaluation

Goal partially met. Mr. Brown remained free of injury while at the clinic.

Nursing Diagnosis #2

Risk for Injury related to cognitive deficits.

Expected Outcome

Mr. Brown will remain free of injury.

Interventions/Rationales

1. Assess environment and make alterations to enhance safety if necessary.
Alterations will lessen likelihood of injury.

(continues)

NURSING CARE PLAN**The Client with Impaired Memory (continued)**

2. Provide support to significant others and/or supervision for tasks deemed potentially harmful to client, discouraging tasks as appropriate (e.g., cooking, smoking).
Prevents physical injury to client or danger to others.
3. Provide a list of community resources and cost of services (e.g., day treatment centers, home health agencies) and encourage utilization of resources as appropriate.
A list will promote access to available resources that offer a safe environment through part- or full-time supervised care.

Evaluation

Goal partially met. Mr. Brown remained free of injury while at the clinic. He stated he was not interested in the list of community resources.

Nursing Diagnosis #3

Anxiety related to cognitive deficits and fear of being a burden to family.

Expected Outcomes

1. Mr. Brown will verbalize feelings of anxiety before leaving the clinic.
2. Mr. Brown will demonstrate decreased anxiety as evidenced by decreased irritability and increased cooperation.

Interventions/Rationales

1. Mr. Brown is informed that tests and examination will be performed only with his consent.
Decreases anxiety by reinforcing client's sense of control and shows respect for client.
2. Encourage Mr. Brown to talk about his concerns.
Verbalization of feelings decreases anxiety.
3. Observe for manifestations of anxiety.
Establishes a baseline of data and determines anxiety level.
4. Teach Mr. Brown one simple relaxation technique.
Increases client's control over anxiety-provoking situations.
5. Provide a referral for follow-up appointment.
Allows practitioner to monitor client's mental status.

Evaluation

1. Goal met. Mr. Brown discussed his fears of losing his mind and of being a burden to his son.
2. Goal partially met. Mr. Brown exhibited signs of relaxation; he stated he was not interested in learning relaxation techniques.
3. Goal met. Mr. Brown stated he would see the nurse practitioner as scheduled, and gave the appointment card to his son for "safekeeping."

- Primary components of consciousness include arousal and awareness.
- Cognitive and perceptual functioning is inferred through assessment of the client's behaviors (e.g., consciousness, orientation, speech, thought processes, and perceptions).
- The sensory system is made up of a complex network of afferent fibers within the peripheral nerves, afferent tracts located in the spinal cord and brain stem, and the higher cortex (cerebral lobes).
- Consciousness is a state of awareness of one's self, others, and the surrounding environment, and it affects intellect and emotions.
- Consciousness is controlled by the reticular activating system located within the midbrain and thalamus, as well as connective fibers between these structures and areas within the cerebral cortex.
- The degree of arousal (alertness) is indicated by a person's general response to the environment.
- Orientation refers to awareness of self in relation to the surrounding environment; an individual who is "oriented $\times 4$ " is aware of time, place, person, and situation.
- There are three distinct types of memory: immediate, recent, and remote.
- An individual's affect (mood or feeling tone) can affect thinking ability.

- Judgment is the ability to compare or evaluate alternatives to life situations and arrive at an appropriate course of action.
- There are two types of perceptual distortions, illusions and hallucinations.
- Language is one of the most complex of cognitive functions, involving the ability to speak, read, write, and comprehend.
- A person can become confused as a result of either overstimulation or understimulation.
- Sensory deprivation, a state of reduced sensory input, can occur as a result of illness, trauma, or isolation.
- Sensory overload is a state of excessive and sustained multisensory stimulation manifested by behavior change and perceptual distortion.

CRITICAL THINKING ACTIVITIES

1. What are the nursing implications when caring for someone with impaired judgment?
2. Why might a drug such as morphine sulfate be contraindicated in a client who has an altered level of consciousness?
3. What is the primary objective regarding learning needs for a client with an altered level of consciousness?
4. What is the primary objective regarding learning needs for a client with altered sensory perception?
5. What nursing interventions are therapeutic for a client experiencing sensory deprivation?
6. What nursing interventions are therapeutic for a client experiencing sensory overload?

WEB RESOURCES

- American Association of Critical Care Nurses
www.aacn.org
- American Association of Neuroscience Nurses
www.aann.org
- American Nurses Association
www.ana.org
- Canadian Association of Neuroscience Nurses
www.cann.ca
- National Institutes of Health
www.nih.gov

Chapter 37

Fluid, Electrolyte, and Acid-Base Balance



The most important practical lesson that can be given to nurses is to teach them what to observe—how to observe—what are of importance.

—Nightingale (in Skretkowicz, 1992)

COMPETENCIES

1. Review the physiological processes and core concepts relative to body fluid and acid-base balance and imbalances.
2. Relate the common disturbances in body fluid and acid-base balance to their clinical manifestations and nursing interventions.
3. Identify the key elements for assessing clients with body fluid and acid-base alterations.
4. Describe the nursing data that supports the common nursing diagnosis and goals for clients with body fluid and acid-base disturbances.
5. Describe the common nursing interventions for clients with alterations in body fluid and acid-base balance.
6. Identify the key indicators to evaluate client achievement of expected outcomes to restore and to maintain body fluid and acid-base balance.

KEY
TERMS

acid	homeostasis	implantable port
acid-base balance	hydrostatic pressure	infiltration
acid-base buffer system	hypercalcemia	intracath
acidosis	hyperchloremia	intravenous (IV) therapy
alkalosis	hyperkalemia	isotonic
angiocatheter	hypermagnesemia	osmolality
arterial blood gases (ABGs)	hyponatremia	osmolarity
base	hyperphosphatemia	osmole
butterfly needles	hypertonic	osmosis
colloid	hypervolemia	osmotic pressure
crystalloid	hypocalcemia	permeability
cytomegalovirus (CMV)	hypochloremia	phlebitis
diffusion	hypokalemia	piggybacked
edema	hypomagnesemia	semipermeable
electrochemical gradient	hyponatremia	skin turgor
electrolyte	hypophosphatemia	solute
flashback	hypotonic	solvent
flow rate	hypoxemia	vesicant

The physiological functions and alterations of body fluid and acid-base balance are presented in this chapter. The term *body fluid* is used to denote both water and electrolytes, whereas the term *body water* refers to water alone. **Homeostasis**, or equilibrium of the internal environment, refers to the state of balance of body fluid.

PHYSIOLOGY OF FLUID AND ACID-BASE BALANCE

The body normally maintains a balance between the amount of fluid taken in and the amount excreted. Health promotion requires a maintenance of body fluid and acid-base balance.

Fluid Compartments

The body's fluid is contained within three compartments: cells, blood vessels, and the tissue space (space between the cells and blood vessels). To understand this concept, visualize cars on a freeway. The cars represent cells; the lanes represent the blood vessels, and the space between the cars in the lanes represents the tissue space. The freeway itself is the body.

Just as traffic is ongoing and continuous, fluids move constantly from one compartment to another to accommodate the cell's metabolic needs (Figure 37-1). Specific terms are used in describing compartmentalized body fluid. The prefixes (see the accompanying display) used with the root words for the compartments that contain the body fluid give meaning to the following terms:

- **Intracellular fluid:** *within* the cell
- **Intravascular fluid:** *within* blood vessels
- **Interstitial fluid:** *between* cells; fluid that surrounds cells

PREFIXES

<i>Inter-</i>	Between
<i>Intra-</i>	Within
<i>Extra-</i>	Outside
<i>Hypo-</i>	Under, beneath, deficient
<i>Hyper-</i>	Above, beyond, excessive

There are two types of body fluid: intracellular (ICF) and extracellular (ECF). Because intravascular and interstitial fluid are outside the cells, these fluids are extracellular. Key terms used in explaining the movement of molecules in body fluids are:

- **Solute:** Substance dissolved in a solution
- **Solvent:** Liquid that contains a substance in solution
- **Permeability:** Capability of a substance, molecule, or ion to diffuse through a membrane (covering of tissue over a surface, organ, or separating spaces)
- **Semipermeable:** Selectively permeable (All membranes in the body allow some solutes to pass through the membrane without restriction but will prevent the passage of other solutes.)

Cells have permeable membranes that allow fluid and solutes to pass into and out of the cell. Permeability allows the cell to acquire the nutrients it needs from extracellular fluid to carry on metabolism and to eliminate metabolic waste products.

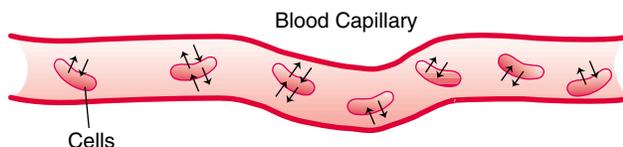


Figure 37-1 The Movement of Fluid Between the Intracellular and Extracellular Compartments

Blood vessels have permeable membranes that bathe and feed the cells. The intravascular fluid of arterioles carries oxygen and nutrients to the cells. The venules take in the waste products from the cells' metabolic activity.

Cells and capillaries form a meshlike structure that creates a tissue space between cells and the vascular system to allow cellular access to the vascular system. Interstitial space promotes access of the cells to the arterioles and venules.

Body Water Distribution

Water is the largest single constituent of the body, representing 45% to 75% of the body's total weight. About two-thirds of the body fluid is intracellular. The remaining one-third is extracellular, with one-fourth of this fluid being intravascular and three-fourths being interstitial fluid. Bones are made up of nearly one-third water, while the muscles and brain cells contain 70% water. Body fat is essentially free of water; therefore, the ratio of water to body weight is greater in leaner people than in obese people.

Water is present in all body tissues and cells, and serves two main functions: to act as a solvent for the essential nutrients, so that they can be used by the body; and to transport nutrients and oxygen from the blood to the cells and to remove waste material and other substance from the cells back to the blood so they can be excreted by the body. Water is also needed by the body to:

- Give shape and form to the cells
- Regulate body temperature
- Act as a lubricant in joints
- Cushion body organs
- Maintain peak physical performance

Water loss has a negative effect on the body's ability to function, because every 2% to 5% of water loss results in a 30% decrease in work performance (Kloss, 1995; Kleiner, 1999).

Electrolytes

An **electrolyte** is a compound that, when dissolved in water or another solvent, forms or dissociates into ions

DISTRIBUTION OF CHLORIDE, BICARBONATE, PHOSPHATE, AND SULFATE IN BODY FLUID

Electrolyte	Extracellular (mEq/L)	Intracellular (mEq/L)
Chloride (Cl ⁻)	98–106	1–4
Bicarbonate (HCO ₃ ⁻)	25–27	10–12
Phosphate (HPO ₄ ⁻)	1.7–4.6	100–104
Sulfate (SO ₄ ⁻)	1	2

(Adapted from Fischbach, F. [2000]. *A manual of laboratory and diagnostic tests* (6th ed.). Philadelphia: Lippincott.)

(electrically charged particles) (Figure 37-2). The electrolytes provide inorganic chemicals for cellular reactions and control mechanisms. Electrolytes have special physiological functions in the body that promote neuromuscular irritability, maintain body fluid osmolarity, regulate acid-base balance, and distribute body fluids between the fluid compartments.

Electrolytes are measured in terms of their electrical combining power, the quantities of cations and anions in a solution, expressed as milliequivalents per liter (mEq/L). Because electrolytes produce either positively charged ions (cations) or negatively charged ions (anions), they are critical regulators in the distribution of body fluid. The main electrolytes in body fluid are: sodium (Na⁺), potassium (K⁺), calcium (Ca²⁺), and magnesium (Mg²⁺).

Table 37-1 discusses the distribution of electrolytes in body fluid, their regulatory functions, and dietary sources. As shown in Table 37-1, the extracellular fluid contains the largest quantities of sodium, chloride, and bicarbonate ions, but only small quantities of potassium, calcium, magnesium, phosphate, sulfate, and organic acid ions. The intracellular fluid contains only small quantities of sodium and chloride ions and almost no calcium ions. Large quantities of potassium and phosphate ions with moderate quantities of magnesium and sulfate ions are contained within intracellular fluid (see the accompanying display).

Movement of Body Fluids

The physiological forces that affect the movement of body fluids through cell walls and capillaries can be perceived as a mass-transportation system that carries traffic between the compartments. These forces transport molecules of water, foods, gases, wastes, and ions to maintain a physiological balance between extracellular and intracellular fluid volumes. These transport processes account for fluid shifts between the compartments (Table 37-2).

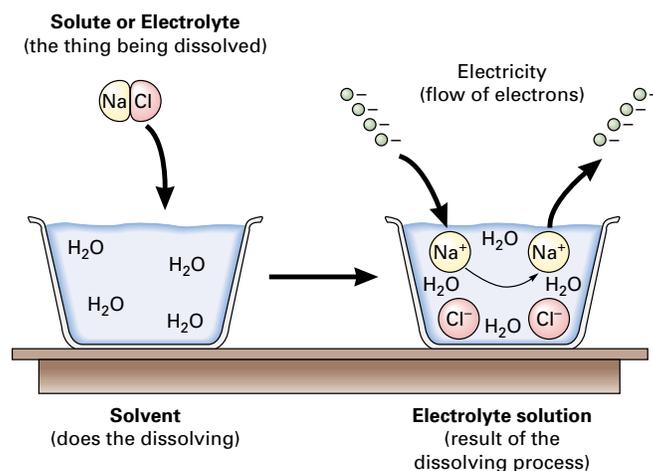


Figure 37-2 Dissolution of Electrolytes

TABLE 37-1
Common Electrolytes

Electrolyte Ion	Distribution in Body Fluid		Basic Functions	Dietary Sources
	Extracellular (mEq/L)	Intracellular (mEq/L)		
Sodium (Na ⁺)	135–154	15–20	<p>Regulates fluid volume within extracellular fluid (ECF) compartment. Increases cell membrane permeability. Regulates vascular osmotic pressure. Controls water distribution between ECF and intracellular fluid (ICF) compartments. Stimulates conduction of nerve impulses. Maintains neuromuscular irritability.</p>	<p>Table salt (NaCl), 40% of which is sodium; cheese, milk, processed meat, poultry, shellfish, fish, eggs, and foods preserved with salt (e.g., ham and bacon)</p>
Potassium (K ⁺)	3.5–5	150–155	<p>Regulates osmolality of ICF. Promotes transmission of nerve impulses. Promotes contraction of skeletal and smooth muscles. Promotes enzymatic action for cellular energy production by transforming carbohydrates into energy and restructuring amino acids into proteins. Regulates acid-base balance by cellular exchange of hydrogen ions.</p>	<p>Fruits, especially bananas, oranges, and dried fruits; vegetables, meats, and nuts</p>
Calcium (Ca ²⁺)	4.5–5.5	1–2	<p>Provides strength and durability to bones and teeth. Establishes thickness and strength of cell membranes. Promotes transmission of nerve impulses. Decreases neuromuscular excitability. Is essential for blood coagulation. Promotes absorption and utilization of vitamin B₁₂. Activates enzyme reactions and hormone secretions.</p>	<p>Dairy products (milk, cheese, and yogurt), sardines, whole grains, and green leafy vegetables</p>
Magnesium (Mg ²⁺)	4.5–5.5	27–29	<p>Activates enzyme systems, mainly those associated with vitamin B metabolism and the utilization of potassium, calcium, and protein. Promotes regulation of serum calcium, phosphorus, and potassium levels. Promotes neuromuscular activity.</p>	<p>Green leafy vegetables, whole grains, fish, and nuts</p>

TABLE 37-2
Movement of Body Fluid

Physiological Force	Process	Related Factors
<p>Diffusion</p> <p>The rate of diffusion (continual movement of molecules in a solution or a gas) is influenced by:</p> <ul style="list-style-type: none"> • The size of the molecule (smaller molecules diffuse faster than larger molecules) • The concentration of the molecules (molecules move from an area of greater concentration to an area of lesser concentration) • The temperature of the solution (higher temperatures increase the rate of diffusion) 	<p>Particles move across a permeable membrane and disperse in all directions through a solution or a gas (Figure 37-3).</p>	<p>The particle's electrical charge can also affect the process of diffusion because ions with opposite charges are pulled toward other ions.</p>
<p>Osmosis</p> <p>The process of osmosis (passage of a solvent from an area of lesser concentration to an area of greater concentration) is influenced by:</p> <ul style="list-style-type: none"> • The net movement of water • The semipermeability of the membrane 	<p>Solvent molecules move across a membrane to an area where there is a higher concentration of solute that cannot pass through the membrane (Figure 37-4).</p>	<p>Osmotic pressure is force created when two solutions of different concentrations are separated by a selectively permeable membrane. An osmole is the unit of measure of osmotic pressure.</p>
<p>Active Transport</p> <p>An electrochemical gradient (sum of all the diffusion forces acting on the membrane, from either a concentration gradient or an electrical or pressure gradient) exists when there is active transport.</p>	<p>Occurs when a cell membrane moves molecules or ions against an electrochemical gradient from an area of lesser concentration to an area of greater concentration.</p>	<p>In order for active transport to occur, there must be a carrier and adenosine triphosphate (ATP) molecules inside the cell membrane (Figure 37-5).</p>
<p>Hydrostatic Pressure</p> <p>Hydrostatic pressure (force a liquid exerts on the sides of the container that holds it) is governed by:</p> <ul style="list-style-type: none"> • The force by which the heart pumps • The rate of blood flow • The arterial blood pressure • The venous blood pressure 	<p>The force of fluid presses outward against the blood vessel wall.</p>	<p>The hydrostatic pressure is twice as great at the arterial end than at the venous end, causing fluid and solutes to go from the arterial end of the capillary into the interstitial space.</p>
<p>Filtration</p> <p>Filtration is governed by the presence of a greater hydrostatic pressure in the arterial end capillaries than in the interstitial spaces.</p>	<p>The movement of fluid through a semipermeable membrane from an area with higher hydrostatic pressure to an area with lower hydrostatic pressure creates an outward gain of fluid in the interstitial spaces.</p>	<p>The body achieves total fluid balance when the excess fluid and solutes remaining in the interstitial spaces are returned to the intravascular compartment by the lymphatic system.</p>
<p>Colloid Osmotic Pressure</p> <p>Created by solutes or colloids (proteins or nondiffusible substances) in the plasma</p>	<p>There is a movement of fluid between the intravascular and interstitial compartments, based on the number of solute particles on the concentrated side and the presence of a semipermeable membrane.</p>	<p>Because the protein content of intravascular fluid is 16 times as great as that of interstitial fluid, the fluids move into the capillary or intravascular compartment when the heart pumps effectively.</p>

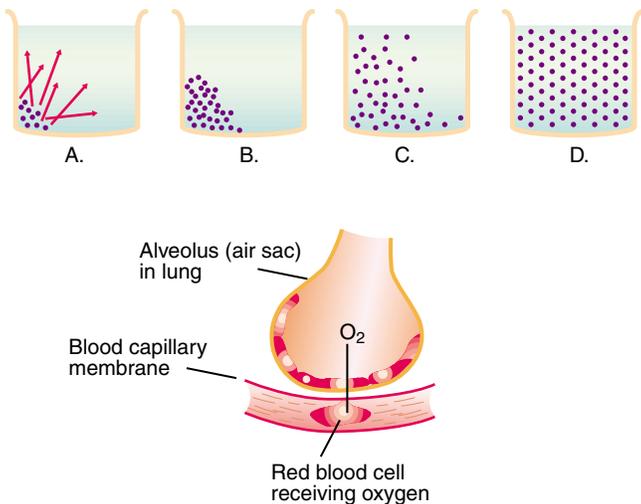


Figure 37-3 The process of diffusion. A. A small lump of sugar is placed in a beaker of water, its molecules dissolve and begin to diffuse outward. B., C. The sugar molecules continue to diffuse through the water from an area of greater concentration to an area of lesser concentration. D. Over a long period of time, the sugar molecules are evenly distributed throughout the water, reaching a state of equilibrium. Example of diffusion in the human body: Oxygen diffuses from an alveolus in a lung, where it is in greater concentration, across the capillary membrane, into a red blood cell, where it is in lesser concentration.

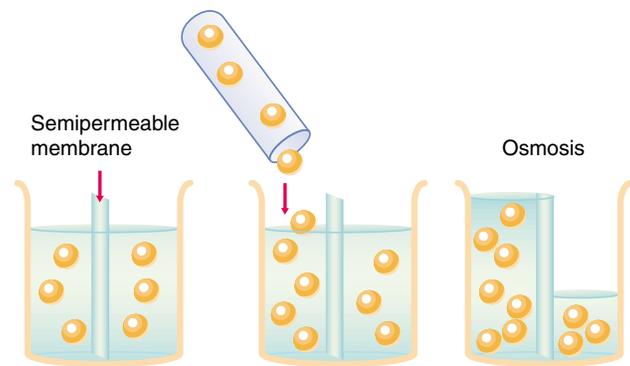


Figure 37-4 The Process of Osmosis

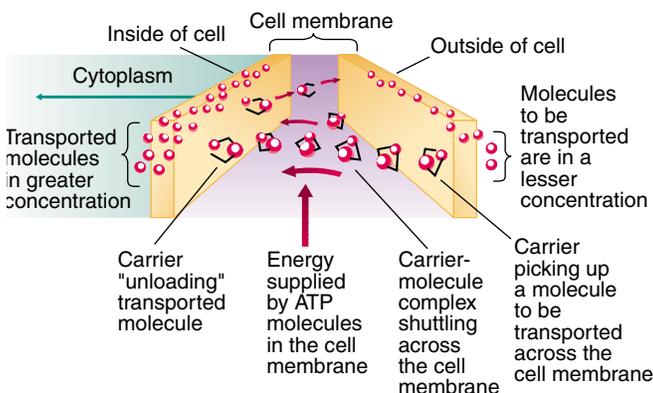


Figure 37-5 The Active Transport of Molecules from an Area of Lesser Concentration to an Area of Greater Concentration

Regulators of Fluid Balance

The body has many regulators that maintain fluid balance, including fluid and food intake, skin, lungs, gastrointestinal tract, and kidneys. When all organs are functioning normally, the body is able to maintain homeostasis.

Fluid and Food Intake and Loss

There are three natural sources by which water enters the body: oral liquids; water in foods; and water formed by oxidation of foods. A normal diet provides the electrolytes required by the body (see the accompanying display for the typical daily amount of body fluid intake for an adult).

Body fluid is replenished by the ingestion of liquids and food products such as meats and vegetables, which contain 65% to 97% water. The third source of body fluid is the metabolism of foods, which yields water of oxidation. The kidneys excrete the largest quantity of fluid; other avenues for water loss are the lungs, skin, and gastrointestinal tract.

NORMAL DAILY BODY FLUID INTAKE FOR AN ADULT

Ingested liquids	1500 ml
Water in foods	700 ml
Water from oxidation	200 ml
TOTAL	2400 ml

Skin

An estimated water loss of 300 to 400 ml per day occurs by diffusion through the skin of an adult. Because the person is not aware of this water loss, it is called *insensible loss*. Water is also lost through the skin by perspiration; however, the total amount of water lost by perspiration can vary from 1.5 to 3.5 L per hour, depending on environmental factors and body temperature.

Lungs

An estimated insensible water loss of 300 to 400 ml per day occurs in an adult through expired air, which is saturated with water vapor. This amount may vary with the rate and depth of respirations.

Gastrointestinal Tract

Although a large amount of fluid—about 8,000 ml per day in the adult—is secreted into the gastrointestinal tract, almost all of this fluid is reabsorbed by the body. In adults, about 200 ml of water is lost per day in feces. Severe diarrhea can cause a fluid and electrolyte deficit because the gastrointestinal fluids contain a large amount of electrolytes.

Kidneys

The kidneys play a major role in maintaining fluid balance by excreting 1,200 to 1,500 ml/day in the adult. The excretion of water by healthy kidneys is proportional to the fluid ingested and the amount of waste or solutes excreted.

When an extracellular fluid volume deficit occurs, hormones play a key role in restoring the extracellular fluid volume. The release of the following hormones into circulation causes the kidneys to conserve water:

- Antidiuretic hormone (ADH) from the posterior pituitary gland acts on the distal tubules of the kidneys to reabsorb water.
- Aldosterone (produced in the adrenal cortex) causes the reabsorption of sodium from the renal tubules. The increased reabsorption of sodium causes water retention in the extracellular fluid, increasing its volume.
- Renin, which is released from the juxtaglomerular cells of the kidneys, promotes vasoconstriction and the release of aldosterone.

The interaction of these hormones with regard to renal functions serves as the body's compensatory mechanism to maintain homeostasis.

Sodium is the main electrolyte that promotes the retention of water. An intravascular water deficit causes the renal tubules to reabsorb more sodium into circulation. Because water molecules go with the sodium ions, the intravascular water deficit is corrected by this action of the renal tubules.

Acid-Base Balance

Acid-base balance refers to the homeostasis of the hydrogen ion concentration in extracellular fluid. The slightest variation in the hydrogen ion concentration causes marked alterations in the rate of cellular chemical reactions. The pH symbol is used to indicate the hydrogen ion concentration of body fluids; 7.35 to 7.45 is the normal pH range of extracellular fluid. Hydrogen ions (H^+), which carry a positive charge, are protons. Depending on the number of hydrogen ions present, a solution can be either acidic, neutral, or alkaline.

As the number of hydrogen ions increases, the fluid becomes acidic. *Acidity of a solution increases as the pH value decreases.* An **acid** is a substance that donates hydrogen ions. For example, hydrochloric acid (HCl) ionizes in water (a solution) to form hydrogen ions and chloride ions. HCl, which is found in gastric juices, has a strong tendency to form ions, discharging hydrogen ions into the solution; carbonic and acetic acids are considered weak acids because in a solution they provide a low concentration of hydrogen ions.

As the number of hydrogen ions decreases, the fluid becomes alkaline. *Alkalinity of a solution increases as the pH value increases.* A **base** is a substance that accepts hydrogen ions (proton acceptor).

A neutral solution has a pH of 7. In such a solution there are equal numbers of hydrogen ions (H^+) and hydroxyl ions (OH^-), which can combine to form water (H_2O). When the number of hydrogen ions is increased, the solution becomes acidic (pH value below 7); a decrease in the number of hydrogen ions causes the solution to become alkaline (pH value above 7). When the number of free hydrogen ions in a solution increases to the point that the pH value becomes less than 7.35, the body is in a state of **acidosis**. The opposite occurs with **alkalosis**, in which a pH value higher than 7.45 results from a low hydrogen ion concentration.

Regulators of Acid-Base Balance

The body has three main control systems that regulate acid-base balance to counter acidosis or alkalosis: the buffer systems; respiration; and renal control of hydrogen ion concentration. These systems vary in their reaction time in regulating and restoring balance to the hydrogen ion concentration of a solution.

Buffer Systems

All body fluids are supplied with an **acid-base buffer system** (a solution containing two or more chemical compounds that prevents marked changes in hydrogen ion concentration when either an acid or a base is added to a solution). The buffer system reacts within a fraction of a second to prevent excessive changes in the hydrogen ion concentration.

There are several *chemical* buffer systems of body fluids, which are activated under different conditions; however, the bicarbonate-carbonic acid system (carbonate system) is the body's primary buffer system. The carbonate system consists of a mixture of carbonic acid (H_2CO_3) and sodium bicarbonate ($NaHCO_3$). The pH of the extracellular fluid can be returned to normal limits by this system because carbonic acid is a weak acid, which ionizes to a limited extent, and bicarbonate is a weak base, which yields the hydroxyl ion.

Bicarbonate helps to stabilize pH by combining reversibly with hydrogen ions. Most of the body's bicarbonate is produced in red blood cells, where the enzyme carbonic anhydrase accelerates the conversion of carbon dioxide to carbonic acid. The production of bicarbonate is illustrated in the following reversible equation:



When the hydrogen ion concentration increases in the extracellular space, the reaction shifts toward the left; a decreased concentration of hydrogen ion drives the reaction to the right.

Respiratory Regulation of Acid-Base Balance

The respiratory buffering system helps to maintain acid-base balance by controlling the content of carbon dioxide

in extracellular fluid. The *rate of metabolism* determines the formation of carbon dioxide. Carbon dioxide is continually being formed in the body by different intracellular metabolic processes. The carbon in foods is oxidized by oxygen to form carbon dioxide.

It takes the respiratory regulatory mechanism several minutes to respond to changes in the carbon dioxide concentration of extracellular fluid. With the increase of carbon dioxide in extracellular fluids, respirations are increased in rate and depth so that more carbon dioxide is exhaled. As the respiratory system removes carbon dioxide, there is less carbon dioxide in the blood to combine with water to form carbonic acid. Likewise, if the blood level of carbon dioxide is low, respirations are depressed to maintain a normal ratio between carbonic acid and basic bicarbonate.

Renal Control of Hydrogen Ion Concentration

The kidneys control extracellular fluid pH by eliminating either hydrogen ions or bicarbonate ions from body fluids. If the bicarbonate concentration in the extracellular fluid is greater than normal, the kidneys excrete more bicarbonate ions, making the urine more alkaline. Conversely, if more hydrogen ions are excreted in the urine, the urine becomes more acidic. The renal mechanism for regulating acid-base balance cannot readjust the pH within seconds, as can the extracellular fluid buffer system, nor within minutes as can the respiratory compensatory mechanism, but it can function over a period of several hours or days to correct an acid-base imbalance.

FACTORS AFFECTING FLUID AND ELECTROLYTE BALANCE

The balance of fluids and electrolytes in the body is dependent on many factors and will vary depending on such elements as age and lifestyle.

Age

Body water distribution is relative to body size. The smaller the body, the larger the fluid content:

- Adult, 60% water
- Child, 60% to 77% water
- Infant, 77% water
- Embryo, 97% water

In the elderly, body water diminishes because of tissue loss; the percentage of total body weight that is fluid may be reduced to 45% to 50% in persons over age 65. Caution must be used when administering diuretics, especially thiazide diuretics, to the elderly to prevent diuretic-induced electrolyte disturbances.

Lifestyle

Loss of body fluids can result from stress, exercise, or a warm or humid environment. Stress leads to increased blood volume and decreased urine production, with a subsequent intensification of antidiuretic hormone levels. Sweating and exercise cause the body to lose water and sodium, thus necessitating electrolyte replacement and intensifying the thirst response. Warm climates can exert a similar effect.

An individual's diet will also determine fluid and electrolyte levels. Adequate intake of fluids, carbohydrates, potassium, calcium, sodium, fats, and protein is essential in helping the body maintain homeostasis and function properly. Dehydration is one of the most common yet most serious fluid imbalances that can occur from poor monitoring of diet. One nursing goal is to ensure that all clients understand the role water plays in health and to see that clients understand how to maintain adequate hydration status.

DISTURBANCES IN ELECTROLYTE AND ACID-BASE BALANCE

The clinical management of clients experiencing disturbances in sodium, potassium, calcium, magnesium, and phosphate is presented using the functional health pattern model. See Table 37-3 for the causes, clinical manifestations, and nursing interventions for these electrolyte disturbances. Because chloride has several characteristics similar to other ions, a brief discussion of chloride imbalance is also presented. Acid-base imbalances caused by a disturbance in the level of either carbonic acid or bicarbonate are also presented using the functional health pattern model.

Electrolyte Disturbances

In health, normal homeostatic mechanisms function to maintain electrolyte and acid-base balance. In illness, one or more of the regulating mechanisms may be affected, or the imbalance may become too great for the body to correct without treatment. Refer to Chapter 28, Table 28-7, for the normal laboratory values of electrolytes.

Sodium

Sodium is the primary determinant of extracellular fluid concentration because of its high concentration and inability to cross the cell membrane easily. As discussed in Table 37-3, alterations in sodium concentration can produce profound central nervous system effects on cognition and sensory perception and on the circulating blood volume. When the kidneys reabsorb sodium ions, chloride and water are reabsorbed with the sodium to maintain the body's fluid volume.

TABLE 37-3
The Clinical Management of Clients Experiencing Common Electrolyte Disturbances

Disturbance/Causes	Clinical Manifestations	Nursing Interventions
<p>Hyponatremia</p> <p>Nutrition and metabolism</p> <ul style="list-style-type: none"> • Low sodium intake • High water intake • Anorexia nervosa • Loss of GI secretions (vomiting, diarrhea, bulimia, suctioning or drainage, tap-water enemas) • Loss of ECF sodium (peritonitis, burns) • Excessive ingestion of water or administration of IV solutions (D₅W) • ECF sodium dilution (congestive heart failure [CHF], cirrhosis, nephrosis) <p>Elimination</p> <ul style="list-style-type: none"> • Advanced renal disorders • Diuretics • Antidiuretic hormone (ADH) • Syndrome of inappropriate antidiuretic hormone (SIADH) 	<ol style="list-style-type: none"> 1. Cognitive and sensory <ul style="list-style-type: none"> • Headaches • Apprehension • Lethargy • Confusion • Depression • Convulsion 2. Activity/mobility <ul style="list-style-type: none"> • Muscular weakness 3. Skin and mucous membranes <ul style="list-style-type: none"> • Dry, pale skin • Dry mucous membranes 4. Oxygenation and ECG <ul style="list-style-type: none"> • Tachycardia • Hypotension 5. Nutrition and metabolism <ul style="list-style-type: none"> • Nausea • Vomiting • Diarrhea • Abdominal cramps 6. Biochemical <ul style="list-style-type: none"> • Serum sodium ↓ 135 mEq/L • Specific gravity ↓ 1.008 • Serum osmolality ↓ 280 mOsm/kg 	<p>Administer comfort measures as needed.</p> <p>Monitor level of consciousness. Institute safety measures for seizures.</p> <p>Assist with range of motion.</p> <p>Administer IV isotonic solution (0.9% NaCl) per order.</p> <p>Monitor hourly vital signs and I&O (ECF excess, restrict fluids and administer diuretics).</p> <p>Monitor daily intake of sodium & watch for water intoxication with SIADH (headaches and behavioral changes).</p> <p>Monitor serum sodium levels. Teach client about adequate intake of sodium, side effects of diuretics, and other causes for hyponatremia.</p>
<p>Hypernatremia</p> <p>Nutrition and metabolism</p> <ul style="list-style-type: none"> • High sodium intake • Low water intake • Severe GI loss (diarrhea and vomiting) • Excessive insensible loss (perspiration) • Salt-water drowning • Administration of IV solutions (hypertonic or isotonic saline, sodium bicarbonate) • Hypertonic saline abortions <p>Elimination</p> <ul style="list-style-type: none"> • Renal dysfunction (nephritis) • Peritoneal dialysis with glucose solution • Uncompensated diabetes insipidus <p>Hemostatic dysfunction</p> <ul style="list-style-type: none"> • CHF (↓ cardiac output, ↓ renal flow, ↑ sodium retention) • Nephrotic syndrome and cirrhosis (↑ aldosterone leading to ↑ sodium retention) 	<ol style="list-style-type: none"> 1. Cognitive and sensory <ul style="list-style-type: none"> • Restlessness • Agitation • Delirium • Twitching • Convulsions • Coma 2. Activity/mobility <ul style="list-style-type: none"> • ↑ Muscle tone • Hyperreflexia 3. Skin and mucous membranes <ul style="list-style-type: none"> • Flushed, dry skin • Red, dry tongue • Sticky mucous membranes 4. Oxygenation and ECG <ul style="list-style-type: none"> • Tachycardia 	<p>Monitor the client's level of consciousness. Institute safety measures for seizures.</p> <p>Maintain body alignment and assist with movement.</p> <p>Administer oral hygiene hourly.</p> <p>Monitor vital signs hourly.</p>

(continues)

TABLE 37-3 (continued)
The Clinical Management of Clients Experiencing Common Electrolyte Disturbances

Disturbance/Causes	Clinical Manifestations	Nursing Interventions
	5. Nutrition and metabolism <ul style="list-style-type: none"> • Nausea • Vomiting • Anorexia 	Administer oral fluids or a parenteral hypotonic solution (0.3% NaCl) as ordered.
	6. Elimination <ul style="list-style-type: none"> • Polyuria (nephritis and uncompensated diabetes insipidus) 	Monitor I&O hourly.
	7. Biochemical <ul style="list-style-type: none"> • Serum sodium ↑ 146 mEq/L • Urine sodium ↓ 40 mEq/L • Specific gravity ↑ 1.025 • Serum osmolality ↑ 295 mOsm/kg 	Monitor laboratory findings. Teach client about foods high in sodium and about sodium-retaining drugs (cough medicines, cortisone, and laxatives with sodium).
Hypokalemia		
Nutrition and metabolism <ul style="list-style-type: none"> • Malnutrition • Starvation • Crash diets • Alcoholism • Anorexia nervosa • Stress • Licorice abuse • GI loss (vomiting, diarrhea, gastric or intestinal suctioning, intestinal fistula) • NPO and potassium-free IV fluids • Diabetes mellitus • Hyperaldosteronism • Adrenal tumor, cirrhosis, CHF 	1. Nutrition and metabolism <ul style="list-style-type: none"> • ↓ Motility (hypoactive → absent bowel sounds) • Abdominal distention • Paralytic ileus • Nausea • Vomiting 	Administer potassium replacement therapy as ordered: <ul style="list-style-type: none"> • Oral potassium should be diluted in 4–8 oz of water or juice (↓ gastric mucosa irritation) • Dilute IV potassium 20–40 mEq in 1 L of IV fluids (irritating to blood vessels and myocardium) • Never administer bolus IV potassium.
	2. Cognitive and sensory <ul style="list-style-type: none"> • Malaise • Disorientation • Coma • Loss of tactile discrimination 	Monitor IV site for phlebitis and infiltration.
	3. Activity/mobility <ul style="list-style-type: none"> • Muscle weakness • Hyporeflexia 	Protect from injury.
Elimination <ul style="list-style-type: none"> • Laxative abuse • Bulimia • Enemas • Potassium-depleting diuretics (thiazide and furosemide) • Diuretic phase of acute renal failure • Dialysis • Steroids • Cushing's syndrome 	4. Elimination <ul style="list-style-type: none"> • Constipation • Polyuria 	Monitor I&O hourly.
	5. Oxygenation and ECG <ul style="list-style-type: none"> • Diminished breath sounds • Shallow, rapid, ineffective respirations • Tachycardia • ↓ Peripheral pulses • Postural hypotension • ↑ Sensitivity to digitalis • ST depression • T wave inverted • U wave prominent • Heart block • Cardiac arrest (severe hypokalemia) 	Monitor vital signs hourly. Monitor heart rate and rhythm. Monitor client closely for signs of digitalis toxicity (premature atrial and ventricular beats).
Skin and cellular integrity: <ul style="list-style-type: none"> • Trauma • Tissue injury • Surgery 		
Redistribution of potassium <ul style="list-style-type: none"> • Insulin • Alkalotic state • Healing phase of burns • Recovery from diabetic acidosis 	6. Biochemical <ul style="list-style-type: none"> • Serum potassium ↓ 3.5 mEq/L • Serum osmolality ↓ 280 mOsm/L 	Teach client about potassium-rich foods and how to prevent excessive loss (abuse of laxatives and diuretics).

(continues)

TABLE 37-3 (continued)
The Clinical Management of Clients Experiencing Common Electrolyte Disturbances

Disturbance/Causes	Clinical Manifestations	Nursing Interventions
<p>Hyperkalemia</p> <p>Nutrition and metabolism</p> <ul style="list-style-type: none"> • Oral potassium supplement • IV potassium <p>Elimination</p> <ul style="list-style-type: none"> • Acute and chronic renal failure • Potassium-sparing diuretics • Addison's disease <p>Skin and cellular integrity</p> <ul style="list-style-type: none"> • Massive trauma and crushing injuries • Hemolysis • Tourniquet application • Phlebotomy • Burns 	<ol style="list-style-type: none"> 1. Nutrition and metabolism <ul style="list-style-type: none"> • Abdominal cramps (intermittent GI pain) • Nausea • Diarrhea 2. Activity/mobility <ul style="list-style-type: none"> • Muscular weakness • Paresthesia • Muscle cramps and pain 3. Elimination <ul style="list-style-type: none"> • Oliguria or anuria 4. Oxygenation and ECG <ul style="list-style-type: none"> • Bradycardia → arrest • T wave tented • P wave small → nonvisible • QRS complex widened • Life-threatening dysrhythmias (supraventricular and/or ventricular tachycardia, premature ventricular beats, and ventricular fibrillation → arrest) 5. Biochemical <ul style="list-style-type: none"> • Serum potassium ↑ 5.3 mEq/L • Serum osmolality ↑ 295 mOsm/L 	<p>Restrict oral and parenteral potassium intake as ordered.</p> <p>Administer cation-exchange resins (Kayexalate) to reduce serum potassium.</p> <p>Administer glucose and insulin parenteral solutions to facilitate movement of potassium into the cells as ordered.</p> <p>Assess for pain and provide comfort measures as indicated.</p> <p>Monitor I&O hourly.</p> <p>Monitor client closely if receiving diuretics.</p> <p>Monitor vital signs and heart rhythm hourly for ECG changes.</p> <p>Institute safety measures when drawing blood:</p> <ul style="list-style-type: none"> • Leave tourniquet on for 1–2 minutes • Draw blood from vein away from all infusions <p>If the client is to receive whole blood, indicate on the blood bank requisition the potassium level (blood 10 days or older has an elevated serum potassium due to hemolysis of aging blood).</p> <p>Teach client about potassium-rich foods, potassium-containing salt substitutes, and potassium-conserving diuretics.</p>
<p>Hypocalcemia</p> <p>Nutrition and metabolism</p> <ul style="list-style-type: none"> • Inadequate dietary intake of calcium-rich foods (e.g., during pregnancy and lactation, when calcium requirements are high) • Poor vitamin D intake and absorption • Associated disorders: hypoparathyroidism, pancreatitis, acute metabolic acidosis, and accidental surgical removal of parathyroid glands during a thyroidectomy <p>Elimination</p> <ul style="list-style-type: none"> • Diarrhea • Wound drainage 	<ol style="list-style-type: none"> 1. Cognitive and sensory <ul style="list-style-type: none"> • Anxiety, irritability • Tingling and numbness of fingers • Tetany • Convulsions 2. Activity/mobility <ul style="list-style-type: none"> • Abdominal and muscle cramps • Positive Trousseau's sign (carpopedal spasm with hypoxia) • Positive Chvostek's sign (contraction of facial muscles when facial nerve is tapped) • Pathologic fractures (persistent deficit) 	<p>Monitor client's state of sensorium for safety factors and breathing for laryngeal stridor.</p> <p>Administer 10% IV solution of calcium gluconate, observe IV solutions with calcium for infiltration.</p> <p>Teach a diet high in calcium with vitamin D supplement.</p> <p>Administer calcium lactate orally.</p>

(continues)

TABLE 37-3 (continued)
The Clinical Management of Clients Experiencing Common Electrolyte Disturbances

Disturbance/Causes	Clinical Manifestations	Nursing Interventions
	3. Oxygenation and ECG <ul style="list-style-type: none"> • ↓ Stroke volume • ECG changes: ST segment lengthened and prolonged PR interval 	Monitor ECG for changes.
	4. Biochemical <ul style="list-style-type: none"> • ↓ Prothrombin • Serum calcium ↓ 4.5 mEq/L (total) • Elevated serum phosphorus 	
Hypercalcemia Activity/mobility <ul style="list-style-type: none"> • Excessive movement of calcium out of bones: multiple fractures, bone tumors, immobility 	1. Cognitive and sensory <ul style="list-style-type: none"> • Depression and lethargy 	Monitor client's state of sensorium for safety.
Nutrition and metabolism <ul style="list-style-type: none"> • Overconsumption of milk or dietary salts • Overactivity of parathyroid glands 	2. Activity/mobility <ul style="list-style-type: none"> • ↓ Muscle tone and deep tendon reflexes • Osteoporosis • Osteomalacia • Pathologic fractures • Deep bone pain 	Encourage client movement and exercise. Assist client with movement to ↓ pain.
Elimination <ul style="list-style-type: none"> • Renal impairment • Thiazide diuretics • Steroid therapy 	3. Oxygenation and ECG <ul style="list-style-type: none"> • Heart block • Arrest (hypercalcemia crisis) 	Monitor for ECG changes.
	4. Nutrition and metabolism <ul style="list-style-type: none"> • Nausea, vomiting, anorexia • Constipation 	Teach client to ↓ calcium intake and ↑ fiber. Encourage oral intake of acid-ash fluids to ↓ deposit of calcium salts.
	5. Elimination <ul style="list-style-type: none"> • Flank pain from calculi • Polyuria 	Monitor for symptoms of digitalis toxicity; calcium enhances the action of digitalis.
	6. Biochemical <ul style="list-style-type: none"> • Serum calcium >5.5 mEq/L (total) 	
Hypomagnesemia Nutrition and metabolism <ul style="list-style-type: none"> • Prolonged inadequate dietary intake of magnesium (e.g., malnutrition and alcoholism) • Excessive losses of magnesium (e.g., vomiting, gastric suction) • Prolonged administration of IV solutions without magnesium additives 	1. Cognitive and sensory <ul style="list-style-type: none"> • Disorientation, confusion • Vertigo • Irritability, tremors 	Monitor the client for seizure activity and laryngeal stridor.
	2. Activity/mobility <ul style="list-style-type: none"> • ↑ Tendon reflexes • Positive Chvostek's & Trousseau's signs 	
Elimination <ul style="list-style-type: none"> • Severe renal disease • Thiazide diuretics • Aldosterone excess • Polyuria 	3. Oxygenation and ECG <ul style="list-style-type: none"> • ↑ BP • Tachycardia • Dysrhythmias • T wave flat or inverted • ST segment depressed 	Monitor for ECG changes and assess the client for digitalis toxicity.
	4. Biochemical <ul style="list-style-type: none"> • Serum magnesium ↓ 1.5 mEq/L 	Teach client to eat magnesium-rich foods and to avoid excessive use of laxatives and diuretics.

(continues)

TABLE 37-3 (continued)
The Clinical Management of Clients Experiencing Common Electrolyte Disturbances

Disturbance/Causes	Clinical Manifestations	Nursing Interventions
<p>Hypermagnesemia</p> <p>Nutrition and metabolism</p> <ul style="list-style-type: none"> Excessive treatment of magnesium deficit <p>Elimination</p> <ul style="list-style-type: none"> Renal failure 	<ol style="list-style-type: none"> Cognitive and sensory <ul style="list-style-type: none"> Lethargy, drowsiness Coma Activity/mobility <ul style="list-style-type: none"> Muscle weakness, paralysis ↓ Deep-tendon reflexes Oxygenation and ECG <ul style="list-style-type: none"> ↓ respirations, 10 to 12 per minute ↓ BP Bradycardia AV block Respiratory and cardiac arrest (severe hypermagnesemia) QRS complex widening QT interval prolonged Biochemical <ul style="list-style-type: none"> Serum magnesium ↑ 2.5 mEq/L 	<p>Monitor client for level of consciousness.</p> <p>Assess patellar reflexes, if absent notify practitioner.</p> <p>Monitor vital signs q15–30 minutes until stable and for ECG changes.</p> <p>Encourage fluids unless contraindicated to dilute the serum level of magnesium.</p> <p>Teach client about over-the-counter drugs with magnesium content.</p>
<p>Hypophosphatemia</p> <p>Nutrition and metabolism</p> <ul style="list-style-type: none"> Inadequate intake: malnutrition, chronic alcoholism Prolonged administration of IV solutions that are phosphorus-poor or phosphorus-free Acid-base imbalances (e.g., diabetic ketoacidosis and respiratory alkalosis) Increased secretion of parathyroid hormone Overuse of aluminum-containing antacids 	<ol style="list-style-type: none"> Cognitive and sensory <ul style="list-style-type: none"> Confusion, seizures, coma Fatigue, memory loss Activity/mobility <ul style="list-style-type: none"> Muscle pain, weakness Paresthesia Hyporeflexia Bone pain Joint stiffness Oxygenation and ECG <ul style="list-style-type: none"> Tissue hypoxia Hyperventilation Possible bleeding Weak pulse Safety <ul style="list-style-type: none"> Possible infection Nutrition and metabolism <ul style="list-style-type: none"> Anorexia Dysphagia Biochemical <ul style="list-style-type: none"> Serum phosphate ↓ 1.7 mEq/L ↓ Platelet count ↓ Leukocyte ↓ Oxygen saturation ↑ Cardiac enzymes 	<p>Monitor client's level of consciousness. Institute safety measures for seizures.</p> <p>Administer pain medications and other comfort measures. Assist the client in maintaining proper body alignment.</p> <p>Monitor for bleeding and respiratory failure.</p> <p>Institute precautions to prevent infection.</p> <p>Teach client about phosphorus-rich foods and over-the-counter drugs that contain aluminum hydroxide.</p> <p>Administer IV phosphate with caution: dilute and infuse slowly to avoid phlebitis; infiltration at the IV site may cause tissue sloughing; do not infuse with calcium.</p>

(continues)

TABLE 37-3 (continued)
The Clinical Management of Clients Experiencing Common Electrolyte Disturbances

Disturbance/Causes	Clinical Manifestations	Nursing Interventions
Hyperphosphatemia Nutrition and metabolism <ul style="list-style-type: none"> Excessive administration of oral and IV solutions containing phosphate substances Hypoparathyroidism Laxatives containing phosphate 	1. Activity/mobility <ul style="list-style-type: none"> Tetany Muscle weakness Flaccid paralysis Circumoral paraesthesia Hyperreflexia 	Monitor for tetany and other signs of hypocalcemia.
Elimination <ul style="list-style-type: none"> Renal insufficiency 	2. Oxygenation and ECG <ul style="list-style-type: none"> Tachycardia ST segment shortened QT interval shortened 	Monitor heart rate and assess for ECG changes.
	3. Nutrition and metabolism <ul style="list-style-type: none"> Nausea, anorexia, vomiting, diarrhea 	Administer calcium replacement. Monitor urinary output; <25 ml/hour will increase serum phosphorus level.
	4. Biochemical <ul style="list-style-type: none"> Serum level \uparrow 2.6 mEq/L \downarrow Serum calcium 	Teach client to avoid foods high in phosphorus (to read the labels on canned foods) and excessive use of phosphorus-containing laxatives and enemas.

Hyponatremia

Hyponatremia is a deficit in the extracellular level of sodium. With hyponatremia, there is either a sodium deficit or a water excess; a hypo-osmolar state exists because the ratio of water to sodium is too high. The water moves out of the vascular space into the interstitial space and then into the intracellular space, causing edema. The low extracellular serum sodium causes water to enter the cells in the brain, thereby producing cerebral edema as manifested by the cognitive and sensory changes listed in Table 37-3.

Hypertatremia

Hypertatremia is an excess in the extracellular level of sodium. With an excess of sodium or a loss of water, a hyperosmolar state exists because the ratio of sodium to water is too high. This ratio causes an increase in the extracellular osmotic pressure, which pulls fluid out of the cells into the extracellular space. The symptoms of this increase depend on the cause and the location of the edema (see Table 37-3).

Potassium

The normal range of extracellular potassium is narrow (3.5–5.0 mEq/L). The slightest decrease or increase can cause serious or life-threatening effects on physiological functions. A reciprocal relationship exists between sodium and potassium; large sodium intake results in an

increased loss of potassium, and vice versa. When potassium is lost from the cells, sodium enters the cells. Intracellular potassium deficit may coexist with an excess of extracellular potassium. There are two main categories of diuretics that can cause hypokalemia:

- Potassium-wasting diuretics* excrete potassium and other electrolytes, such as sodium and chloride.
- Potassium-sparing diuretics* retain potassium but excrete sodium and chloride.

Hypokalemia

Hypokalemia is a decrease in the extracellular level of potassium. Gastrointestinal-tract disturbances and the use of diuretics can place the client at risk for hypokalemia and an acid-base imbalance (metabolic alkalosis). Potassium-wasting diuretics can cause

NURSING ALERT

Hypokalemia

Hypokalemia can cause a cardiac arrest when:

- The potassium level is less than 2.5 mEq/L.
- The client is taking digitalis (a drug that strengthens the contraction of the myocardium and slows down the rate of the heart). *Hypokalemia enhances the action of the drug, causing toxicity.*

hypokalemia. Besides diuretics, other major drug groups that can cause hypokalemia are laxatives, corticosteroids, and antibiotics.

Hyperkalemia

Hyperkalemia is an increase in the extracellular level of potassium. There are major drug groups that may cause hyperkalemia:

- Potassium-sparing diuretics
- Central nervous system agents
- Oral and intravenous replacement potassium salts

Hyperkalemia can also inhibit the action of digitalis.

NURSING ALERT

Potassium Chloride

Never administer more than 10 mEq of intravenous potassium chloride (KCl) per hour; the normal dose of intravenous KCl is 20–40 mEq/L to infuse over an 8-hour period.

Calcium

Most of the body's calcium (99%) is deposited in bone as phosphate and carbonate. The remaining 1% is in the blood plasma (serum). Normally, 50% of the serum calcium is ionized (physiologically active), with the remaining 50% bound to protein. Free, ionized calcium is needed for cell membrane permeability. The calcium that is bound to plasma protein cannot pass through the capillary wall and therefore cannot leave the intravascular compartment.



NURSING TIP

Serum Calcium

Approximately 50% of the serum calcium level is bound to protein. Correlate the serum calcium level with the serum albumin level when evaluating the laboratory results. *Any change in serum protein will result in a change in the total serum calcium.*

A stable blood level of calcium is maintained by a negative-feedback system controlled by vitamin D, parathyroid hormone, calcitonin (thyrocalcitonin), and the serum concentrations of calcium and phosphate ions. A decreased blood level stimulates the parathyroid gland to secrete parathyroid hormone, which in turn mobilizes the release of calcium from the bone,

increases the renal reabsorption, and increases intestinal absorption in the presence of vitamin D. Likewise, calcitonin, secreted by the thyroid gland, reduces the blood calcium concentration.

Calcium ions are never completely absorbed from the gastrointestinal tract. Dietary calcium absorption and utilization require an adequate amount of protein and vitamin D. Besides being needed by the body for bone and tooth formation, calcium is an important ion in the blood-clotting mechanism and for maintaining the integrity of the neuromuscular system.

Hypocalcemia

Hypocalcemia is a decrease in the extracellular level of calcium. The rapid administration of citrated blood, alkalosis, and elevated levels of serum albumin increase the activity of calcium binders, thereby decreasing the amount of free calcium.

Hypercalcemia

Hypercalcemia is an increase in the extracellular level of calcium. The clinical symptoms result from a decrease in neuromuscular activity, reabsorption of calcium from bone, and the kidney's response to a high serum calcium concentration.

NURSING ALERT

Hypercalcemic Crisis

A rapid increase in the extracellular level of calcium (above 8 to 9 mEq/L) can trigger a hypercalcemic crisis. To prevent a hypercalcemic crisis, provide adequate hydration and administer diuretics or phosphate or both as prescribed by the health care practitioner.

Magnesium

Magnesium plays an important role as a coenzyme in the metabolism of carbohydrates and proteins and as a mediator in neuromuscular activity. Magnesium has the unique characteristic of being the only cation that has a higher concentration in cerebrospinal fluid than in extracellular fluid.

Hypomagnesemia

Hypomagnesemia is a decrease in the extracellular level of magnesium and usually occurs with hypokalemia and hypocalcemia. It is probably the most undiagnosed electrolyte deficit because it is asymptomatic until the serum level approaches 1.0 mEq/L; the normal range is 4.5–5.5 mEq/L (Kee & Paulanka, 2000).

Drugs that may cause hypomagnesemia include: digitalis, potassium-wasting diuretics, cortisone, aminoglycosides, and amphotericin B; the chronic use of laxatives may also cause the condition. Clinical manifestations are related to the neuromuscular, neurologic, or cardiovascular system (see Table 37-3).

NURSING ALERT

Hyperalimentation

The continuous use of total parenteral nutrition (TPN, hyperalimentation) without a magnesium supplement can cause hypomagnesemia.

Hypermagnesemia

Hypermagnesemia refers to an increase in the extracellular level of magnesium. It rarely occurs from excessive dietary ingestion; however, overuse of magnesium-containing drugs (antacids, laxatives, and intravenous magnesium sulfate) can cause hypermagnesemia. The clinical manifestations of hypermagnesemia are non-specific (refer to Table 37-3).

Phosphate

Phosphate is the main intracellular anion; it appears as phosphorus in the serum. Phosphorus is similar to calcium in that vitamin D is needed for its reabsorption from the renal tubules.

THINK ABOUT IT

Intake of Phosphorus

When the dietary intake of calcium from milk is sufficient to meet minimal requirements, phosphorus needs will also be met. How will you educate clients who either cannot or will not consume an adequate daily intake of milk to meet their calcium and phosphorus needs?

Hypophosphatemia

Hypophosphatemia is a decreased extracellular level of phosphorus. An increase in parathyroid hormone causes decreased renal reabsorption and increased excretion of phosphates. The aim of nursing care is to protect the client from injury and to correct the deficit (see Table 37-3).

Hyperphosphatemia

Hyperphosphatemia is an increased extracellular level of phosphorus. Excessive administration (oral or intravenous) of phosphate-containing substances can cause hyperphosphatemia. Other causes of hyperphosphatemia are hypoparathyroidism, renal insufficiency, and laxatives containing phosphate.

Chloride

As previously stated, chloride and water move in the same direction as sodium ions, influencing the osmolality of extracellular fluid. Although chloride losses usually follow sodium losses, the proportion will differ

because a loss of chloride can be compensated for by an increase in bicarbonate. Therefore, signs and symptoms of a chloride imbalance will be similar to those of a metabolic acid-base imbalance, discussed later in this chapter. A deficit of either chloride or potassium will lead to a deficiency of the other electrolyte.

Hypochloremia

Hypochloremia is a decrease in the extracellular level of chloride. Gastrointestinal tract losses may cause a decrease in chloride because of the acid content of gastric juices, mainly hydrogen chloride. Because the bicarbonate ion compensates for the loss of chloride, the client is at risk for developing metabolic alkalosis. The signs and symptoms of hypochloremia are muscle twitching and slow, shallow breathing. With a severe loss of chloride and extracellular fluid volume, there may be a drop in blood pressure.

Hyperchloremia

Hyperchloremia is an increase in the extracellular level of chloride. It usually occurs with dehydration, hyponatremia, and metabolic acidosis. The signs and symptoms of hyperchloremia are muscle weakness, deep, rapid breathing, and lethargy progressing to unconsciousness if untreated.

Acid-Base Disturbances

The common types of acid-base imbalances are respiratory acidosis and alkalosis and metabolic acidosis and alkalosis.

Laboratory Data

The biochemical indicators of acid-base imbalance are assessed by measurement of arterial blood gases (ABGs). **Arterial blood gases** measure the levels of oxygen and carbon dioxide in arterial blood. The levels of blood pH, bicarbonate ion, sodium, potassium, and chloride are also important in the assessment of acid-base imbalance.

In the determination of whether the acid-base imbalance is caused by a respiratory or a metabolic alteration, the key indicators are bicarbonate and carbonic acid levels (Figure 37-6). With respiratory acidosis and alkalosis, the bicarbonate level is normal and carbonic acid is either increased (acidosis) or decreased (alkalosis). With metabolic acidosis and alkalosis, the carbonic acid is normal and the bicarbonate level is either decreased (acidosis) or increased (alkalosis). Refer to Chapter 28 for a complete discussion of arterial blood gas analysis and to Chapter 32, Table 32-4, for normal values for arterial blood gases.

Respiratory Acidosis (Carbonic Acid Excess)

Respiratory acidosis is characterized by an increased hydrogen ion concentration (a blood pH below 7.35), an

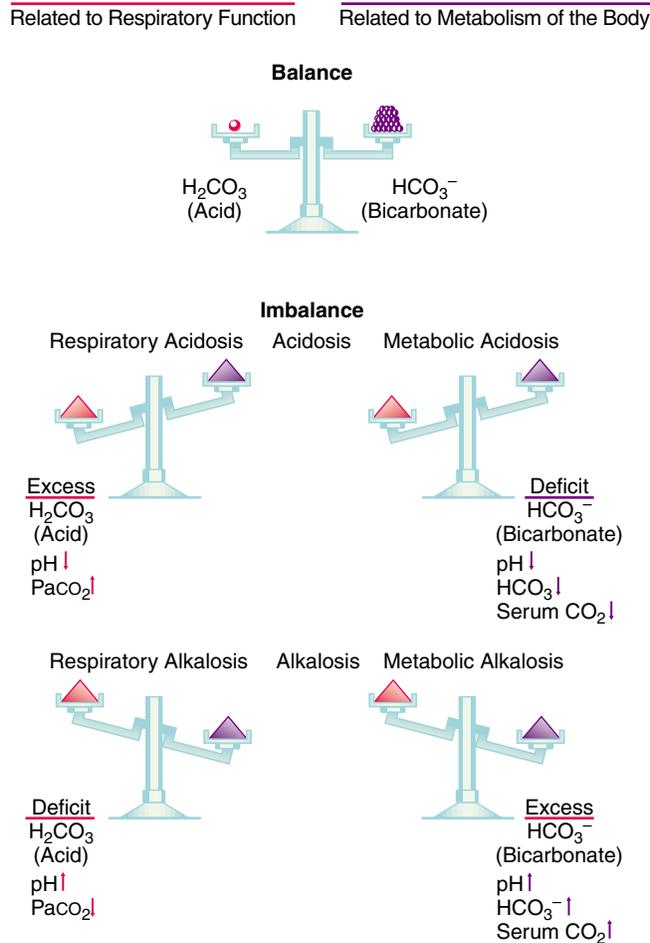


Figure 37-6 Acid-Base Balance and Imbalance

increased arterial carbon dioxide pressure (greater than 45 mm Hg), and an excess of carbonic acid. Respiratory acidosis is caused by hypoventilation or any condition that depresses ventilation (see the accompanying display).

Hypoventilation can begin in the respiratory system, as occurs with respiratory failure, or outside the respiratory system, as occurs with drug overdose. Common drugs that can cause central nervous system depression and place the client at risk for respiratory acidosis are narcotics, barbiturates, and anesthetic agents.

COMMON CAUSES OF ACUTE AND CHRONIC RESPIRATORY ACIDOSIS

Acute

Drug-induced CNS depression
Pneumonia and atelectasis
Pulmonary edema
Respiratory distress syndrome
Pneumothorax
Hypoventilation
Poliomyelitis
Chest trauma
Brain and spinal cord injury

Chronic

Asthma
Cystic fibrosis
Emphysema

Clients with respiratory acidosis experience neurologic changes resulting from the acidity of the cerebrospinal fluid and brain cells. Hypoventilation causes **hypoxemia** (decreased oxygen levels), which causes further neurologic impairments; refer to Chapter 32 for a complete discussion of hypoxemia. Hyperkalemia may accompany acidosis. See Table 37-4 for the clinical manifestations and nursing interventions used to treat respiratory acidosis.

Respiratory Alkalosis (Carbonic Acid Deficit)

Respiratory alkalosis is characterized by a decreased hydrogen ion concentration (a blood pH above 7.45) and a decreased arterial carbon dioxide pressure (less than 35 mm Hg). Respiratory alkalosis is caused by hyperventilation (excessive exhalation of carbon dioxide) resulting in hypocapnia (decreased arterial carbon dioxide concentration). Hyperventilation can be triggered by hypoxia at high altitudes, anxiety, fear, pain, fever, and rapid mechanical ventilation. Other causes of hyperventilation, which involve overstimulation of the respiratory center, include salicylate poisoning, hyperthyroidism, pneumonia, atelectasis, asthma, adult respiratory distress syndrome, congestive heart failure, pulmonary edema and embolus, brain tumors, meningitis, and encephalitis; refer to Table 37-4 for the clinical manifestations and treatment.

Metabolic Acidosis (Bicarbonate Deficit)

Metabolic acidosis is characterized by an increase in hydrogen ion concentration (blood pH below 7.35) or a decrease in bicarbonate concentration. Causes of metabolic acidosis can be divided into two categories: loss of base and gain in metabolic acids. Chronic diarrhea causes an excessive loss of bicarbonate and sodium ions from the small intestines. With the loss of sodium ions, chloride ions are in excess and combine with hydrogen to produce a strong acid (hydrochloric acid).

Clients with certain medical diagnoses are at risk for metabolic acidosis. Such conditions include:

1. **Diabetic ketoacidosis:** The cells are deprived of glucose (decrease or absence of insulin) for metabolism; the liver, in response to the needs of the cells, increases the metabolism of fatty acids, which causes an increase in ketone bodies, making the extracellular fluid more acidic.
2. **Renal failure:** The normal mechanism of the kidneys to conserve sodium and water and excrete hydrogen is compromised.
3. **Anaerobic metabolism:** Cellular catabolism and acid accumulation occur with starvation, severe malnutrition, infection, fever, trauma, shock, and excessive exercise.
4. **Drug overdose:** Acid accumulation results from excessive ingestion of salicylate, paraldehyde, and methanol.

TABLE 37-4
Respiratory and Metabolic Acidosis and Alkalosis

Imbalance/Causes	Clinical Manifestations	Nursing Interventions
Respiratory Acidosis (Retention of Carbon Dioxide)		
<ul style="list-style-type: none"> • CNS disorders • Drug overdose • Pneumonia • Pulmonary edema • Pneumothorax • Restrictive lung disease 	<ol style="list-style-type: none"> 1. Cognitive and sensory <ul style="list-style-type: none"> • Disorientation • Depression • Weakness → stupor 2. Skin and mucous membranes <ul style="list-style-type: none"> • Flushed and warm 3. Oxygenation and ECG <ul style="list-style-type: none"> • Dyspnea • Tachycardia • Dysrhythmia 4. Biochemical <ul style="list-style-type: none"> • ↓ pH (<7.35) • ↑ PaCO₂ (>45 mm Hg) • ↑ HCO₃⁻ (>28 mEq/L, indicating metabolic renal compensation) 	<ol style="list-style-type: none"> 1. Institute safety measures. Assist with positioning. 2. Monitor I&O, and administer fluids as ordered. 3. Administer oxygen and medications per order; monitor hourly vital signs and respiratory status (may require mechanical ventilation). 4. Monitor arterial blood gases (ABGs), pH, PaCO₂, HCO₃⁻.
Respiratory Alkalosis (Hyperventilation)		
<ul style="list-style-type: none"> • Anxiety, fear • CNS disorders • Pain • Fever • Pneumonia, atelectasis • Asthma • Adult respiratory distress syndrome (ARDS) • Congestive heart failure, pulmonary edema • Pulmonary embolus 	<ol style="list-style-type: none"> 1. Cognitive and sensory <ul style="list-style-type: none"> • Hyperactive reflexes • Tetany • Positive Chvostek's sign • Positive Trousseau's sign • Vertigo • Unconsciousness 2. Skin and mucous membranes <ul style="list-style-type: none"> • Sweating (may occur) 3. Oxygenation and ECG <ul style="list-style-type: none"> • Rapid, shallow breathing • Palpitations 4. Biochemical (uncompensated respiratory alkalosis) <ul style="list-style-type: none"> • ↑ pH (>7.45) • ↓ PaCO₂ (<35 mm Hg) 	<ol style="list-style-type: none"> 1. Institute safety measures for the client with vertigo or the unconscious client. Encourage the anxious client to verbalize fears. Administer sedation as ordered to relax the client. 2. Keep the client warm and dry. 3. Encourage the client to take deep, slow breaths or breathe into a brown paper bag (inspire CO₂). Monitor vital signs. 4. Monitor ABGs, primarily PaCO₂, a value ↓ 35 mm Hg indicates too little CO₂ (e.g., carbonic acid)
Metabolic Acidosis (Gain of Metabolic Acids or Loss of Base)		
Increased acids: <ul style="list-style-type: none"> • Renal failure • Diabetic ketoacidosis • Anaerobic metabolism • Drug overdose (salicylates, methanol) 	<ol style="list-style-type: none"> 1. Cognitive and sensory <ul style="list-style-type: none"> • Restlessness, disorientation • Stupor, coma 2. Activity/mobility <ul style="list-style-type: none"> • Weakness, lethargy 	<ol style="list-style-type: none"> 1. Institute safety measures. Monitor client's sensorium, report alteration in level of consciousness. 2. Assist the client with positioning and proper body alignment.
Loss of base: <ul style="list-style-type: none"> • Diarrhea 	<ol style="list-style-type: none"> 3. Skin and mucous membranes <ul style="list-style-type: none"> • Warm, flushed skin 4. Oxygenation and ECG <ul style="list-style-type: none"> • Kussmaul breathing (deep, rapid respirations) • Bradycardia, decreased cardiac output • Dysrhythmias 	<ol style="list-style-type: none"> 3. Keep the client comfortable. 4. Monitor vital signs and I&O. Monitor and report cardiac dysrhythmias. Administer sodium bicarbonate and fluid replacement as ordered. (<i>continues</i>)

TABLE 37-4 (continued)
Respiratory and Metabolic Acidosis and Alkalosis

Imbalance/Causes	Clinical Manifestations	Nursing Interventions
	5. Nutrition and metabolism <ul style="list-style-type: none"> • Nausea, vomiting • Abdominal pain 	5. Provide comfort measures. Correct metabolic problem as ordered.
	6. Biochemical <ul style="list-style-type: none"> • ↓ pH (<7.35) • ↓ HCO₃⁻ (<24 mEq/L) • ↓ BE (base excess <2 mEq/L) • ↓ Serum CO₂ (<22 mEq/L) 	6. Monitor ABGs and evaluate the metabolic indicators (HCO ₃ ⁻ & BE).
Metabolic Alkalosis (Gain of Base or Loss of Metabolic Acids)		
Gain of base: <ul style="list-style-type: none"> • Excess ingestion of antacids • Excess administration of sodium bicarbonate 	1. Cognitive and sensory <ul style="list-style-type: none"> • Irritability, confusion 	1. Monitor the client's sensorium and report increasing mental confusion.
	2. Activity/mobility <ul style="list-style-type: none"> • Tetany • Hypertonic muscles • Hypertonic reflexes 	2. Institute safety and comfort measures. Report symptoms of tetany.
Loss of metabolic acids: <ul style="list-style-type: none"> • Vomiting • Nasogastric suctioning or lavage • Low potassium or chloride • Increased aldosterone • Administration of steroids or diuretics 	3. Oxygenation and ECG <ul style="list-style-type: none"> • Depressed rate and depth of respirations 	3. Monitor vital signs and report changes in the client's respiratory status.
	4. Nutrition and metabolism <ul style="list-style-type: none"> • Vomiting 	4. Monitor I&O, recording amount of fluid loss from vomiting and gastric suctioning. Administer intravenous sodium chloride solutions (0.45–0.9%) as ordered.
	5. Biochemical <ul style="list-style-type: none"> • ↑ pH (>7.45) • ↑ HCO₃⁻ (>28 mEq/L) • ↑ BE (base excess >2 mEq/L) • ↓ Serum levels of potassium and chloride 	5. Monitor ABGs and evaluate the metabolic indicators (HCO ₃ ⁻ and BE).

(From Hartshorn, J., Sole, M. L., Lamborn, M., & Cullen, B. N. [1997]. *Introduction to critical care nursing* [2nd ed.]. Philadelphia: Saunders; Kee, J. L., & Paulanka, B. J. [2000]. *Fluids and electrolytes with clinical applications* [6th ed.]. Albany, NY: Delmar Thomson Learning)

In response to metabolic acidosis, the respiratory center is stimulated, causing an increase in the rate and depth of respirations (Kussmaul breathing), to lower the acid concentration in extracellular fluid by increasing the exhalation of carbon dioxide. The respiratory compensatory mechanism is usually ineffective in

decreasing acids, especially if the client has chronic obstructive pulmonary disease or is in ketoacidosis. Refer to Chapter 32 for additional information on these diagnoses. The renal compensatory mechanism tries to increase the pH by exchanging sodium ions with hydrogen ions to increase the excretion of hydrogen; refer to Table 37-4 for the clinical manifestations and treatment of metabolic acidosis.

NURSING ALERT

Electrolyte Shift

Metabolic acidosis causes an electrolyte shift: Hydrogen and sodium ions move into the cell, and potassium moves into the extracellular fluid. Hyperkalemia may cause ventricular fibrillation and death.

Metabolic Alkalosis (Bicarbonate Excess)

Metabolic alkalosis is characterized by an increased loss of acid from the body or a gain in base (increased levels of bicarbonate). The blood pH is above 7.45. A gain in base may result from excessive ingestion of antacids. These substances neutralize acids, producing alkalosis

and hypercalcemia. The excessive oral or parenteral administration of sodium bicarbonate or other alkaline salts (e.g., sodium or potassium acetate, lactate, or citrate) increases the amount of base in extracellular fluids.

The following clinical conditions can place clients at risk for metabolic alkalosis:

1. Vomiting and nasogastric suctioning or lavage cause a loss in hydrochloric acid and chloride; with the loss of the hydrogen and chloride ions, bicarbonate ions are absorbed, unneutralized, into the bloodstream and the pH of the extracellular fluid rises (alkalosis).
2. Diarrhea, and steroid or diuretic therapy can cause the excessive loss of potassium, chloride, and other electrolytes; the potassium deficit causes the kidneys to exchange hydrogen ions (instead of potassium ions) for sodium ions, which promotes the loss of hydrogen, thereby increasing bicarbonate level. Hydrochlorothiazide, a thiazide diuretic, blocks the reabsorption of sodium in the cortex in the distal tubule causing sodium to be excreted in greater amounts than water (hyponatremia). Thiazides also cause hypokalemia because of the loss of urinary potassium. The secondary effects of thiazides lead to metabolic alkalosis because of a depletion in volume, chloride, potassium, and hydrogen ions (DeJong, 1998).

The respiratory and renal compensatory mechanisms respond to an increased bicarbonate–carbonic acid ratio. The rate and depth of respirations are decreased in an effort to retain carbon dioxide. The arterial carbon dioxide concentration rises, creating respiratory acidosis, to counter the pH imbalance of metabolic alkalosis.

A normal serum potassium level is a prerequisite to renal compensation. In alkalosis, potassium ions enter the cells in exchange for hydrogen ions, causing hypokalemia. Hypokalemia further potentiates metabolic alkalosis because the kidneys conserve hydrogen ions by excreting potassium ions in exchange for sodium ions. When hypokalemia is present, the kidneys cannot function as a compensatory mechanism; therefore, they continue to excrete hydrogen, and bicarbonate excess continues. Refer to Table 37-4 for the clinical manifestations and treatment of metabolic alkalosis.

ASSESSMENT

Assessment data are used to identify clients who have potential or actual alterations in fluid volume. Clients receiving certain treatments, such as medications and IV therapy, are at risk for developing imbalances. The key nursing assessment indicators that identify imbalances are daily weights, vital signs, intake and output, and the physical findings of the skin, oral cavity, eyes, venous filling, and neuromuscular system.

Health History

The nursing history should elicit data specific to fluids (see the accompanying display for sample topics to direct the interview).

HEALTH HISTORY

- Lifestyle (sociocultural and economic factors, stress, exercise)
- Dietary intake (recent changes in the amount and types of fluid and food, increased thirst)
- Religion (whether illness has had an effect on beliefs or religion; query whether the client would like a visit from his or her religious counselor)
- Weight (sudden gain or loss)
- Fluid output (recent changes in the frequency or amount of urine output)
- Gastrointestinal disturbances (prolonged vomiting, diarrhea, anorexia, ulcers, hemorrhage)
- Fever and diaphoresis
- Draining wounds, burns, trauma
- Disease conditions that could upset homeostasis (renal disease, endocrine disorders, neural malfunction, pulmonary disease)
- Therapeutic programs that can produce imbalances (special diets, medications, chemotherapy, administration of intravenous fluid or total parenteral nutrition, gastric or intestinal suction)

Physical Examination

The nurse performs a complete physical examination and identifies all abnormalities because fluid alterations may affect any body system. The physical assessment of clients with altered fluid status is discussed in this section: refer to Chapter 27 for procedures on weight and vital sign measurement.

Daily Weight

Changes in the body's total fluid volume are indicated by weight; for instance, each kilogram (2.2 lb) of weight gained or lost is equivalent to one liter (1000 ml) of fluid gained or lost. Accurate measurement of daily weight requires the nurse to implement the agency's protocol to control certain variables. For example, the nurse should obtain the measurement at the same time each day, using the same scale.

Vital Signs

Measurement of vital signs provides the nurse with information regarding the client's fluid, electrolyte, and acid-base status and the body's compensatory response for maintaining balance. An elevated temperature places the client at risk for dehydration caused by an increased loss of body fluid.



NURSING TIP

Monitoring Water Balance

The most accurate way to monitor water balance is through daily body weight measurement because water constitutes 45% to 75% of the body's total weight.

Changes in the pulse rate, strength, and rhythm are indicative of fluid alterations. Fluid volume alterations may cause the following pulse changes:

- Fluid volume deficit (FVD): increased pulse rate and weak pulse volume
- Fluid volume excess (FVE): increased pulse volume and third heart sound

Respiratory changes are assessed by inspecting the movement of the chest wall, counting the rate, and auscultating the lungs. Changes in the rate and depth may cause respiratory acid-base imbalances or may be indicative of a compensatory response in metabolic acidosis or alkalosis, as previously discussed in Table 37-4.

Blood pressure measurements can be used to assess the degree of FVD. FVD can lower the blood pressure with or without orthostatic hypotension. A narrow pulse pressure (less than 20 mm Hg) may indicate FVD that occurs with severe hypovolemia.

Intake and Output

Measure and record the client's intake and output for a 24-hour period to assess for an actual or potential imbalance. A minimum intake of 1,500 ml is essential to balance urinary output and the body's insensible water loss. Intake includes all liquids (e.g., ice cream, soup, gelatin, juice, and water) taken by mouth and liquids administered through tube feedings (nasogastric or jejunostomy) and parenterally (IV fluids and blood or its components). Output includes urine, diarrhea, vomitus, and drainage from tubes such as through gastric suction. The recording of intake and output data is usually referred to as the I&O.

Thirst

The most common indicator of FVD is thirst. With a decrease in extracellular fluid volume or an increase in the plasma osmolality, the hypothalamus triggers a thirst response.

Food Intake

The intake of food also contributes to maintaining extracellular fluid volume. One-third of the body's fluid

NURSING ALERT

Dehydration in the Elderly

The elderly are prone to a fluid volume deficit (dehydration), because the thirst mechanism in the medulla becomes less responsive with aging.

needs are met by ingested food. Food also provides the body with necessary electrolytes. See Chapter 38 for a complete discussion of metabolism.

Edema

Edema (the detectable accumulation of increased interstitial fluid) is the main symptom of FVE. Edema may be localized (confined to a specific area) or generalized (occurring throughout the body's tissue). Localized edema is characterized by taut, smooth, shiny, pale skin. The body may retain 5 to 10 pounds of fluid before edema is noticeable (Bulechek & McCloskey, 1999). Inspect the dependent body parts—sacrum, back, and legs—to assess peripheral edema. Pitting edema is rated on a four-point scale:

- +0" no pitting
- +1, 0"–1/4" pitting (mild)
- +2, 1/4"–1/2" pitting (moderate)
- +3, 1/2"–1" pitting (severe)
- +4, greater than 1" pitting (severe)

Skin Turgor

Skin turgor is the normal resiliency of the skin. When the skin is pinched and released, it springs back to a normal position because of the outward pressure exerted by the cells and interstitial fluid. To measure the client's skin turgor, grasp and raise the skin with two fingers as follows:

- Adults: over the sternum, forehead, or inner aspect of the thigh
- Children: over the abdominal area or medial aspect of the thigh



NURSING TIP

Skin Turgor in the Elderly

With aging, there are fewer elastic fibers in the skin, resulting in reduced skin turgor. Assess the tongue for creases or furrows to monitor dehydration in the elderly (Hogstel, 2001).

With dehydration there is a decreased skin turgor, as manifested by lax skin that returns slowly to the normal position. Increased skin turgor, which occurs with edema, is manifested by smooth, taut, shiny skin that cannot be grasped and raised.

Buccal (Oral) Cavity

Inspect the buccal cavity. With FVD, there is a decrease in saliva, which causes sticky, dry mucous membranes and dry cracked lips. The tongue has longitudinal furrows.

Eyes

Inspect the eyes. FVD causes sunken eyes, dry conjunctiva, and decreased or absent tearing. Puffy eyelids (periorbital edema, or papilledema) are characteristic of FVE; the client may also have a history of blurred vision.

Jugular and Hand Veins

Circulatory volume is assessed by measuring venous filling of the jugular and hand veins. Place the client in a low Fowler's position. Then:

1. Palpate the jugular (neck) veins: FVE causes a distention in the jugular veins (Figure 37-7).
2. Place the client's hand below the heart level, and palpate the jugular veins; with FVD there is decreased venous filling (flat neck veins).

Neuromuscular System

Fluid and electrolyte imbalances may cause neuromuscular alterations: The muscles lose their tone and become soft and underdeveloped, and reflexes are diminished. Calcium and magnesium imbalances cause an increase in neuromuscular irritability. To assess for neuromuscular irritability perform the following tests:

1. Chvostek's sign: Tap the facial nerve 2 cm anterior to the earlobe; unilateral twitching of the facial muscles (inclusive of the eyelids and lips) indicates a positive response (Figure 37-8).



Figure 37-7 Positioning the Client to Assess Jugular Vein Distention



Figure 37-8 Assessing for Chvostek's Sign

2. Trousseau's sign: Place a blood pressure cuff on the arm, inflate the cuff slightly above the systolic pressure, leave the cuff inflated 2–3 minutes, and deflate; carpal spasm or tetany indicates a positive response.

A positive Chvostek's sign and Trousseau's sign may occur with hypocalcemia and hypomagnesemia.

Other neurologic signs include inability to concentrate, confusion, and emotional lability, as previously discussed in Tables 37-3 and 37-4.

Diagnostic and Laboratory Data

Biochemical assessment is another essential source of objective data. Laboratory results can be used to detect imbalances before clinical symptoms are assessed in the physical examination. Laboratory tests used in assessing clients with common alterations in extracellular fluid volume are discussed next; refer to Chapter 28 for the normal values presented in this section.

Hemoglobin and Hematocrit Indices

The hematocrit is affected by changes in plasma volume. For instance, with severe dehydration and hypovolemic shock, the hematocrit is increased, whereas overhydration decreases the hematocrit. Hemoglobin levels are decreased with severe hemorrhage.

Osmolality

Osmolality is a measurement of the total concentration of dissolved particles (solutes) per kilogram of water. Osmolality measurements are performed on both serum and urine samples to determine alterations in fluid and electrolyte balance. Osmolality can also be explained in

relation to the specific gravity of body fluids. Specific gravity expresses the weight of the solution when compared with an equal volume of distilled water; the osmolality of a solution can be estimated by the specific gravity.

Serum Osmolality

Serum osmolality is a measurement of the total concentration of dissolved particles per kilogram of water in serum, recorded in milliosmoles per kilogram (mOsm/kg). The particles measured in serum osmolality include electrolyte ions, such as sodium and potassium, and electrically inactive substances dissolved in serum, such as glucose and urea. Water and sodium are the main entities that control the osmolality of body fluids. Serum sodium is responsible for 85% to 90% of the serum osmolality.

The normal serum osmolality is 275 to 295 mOsm/kg (Fischbach, 2000). It can increase with dehydration and loss of body water and decrease with water excess.

In clinical practice, the terms *osmolality* and **osmolarity** (the concentration of solutes per liter of cellular fluid) are often used interchangeably to refer to the concentration of body fluid. However, these terms are actually different, in that osmolality refers to the concentration of solutes in the total body water (solute per kilogram of body weight) rather than in cellular fluid. Figure 37-9 relates osmosis to the osmolality of a solution. The appropriate term to use in intravenous fluid therapy is *osmolarity* (Bulechek & McCloskey, 1999). An osmolaritic solution is described as:

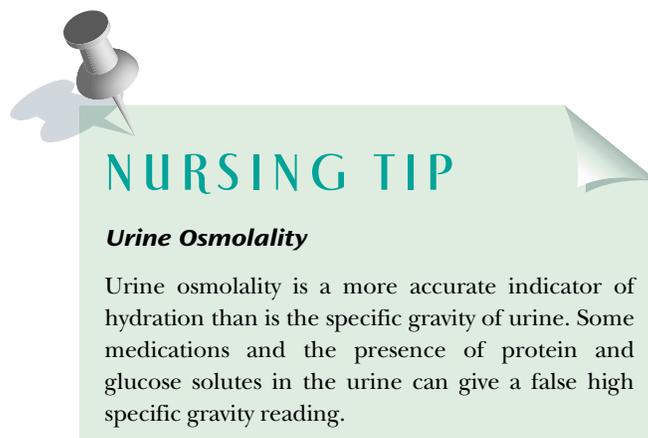
- **Hypotonic** (hypo-osmolar) when there are less solutes in proportion to the volume of water than is the case in the body
- **Isotonic** (iso-osmolar) when body water and solutes (sodium) are in amounts equal to those in the body
- **Hypertonic** (hyperosmolar) when there are more solutes in proportion to the volume of water than is the case in the body

Urine Osmolality

Urine osmolality is a measurement of the total concentration of dissolved particles per kilogram of water in urine, recorded in milliosmoles per kilogram (mOsm/kg). The particles measured in urine osmolality come from nitrogenous waste (creatinine, urea, and uric acid), with urea contributing most. Urine osmolality varies greatly with diet and fluid intake and reflects the ability of the kidney to adjust the concentration of urine in order to maintain fluid balance. With normal kidney function, a dehydrated client will have an elevated urine osmolality, whereas clients with shock, hyperglycemia, hemoconcentration, and acidosis will have elevations in both urine and serum osmolality.

Urine pH

The measurement of the pH of urine reveals the hydrogen ion concentration of the urine to determine its acid or alkaline status. When the kidney buffering system is



NURSING TIP

Urine Osmolality

Urine osmolality is a more accurate indicator of hydration than is the specific gravity of urine. Some medications and the presence of protein and glucose solutes in the urine can give a false high specific gravity reading.

compensating for either metabolic acidosis or alkalosis, the pH of the urine should be within normal range (4.6–8.0). This is considered a sign of normal function. However, when the renal compensatory function fails to respond to the pH of the blood, the urine pH will increase with acidosis and decrease in alkalosis.

Serum Albumin

Albumin is synthesized in the liver from amino acids. Serum albumin plays an important role in fluid and

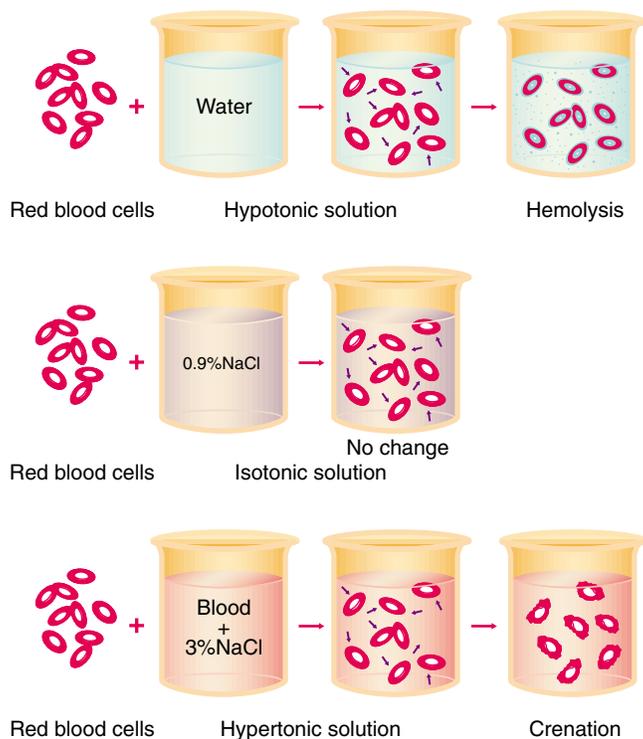


Figure 37-9 Osmosis as it relates to the osmolality of a solution. The movement of water through a membrane from a lower concentration to a higher concentration is called osmosis. In a hypotonic solution, the water moves into the cells, causing them to swell and burst. The cells in the isotonic solution are normal in size and shape because the same amount of water is entering and leaving the cells. Cells in the hypertonic solution are losing water because water moves from a weaker concentration inside the cell to a greater concentration outside the cell membrane.

electrolyte balance by maintaining the colloid osmotic pressure of blood, which prevents the accumulation of fluid (edema) in the tissues. However, serum albumin has a half-life of 21 days and fluctuates according to the level of hydration; therefore, it is not a good indicator of acute alterations in protein depletion. Clinically, this blood test is used to measure prolonged protein depletion, which occurs in chronic malnutrition. Refer to Chapter 38 for a discussion of serum albumin and pre-albumin.

NURSING DIAGNOSIS

In order to make a nursing diagnosis, the nurse must be able to interpret assessment and biochemical data and draw conclusions relative to the client's imbalance. The primary nursing diagnoses for clients with fluid imbalances are presented in the accompanying display.

NURSING DIAGNOSES FOR FLUID ALTERATIONS

Excess Fluid Volume related to:

- Excessive fluid intake secondary to excess sodium intake
- Compromised regulatory mechanism (renal and cardiac dysfunction)
- Inaccurate intravenous infusion rate

Deficient Fluid Volume related to:

- Excessive fluid loss secondary to vomiting, blood loss, surgical drains and tubes, diarrhea, and diuretics

Risk for Deficient Fluid Volume related to:

- Extremes of age (very young or old) and weight
- NPO and fluid restrictions
- Increased fluid output from normal routes: vomiting, diarrhea, urine
- Increased fluid losses from drainage or suction routes: wounds, drains, indwelling tubes (e.g., urine catheter, nasogastric suction)
- Loss of plasma associated with severe trauma and burns
- Disorders that impair fluid intake or absorption (immobility, unconsciousness)
- Chronic disorders: congestive heart failure, pulmonary edema, chronic obstructive lung disease, renal failure, diabetes, cancer, transplant candidates
- Deficient knowledge related to factors influencing fluid requirements (hypermetabolic states, hyperthermia, and dry, hot environment)
- Medications (e.g., diuretics)

Excess Fluid Volume

Excess fluid volume (EFV) exists when the client has increased interstitial and intravascular fluid retention and edema. EFV is related to the excess fluid either in tissues of the extremities (peripheral edema) or in lung tissues (pulmonary edema). Factors that put the client at risk for EFV are:

- Excessive intake of fluids (e.g., intravenous therapy, sodium)
- Increased loss or decreased intake of protein (chronic diarrhea, burns, kidney disease, malnutrition)
- Compromised regulatory mechanisms (kidney failure)
- Decreased intravascular movement (impaired myocardial contractility)
- Lymphatic obstruction (cancer, surgical removal of lymph nodes, obesity)
- Medications (steroid excess)
- Allergic reaction

Assessment findings in the client with FVE include acute weight gain; decreased serum osmolality (less than 275 mOsm/kg), protein and albumin, BUN, Hgb, Hct; increased central venous pressure (greater than 12–15 cm H₂O); and signs and symptoms of edema. The clinical manifestations of edema are relative to the area of involvement, either pulmonary or peripheral (see the accompanying display).

CLINICAL MANIFESTATIONS OF EDEMA

Pulmonary Edema

Constant cough
Dyspnea
Engorged neck and hand veins
Moist crackles in lungs
Bounding pulse

Peripheral Edema

Pitting edema in extremities
Edematous area: tight, smooth, shiny, pale, cool skin
Puffy eyelids
Weight gain

Deficient Fluid Volume

Deficient fluid volume (DFV) exists when the client experiences vascular, interstitial, or intracellular dehydration. The degree of dehydration is classified as mild, marked, severe, or fatal on the basis of the percentage of body weight lost.

There are three types of dehydration based on the proportion of fluid and particles in the intracellular and extracellular spaces (see the accompanying display).

Kleiner (1999) reports that a portion of the general population may be chronically mildly dehydrated based on the Nationwide Food Consumption Surveys. According to Sansevero (1997), approximately 1 million elderly people a year are admitted to hospitals with iso-

TYPES OF DEHYDRATION

Isotonic dehydration (hypovolemia) refers to the loss of both fluid and particles in the vascular space that occurs with vomiting, diarrhea, and bleeding; it is the most common form of dehydration, especially in infants and children.

Hypertonic dehydration refers to a greater loss of fluid than particles in the vascular space when the body tries to maintain a normalized isotonic state by pulling fluids from the intracellular space into the vascular space; it occurs in diabetic ketoacidosis, renal insufficiency, and with the administration of hypertonic solutions.

Hypotonic dehydration refers to a greater loss of particles than fluid in the vascular space when the body tries to maintain a normal isotonic state by pushing fluids from the vascular space into the intracellular space, causing the cells to swell; it occurs in chronic disease states and with the administration of hypotonic solutions.

Adapted from Woods, A. (1998). Understanding types of dehydration. *The Nurse Practitioner*, 23(12), 62.

tonic dehydration, and 19% of emergency room admissions were prompted by dehydration, frequent falling, or failure to care for self. Mild dehydration, as little as 2% loss of body weight, results in impaired physiological and performance responses, and may be misinterpreted as a sign of aging and not hydration status (Kleiner, 1999).

Assessment findings in the client with DFV include thirst and weight loss, with the amount varying with the degree of dehydration. With marked dehydration, the mucous membranes and skin are dry. There is poor skin turgor; low-grade temperature elevation; tachycardia; respirations 28 or greater; a decrease (10–15 mm Hg) in systolic blood pressure; slowing in venous filling; a decrease in urine (less than 25 ml per hour); concentrated urine; elevated Hct, Hgb, BUN, and an acid blood pH (less than 7.4).

Severe dehydration is characterized by the symptoms of marked dehydration. Also, the skin becomes flushed. The systolic blood pressure continues to drop (60 mm Hg or below). There are behavioral changes (restlessness, irritability, disorientation, and delirium). The signs of fatal dehydration are anuria and coma that leads to death.

Risk for Deficient Fluid Volume

Risk for fluid volume deficit exists when the client is at high risk of developing vascular, interstitial, or intracellular dehydration resulting from active or regulatory losses of body water in excess of needs. The multiple factors that can place the client at risk for FVD are listed in the preceding accompanying display.

NURSING ALERT

Loss of Gastric Juices

Clients who lose excessive amounts of gastric juices, either through vomiting or suctioning, are prone to develop not only DFV but also metabolic alkalosis, hypokalemia, and hyponatremia; gastric juices contain hydrochloric acid, pepsinogen, potassium, and sodium.

Other Nursing Diagnoses

The relationship between the primary nursing diagnoses just discussed and the secondary diagnoses in clients with fluid imbalances are reciprocal: The primary diagnoses influence and are influenced by the secondary diagnoses. Holistic nursing requires that all diagnoses relative to clients be considered when developing their plan of care.

Impaired Gas Exchange

Impaired gas exchange related to a ventilation perfusion imbalance occurs when clients experience a decreased passage of oxygen or carbon dioxide between the alveoli of the lungs and the vascular system. This alteration is assessed by measuring the oxygen and carbon dioxide content through arterial blood gas analysis or pulse oximetry or both. Refer to Chapter 32 for further discussion of oxygenation.

Decreased Cardiac Output

Decreased cardiac output occurs when the blood pumped by a client's heart is reduced so much that it is inadequate to meet the needs of the body's tissue. This alteration may be caused by heart failure and various types of shock. Assessment findings may include low blood pressure; cool, clammy skin; weak, thready pulses; decreased urinary output; and a diminished level of consciousness.

Risk for Infection

Many disorders may place the client at risk for invasion by pathogenic organisms. Clients receiving IV therapy are at risk for an infection because their primary defense, the skin, is broken at the puncture site. Assessment findings indicative of IV site infection are client complaints of soreness around site, erythema, swelling at site, and foul-smelling discharge.

Impaired Oral Mucous Membrane

Altered oral mucous membrane occurs when a client experiences disruption in the tissue layers of the oral cavity. It is frequently related to dehydration. Assessment findings may include: oral pain or discomfort; stomatitis; and decreased salivation.

Deficient Knowledge

A knowledge deficit may exist to varying degrees in clients with fluid imbalances. Information obtained from a client's health history may indicate the client's level of understanding and perception of these alterations and direct teaching. Clients need to participate actively in their plan of care.

PLANNING AND OUTCOME IDENTIFICATION

Holistic nursing care for clients experiencing fluid imbalances requires that the nurse, in collaboration with each client, identify specific goals for the nursing diagnosis. These goals should be individualized to reflect the client's capabilities and limitations and should be appropriate to the diagnosis as determined by the assessment data.

During the planning phase, the nurse also selects and prioritizes nursing interventions to support the client's achievement of expected outcomes based on the goals. For example, if vomiting and diarrhea, with a weight loss of 5% and dry mucous membranes, led to a diagnosis of *Deficient Fluid Volume*, then goals might include relief from vomiting and diarrhea and achievement of the proper fluid balance of intake and output.

Expected outcomes for clients with fluid imbalances are not only specific to their primary diagnosis but also require inclusion of outcomes relative to interventions. An expected outcome for clients receiving IV therapy might read: *IV site remains free from erythema, edema, and purulent drainage, because these clients are at risk for infection.* Achievement of the goals and the client's expected outcomes indicates resolution of the problem.

IMPLEMENTATION

Nurses have the responsibility to collaborate with and advocate for clients to assure that they receive care that is appropriate, ethical, and based on practice standards. Nurses rely heavily on the data obtained from the history in formulating expected outcomes and selecting appropriate nursing interventions to support the clients' natural patterns as revealed in their history.

The rationale for interventions related to alterations in either body fluid or electrolytes is based on the goal of maintaining homeostasis and regulating and maintaining essential fluids and nutrients. The nurse capitalizes on the clients' adaptive capabilities by selecting interventions based on the clients' perception of their support, strengths, and options.

Bulechek and McCloskey (1999) address the importance of the nursing interventions relative to fluid therapy by identifying the nurse's responsibilities to:

- Understand the client's metabolic needs and to make judgments concerning the outcomes of therapy
- Perform frequent assessment and monitoring to recognize the adverse effects of fluid and electrolyte therapy and prevent complications
- Prevent the rapid depletion of the body's protein and energy reserves

The nursing activities relative to assessment and implementation often require the same measurements: for example, weight and vital signs. Common interventions that promote attainment of expected outcomes to restore and maintain homeostasis are discussed next.

Monitor Daily Weight

Daily weight is one of the main indicators of water and electrolyte balance. The nurse is responsible for the accurate measurement and recording of daily weights; the health care practitioner uses these data with other clinical findings in determining the client's fluid therapy.

Measure Vital Signs

The frequency of measuring the vital signs is dependent upon the client's acuity level and clinical situation. For example, the vital signs of the typical postoperative client might be taken every 15 minutes until stable, whereas a client experiencing shock or hemorrhage should have vital signs monitored continuously. Vital sign measurements and other clinical data are used to determine the type and amount of fluid therapy.

Measure Intake and Output

Intake and output measurements are initiated to monitor the client's fluid status over a 24-hour period (see Procedure 37-1 for information on how to measure the I&O). Agency policy relative to I&O may vary with regard to:

- The time frames for charting (e.g., every 8 hours versus every 12 hours)
- The time at which the 24-hour totals are calculated
- The definition of "strict" I&O

"Strict" I&O measurement usually involves accounting for incontinent urine, emesis, and diaphoresis and might require weighing soiled bed linens. *Don gloves before handling soiled linen.*

The nurse reviews the client's 24-hour I&O calculations to evaluate fluid status. Intake should exceed the output by 500 ml to account for insensible body losses. I&O and daily weights are critical components of intervention because these measurements are also used to evaluate the effectiveness of diuretic or rehydration therapy.

PROCEDURE 37-1

Measuring Intake and Output

Equipment

- | | |
|----------------------------------|--------------------------------------|
| ■ I&O form at bedside | ■ I&O graphic record in chart |
| ■ Glass or cup | ■ Bedpan, urinal, or bedside commode |
| ■ Graduated container for output | ■ Nonsterile gloves |

Action

1. Wash hands.
2. Explain purpose of keeping I&O record to client. Explain that:
 - All fluids taken orally must be recorded.
 - Form for recording must be used.
 - Client must void into bedpan or urinal, not into toilet.
 - Toilet tissue should be disposed of in plastic-lined container, not in bedpan.

Oral Intake

3. Measure all oral fluids in accord with agency policy (e.g., cup = 150 ml, glass = 240 ml).
4. Record time and amount of all fluid intake in the designated space on bedside form (oral, tube feedings, IV fluids).
5. Transfer 8-hour total fluid intake from bedside I&O record to graphic sheet or 24-hour I&O record on client's chart.
6. Record all forms of intake, except blood and blood products, in the appropriate column of the 24-hour record.
7. Complete 24-hour intake record by adding all 8-hour totals.

Output

8. Don nonsterile gloves.
9. Empty urinal, bedpan, or indwelling catheter drainage bag into graduated container or commode "hat."
10. Remove gloves, and wash hands.
11. Record time and amount of output (urine, drainage from nasogastric tube, drainage tube) on bedside I&O record.
12. Transfer 8-hour output totals to graphic sheet or 24-hour I&O record on the client's chart.
13. Complete 24-hour output record by totaling all 8-hour totals.

Rationale

1. Reduces potential for transmission of pathogens.
2. Elicits client support.
3. Provides for consistency of measurement.
4. Documents fluids.
5. Provides for data analysis of client's fluid status.
6. Documents intake by type and amount.
7. Provides consistent data for analysis of client's fluid status over a 24-hour period.
8. Reduces potential for transmission of pathogens.
9. Provides accurate measurement of urine.
10. Prevents cross-contamination.
11. Documents output.
12. Provides for data analysis of client's fluid status.
13. Provides consistent data for analysis of client's fluid status over a 24-hour period.

Securing an accurate I&O requires the full support of the client and his or her family. The client and family members should be taught how to measure and record the intake (see the accompanying display for special home health care considerations).

APPLICATION: HOME CARE

Considerations for Measuring I&O

- Elicit client and family member input when selecting household items to be used for intake measurement.
- Provide containers for measuring output; adapt the urinary container to home facilities, and include teaching relative to proper washing and storage.
- Teach handwashing technique.
- Provide written instructions on what is to be measured.
- Provide sufficient I&O forms to last between the nurse's visits.
- Identify the parameters for evaluating a discrepancy between the intake and output and for notifying the nurse or health care practitioner.

NURSING ALERT

Remove Gloves before Charting

Remove gloves and wash hands before recording the amount of drainage on the I&O form, to prevent the transfer of microorganisms when the form is removed from the client's room.

Provide Oral Hygiene

The nurse is responsible for providing oral hygiene to promote client comfort and integrity of the buccal cavity. Refer to Chapter 31 for the procedure on oral hygiene. The frequency of oral hygiene depends on the condition of the client's buccal cavity and the type of

THINK ABOUT IT

Oral Hygiene

When you wake up in the morning, do you drink or eat anything before brushing your teeth? If you were sick, hospitalized, without family or significant other support, would you want to drink or eat if your mouth tasted sour? Many of your clients will feel the same way and will need supportive nursing care to maintain oral hygiene. Muscular weakness and difficulty swallowing are other problems that could compound the client's dependency on you for oral hygiene.

fluid imbalance. A client who is dehydrated or NPO for more than 24 hours may have decreased or absent salivation, coated tongue, and furrows on the tongue. These clients are at risk for developing oral diseases such as stomatitis, oral lesions or ulcers, and gingivitis.



NURSING TIP

Mouthwashes

Avoid the use of alcohol and glycerin mouthwashes and glycerin swabs. These ingredients may feel refreshing, but they have a drying effect on the mucous membranes.

Initiate Oral Fluid Therapy

Oral fluids may be totally restricted—a situation commonly referred to as *nothing by mouth* (NPO, which is from the Latin *non per os*)—or they may be restricted or forced, depending on the client's clinical situation. For example, oral replacement therapy is often used for clients with mild dehydration. According to Hugger, Harkless, and Rentschler (1998), oral rehydration therapy has a very high success rate in the treatment of childhood diarrhea with mild to moderate dehydration, and it has fewer complications when compared to intravenous replacement therapy. Severe dehydration in children is a medical emergency and must be treated with intravenous replacement therapy.

Nothing by Mouth

Clients are placed NPO status as prescribed by the health care practitioner. On the basis of agency policy and clarification with the health care practitioner, the client may be allowed small amounts of ice chips or medications with a sip of water when NPO. Common clinical situations that may require NPO status include the need to:

- Avoid aspiration in unconscious, perioperative, and preprocedural clients who will receive anesthesia or conscious sedation
- Rest and heal the gastrointestinal (GI) tract in clients with severe vomiting or diarrhea or when the client has a GI disorder (inflammation or obstruction)
- Prevent the further loss of gastric juices in clients with nasogastric suctioning

NPO clients should receive oral hygiene every 1 to 2 hours or as needed for comfort and to prevent alterations of the mucous membranes.

Restricted Fluids

Intake may be restricted to 200 ml over a 24-hour period; intake is commonly restricted in the treatment of EFV related to heart and renal failure. Client and family teaching and collaboration are the main nursing interventions in implementing this measure.

How the nurse limits the fluids should be determined in collaboration with the client. For example:

- Fifty percent of the allowed fluids might be taken at breakfast and lunch.
- The remaining 50% might be taken with the evening meal, before bedtime, unless the client has to be awakened during the night for a medication.

Forced Fluids

Forcing or encouraging the intake of oral fluids, mainly water, may be done when treating elderly clients who are at risk for dehydration and clients with renal and urinary problems, for example, kidney stones. Compliance is obtained by client education and preference relative to timing and the type of liquids.

A client might, for example, be requested to consume 2,000 ml over a 24-hour time period. If the client is intimidated on hearing this amount, which may sound very large, explain that the number of glasses to which this volume equates is only eight. Follow a similar time frame as set forth for restricted fluids, with the largest quantity of fluids administered with meals. Ice, gelatin, and ice cream count as liquid intake.

Maintain Tube Feeding

When the client cannot ingest oral fluids and has a normal GI tract, fluids and nutrients can be administered through a feeding tube as prescribed by a health care practitioner. Refer to Chapter 38 for a complete discussion of feeding tubes.

Monitor Intravenous Therapy

When fluid losses are severe or the client cannot tolerate oral or tube feedings, fluid volume is replaced parenterally through the intravenous route. **Intravenous (IV) therapy** is the administration of fluids, electrolytes, nutrients, or medications by the venous route. The health care practitioner prescribes IV therapy to treat or prevent fluid and electrolyte or nutritional imbalances. The nurse has specific responsibilities relative to IV therapy (see the accompanying Nursing Process Highlight).

The Intravenous Nurses Society (INS) is the professional organization that establishes standards of practice to promote excellence in intravenous nursing to ensure the highest quality, cost-effective care for all individuals requiring infusion therapies (INS, 2000). INS standards of practice direct the development of agency policy/pro-

Nursing Process Highlight

Implementation of IV Therapy

- Know why the therapy is prescribed.
- Document client understanding.
- Select the appropriate equipment in accordance to agency policy.
- Obtain the correct solution as prescribed.
- Assess the client for allergies: tape, iodine, ointment, or antibiotic preparations to be used for skin preparation of the venipuncture site.
- Administer the fluid at the prescribed rate.
- Observe for signs of **infiltration** (the seepage of substances into the interstitial tissue that occurs as the results of accidental dislodgement of the needle from the vein) and other complications that are fluid-specific.
- Document implementation of prescribed IV therapy in the client's medical record.

ocols in accordance with state and federal regulations and should complement the manufacturer's direction for usage. The nurse should review the agency's protocols before gathering the equipment. IV therapy requires parenteral fluids (solutions) and special equipment: administration set, IV pole, filter, regulators to control IV flow rate, and an established venous route.

Parenteral Fluids

The nurse confirms the type and amount of IV solution by reading the health care practitioner's prescription in the medical record. IV solutions are sterile and packaged in plastic bags or glass containers. Solutions that are incompatible with plastic are dispensed in glass containers.

Plastic IV solution bags collapse under atmospheric pressure to allow the solution to enter the infusion set. Plastic solution bags are packaged with an outer plastic bag, which should remain intact until the nurse prepares the solution for administration. When the plastic solution bag is removed from its outer wrapper, the solution bag should be dry. If the solution bag is wet, the nurse should not use the solution. The moisture on the bag indicates that the integrity of the bag has been compromised and that the solution cannot be considered sterile. The bag should be returned to the dispensing department that issued the solution. Glass containers are discussed in the section on equipment.

IV solutions are usually packaged in quantities ranging from 50 to 1,000 ml. The nurse should select a container that has the prescribed amount of solution or select several containers that together contain the prescribed volume. *At no time should the nurse select a container*

whose volume is greater than that prescribed. For example, if the client is to receive 600 ml of normal (0.9%) saline, the nurse must not select a 1000 ml container, but rather two containers, 100 ml and 500 ml (containers are not prepared in volumes of 600 ml). **Crystalloids** (electrolyte solutions with the potential to form crystals) are used to replace concurrent losses of water, carbohydrates, and electrolytes. Sodium chloride and Ringer's lactate are commonly used crystalloid solutions.

There are three types of parenteral fluids that are classified in accord with the tonicity of the fluid relative to normal blood plasma. As previously discussed, an osmolar solution can be hypotonic, isotonic, or hypertonic. The type of solution is prescribed on the basis of the client's diagnosis and the goal of therapy. The normal osmolarity of blood is between 280 and 295 mOsm/L, so the desired effect of the tonicity of the fluid is determined as follows:

1. Hypotonic fluid (hypo-osmolar, less than 290 mOsm/L) lowers the osmotic pressure and causes fluid to move into the cells; if fluid is infused beyond the client's tolerance, water intoxication may result.
2. Isotonic fluid (iso-osmolar, 290 mOsm/L) increases extracellular fluid volume; if fluid is infused beyond the client's tolerance, cardiac overload may result.
3. Hypertonic fluid (hyperosmolar, greater than 290 mOsm/L) increases the osmotic pressure of the blood plasma, drawing fluid from the cells; if fluid is infused beyond the client's tolerance, cellular dehydration may result (Bulechek & McCloskey, 1999).

Table 37-5 discusses the common types of intravenous solutions in terms of their tonicity, contents, and clinical usage.

Crystalloid solutions can be isotonic (equal to the sodium chloride concentration of blood, 0.9%); hypotonic (less than the sodium chloride concentration of blood); and hypertonic (greater than the sodium chloride concentration of blood) (Kee & Paulanka, 2000).

Colloids (nondiffusible substances) function like plasma proteins in blood by exerting a colloidal pressure to replace intravascular volume only. Examples of colloidal solutions are albumin, dextran, Plasmanate, and hetastarch (artificial blood substitute). During the admin-

TABLE 37-5
Common Intravenous Solutions

Tonicity	Solution	Contents (MEq/L)	Clinical Implications
Hypotonic	Sodium chloride 0.45%	77 Na ⁺ , 77 Cl ⁻	Daily maintenance of body fluid and establishment of renal function.
Isotonic	Dextrose 2.5% in 0.45% saline	77 Na ⁺ , 77 Cl ⁻	Promotes renal function and urine output.
	Dextrose 5% in 0.2% saline	38 Na ⁺ , 38 Cl ⁻	Daily maintenance of body fluids when less Na ⁺ and Cl ⁻ are required.
	Dextrose 5% in water (D ₅ W)		Promotes rehydration and elimination; may cause urinary Na ⁺ loss; good vehicle for K ⁺ .
	Ringer's lactate	130 Na ⁺ , 4 K ⁺ , Ca ²⁺ , 109 Cl ⁻ , 28 lactate	Resembles the normal composition of blood serum and plasma; K ⁺ level below body's daily requirement.
	Normal saline (NS), 0.9%	154 Na ⁺ , 154 Cl ⁻	Restores sodium chloride deficit and extracellular fluid volume.
	Dextran 40 10% in NS (0.9%) or D ₅ W		A colloidal solution used to increase plasma volume of clients in early shock; <i>it should not be given to severely dehydrated clients and clients with renal disease, thrombocytopenia, or active hemorrhaging.</i>
Dextran 70% in NS		A long-lived (20 hours) plasma volume expander; used to treat shock or impending shock due to hemorrhage, surgery, or burns. <i>It can prolong bleeding and coats the RBCs (draw type and crossmatch prior to administering).</i>	

(continues)

TABLE 37-5 (continued)
Common Intravenous Solutions

Tonicity	Solution	Contents (MEq/L)	Clinical Implications
Hypertonic	Dextrose 5% in 0.45% saline	77 Na ⁺ , 77 Cl ⁻	Daily maintenance of body fluid and nutrition; treatment of FVD.
	Dextrose 5% in saline 0.9%	154 Na ⁺ , 154 Cl ⁻	Fluid replacement of sodium, chloride, and calories (170).
	Dextrose 10% in saline 0.9%	154 Na ⁺ , 154 Cl ⁻	Fluid replacement of sodium, chloride, and calories (340).
	Dextrose 5% in lactated Ringer's	130 Na ⁺ , 4 K ⁺ , 3 Ca ²⁺ , 109 Cl ⁻ , 28 lactate	Resembles the normal composition of blood serum and plasma; K ⁺ level below body's daily requirement; caloric value 180.
	Hyperosmolar saline 3% and 5% NaCl	856 Na ⁺ , 865 Cl ⁻	Treatment of hyponatremia; raises the Na ⁺ osmolarity of the blood, and reduces intracellular fluid excess.
	Ionosol B with dextrose 5%	57 Na ⁺ , 25 K ⁺ , 49 Cl ⁻ , 25 lact., 5 Mg ²⁺ , 7 PO ₄ ⁻	Treatment of polyionic parenteral replacement caused by vomiting-induced alkalosis, diabetic acidosis, fluid loss from burns, and postoperative FVD.
	Ionosol D-CM with dextrose 5%	138 Na ⁺ , 12 K ⁺ , 5 Ca ²⁺ , 108 Cl ⁻ , 50 lactate, 3 Mg ²⁺	Treatment of electrolyte losses of duodenal fluids caused by intestinal suction or biliary or pancreatic drainage; treatment of mild acidosis.
	Aminosyn RF 5.2%	5.4 K ⁺	Restores fluid and protein and promotes wound healing.
	Aminosyn II 3.5%	18 Na ⁺	Treatment of malnourished elderly clients and hypoproteinemia; <i>it is not to be given to clients with severe liver damage.</i>

(From Kee, J. L., & Paulanka, B. J. [2000]. *Fluids and electrolytes with clinical applications* [6th ed.]. Albany, NY: Delmar Publishers)

istration of these solutions, the nurse should monitor the client for hypotension and allergic reactions (Bulechek & McCloskey, 1999; Kee & Paulanka, 2000). Blood transfusions are discussed later in this chapter.

Equipment

IV equipment is sterile, disposable, and prepackaged with user instructions. The user instructions are usually placed on the outside of the package, with a schematic that labels the parts, allowing the user to read the package prior to opening. The following discussion regarding intravenous equipment, inclusive of the frequency when to change disposal intravenous therapy equipment, is based on the revised *2000 Infusion Nursing Standards of Practice* developed by INS. All intravenous equipment must be inspected by the nurse to determine the integrity of the IV product before, during, and after

use. Product integrity refers to the sterility of the equipment. Products are assessed for integrity by visual examination of the product and checking the expiration date on the equipment. All products identified with a defect must be returned to the appropriate department within the agency with a written report identifying the defect.

Since intravenous therapy provides a direct access into the vascular system, the nurse must understand the basic epidemiology principles and common organisms that may cause an infection and implement infection control measures to minimize the potential for infectious complications. The nurse uses aseptic technique and standard precautions when assembling and changing intravenous equipment. To decrease the risk of pathogen transmission, handwashing is required before and immediately after all IV procedures and upon removal of gloves. The frequency of changing sterile intravenous equipment not only reflects the national standards of practice but the

agency's established infection control policies. Infection control data may allow the agency to increase the time interval beyond the recommended standard provided the data verifies low infection rates. INS (2000) recommends that an organization that exhibits an increased rate of catheter-related bloodstream infection with the practice of 72-hour administration set changes should return to a 48-hour administration set change interval.

Administration Set

The administration set (infusion set) refers to the plastic disposal tubing that provides for the infusion of a solution. There are several types of infusion sets to accommodate the solution and the mode of administration: primary continuous; secondary; primary intermittent; and special tubing for certain solutions such as blood/blood components. There are several add-on devices, such as extension sets, filters, stopcocks, PRN adaptor, and needleless devices that are used in conjunction with the administration set and changed whenever the set is changed. Administration sets are changed at established time intervals and immediately upon suspected contamination or when the integrity of the set has been compromised. The administration set contains an insertion spike with a protective cap, a drip chamber, tubing with a slide clamp and regulating (roller) clamp, a rubber injection port, and a protective cap over the needle adapter (Figure 37-10). The protective caps keep both ends of the infusion set sterile and are removed only just before usage. The insertion spike is inserted into the port of the IV solution container.

Infusion sets can be vented or nonvented. The nonvented type is used with plastic bags of IV solutions and vented bottles. The vented set is used for glass containers that are not vented (Figure 37-11).

Glass containers require an air vent so that air can displace fluid from the container into the IV tubing.

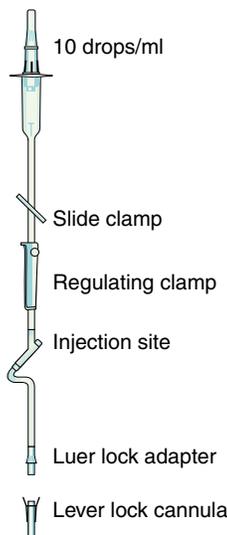


Figure 37-10 Basic Administration Set (Courtesy of Baxter, IV Systems Division)

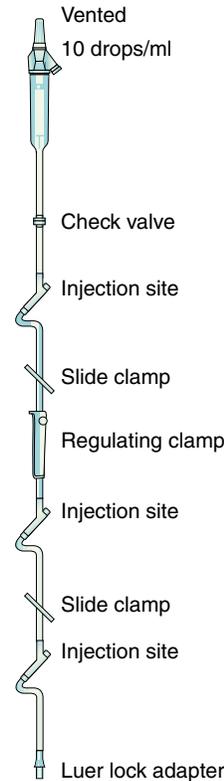


Figure 37-11 Vented Administration Set (Courtesy of Baxter, IV Systems Division)

Some glass bottles are vented with an inside tube that exits the bottle into a rubber stopper in the neck of the bottle; if the bottle is not vented, then the nurse needs to select a vented infusion set.

The drip chamber is calibrated to allow a predictable amount of fluid to be delivered. There are two types of drip chambers: a macrodrip, which delivers 10 to 20 drops per milliliter of solution, and a microdrip, which delivers 60 drops per milliliter. The drip rate varies with the manufacturer as indicated on the package.

The administration set has a manual flow-control device such as a slide clamp (Figure 37-10), a roller clamp, or a screw to regulate a prescribed infusion rate. Follow the manufacturer's guidelines when using the manual flow-control device to regulate the prescribed infusion rate. The end of the IV tubing contains a needle adapter that attaches to the sterile device inserted in the client's vein. Extension tubing may be used to lengthen the primary tubing. A primary continuous administration set is used to administer routine solutions prescribed to infuse continuously over a 24 hour period. The primary administration set, inclusive of the add-on devices, is changed every 48 to 72 hours in conjunction with the peripheral cannula change. A bag of intravenous solution should not hang longer than 24 hours. Secondary administration sets are often referred to as "piggyback" administration sets. The secondary tubing is connected into the primary tubing at an injection site (see Figure 37-11) and allows for the administration of a second solution such as medication.

Secondary administration sets are also changed every 48 to 72 hours.

Primary intermittent administration sets are used to deliver medications at prescribed intervals through an injection/access port and are changed every 48 to 72 hours; all add-on devices such as extension sets, filters, PRN adaptors, and stopcocks are changed with the intermittent administration set. A sterile needle/needleless device should be aseptically attached to the intermittent administration set prior to administering the medication and removed immediately after each use.

Health Hazard

A *Health Alert* from Health Care Without Harm (HCWH) (1999) cautioned the public about the potential risks of exposure to diethylhexyl phthalates (DEHP) from medical products such as IV bags and tubing. More than 500 million IV bags are used in the United States every year to deliver blood, medication, and other essential solutions to clients (HCWH, 1999). Eighty percent of the IV bags are made with polyvinyl chloride (PVC), which requires a plasticizer to make the bags soft and flexible. DEHP is the softener used in PVC products. DEHP has been shown to leach from IV bags into the solutions they contain and directly into the client's bloodstream.

The Environmental Protection Agency has classified DEHP as a probable human carcinogen and HCWH claims that studies have shown that DEHP can damage the heart, liver, testes, and kidneys and interfere with sperm production. Certain drugs such as Taxol (used to treat breast cancer) and Taxotere (used to treat ovarian and breast cancer and AIDS-related Kaposi's sarcoma) have been shown to increase the leaching of DEHP from PVC plastics into the solution (Stewart, 1999); see the accompanying display for additional drugs that can increase leaching of DEHP from PVC IV products. Although one leading producer of intravenous vinyl IV bags containing DEHP plans to develop an alternative to polyvinyl chloride or PVC for their products, no time frames were given to totally remove these products from the market.

DRUGS THAT INCREASE LEACHING OF DEHP FROM PVC PLASTICS

- Chemotherapeutic agents: Etoposide (VePesid) and Teniposide (Vumon)
- Antianxiety agents: Chlordiazepoxide HCl (Librium)
- Antifungal agents: Miconazole (Monistat IV)
- Immunosuppressive agents: Cyclosporine (Sandimmune) and Tacrolimus (Prograf)
- Nutritional solutions: Fat emulsions and vitamin A

Adapted from Stewart, M. (1999). IV bags pose patient risk. *The American Nurse*, March/April, 12.

A second health hazard is inherent in the use of DEHP. The disposal of medical products containing DEHP releases highly toxic and endocrine-disrupting dioxins. According to the ANA (1999), PVC is the only plastic linked both to phthalate chemical leaching and to the production of dioxin.



NURSING TIP

Age Considerations for Choosing IVs and Equipment

Neonates, infants, and children are at risk for *Altered Fluid Balance: Overload, related to rehydration*. IV tubing with a microdrip and special volume control chambers is used to regulate the amount of fluid to be administered over a specific time interval. Armboards and soft restraints are used to stabilize peripheral infusions by immobilizing the extremity to prevent accidental removal of infusion devices.

Intravenous Filters

Intravenous filters prevent the passage of undesirable substances such as particulate matter and air from entering the vascular system. Particulate matter filters are utilized when preparing infusion medications for administration to prevent obstruction in the vascular/pulmonary systems, irritation and **phlebitis** (inflammation of a vein). Air-eliminating filters are used for the delivery of infusion therapy to decrease the potential of air emboli; the filter should be located as close as possible to the cannula site. IV filters come in various sizes; the finer the filter, the greater is the degree of solution filtration. Although studies have shown that IV filters reduce the risk of bacteremia and phlebitis as much as 40%, some agencies do not use IV filters because of cost. Many IV catheters contain an in-line filter; if the catheter has an in-line filter, it is not necessary to add a filter to the tubing.

Needles and Venous Peripheral-Short Catheters

Needles and peripheral-short catheters provide access to the venous system. A variety of devices are available in different sizes to complement the age of the client, the type and duration of the therapy, and to protect the user from injury (Figure 37-12).

As with any gauge needle, the larger the number, the smaller the lumen. The nurse considers the client's age, body size, and the type of solution to be administered when selecting the gauge of the needle or catheter:

- Infants and small children, 24 gauge
- Preschool through preteen, 24 or 22 gauge

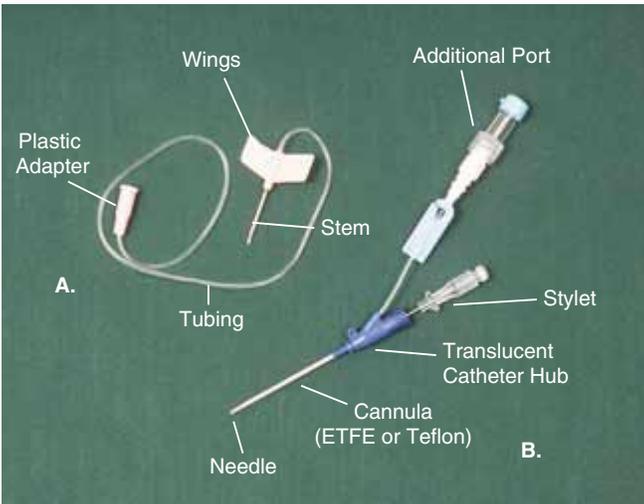


Figure 37-12 Peripheral IV Devices: A. Butterfly; B. Angiocatheter

- Teenagers and adults, 22 or 20 gauge
- Geriatric, 22 or 24 gauge

Butterfly (scalp vein or wing-tipped) **needles** are short, beveled needles with plastic flaps attached to the shaft. The flaps (which are flexible) are held tightly together to facilitate ease of insertion and then flattened against the skin to prevent dislodgement during infusion. These needles are commonly used for short-term or intermittent therapy and for infants and children.

There are several types of short catheters used to access peripheral veins. Short peripheral venous catheters vary in length from $\frac{3}{4}$ to $1\frac{1}{4}$ inches. During insertion, some of these catheters are threaded over a needle, and others are threaded inside a needle. **Intracath** is a term used to refer to a plastic tube inserted into a vein. An **angiocatheter** is a type of intracath with a metal stylet to pierce the skin and vein, after which the plastic catheter is threaded into the vein and the metal stylet is removed, leaving only the plastic catheter in the vein. Short venous catheters can have safety devices to reduce the risk of accidental needlesticks. These devices are designed to allow for easy insertion of the catheter while providing a built-in safety feature for the user. As the catheter is threaded over the needle and advanced into the vein, the built-in needle guard advances forward toward the tip of the needle; when the catheter hub is removed from the device, the entire needle is encased within the needle guard.

Peripheral Intravenous (PI) and Heparin Locks

Peripheral intravenous (PI) and heparin locks are devices that establish a venous route as a precautionary measure for clients whose condition may change rapidly or who may require intermittent infusion therapy. A butterfly needle or peripheral catheter is inserted into a vein and the hub is capped with a lock port, also called a Luer lock (Figure 37-13).

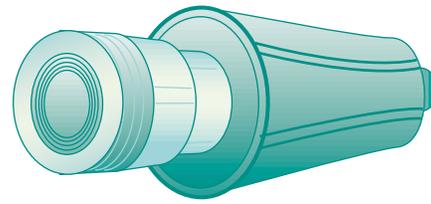


Figure 37-13 Luer Lock Injection Site

Needle-Free System

Safety is a concern associated with IV therapy; refer to Chapter 31. Accidental needle-stick injuries and puncture wounds with contaminated devices increase the employee's risk for infectious diseases such as AIDS, hepatitis (B and C), and other viral, rickettsial, bacterial, fungal, and parasitic infections. Most health care agencies now use totally needle-free IV systems (Figure 37-14) to decrease the risk of employee injuries.

Vascular Access Devices

Vascular access devices (VAD) include various catheters, cannulas, and infusion ports that allow for long-term IV therapy or repeated access to the central venous system. The kind of VAD used depends on the client's diagnosis and the type and length of treatment (see Table 37-6). Site selection and insertion of central catheters, other than peripherally inserted central catheters, is a medical act performed by a practitioner. Although there are many types of catheter materials, insertion techniques and kinds of central catheters, *all central catheters must be radiopaque to allow for radiographic verification of placement of the catheter and its tip prior to the administration of any solution.*

Central catheters are usually inserted into the internal jugular and subclavian veins with the distal tip located in the superior vena cava to minimize vessel irritation and sclerosis. The femoral vein can be used for central venous access when there is thrombosis of the internal jugular or subclavian veins; correct tip location should be in the inferior vena cava. Insertion of a central catheter can be performed either percutaneously or surgically. Surgically, a central catheter is either placed

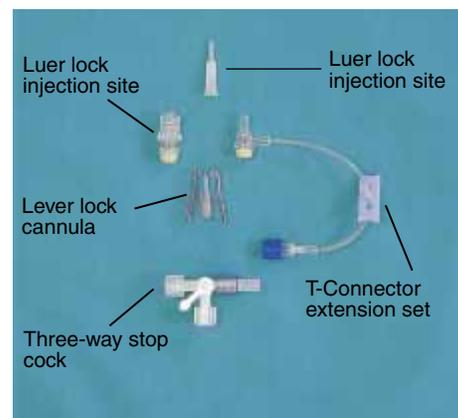


Figure 37-14 Needle-free System

NURSING ALERT

Inserting a CVC

When assisting with the insertion of a long-line central catheter, observe the client for symptoms of a pneumothorax: sudden shortness of breath or sharp chest pain; increased anxiety; a weak, rapid pulse; hypotension; pallor or cyanosis. These symptoms indicate accidental puncture of the pleural membrane.

entirely under the skin (implanted), or the catheter partially exits the skin (tunneled).

A tunneled catheter is inserted through the subcutaneous tissue, usually between the nipple and clavicle, with the catheter tip inserted through the cephalic or external jugular vein and threaded to the right atrium.

An **implantable port** is a device made of a radiopaque silicone catheter and a plastic or stainless steel injection port with a self-sealing silicone-rubber septum. The health care practitioner inserts the device into a subcutaneous pocket, usually over the third or fourth rib, lateral to the sternum. The distal tip of the catheter is surgically tunneled in the cephalic or external jugular vein, with the proximal end of the catheter tunneled through the subcutaneous tissue into the injection port of the device.

Implanted ports and pumps are vascular access devices that provide for the delivery of prescribed parenteral therapies. Accessing these devices requires the use of aseptic technique. Noncoring needles such as a Huber needle are used to access an implanted port/pump and should be changed at least every 7 days. The smallest gauge noncoring needle that can deliver the prescribed therapy should be used when accessing the port/pump. Nurses caring for clients with

implanted ports/pumps must have a thorough knowledge of the design features of the device, as explained in the manufacturer's guidelines, to ensure correct access and administration techniques, maintenance, and potential complications.

Implanted pumps have a reservoir designed to continuously infuse a specific volume of solution over a pre-set period of time; the pump must be routinely emptied and refilled at established intervals. Some pumps have an additional feature, a side port designed for administration of intermittent medication. The flow rate of some pumps is sensitive to changes in atmospheric pressure, body temperature, blood pressure and the viscosity of the medications. Clients are instructed to report changes in their lifestyle and physical condition that may affect the pump's flow rate. *Only nurses who have been specially trained are allowed to access an implanted port/pump because of the risk of infiltration into the tissue if needle placement is incorrect.*

A peripherally inserted central catheter (PICC) is the generic name for 11 different devices. A PICC is a silicone or polyurethane catheter inserted into one of the major veins in the antecubital fossa. Although the length of the catheter varies, on an average a PICC is 52 cm long, and its tip resides in the lower-third section of the superior vena cava. A PICC can be trimmed at the time of insertion to a specific length that is determined by the approximate distance between the insertion site and the superior vena cava. The majority of state boards of registered nurses allow specially trained nurses to insert the PICC. Placement of the catheter's tip is confirmed by x-ray prior to the administration of any solution. The registered nurse that inserts the PICC must document the type of PICC inserted and the total length of the inserted catheter, and record if the length of the catheter was trimmed prior to insertion.

TABLE 37-6
Vascular Access Devices

Type	Brand Name	Use
Nontunneled central venous catheter (triple-lumen)	Hohn, Deseret	Short-term fluid or blood administration, obtaining blood specimens, and administering medications
Tunneled central venous catheter (single or double lumen)	Hickman, Broviac, Groshong	Long-term (months to years) fluid replacement therapy, medication administration, nutritional supplement, and blood specimen withdrawal
Implanted infusion port	Chemo-Port, Infuse-a-Port, Mediport, Port-a-Cath	Long-term (months to years) fluid replacement therapy, medication administration (especially chemotherapy), blood or blood product administration, and blood specimen withdrawal
Peripherally inserted central catheter (PICC)	C-PICC, Groshong PICC, SoloPICC	Long-term fluid replacement therapy, medication administration (chemotherapy, antibiotics, controlled narcotics), blood or blood product administration, and blood specimen withdrawal

Preparing an Intravenous Solution

To prepare an IV solution, read the agency's protocol and gather the necessary equipment. Because IV equipment and solutions are sterile, check the expiration date on the package prior to usage. The solution can be prepared at the nurses' work area or in the client's room (Procedure 37-2).

The nurse prepares and applies a time strip to the IV solution bag to facilitate monitoring of the infusion rate as prescribed by the health care practitioner (Figure 37-19). The IV tubing is tagged with the date and time to indicate when the tubing replacement is necessary. IV tubing is changed every 48 to 72 hours in accord with the agency's protocol. The nurse initials the time strip and IV tubing tag.

PROCEDURE 37-2

Preparing an Intravenous Solution

Equipment

- | | |
|-------------------------------|--|
| ■ IV solution (bag or bottle) | ■ Administration set (vented or nonvented) |
| ■ Extension set | ■ IV pole |
| ■ IV line filter | |

Action

1. Wash hands before preparing IV equipment.
2. Check the health care practitioner's order for the type and amount of solution.
3. Check integrity of the IV solution and equipment.
4. Select IV tubing in accord with agency policy.
5. Prepare IV solution label with client's name, date, time, additives, and your initials.

Plastic Bag

6. Prepare the IV solution bag for administration
 - Remove outer wrapper around IV bag of solution.
 - Inspect bag for tears or leaks by noting any moisture on the protective covering.
 - Apply gentle pressure and observe for leakage.
 - Examine solution for discoloration, cloudiness, or particulate matter by holding the bag against a dark and light background; if there is any evidence of contamination, do not use, and return bag to agency's dispensing department.
7. Hang IV bag on the IV pole.
8. Remove administration set from the package and close the roller clamp on the IV tubing (Figure 37-15).
9. Remove the protective cap from the nonvented IV tubing spike and maintain the sterility of the spike.

Rationale

1. Decreases the transmission of microorganisms.
2. Ensures the correct type and amount of fluid.
3. Ensures the sterility of the solution and items.
4. Agency protocols reflect which items of equipment are to be used with specific IV solutions and to complement volume control devices.
5. Provides information to other health care workers relative to when the solution was hung and what additives are infusing in the solution.
6. Ensures that solution is free of contamination; contaminated solutions are returned to central supply or pharmacy for manufacturer notification.
7. Provides easy access to container.
8. Prevents solution from escaping into the tubing until the drip chamber on the tubing has been primed.
9. Prepares the sterile spike for insertion into the IV container; IV bags have a vented port.

(continues)

PROCEDURE 37-2

Preparing an Intravenous Solution (continued)

Action



Figure 37-15 Remove tubing from the package, leaving the protective caps on both ends intact.

10. Grasp the port of the IV bag with your nondominant hand. With your dominant hand, remove the plastic tab covering the port (Figure 37-16) and insert the full length of the spike into the bag's port (Figure 37-17).



Figure 37-16 Open the IV plastic bag and pull down the plastic tab covering the port with one hand while pinching the port with the other hand.



Figure 37-17 Remove the cap from the spike and spike the IV port.

11. Squeeze and quickly release pressure on the drip chamber of the IV tubing until the chamber is one-third to one-half full.

Rationale

10. Prevents contamination of both the port and the spike.

11. Primes the chamber by displacing air with IV solution, allowing half the chamber to remain free of solution. *(continues)*

PROCEDURE 37-2

Preparing an Intravenous Solution (continued)

Action

12. Connect IV filter to tubing.
 - Remove cap from filter.
 - Fit tubing's male adapter into filter's female connector, and twist to ensure tight connection.
 - Hold filter so connector joint is pointed down.
 - Hold tubing's end tip higher than the tubing's dependent loop to displace the air.
 - Open roller clamp on IV tubing to prime the tubing and filter (Figure 37-18).
 - Tap the filter as the IV solution runs through.
 - Close the roller clamp on the IV tubing.



A.

Rationale

12. Reduces the risk for bacteremia and the incidence of infusion phlebitis; tapping the filter as the solution runs through it eliminates any air bubbles trapped in the filter's membrane.



B.

Figure 37-18 A. Priming the IV Tubing. B. Open the roller clamp on the tubing to allow the fluid to enter the tube and expel the air.

13. Replace the cap on the IV tubing's free end.
 - 13. Maintains the sterility of the system.
14. Attach a Dial-a-Flo fluid regulator at the end of the IV tubing if fluids are to be administered with this device. With the cap off the end of the tubing, turn the Dial-a-Flo to the open position, open all the tubing regulator clamps, and clear the tubing of air; close the regulator clamp and replace the cap on the end of the tubing.
 - 14. Controls the rate of infusion.
15. Tag tubing with date and time and your own initials.
 - 15. Indicates when tubing replacement is due (every 24 to 48 hours, in accord with agency protocol).
16. Explain to the client what you are doing before taking the IV equipment into the client's room.
 - 16. Elicits client cooperation.

(continues)

PROCEDURE 37-2

Preparing an Intravenous Solution (continued)

<i>Action</i>	<i>Rationale</i>
Glass Bottle	
<p>17. Repeat steps 1–5.</p> <ul style="list-style-type: none"> • Vented tubing is used for glass bottles that are not vented. 	
<p>18. Prepare the IV solution for administration.</p> <ul style="list-style-type: none"> • Check bottle for cracks or leaks. • Remove metal cap, metal disk, and rubber diaphragm from top of glass bottle, or remove protective additive cap if pharmacy has added medications to the IV bottle. • Listen for the escape of air when the rubber diaphragm is removed. 	<p>18. Ensures that solution is free of contamination; contaminated solutions are returned to central supply or pharmacy for manufacturer notification. Escape of air indicates the breaking of the vacuum inside the bottle, which will allow the fluid to flow into the tubing.</p>
<p>19. Close the roller clamp on the IV tubing.</p>	<p>19. Stops flow of fluid.</p>
<p>20. Remove the protective cap from the IV tubing spike and maintain the sterility of the spike.</p>	<p>20. Prevents contamination.</p>
<p>21. Place the glass bottle on a firm surface, and, using firm downward pressure, insert the spike through designated port on the bottle cap.</p>	<p>21. Pressure is required to puncture the rubber stopper in the neck of the IV bottle.</p>
<p>22. Invert IV bottle (if the bottle is vented, the fluid inside the vent tube will escape), and hang the bottle on an IV pole.</p>	<p>22. Allows gravity to displace the air in the IV tubing when the roller clamp is opened.</p>
<p>23. Continue steps 11–16.</p>	



Figure 37-19 Apply time strip to the IV container.

Initiating IV Therapy

When initiating IV therapy, the nurse should assess for a venipuncture site. Figure 37-20 presents the common peripheral sites for starting IV therapy in pediatric, adult, and geriatric clients (see Chapter 28, Procedure 28-1, Venipuncture).

When assessing clients for potential sites, consider their age, body size, clinical status and impairments, and the skin condition (see the accompanying display for contraindications when selecting a site). Lower-extremity veins are used for IV therapy only when so prescribed by the health care practitioner; circulating

NURSING ALERT

Marking an IV Bag

Do not use a felt-tip pen to mark an IV bag; the ink from the pen can leak through the plastic and contaminate the solution. Do not label bag with time strip made of adhesive/silk/paper tape, as the adhesive will leach into the bag. Use only labels appropriate for IV bags.

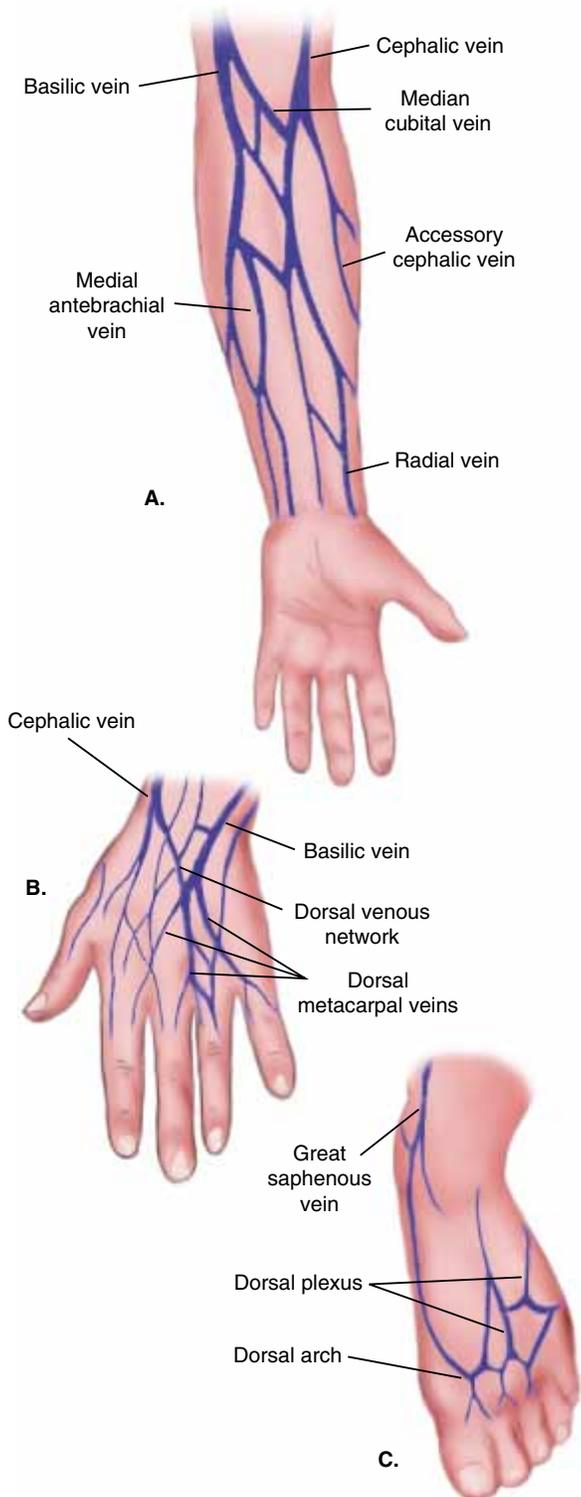


Figure 37-20 Peripheral Veins Used in Intravenous Therapy. A. Arm and Forearm; B. Dorsum of the Hand; C. Dorsal Plexus of the Foot

blood in the lower extremities is likely to pool and clot, which may result in an embolism. Because contact with blood is likely, venipuncture requires the implementation of Standard Precautions. Refer to Chapter 31 for a complete discussion of Standard Precautions.

Select a vein for puncture at its most distal end to maintain the integrity of the vein, because venous blood

VENIPUNCTURE SITE CONTRAINDICATIONS

- Signs of infection, infiltration, or thrombosis
- Affected arm of a postmastectomy client
- Arm with a functioning arteriovenous fistula
- Affected arm of a paralyzed client
- Any arm that has circulatory or neurologic impairments

NURSING ALERT

Prepping Skin for Venipuncture

When prepping the client's skin for a venipuncture, cleanse the skin with betadine and wait for it to dry. Do not apply alcohol after the skin has been prepped with betadine. If these substances are combined, they form a toxic material that may be absorbed through the skin.

flows with an upward movement toward the heart. When a vein is punctured with an instrument, such as a needle, fluids can infiltrate (leak from the vein into the tissue at the site of puncture). If IV therapy has to be discontinued for any reason, such as infiltration, it can be restarted above the initial puncture site only.

Vein Finder

A vein finder is a device used to locate hard-to-find veins. It is helpful, for example, in working with obese clients whose superficial veins are difficult to locate. A Venoscope (Figure 37-21) is a type of vein finder with adjustable fiberoptic arms that reveal veins. The room is dimmed, and the disposable skirts are placed flush against the skin. The nurse slowly moves the Venoscope along the extremity until a dark, shadowy line is seen between the fiberoptic arms.

Once the vein is identified, it can also be checked to determine whether it is sclerotic. To assess for sclerotic veins, apply a downward pressure over the fiberoptic arms and observe the vein when pressure is applied then released. A nonsclerotic vein will disappear with pressure and reappear when pressure is released.

Administering IV Therapy

Once the solution is prepared for administration, the nurse calculates the rate and explains the procedure to the client (see Procedure 37-3 for the administration of IV therapy). There are three ways to administer solutions:

1. Initiate the infusion by performing a venipuncture.
2. Use an existing IV system: catheter, heparin or PI lock, central line, or implanted port.
3. Add a solution to a continuous-infusion line.



Figure 37-21 Venoscope (Courtesy of Applied Biotech Products, Inc., P.O. Box 52703, Lafayette, LA 70505-2703, 800-284-7655)

NURSING TIP

Age Considerations for Initiating IV Therapy

The aging process causes physiological changes in the skin, muscles, and veins. The skin loses its durability, making it prone to tears and abrasions. Decrease in muscle mass may cause the vein to roll during puncture. The veins themselves are also more fragile in the elderly. When first infusing fluid into the vein, administer it slowly and observe carefully for any sign of infiltration.

Fluid administration can be continuous, ongoing over a 24-hour period, or intermittent, 1000 ml ordered once in a 24-hour period. Although fluids may be continuous, the type of fluids can alternate over a 24-hour period; for example, an order might be *add 40 mEq of KCl to first bag of 1000 ml of normal saline*.

IV medications may be **piggybacked**, added to an existing intravenous solution to infuse concurrently. IV solutions and medications that have been refrigerated should

PROCEDURE 37-3

Administering an IV Solution

Equipment

Adding Solution to a Continuous Infusion Line

- Prepared IV solution and medication

Adding a Secondary Line, Additive Bag (IV Piggyback)

- Prepared and labeled medication solution bag from pharmacy
- Alcohol swab

Adding a Solution to an Existing Heparin or PI Lock

- Prepared IV solution system with needleless locking cannula
- Alcohol or iodophor swab

- Secondary administration set
- Needleless locking cannula

- Needleless injection cap (if one is not in place)
- 2 prefilled syringes of 2 ml each of normal saline
- Nonsterile gloves

Action

- Gather prepared equipment (solution labeled with the client's name, and time-taped for fluids to infuse per hour). Check the prescriber's order for the type and amount of solution.
- Wash hands, and don gloves if you have to perform a venipuncture or connect the tubing to an existing PI. *Gloves are not necessary if you are adding fluids to an existing infusion line.*

Rationale

- Ensures correct fluids to be administered to the right client at the prescribed infusion rate.
- Decreases risk of transmission of microorganisms.

(continues)

PROCEDURE 37-3

Administering an IV Solution (continued)*Action**Rationale*

3. Check the client's armband.
4. Explain the procedure to the client.
5. Assess the puncture site.
 - Observe for redness and puffiness.
 - Palpate for tenderness.
6. Check patency of infusion site.
 - Verify that fluid is infusing.
 - Remove IV container from the pole and lower the container below the level of infusion site.
 - Observe for backflow of blood into the hub of the venous access device.
 - Replace container on IV pole.

3. Ensures correct client.
4. Elicits client support and decreases anxiety.
5. Indicates signs of infiltration or infection.
6. Verifies patency of IV system with venous access device in the client's vein.

Adding Solution to a Continuous Infusion Line

7. Check the date on the tubing tag; if the tubing needs changing, refer to Procedure 37-2.
8. Hang the new bag of fluids on the IV pole and remove the cover from the port.
9. Remove the current infusion bag of fluids from the IV pole.
10. While maintaining aseptic technique, remove the tubing spike from the port of the infusing bag of fluids and reinsert the tubing spike into the port on the new bag of fluids; push the full length of the spike into the port.
11. Set the infusion rate.

7. Indicates when tubing replacement is due.
8. Provides easy access to the fluids.
9. Makes room for new bag.
10. Maintains the sterility of the IV system.
11. Produces correct drip rate.

Manual Rate Regulation

- Open regulator clamp; close slowly while observing the drip chamber until the fluid is dripping at a slow, steady pace.
- Count the number of drops for a 15-second interval and multiply by 4; for example, if the drop factor of tubing is 10 drops/ml then the drop rate should be 21 drops/minute to infuse 1000 ml/8 hours (Figure 37-22).
- Open the regulator clamp slowly to increase the drip flow rate; close the regulator clamp to decrease the drip rate to achieve 21 drops/minute.
- Recount the drop rate after 5 and 15 minutes.
- Proceed to steps 12–19.

- Determines patency of venous access device.
- Determines number of drops falling per minute.
- Controls drip rate with regular clamp.
- Detects changes in rate due to expansion and contraction of tubing.

(continues)

PROCEDURE 37-3

Administering an IV Solution (continued)

Action



Figure 37-22 Manual Rate Regulation: Counting the Number of Drops for a 15-Second Interval

Rationale

Dial-a-Flo Regulation

- Turn Dial-a-Flo regulator until arrow is aligned with desired volume of fluid to infuse over 1 hour.
- Check drip rate over 15 seconds, and multiply by 4.
- Adjust height of IV pole if necessary.
- Recount drip rate after 5 minutes and again after 15 minutes.
- Proceed to steps 12–19.

Infusion Controller or Pump Regulation

- Insert tubing into infusion controller or pump in accord with manufacturer's instruction (Figure 37-23).
- Close door to controller or pump and open all tubing clamps and regulators.
- Set volume dials to regulate the volume to infuse per hour or drops per minute in accord with the type of machine.
- If the controller or pump has an electronic eye, clamp it over the upper portion of the drip chamber that does not contain fluid.
- Push the *start* or *on* bottom.
- If desired, set the volume infusion alarm.
- Proceed to steps 12–19.

- Regulates infusion of fluid at the desired rate.
- Verifies calculated drip rate with infusion rate.
- Facilitates flow by gravity; the higher the pole, the greater is the infusion rate.
- Detects changes in rate due to expansion and contraction of tubing.
- Ensures proper functioning of the device.
- Allows controller or pump to regulate the infusion rate.
- Determines amount of fluid the device will deliver.
- Allows controller or pump to monitor drip rate.
- Initiates the device's regulation of the fluid flow.
- Sounds when the set volume has been infused.

(continues)

PROCEDURE 37-3

Administering an IV Solution (continued)

Action

Figure 37-23 IV Tubing Threaded into an Infusion Pump with Controls Set

*Rationale***Volume Control Chamber (Buretrol) Regulation**

- Close regulators both above and below the chamber.
- If adding a new Buretrol, open regulator above the chamber and fill the chamber with 10 ml of fluid, close the top regulator, and slowly open the regulator below the chamber to remove air from the tubing. Close the bottom regulator (Figure 37-24).
- Allows for precise release of fluids into the chamber.
- Facilitates priming the drip chamber and clearing the tubing below the chamber of air.



Figure 37-24 Volume Control Set

(continues)

PROCEDURE 37-3

Administering an IV Solution (continued)

<i>Action</i>	<i>Rationale</i>
<ul style="list-style-type: none"> • Open the top regulator and fill the chamber with the volume of fluid to infuse in 1 hour or 2 hours if the volume is small. • Close top regulator and ensure that air vent is open. • Open bottom regulator and regulate drops to calculated drip rate in accord with the drop factor. • Count drip rate over 15 seconds and multiply by 4. • Time-tape the chamber if a controller or pump is not used. • Check chamber every 1 to 2 hours depending on the volume placed in the chamber. • Proceed with steps 12–19. 	<ul style="list-style-type: none"> • Facilitates close monitoring of fluid volume. • Allows fluid to escape from the chamber. • Determines volume to infuse over an hour. • Verifies rate of infusion. • Facilitates easy check of fluid infusion and shows when to add fluid to the chamber. • Maintains fluid infusion and prevents air from entering the chamber and tubing if all fluid is infused.
<p>12. On the time tape, write the time the fluids were initiated and your initials.</p>	<p>12. Facilitates easy check of fluid infusion progress as prescribed.</p>
<p>13. Monitor the volume delivered every 1 to 2 hours and compare with the time tape.</p>	<p>13. Ensures the actual volume being delivered.</p>
<p>14. If fluids are not infusing at the prescribed rate as indicated by time tape:</p> <ul style="list-style-type: none"> • Check setting on controller or pump or Dial-a-Flo and adjust as indicated. • Increase height of IV pole. • Assess puncture site, reposition the venous access device, lower the IV fluid container below the puncture site and observe for a backflow of blood. Replace container on pole. 	<p>14. Ensures that prescribed amount of fluid is delivered.</p> <ul style="list-style-type: none"> • Allows gravity to facilitate the drip rate. • Ensures that venous access device is still in the vein.
<p>15. Instruct client to limit movement of puncture site and to notify a nurse of any problems or discomfort.</p>	<p>15. Facilitates early detection of problems.</p>
<p>16. Apply an armboard, if indicated (Figure 37-25).</p>	<p>16. Immobilizes the extremity receiving the infusion.</p>



Figure 37-25 Positioning of Client with an IV Armboard

(continues)

PROCEDURE 37-3

Administering an IV Solution (continued)

<i>Action</i>	<i>Rationale</i>
17. Position the client for comfort and place the call light in easy reach.	17. Promotes client comfort and safety.
18. Wash hands and dispose of used supplies.	18. Decreases transmission of microorganisms.
19. Document on the client's medical record: <ul style="list-style-type: none"> • Time of initiation of fluid infusion • Type and volume of fluid infusing • Infusion device used, if applicable • Status of the venous access insertion site • Problems encountered: for example, if venous access device is repositioned • Client's tolerance to the fluid infusion • Client teaching and learning 	19. Provides a record of the nursing intervention and the client's response.
Adding a Secondary Line, Additive Bag (IV Piggyback)	
Refer to Chapter 29, Procedure 29-7.	
Adding a Solution to an Existing Heparin or PI Lock	
20. Repeat steps 1–5.	
21. Hang IV solution on IV pole.	21. Provides easy access to system.
22. Don nonsterile gloves and cleanse needleless injection port with alcohol or iodophor swab. Allow to dry.	22. Reduces risk of transmission of microorganisms.
23. Insert saline syringe into port, slowly aspirate, and observe for blood; flush system and observe for swelling at puncture site.	23. Indicates a patent system and, with the presence of blood and lack of swelling, that the needle is probably in the vein.
24. Connect needleless locking cannula into injection port, open tubing clamp, and adjust rate as indicated in step 11.	24. Ensures administration of solution at the correct drip rate.
25. Dispose of equipment and gloves in proper receptacle and wash hands.	25. Reduces risk of transmission of pathogens.
26. When secondary bag and drip chamber are empty, don gloves, close the clamp, and disconnect the needleless locking cannula from the port's lock.	26. Indicates infusion of the solution.
27. Flush port with second saline syringe and place sterile needleless injection cap on the port.	27. Clears the line and reduces the risk of contaminating the port.
28. Dispose of equipment and gloves in proper receptacle and wash hands.	28. Reduces risk of transmission of pathogens.
29. Record fluid administration on MAR and client response in nurses' notes.	29. Documents nursing intervention and any client adverse reactions.

Nursing Process Highlight

Implementation

Instead of setting the total volume to be infused (e.g., 1000 ml), set the volume slightly lower (e.g., at 950 ml) so that the alarm will go off before the fluids are absorbed completely. This method will give you time to have the next bag of fluids ready when all 1000 ml has been absorbed. This is especially helpful when dealing with refrigerated fluids that must be warmed to room temperature before administering. If you will be off duty when the volume will be absorbed and you have set the alarm to go off early, tell the oncoming nurse during report.

be warmed to room temperature before administration (usually 30 minutes) to increase client's comfort.

Flushing

Flushing refers to the instillation of a solution into an intravenous cannula. Flushing is performed to assess and maintain cannula patency and prevent the mixing of incompatible medications and/or solutions, following the conversion of continuous IV therapy to intermittent IV therapy, and to maintain intermittent cannula patency following IV medication administration and blood sampling.

The type of solution and frequency of flushing an intermittent intravenous cannula is determined by the agency's policy/protocol. According to the INS (2000), flushing a cannula at established intervals with saline (0.9% sodium chloride injection) is the accepted solution to ensure and maintain patency of an intermittent PI cannula, while a heparin flush solution is the accepted solution to maintain patency of an intermittent central venous devices. The volume of flush is equal to the volume capacity of the cannula and add-on devices times two (INS, 2000). Consideration is also given to the volume and frequency of heparin flush in order to prevent an alteration in the client's clotting factors.

When flushing a cannula positive pressure within the lumen of the catheter must be maintained to prevent the reflex of blood into the cannula lumen. Use the manufacturer recommended maximum pressure limits (pounds per square inch) when selecting the size of the syringe to use for flushing since the smaller the syringe the greater the pressure generated; excessive internal pressures in the device increase the potential for cannula damage and/or progressive internal cannula weakening over the life of the device (INS, 2000). If resistance is met when flushing a cannula, do not exert pressure in an attempt to restore patency of an occluded cannula since



Title of Study

"The Use of Heparin and Normal Saline Flushes in Neonatal Intravenous Catheters"

Authors

Paisley, M. K., Stamper, M., Brown, J., Brown, N., & Ganong, L. H.

Purpose

To compare the use of heparin versus normal saline flush solutions on maintaining the patency of peripheral IV catheters in neonates.

Methods

This quasi-experimental study compared the outcomes in 87 infants with 159 IV starts who were 32 weeks or older gestation at birth; 32 received heparin, and 54 received normal saline.

Findings

There were no statistically significant differences in the duration of patency between the groups receiving heparin and normal saline; however, the duration of patency was significantly longer for term than pre-term infants and for insertion in the scalp, arm, or hand veins rather than the leg or foot veins.

Implications

Although this study found no difference in the duration of patency relative to the type of flush solution, two other variables were identified for duration of patency for IV catheters: gestational age and site of insertion. Results of this study also demonstrated the cost-saving benefit to the agency when using saline as a flush solution rather than heparin.

Paisley, M. K., Stamper, M., Brown, J., Brown, N., & Ganong, L. H. (1997). The use of heparin and normal saline flushes in neonatal intravenous catheters. *Pediatric Nursing*, 23(5), 521–524, 527.

this action may result in the dislodgement of a clot into the vascular system and/or rupture of the catheter.

Regulating IV Solution Flow Rates

Infusion sets with macrodrip chambers are often used for adult clients, whereas microdrip chambers are used for volume-sensitive clients, such as geriatric or pediatric clients. Pediatric and geriatric clients usually require some type of device to regulate the fluids as a safety factor to prevent overload. Devices such as

controllers and pumps are commonly used to regulate the rate of infusion.

Calculation of Flow Rate

The **flow rate** is the volume of fluid to infuse over a set period of time as prescribed by the health care practitioner. The health care practitioner will identify either the amount to infuse per hour (such as 125 ml per hour or 1000 ml over an 8-hour period). Calculate the hourly infusion rate as follows:

$$\frac{\text{Total volume}}{\text{Number of hours to infuse}} = \text{ml/hour infusion rate}$$

For example, if 1000 ml is to infuse over 8 hours:

$$\frac{1000}{8} = 125 \text{ ml/hour}$$

Calculate the actual infusion rate (drops per minute) as follows:

$$\frac{\text{Total fluid volume}}{\text{Total time (minutes)}} \times \text{drop factor} = \text{drops per minute}$$

For example, if 1000 ml is to infuse over 8 hours with a tubing drop factor of 10 drops per milliliter:

$$\frac{1000 \text{ ml}}{8(60) \text{ min}} \times 10 \text{ drops/ml} = \frac{10,000 \text{ drops}}{480 \text{ min}} = 20.8 \text{ or } 21 \text{ drops/min}$$

Another way to calculate the actual infusion rate is to use the hourly infusion rate; for the example just given:

$$\frac{125 \text{ ml} \times 10 \text{ drops/ml}}{60 \text{ min}} = 20.8 \text{ or } 21 \text{ drops/min}$$

Flow-Control Devices

Flow-control devices are used to regulate the infusion at the prescribed administration rate. Safety factors such as the client's age and condition, prescribed therapy, and setting are considered when selecting a flow-control device. There are two basic types of flow-control devices: manual flow-control devices and electronic infusion devices. Manual flow-control devices include roller, screw, and slide clamps and may include volume control devices such as Buretrol. These devices are used routinely to regulate the accurate delivery of most prescribed IV therapy.

Electronic infusion devices are operated either by electricity or battery and are used to administer IV fluids and medications and should be considered on all central access devices (INS, 2000). Electronic infusion pumps have audible alarms that sound when the solution has infused, the infusion tubing contains air or is kinked, or the cannula is clotted. There are two types of electronic infusion devices: controllers and pumps. Controller infusion devices generate flow by gravity and are capable of maintaining a constant preset flow rate either by drop counting or volumetric delivery. The nurse sets the flow rate, and the specific gravity of the solution and the height of the bag determine the maxi-

um delivery pressure. Fluids with low-viscosity are usually infused by electronic controllers.

Infusion pumps maintain the flow rate under positive pressure. Pumps counter the effects of resistance in the delivery system and pressure fluctuations at the infusion site (McConnell, 1999). Positive pressure infusion devices are classified as either volumetric or syringe pumps, and are used to deliver viscous fluids or large volumes of fluids. Volumetric pumps use either a peristaltic pumping action or a pumping cassette or chamber to delivery a fixed volume over a specified period of time. Syringe infusion pumps rely on a syringe or cartridge to deliver the fluid at a specific set rate.

Managing IV Therapy

IV therapy requires frequent client monitoring by the nurse to ensure an accurate flow rate and other critical nursing actions; refer to Procedure 37-4. These other actions include ensuring client comfort and positioning; checking IV solution for correct solution, amount, and timing; monitoring expiration dates of the IV system (tubing, venipuncture site, dressing) and changing as necessary; and being aware of safety factors.

NURSING ALERT

Catheter Sepsis

If client complains of chills and fever, check length of time that this IV solution has been hanging and the needle or catheter has been in place; assess client's vital signs, and assess for other symptoms of pyrogenic reactions, such as backache, headache, malaise, nausea, and vomiting. Unexplained fever may be related to catheter sepsis. Pulse rate increases and temperature is usually above 100°F if IV-related sepsis occurs. Stop infusion, notify health care practitioner, and obtain blood specimens if prescribed.

Coordinate client care with the maintenance of IV lines. Clients with IV therapy usually require assistance with hygienic measures, such as changing a gown (see Procedure 37-4). Change IV tubing when doing site care to decrease the number of times the access device is manipulated, thereby decreasing the risk for infiltration and phlebitis. PI devices are changed every 72 hours as directed by the Centers for Disease Control and Prevention (CDC) guidelines.

Hypervolemia

Hypervolemia (increased circulating fluid volume) may result from rapid IV infusion of solutions. This causes cardiac overload, which may lead to pulmonary edema and cardiac failure. Monitor the infusion rate hourly and refer to the Nursing Care Plan, Client with Fluid Volume Excess, for the assessment and interventions for a client experiencing fluid volume excess.

PROCEDURE 37-4

Managing IV Therapy and Dressing Change

Equipment

Assessing and Changing IV Tubing

- Nonsterile gloves (use with contact with bodily fluids)

Troubleshooting an IV System

- Nonsterile gloves
- Sterile needle and 5-cc syringe with 1 ml normal saline
- Armboard

Changing a Gown

- Clean gown

Converting to a Heparin or PI Lock

- Nonsterile gloves
- Protective pad
- Needleless injection cap

Changing a Peripheral IV Dressing

- Protective pad
- Tape (check for client allergy to tape)
- 70% isopropyl alcohol or povidone-iodine swab (check for client allergy to iodine)
- Receptacle for contaminated items

Discontinuing an IV Line

- Sterile 2 × 2 gauze
- Nonsterile gloves

- Administration sets (as determined by tubing to be replaced)

- 70% isopropyl alcohol or povidone-iodine swab (check for client allergy to iodine)

- Sterile needle and 3-cc syringe with 1–3 ml of normal saline; if heparin lock, second sterile needle and syringe with heparin, in accord with agency protocol

- Sterile IV dressing tray or sterile 2 × 2 gauze dressing; or sterile adhesive, or transparent semipermeable membrane (TSM) dressing; and sterile gloves

- Band-Aid

Action

1. Gather equipment, check integrity of the equipment, and wash hands.
2. Explain procedure to client.
3. Place bed at comfortable working height and lower side rails as necessary.

Managing IV Site

4. Don gloves; assess IV site, in accord with agency protocol and CDC guidelines, at least every 4 hours for signs and symptoms of complications (phlebitis, infiltration, infection at site, allergic reaction).
5. Assess dressing.
 - Determine when dressing was applied by checking date and time written on dressing itself.
 - Observe dressing for moisture.

Rationale

1. Promotes efficiency; ensures the sterility of the item; prevents transmission of microorganisms.
2. Decreases anxiety and elicits client cooperation.
3. Promotes proper body mechanics and provides access to area.
4. Decreases risk of contact with bloodborne pathogens; provides early detection of symptoms of complications and appropriate intervention.
5. Allows for assessment without disrupting an intact IV dressing.
 - Monitors medium for bacterial growth that would render sterile dressing contaminated.

(continues)

PROCEDURE 37-4

Managing IV Therapy and Dressing Change (continued)

*Action**Rationale*

- | | |
|---|--|
| <ul style="list-style-type: none"> • Observe that dressing is intact. • Gently palpate over the intact dressing. • If client complains of tenderness or pain, remove dressing and inspect site. <ol style="list-style-type: none"> 6. Change dressing immediately if it becomes wet, soiled, or loose. 7. Change TSM dressings routinely every 48 hours in accord with agency IV protocol. 8. Observe patency of IV line and needle. <ul style="list-style-type: none"> • Open roller clamp and observe for rapid flow of fluid into drip chamber; close roller clamp and set drip rate to prescribed flow rate. • If fluid does not flow, remove IV container from pole, place below level of infusion site, and observe for blood return. 9. Peripheral-short cannulas are removed and changed to a new site every 72 hours. 10. Change administration sets. <ul style="list-style-type: none"> • Use IV sets for blood, blood products, or lipids only once. • Every 24 hours, change IV tubing used for hyperalimentation. • Every 24 hours, change IV tubing used for piggyback solutions and when adding a new container to a continuous IV line. <p>Troubleshooting an IV system</p> <ol style="list-style-type: none"> 11. Overfilled drip chamber: <ul style="list-style-type: none"> • Close drip chamber. • Remove container from IV pole and turn it upside down. • Squeeze drip chamber until it is one-third to one-half full. 12. Air in tubing: <ul style="list-style-type: none"> • Observe fluid level in drip chamber. • Check tubing connections. • Disinfect injection port distal to air. | <ul style="list-style-type: none"> • Decreases risk of bacterial contamination to venipuncture site from nonadhering dressing. • Detects IV site swelling and edema around venipuncture site. • Detects early signs of phlebitis. <ol style="list-style-type: none"> 6. Decreases risk of bacterial infection. 7. Decreases risk of complications. 8. Ensures proper infusion rate; IV line and needle must be free of kinks, knots, and clots. <ul style="list-style-type: none"> • Denotes patency of IV line and prevents fluid overload. • Determines patency of needle or cannula and placement of the device in the vein; venous pressure should be greater than IV tubing pressure. 9. Supports CDC recommendations for changing peripheral cannulas to a new site every 48–72 hours to decrease the risk of complications. 10. Promotes compliance with CDC guidelines to prevent infection. <ol style="list-style-type: none"> 11. Maintains air in chamber to allow for flow-rate calculation. 12. Prevents infusion of air into the bloodstream. |
|---|--|

(continues)

PROCEDURE 37-4

Managing IV Therapy and Dressing Change (continued)

<i>Action</i>	<i>Rationale</i>
<ul style="list-style-type: none"> • Insert sterile needle and syringe into injection port, and aspirate. 	
<p>13. Blood is backing up IV tubing:</p> <ul style="list-style-type: none"> • Check that IV container is above the level of the site and heart. • Check security of tubing connections. • Check fluid level in tubing chamber and IV container. 	<p>13. Prevents clot formation at the needle or cannula tip inside the vein.</p>
<p>14. IV is positional:</p> <ul style="list-style-type: none"> • Reposition hand or arm. • If IV infuses freely in new position, stabilize with armboard. 	<p>14. Maintains bevel of needle or tip of cannula away from the inner lumen of the vein.</p>
<p>15. Infusion controller or pump alarms:</p> <ul style="list-style-type: none"> • Check drip chamber for excess or inadequate fluid level. • Remove tubing from controller or pump and open all roller clamps. Check that air vent is open (if applicable) and that tubing is free of kinks. • Check patency of IV site, disinfect injection port closest to site, and insert needle and syringe with 5 ml of saline. Gently flush with saline and aspirate for blood; if unsuccessful, discontinue IV and change to a new site. • Place tubing in controller or pump and reset alarm. 	<p>15. Indicates flow problem.</p>
<p>Changing a Gown, Continuous IV Infusion in Hand or Arm</p>	
<p>16. Untie back or side of gown.</p>	<p>16. Allows gown to slip freely from arms.</p>
<p>17. Remove gown's sleeve from arm and hand without IV.</p>	<p>17. Frees the gown for removal from the involved arm.</p>
<p>18. Adjust the tubing to extend over IV hand, then slip the sleeve down arm; avoid tugging on tubing.</p>	<p>18. Prevents pressure on the tubing, which could disturb the venipuncture site or dislodge the IV.</p>
<p>19. Place clean gown over client's chest and abdomen.</p>	<p>19. Prevents unnecessary exposure and maintains client warmth.</p>
<p>20. Remove IV container from pole and slip sleeve over container, keeping container above client's arm.</p>	<p>20. Prevents backflow of blood into tubing.</p>
<p>21. Place your hand up through distal end of clean gown sleeve and grasp container; pull container and tubing out through clean gown sleeve.</p>	<p>21. Maintains integrity of the IV system.</p>

(continues)

PROCEDURE 37-4

Managing IV Therapy and Dressing Change (continued)

<i>Action</i>	<i>Rationale</i>
22. Hang container on pole and check flow rate.	22. Ensures that solution is infusing at prescribed rate.
23. Slip sleeve over client's IV arm and then on other arm; tie gown at back.	23. Maintains client's warmth and comfort.
Converting to a Heparin or PI Lock	
24. Perform steps 1–3.	
25. Check health care practitioner's order.	25. Verifies action to establish a lock.
26. Don clean gloves and close roller clamps on tubing.	26. Decreases risk of contact with bloodborne pathogens; prevents escape of solution from tubing.
27. Place protective pad under arm or hand with venipuncture site.	27. Prevents soiling of bed linen.
28. Open sterile package containing needleless injection cap and place in easy reach near venipuncture site.	28. Provides easy access.
29. With your nondominant hand, grasp hub of needle or cannula. With your dominant hand, disconnect IV tubing and attach needleless injection cap to hub.	29. Prevents dislodgement of needle or cannula.
30. While stabilizing hub with nondominant hand, inject needleless injection cap port with 1 ml of normal saline; if heparin lock, instill heparin.	30. Maintains patency of lock.
31. Discard old tubing and used supplies in receptacle.	31. Promotes a clean environment.
Changing a Peripheral IV Dressing	
32. Perform steps 1–3.	
33. Place protective pad under IV site; don gloves.	33. Prevents soiling of bed linen; reduces risk of contact with bloodborne pathogens.
34. Remove transparent or gauze dressing in direction that client's hair grows; keep pressure over IV site and leave in place tape that secures IV needle or cannula (Figure 37-26).	34. Decreases client's discomfort when removing tape; prevents dislodgement of needle or cannula.
35. Discard dressing and gloves in receptacle; wash hands.	35. Reduces risk for transmission of microorganisms.
36. Don gloves; inspect IV site for erythema, edema, infiltration.	36. Reduces risk of contact with bloodborne pathogens; denotes complications—for example, phlebitis, infiltration—that would necessitate changing IV site.
37. Cleanse IV site with alcohol or povidone-iodine. Using a circular motion, start at the puncture site and move outward peripherally; allow to dry (1 minute).	37. Reduces skin surface bacteria and prevents cross-contamination from skin bacteria near venipuncture site.

(continues)

PROCEDURE 37-4

Managing IV Therapy and Dressing Change (continued)

Action

Figure 37-26 Removing Tape from a Peripheral-Short Catheter. Remove tape with one hand while stabilizing the catheter's hub with the other hand.

38. Replace tape:

Butterfly

- Place smallest pieces of tape across wings of butterfly.
- Place another piece of tape across middle to form an H; or
- Place small piece of tape under wings (Figure 37-27).



Figure 37-27 Retaping a Butterfly Needle via the Crisscross Method

Rationale

38. Allows for stabilization of needle or catheter without tape's covering the insertion site, and eliminates positional flow of IV solution.

(continues)

PROCEDURE 37-4

Managing IV Therapy and Dressing Change (continued)

Action

- Tape over to form a V.
- Then place piece of tape across V.
- Avoid placing tape over insertion site.

Peripheral-short Catheters

- With tape edges sticking to your thumb and fingertip, slide small piece of tape under catheter hub, with adhesive side up.
- Cross tape over hub to form a U (Figure 37-28).
- Place another small piece of tape across catheter hub.
- Avoid placing tape over insertion site.



Figure 37-28 Retaping a Peripheral-Short Catheter via the U Method

39. Using aseptic technique, apply transparent or gauze dressing over IV insertion site; avoid wrinkling transparent dressing.
40. The catheter–skin junction site should be visible.
41. Place date, time, and your initials directly on dressing.
42. Discard soiled items and gloves in receptacle; wash hands.
43. Reassess patency of IV system, flow rate, and client's response to dressing change.
44. Record in nurses' notes: time and type of dressing change, nature of venipuncture site, patency and IV flow rate.

Rationale

39. Provides protective barrier against bacteria.
40. Allows for visual inspection palpation for tenderness through the intact dressing.
41. Documents dressing change.
42. Reduces risk of transmission of microorganisms.
43. Validates patency of IV system and infusion of solution at prescribed flow rate.
44. Documents actions taken and condition of IV site and system.

(continues)

PROCEDURE 37-4

Managing IV Therapy and Dressing Change (continued)

<i>Action</i>	<i>Rationale</i>
Discontinuing an IV Line	
45. Perform steps 1–3. Don nonsterile gloves.	
46. Assess device in place before discontinuing.	46. Allows for verification of complete removal of device.
47. Close roller clamp on IV tubing. If infusing, note amount of solution left in IV container.	47. Prevents spillage of solution when needle or catheter is removed; provides accurate amount of solution infused.
48. Stabilize needle or cannula with nondominant hand and remove tape in direction of hair growth.	48. Prevents unnecessary movement that could injure the vein; decreases discomfort when tape is removed.
49. Place sterile 2 × 2 gauze over puncture site and, while applying pressure, quickly and smoothly remove needle or catheter. Avoid pressing down on top of needle point while it is still in the vein.	49. Decreases bleeding and prevents injury to the vein.
50. Discard needle or catheter in receptacle.	50. Reduces risk of transmission of microorganisms.
51. Apply pressure over puncture site with sterile 2 × 2 gauze until bleeding stops. Apply Band-Aid; discard 2 × 2 gauze and gloves in receptacle and wash hands.	51. Promotes clot formation; keeps puncture site clean.
52. Inspect site for redness, swelling, or hematoma formation.	52. Determines whether bleeding is occurring in the tissue.
53. Check site again in 15 to 30 minutes.	53. Monitors for complications.
54. Record in nurses' notes: time and amount of IV solution left in container when discontinued and nature of puncture site.	54. Documents actions taken; promotes accurate intake recording, and documents condition of puncture site.

If a solution infuses at a rate greater than prescribed, decrease the rate to *keep vein open* (KVO) and immediately notify the health care practitioner. Report the amount and type of solution that infused over the exact time period and the client's response.

Infiltration

Infiltration may be caused by inserting the wrong type of device, using the wrong-gauge needle, or dislodgement of the device from the vein. When a drug or solution is administered under high pressure by a pump, it may also cause infiltration or vein irritation.

Infiltration results in the leaking of fluids or medications into the surrounding tissue. The client usually

complains of discomfort at the IV site. Inspect the site by palpating for swelling, and feel the temperature of the skin (coolness and paleness of skin are indications of infiltration).

The nurse confirms that the needle is still in the vein by pinching the IV tubing; this action should cause a **flashback** (blood should rush into the tubing if the needle is still in the vein). If a flashback does not occur, aspirate the injection port nearest the device as explained in Procedure 37-4. Discontinue the needle or catheter if it cannot be aspirated and apply a sterile dressing to the puncture site.

After the IV has been removed, the puncture site may ooze or bleed (especially in clients receiving anticoagulants).

NURSING ALERT

IVs and the Critically Ill

Never remove a functioning intravenous device from a critically ill client until another successful venipuncture has been performed; an established intravenous route may be needed for the administration of solutions, medications, or blood components.

If oozing or bleeding occurs, apply pressure and reapply a sterile dressing until it stops. Accurately assess and document the degree of edema.

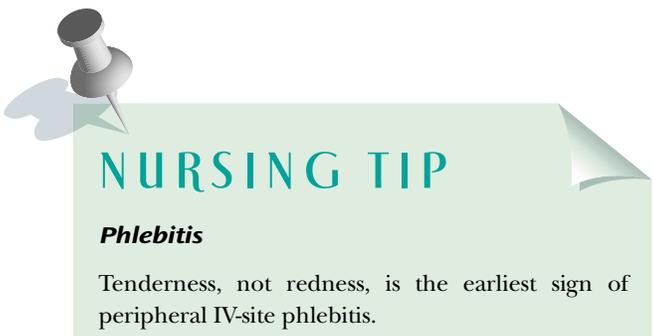
Clients may be injured by infiltration. If the IV site becomes grossly infiltrated, the edema in the soft tissue may cause a nerve compression injury with permanent loss of function to the extremity. If a **vesicant** (medication that causes blistering and tissue injury when it escapes into surrounding tissue) infiltrates, it may cause significant tissue loss with permanent disfigurement and loss of function.

Phlebitis

Phlebitis may result from either mechanical or chemical trauma. Mechanical trauma may be caused by inserting a device with too large a gauge, using a vein that is too small or fragile, or leaving the device in place for too long. Chemical trauma may result from infusing too rapidly, or from an acidic solution, hypertonic solution, a solution that contains electrolytes (especially potassium and magnesium), or other medications.

Phlebitis may be a precursor of sepsis. Listen for client complaints of tenderness, the first indication of an inflammation. Inspect the IV site for changes in skin color and temperature (a reddened area or pink or red stripe along the vein, warmth, and swelling are indications of phlebitis).

If phlebitis is present, discontinue the IV infusion. Before removing and discarding the venous device, check the agency's protocol to see whether the tip of the device needs to be cultured and sent to the laboratory for a culture and sensitivity. After removing the device, apply a sterile dressing to the site and wet warm compresses to the affected area. Document in the nurses' notes the time, symptoms, and nursing interventions.



NURSING TIP

Phlebitis

Tenderness, not redness, is the earliest sign of peripheral IV-site phlebitis.

Hypertonic solutions may cause irritation necessitating frequent IV site changes. Observe site for symptoms of postinfusion phlebitis following IV removal. This may occur in response to either chemical or mechanical factors of the preexisting IV. Postinfusion phlebitis is treated with hot compresses to the site and elevation of the extremity.

Intravenous Dressing Change

IV dressing changes require the use of Standard Precautions and aseptic technique; refer to Procedure 37-4. Institutional protocol and the type of intravenous access device and dressing determine the frequency of care:

1. Nontransparent (gauze) dressing may be used for a PI. It is changed every 24 hours.
2. Transparent dressings (Bioclusive, OpSite, Tegaderm) allow visualization of the IV site; these dressings are changed every 48 hours.

Persistent drainage at the IV site may require dressing changes more frequently or necessitate changing the IV site.

Discontinuation of Intravenous Therapy

Intravenous therapy is discontinued on health care practitioner order as determined by the client's need or response to therapy. The removal of a short peripheral catheter is a nursing intervention to minimize the complication risks related to infusion therapy or to implement the health care practitioner's order. Peripheral catheters are removed every 48 hours and immediately upon suspected contamination or complications. Pressure and a dry sterile dressing are applied to the site upon removal of the catheter; refer to Procedure 37-4. The integrity of the catheter and insertion site should be assessed with observations and actions documented to the client's medical record.

The removal of a PICC is usually a simple procedure; however, research suggests that, in 7% to 12% of PICC removals, difficulties can arise (Macklin, 2000). Only nurses who have been trained in the insertion of a PICC line should remove the catheter. Since the catheter is completely inserted in the vascular system and invisible, the nurse must feel for resistance during removal. If resistance is felt, the nurse stops and assesses for certain complicating factors: venous spasm, vagal reaction, phlebitis, thrombosis, and knotting of the catheter. Prior to removal, the nurse must verify in the client's medical record the type and the specific length of the inserted PICC.

Blood Transfusion

The purpose of a blood transfusion is to replace blood loss (deficit) with whole blood or blood components. On the basis of the client's unique needs, the health care practitioner determines the type of transfusion to

administer, either whole blood or a component of whole blood, such as packed red blood cells.

Whole Blood and Blood Products

Clients with a demonstrated deficiency in either whole blood or a specific component of blood are given a blood transfusion. Whole blood contains red blood cells (RBCs) and plasma components of blood. It is used when the client needs all the components of blood to restore blood volume after severe hemorrhage and to restore the capacity of the blood to carry oxygen. Various types of blood components are used in the clinical setting (Table 37-7). Packed RBCs are more commonly prescribed than whole blood.

Plasma or fresh frozen plasma is separated and frozen within 8 hours after blood collection. Albumin (protein colloid) is a volume expander that maintains the colloid osmotic pressure of the blood. Albumin, hetastarch, and dextran (nonprotein colloids) are agents that increase intravascular volume in order to maintain hemodynamic stability and to provide adequate tissue perfusion. Cryoprecipitate is the most expensive of all blood components because it is constituted from many units of whole blood.

When the health care practitioner prescribes the administration of whole blood or a blood product, the client's blood is typed and crossmatched; refer to Chapter 28 for a complete discussion of blood groups and Rhesus (Rh) factor. Check with the family for donors if time and the client's condition permit. The blood is stored in the blood bank after typing and crossmatching until the nurse is ready to administer.

Although whole blood has a refrigerated shelf life of 35 days, platelets must be administered within 3 days after they have been extracted from whole blood. If the

RBCs and plasma are frozen, their shelf life can be extended up to 3 years (Kee & Paulanka, 2000).

Initial Assessment and Preparation

The nurse must perform an initial assessment before administering blood (see the accompanying display). The viscosity of whole blood usually requires the use of an 18- or 19-gauge needle or catheter to prevent damage to the red cells.

BLOOD TRANSFUSION, INITIAL ASSESSMENT

- Verify that client has signed a blood administration consent form and that this consent matches what the health care practitioner has prescribed.
- Verify whether the client has an 18- or 19-gauge needle or catheter in the vein; if the blood is to be infused quickly, a 14- or 15-gauge device must be used. Pediatric and elderly clients may require a 23-gauge device because of smaller or thin-walled veins.
- Ensure patency of the existing IV site.
- Establish baseline data for vital signs, especially temperature, and assess skin for eruptions or rashes.
- Check client's blood type against the label on the whole blood or blood component prior to administration, to ensure compatibility.
- Assess client's age. If the client is at risk for circulatory overload (pediatric, elderly, or malnourished clients), notify the blood bank to divide the 500-ml bag of blood into two 250-ml bags or discuss with the health care practitioner other alternatives, such as packed RBCs rather than whole blood.

TABLE 37-7
Blood-Component Therapy

Type	Use	Special Considerations
Fresh or frozen plasma	Replaces deficient coagulation factors. Increases intravascular compartment.	Use within six hours with any straight-line administration set. Client is at risk for hepatitis.
Platelet	Corrects bleeding disorders (e.g., thrombocytopenia). Replaces platelets.	Infuse at rate of 10 minutes a unit with special platelet administration set.
Albumin	Restores intravascular volume. Treats shock and hypoproteinemia.	Available in 5% and 25% solution. Infuse slowly with special tubing that accompanies solution.
Granulocyte (white blood cell)	Restores the leukocyte count, usually depressed in clients receiving radiation or chemotherapy.	Infuse slowly, over 2- to 4-hour interval with Y-type blood filters, and prime with normal saline.
Cryoprecipitate	Restores factor VIII and fibrinogen in treating hemophilia A.	Infuse with a straight-line administration set. Observe for febrile reactions.

NURSING ALERT

Transfusion Reaction

The severity of a transfusion reaction is relative to its onset. Severe reactions may occur shortly after the blood starts to infuse. At the first sign of a reaction, stop the blood infusion immediately.

Scheduled IV medications should be infused before blood administration. This sequence prevents a reaction to a medication while blood is infusing; if a reaction were to occur, the nurse would not be able to discern which infusate was causing the reaction.

Administering Whole Blood or a Blood Component

The agency's blood protocol may require that a licensed person sign a form to release the blood from the blood bank and that a blood product be checked by two licensed personnel prior to infusion. The following information must be on the blood bag label and verified for accuracy: the client's name and identification number, ABO group and Rh factor, donor number, type of product ordered by the practitioner, and the expiration date.

Observe the blood bag for any signs of puncture, gas bubbles, color, and consistency (RBCs clumping). When the information has been verified, both licensed person-

nel sign the appropriate form. If any of the information does not match exactly or if the product has expired, return the product immediately to the blood bank.

Blood should be administered within 30 minutes after it has been received from the bank, to maintain RBC integrity and to decrease the chance of infection. Whole blood should not go unrefrigerated for more than 4 hours. Room temperature will cause RBC lysis, releasing potassium and causing hyperkalemia (Procedure 37-5).

Safety Measures

As discussed in Procedure 37-5, the client should be observed for the initial 15 minutes for a transfusion reaction. Vital signs are usually taken every 15 minutes for the first hour, then every hour while the blood is transfusing.

To prevent blood contamination, change the blood tubing and filter every 4 hours or after each unit of blood. Transfuse each unit of blood over a 2- to 4-hour interval.

NURSING ALERT

Blood Transfusion Incompatibility

Use only normal saline with a blood product. Blood transfusions are incompatible with dextrose and with Ringer's solution. Together, they cause hemolysis, clumping of RBCs.

PROCEDURE 37-5

Administering a Blood Transfusion

Equipment

- Y-administration set tubing with in-line filter
- 2 bags of 250 to 500 ml of normal saline
- 18 or 19-gauge needle or 18- or 19-gauge catheter; if blood is to be administered rapidly, 14-gauge needle
- Alcohol swabs and tape
- Needleless injection cap
- Regular administration set
- Blood unit as prescribed by health care practitioner
- Venipuncture supplies, if client does not have an IV in place
- Nonsterile gloves

Action

1. Check prescriber's orders for number of units and client's signed consent form.
2. Check with the blood laboratory or blood bank that type and crossmatch have been completed and that blood is ready.
3. Gather equipment and check integrity of the equipment.
4. Check client's arm for an identaband (special band that contains essential data, blood group and type).

Rationale

1. Verifies health care practitioner prescription for blood transfusion and client's consent.
2. Ensures that blood is ready for administration.
3. Promotes efficiency. Blood must be started within 30 minutes from the time it is removed from refrigeration. Ensures the sterility of the items.
4. Verifies client. Blood can not be administered without an identaband.

(continues)

PROCEDURE 37-5

Administering a Blood Transfusion (continued)

<i>Action</i>	<i>Rationale</i>
<ol style="list-style-type: none"> 5. Explain procedure to client, and answer questions. 6. Assess IV site for patency, gauge size of needle or catheter and verify that IV is in place. 7. Check vital signs. 8. Obtain whole blood unit or packed cells from the blood laboratory or blood bank. <ul style="list-style-type: none"> • Check requisition form with laboratory personnel. • Check blood label against blood unit for client's name and identaband number, blood group (ABO) and type (Rh), blood unit number, and expiration date of blood unit. 9. Check requisition form and blood label with another RN and sign form with another RN in accord with agency protocol (Figure 37-29). 	<ol style="list-style-type: none"> 5. Decreases client anxiety and elicits cooperation. 6. Ensures patent IV with the correct needle gauge to prevent hemolysis of RBCs. 7. Provides baseline data. 8. Ensures correct blood unit to decrease the risk of a transfusion reaction. 9. Provides for a double-check to decrease the risk of error.
	
<p>Figure 37-29 Blood Transfusion Verification</p>	
<ol style="list-style-type: none"> 10. Check blood unit for bubbles, cloudiness, dark color, or sediment; if any of these signs is present, return blood unit to laboratory and process a written report of actions in accord with agency protocol. 11. Check label on blood unit against client's identaband: name, identification number, blood group, blood type, and blood unit number. 12. Hang one bag of normal saline on IV pole, pull back tab, and spike with regular administration set; prime tubing, replace protective cap on distal end of tubing. 13. Prepare Y-set tubing with in-line filter: <ul style="list-style-type: none"> • Hang second bag of normal saline and blood bag on pole. 	<ol style="list-style-type: none"> 10. Indicates bacterial contamination of blood. 11. Decreases risk of error; ensures correct ABO group and Rh factor. 12. Establishes a secondary bag of normal saline to infuse in the event of a transfusion reaction when Y-set with blood and normal saline is discontinued. 13. Allows for normal saline infusion to flush existing needle or catheter. <ul style="list-style-type: none"> • Isotonic saline prevents hemolysis.

(continues)

PROCEDURE 37-5

Administering a Blood Transfusion (continued)

Action

- Remove Y-tubing from package and close roller clamp. Note red and white caps of tubing spikes.
 - Remove tab from normal saline port.
 - Remove white cap from Y-tubing spike, insert into port of normal saline bag, and hang on IV pole.
14. Prime Y-set with normal saline.
- Open clamp to saline bag.
 - Squeeze sides of drip chamber until filter is half covered and drip chamber is full (Figure 37-30).



Figure 37-30 Closing Roller Clamp on Administration Set and Priming Drip Chamber

- Open main clamp, remove protective cap from distal end of tubing, and prime tubing.
 - Close main clamp when tubing is primed, and replace protective cap.
15. Don nonsterile gloves.
16. Gently rotate blood bag.
17. Continue preparing Y-set.
- Remove tab from blood bag to expose port.
 - Remove red cap from tubing spike; insert spike into port of blood bag.
18. Cleanse injection port with alcohol swab.
19. Affix large-gauge needle to end of Y-tubing and prime needle.

Rationale

14. Clears air bubbles from tubing.

15. Reduces risk of contact with blood-borne pathogens.
16. Mixes blood with plasma.
17. Prepares blood bag for infusion.
18. Decreases transfer of microorganisms.
19. Prevents damage to RBCs.

(continues)

PROCEDURE 37-5

Administering a Blood Transfusion (continued)

Action

20. Insert needle into injection port, and tape.
21. Open roller clamp to saline bag, and open main clamp on Y-set; infuse slowly to clear the lock.
22. Clamp off saline bag, and open clamp to blood bag (Figure 37-31); if administering packed RBCs, allow saline to infuse simultaneously with RBCs.



Figure 37-31 Closing the Saline Roller Clamp and Opening the Blood Roller Clamp

Rationale

- | | |
|--|--|
| <ol style="list-style-type: none"> 23. Squeeze sides of Y-set drip chamber to allow blood to cover entire filter. 24. Regulate drip rate with main clamp to deliver 20 gtts per minute for the first 15 minutes. 25. Take vital signs, and observe closely for reactions: chilling, skin rash, backache, headache, nausea or vomiting, tachycardia, tachypnea, fever, or hypotension; if reaction occurs, stop transfusion. 26. Adjust flow rate as prescribed. If no adverse reactions, complete blood transfusion in less than 4 hours. 27. Instruct client to call a nurse if there are any unusual symptoms; test call light, and place within easy reach. 28. Monitor client throughout transfusion in accord with protocol; observe IV site for formation of a hematoma. If this occurs, stop transfusion and discontinue IV site. | <ol style="list-style-type: none"> 20. Decreases manipulation of needle, and preserves integrity of vein. 21. Allows saline to flush the lock, preventing mixing of blood with incompatible solutions. 22. Prevents saline from infusing into blood bag when roller clamp is opened; saline is needed to decrease the viscosity of packed cells; otherwise tubing or needle will clog. 23. Fills chamber with blood. 24. Allows time to observe for adverse reactions. Most reactions occur within the first 15 minutes of infusion. 25. Assesses client for adverse transfusion reactions. 26. Prevents rapid deterioration of blood that occurs after 2-hour exposure to room temperature. 27. Elicits client support in monitoring for a transfusion reaction or circulatory overload. 28. Reveals signs of infiltration, needle dislodgement from vein. |
|--|--|

(continues)

PROCEDURE 37-5

Administering a Blood Transfusion (continued)

<i>Action</i>	<i>Rationale</i>
29. Initiate transfusion record.	29. Documents onset of blood administration and baseline data.
30. Discontinue Yset when transfusion is complete. <ul style="list-style-type: none"> • Close blood roller clamp. • Open saline roller clamp, and allow all blood in tubing to infuse. • Don nonsterile gloves. • Close main clamp. • Disconnect tubing from injection port. If other fluids are to follow, connect or reestablish the lock. 	30. Ensures that client receives the full bag of blood. Infuses blood in the tubing, and flushes IV needle or catheter with saline.
31. Discard Yset tubing and blood bag in a biohazard bag and follow protocol regarding disposition.	31. Provides for proper disposal of contaminated equipment. Many protocols require return of blood bag and tubing to blood bank.
32. Remove gloves, wash hands.	32. Decreases spread of microorganisms.
33. Obtain postinfusion vital signs.	33. Monitors client response to transfusion, and detects signs of circulatory overload.
34. Document to transfusion record: <ul style="list-style-type: none"> • Date and time of starting and completing the transfusion • Type of blood transfused • Vital signs • Absence or presence of any reaction or complications • Status of the IV site • Disposition of the blood bag and tubing 	34. Provides a recording of significant data.

As a precaution against a blood transfusion reaction, prepare a bag of normal saline, as directed by protocol. The normal saline is prepared as a secondary infusion system; it should not be connected to the Yset tubing that is transfusing blood. If the client has a reaction, and the blood is discontinued, the secondary bag of normal saline should be connected and infused. This action prevents the client from receiving all the blood that is in the Yset tubing, approximately 20 to 30 ml. Even though the procedure for infusing packed cells, and sometimes whole blood, requires a Yset for coadministering normal saline, the secondary bag of normal saline is a precautionary measure for transfusion reactions.

There are three basic types of transfusion reactions: allergic, febrile, and hemolytic. Other complications include sepsis, hypervolemia, and hypothermia. An allergic reaction may be mild or severe, depending on the cause. Hemolytic reactions may be immediate or

delayed up to 96 hours, depending on the cause of the reaction. The classic symptoms of a reaction and sepsis are fever and chills.

The immediate nursing actions for all types of reactions and complications are: stop the transfusion, keep the vein open with normal saline, and notify the health care practitioner. Other measures include sending the IV tubing and bag of blood back to the blood bank; obtaining a blood and urine specimen; labeling the specimen “Blood Transfusion Reaction”; processing a transfusion reaction report; monitoring vital signs every 15 minutes for 4 hours or until stable; and monitoring the intake and output.

A delayed hemolytic reaction results when the donor and client’s anti-A or anti-B agglutinins are mismatched or when there has been improper storage of the blood unit. This reaction causes the cells to clump and form plugs in small blood vessels. Within a few hours or days, the phagocytic WBCs and the reticuloendothelial sys-

tem destroy agglutinated cells, releasing hemoglobin into the plasma. The client is monitored for jaundice, persistent anemia or fever, oliguria, flank pain, and abnormal bleeding.

An immediate hemolytic reaction is a rare occurrence. It results from a mismatch of donor and client's blood, causing immediate hemolysis of RBCs. The antibodies cause lysis of RBCs, which release proteolytic enzymes that rupture the cell membranes. The clinical manifestations are headache, dyspnea, cyanosis, chest pain, and tachycardia.

Febrile reactions are common and result from the client's sensitivity to WBCs, platelets, or plasma proteins. Warm, flushed skin, headache, muscle pain, and anxiety are the symptoms of a febrile reaction. It is treated with antipyretic medication.

To help prevent a febrile reaction, keep the client warm during the transfusion. Make sure that the tubing has a leukocyte-reduction filter. The leukocyte-reduction filters also reduces the risk of transmitting **cytomegalovirus (CMV)** (a DNA virus that causes intranuclear and intracytoplasmic changes in infected cells). Approximately 10% of seropositive donors are capable of transmitting CMV infection.

Mild allergic reactions are common, resulting from a sensitivity to infusing plasma proteins. Allergic reactions cause a rash, itching, hives (urticaria), and wheezing. Clients with these symptoms should be monitored for anaphylactic shock. Antihistamines may be prescribed to counter the allergic response.

Severe allergic reaction results from an antibody-antigen response as demonstrated by shortness of breath and chest pain; if untreated, it may cause circulatory collapse and cardiac arrest. If this occurs, initiate CPR after the blood has been discontinued.

Sepsis results from the administration of contaminated blood (containing gram-negative bacteria). It is a serious complication. Clinical manifestations include chills and fever, vomiting, abdominal cramping, diarrhea, shock, and renal failure. It is treated with broad-spectrum antibiotics and steroids. Nursing measures are directed toward maintaining hydration and monitoring intake and output to evaluate renal function.

Hypervolemia from fluid overload is a preventable complication. Clients at risk for FVE are placed in a sitting position. The blood is transfused at a reduced flow rate; request the blood laboratory to divide the unit into 2 containers of blood so that none of it is unrefrigerated for more than 2 hours during transfusion. Clinical manifestations of hypervolemia are similar to those of FVE (dyspnea, cough and rales, distended neck veins, hypertension, tachycardia, and pulmonary edema). Administer oxygen and IV diuretics as prescribed to treat circulatory overload.

Clients needing rapid transfusions are at risk for transfusion-induced hypothermia. Such clients may include neonates needing exchange-transfusions and trauma victims who require large volumes of whole

blood. A blood-warming device may be prescribed to prevent transfusion-induced hypothermia. The symptoms of transfusion-induced hypothermia result from the rapid transfusion of large amounts of cold blood. If the infusing blood temperature is below 30°C (86°F), the myocardial temperature decreases, causing hypotension and myocardial irritability that may progress to ventricular fibrillation and cardiac arrest. Nursing interventions are directed toward warming the client with temperature-regulating blankets after the transfusion has been stopped. Obtain an ECG to assess for cardiac arrhythmias.

Complementary Therapy

Herbs and certain foods are used to maintain health and prevent the onset of chronic debilitating diseases such as diabetes mellitus and renal failure. Naturopathic health care practitioners (NDs) use herbs as medicine, and although herbs are the main ingredient of some of the drugs used in conventional medicine, NDs use herbs differently than MDs. MDs prescribe drugs to treat symptoms. For example, in hypertension, the prescribed drug controls the blood pressure but does not correct the reason why the body has increased the pressure in the first place; an ND uses herbs to correct the underlying problem (Morton & Morton, 1996). The following discussion will explain how herbs and foods can be used to treat certain conditions that create disturbances in body fluids and pH.

Traditional Chinese medicine relies on nutrition and dietetic principles to treat certain illnesses and/or imbalances. Foods are recommended based on their energetic properties such as toxifying, dispersing, heating, cooling, moistening, and drying, and by eating in tune with seasonal changes. Cooling foods such as watermelon, celery, and cucumber are recommended during the warmer months of spring and summer because they contain a higher percent of water than warming foods such as meats, garlic, and spices, which are eaten during the cooler months of autumn and winter (Kloss, 1995).

Many plants have a hypoglycemic action; they lower blood sugar levels. Such plants include dandelion root, garlic, ginseng, and nettles. Other plants have also been identified as possessing hypoglycemic action such as allspice, artichoke, banana, barley, bugleweed, lettuce, oats, onion, and spinach, to name a few. When herbs and diet are used in a tailor-made combination for the individual, the amount of glucose entering the blood is kept at a constant level (Hoffmann, 1998). Tierra (1998) recommends dandelion root in combination with other tonic herbs such as ginseng and a little ginger for maximum benefit, along with a balanced diet for hypoglycemia.

Herbs such as dandelion and cleavers, which aid the kidneys, are not only useful for renal problems but may aid the cleansing mechanism in treating the whole

body, no matter what the problem (Hoffmann, 1998). The main benefits of dandelion are exerted upon the functions of the liver by clearing obstructions and stimulating and aiding the liver to eliminate toxins from the blood. Dandelion root is helpful in treating hypertension, thus aiding the action of the heart. Dandelion (root and leaf) acts as a diuretic and can be taken for fluid retention, cystitis and nephritis. Dandelion also contains a high percentage of potassium and actually increases the potassium level, thereby avoiding the loss of potassium caused by synthetic diuretics.

Caution should be used when taking licorice since this herb contains a variety of active ingredients. Glycyrrhizin, an active ingredient of licorice, can produce effects similar to aldosterone. Due to the aldosterone-like effects, whole licorice can cause fluid retention, high blood pressure, and potassium loss in doses that exceed 3 g daily for more than 6 weeks. Clients who take digitalis or a thiazide diuretic or who

have hypertension, heart disease, diabetes, or kidney disease should avoid the use of licorice.

EVALUATION

Evaluation is an ongoing process for clients with fluid, electrolyte, and acid-base imbalances. Focus on the client's responses when evaluating whether the time frames and expected outcomes are realistic (such as whether the intake and output are within 200 to 300 ml of each other). The client's vital signs should be within normal limits. The IV infusion rate is accurately calculated and reassessed throughout therapy to maintain the client's hydration. The IV site should remain free from erythema, edema, and purulent drainage. The nursing care plan is modified as necessary to support the client's expected outcomes.

NURSING CARE PLAN

The Client with Deficient Fluid Volume

Case Presentation

Mrs. Gray is a 75-year-old woman with diabetes who has been experiencing flu-like symptoms of vomiting and diarrhea for 5 days. She lives alone and does not like to cook. When she got up this morning, she felt weak and dizzy; she called 911 to take her to the clinic. The EMS providers called the practitioner en route, and Mrs. Gray was taken directly to the infusion center.

Assessment

- Marked thirst
- Temperature 37.2°C
- BP 94/74
- Wt 157 lb (5% loss from 165)
- Dry mucous membranes
- Respirations 30
- Apical pulse 108/min
- ↑ Hct, ↑ Hbg, ↑ BUN

Nursing Diagnosis #1

Deficient Fluid Volume related to vomiting and diarrhea.

Expected Outcomes

1. The client will
 - Experience relief from vomiting and diarrhea in 2–4 hours.
 - Demonstrate clinical signs of adequate hydration prior to discharge.
 - Understand the reasons for the deficient fluid and the amounts and types of foods and fluids to consume to prevent a recurrence.
2. The client's fluid intake and output will be balanced in 12–24 hours.
3. The client's weight will be stable and lab values will be within normal limits prior to discharge.

Interventions/Rationales

1. Assess and document amount, color, and characteristics of vomitus and diarrhea. *Determines fluid replacement.*

(continues)

NURSING CARE PLAN**The Client with Deficient Fluid Volume (continued)**

2. Maintain NPO status. *Allows the GI tract to heal.*
3. Measure vital signs qh. *Monitors client status.*
4. Assess skin turgor. *Indicates hydration status.*
5. Administer antiemetics and antidiarrheals. *Prevents further fluid loss.*
6. Measure and document qh. *Assesses fluid balance.*
7. Report and document O ↓ 30 ml/h. *Alerts to severe fluid imbalance.*
8. Administer PO fluids as tolerated 2 hours postvomiting/diarrhea. *Gradually reintroduces oral intake.*
9. Administer IV lactated Ringer's solution with flow rate as prescribed. *Prevents overhydration.*
10. Assess and document skin and mucous membrane moisture, skin color and hydration, urine for sugar or acetone, and mental status. *Indicates hydration status.*
11. Weigh the client on same scale, in the same clothes, after voiding. Monitor serum glucose, osmolality, Hct, Hgb, BUN. *Monitors weight changes and fluid and electrolyte status.*
12. Assess the client's knowledge level; provide information about causes and why interventions are being performed, and explain actions to take to prevent a recurrence. *Educates client as to causes and remedies for fluid volume deficit.*

Evaluation

Client free from vomiting 2 hours postadmission; diarrhea stopped within 5 hours after being placed NPO. Hourly urinary output >30 ml/h; tolerated 4 oz of Gatorade 6 hr postadmission, progressed to clear liquid diet; I&O balanced 20 hrs post-admission.

Mucous membranes moist; good skin turgor and color; absence of thirst; urine was free from sugar and acetone; alert client prior to discharge.

Client's weight and lab values were within normal limits prior to discharge.

Client verbalizes knowledge of causes and methods of monitoring fluid status

NURSING CARE PLAN**The Client with Excess Fluid Volume****Case Presentation**

Mr. Hill, a 68-year-old widower, was taken to the emergency department by his granddaughter and stated, "I can't breathe." He has a history of hypertension and heart disease. He is obese. The practitioner ordered a stat chest x-ray, CBC, electrolytes.

Assessment

- Shortness of breath, rales
- Constant cough
- Wt 161.8 lb
- Pitting edema, ankles
- 36.4°C; 186/114; 98; 30 and labored
- Engorged neck veins
- Pulmonary congestion (x-ray)
- ↓ Hct; ↓ Hgb

Nursing Diagnosis #1

Excess Fluid Volume related to body fluid overload secondary to heart dysfunction.

Expected Outcomes

1. The client will
 - Have a balanced fluid intake and output (est. 2,500 ml/day) for 2 days.

(continues)

NURSING CARE PLAN

The Client with Excess Fluid Volume (continued)

- Identify a specific amount of weight to lose over the next 6 months.
 - Manifest normal hydration status prior to discharge.
 - Demonstrate understanding of the causes of excess fluid and the role of heart medications, foods, and exercise to assist with weight reduction.
2. The client's skin integrity will be maintained over the edematous areas.

Interventions/Rationales

1. Measure and document hourly I&O; restrict fluids as ordered. *Monitors fluid status.*
2. Administer diuretics as ordered, document the response. *Increases excretion of electrolytes.*
3. Weigh daily at the same time with the same clothing. *Monitors overall client status.*
4. Measure and document vital signs qh until shortness of breath (SOB) subsides, then q2h. Hourly assessments: auscultate for third heart sound, breath sounds; assess rate, rhythm, depth of respirations, and the position the client takes to relieve SOB; report changes in respiratory pattern. *Monitors client response to therapy and diuretics, gives information to modify plan of care.*
5. Inspect and palpate areas of edema. *Determines whether edema is localized or generalized and reveals extent.*
6. Institute preventive skin measures: elevate extremities on pillows to ↓ pressure and promote venous circulation; avoid rubbing the skin, apply lotion, pat dry; avoid soap on the area; inspect for redness or blanching. *Maintains skin integrity, promotes circulation, and promotes client comfort.*
7. Assess client's knowledge of hypertension, decreased cardiac output; digitalis; the effects of a large abdominal girth on breathing; foods low in sodium, fats, and carbohydrates. *Educating client about causes, aggravating and alleviating factors, and effects of fluid excess is the first step in encouraging client in proper self-care.*

Evaluation

Output for the first 2 hr 2020 mls; day 2, I&O measurements indicative of fluid balance.

Client identified need to lose 30 lb over the next 6 months.

The client's hemodynamic status is within normal levels as demonstrated by Hct, Hgb, BP 156/92; the absence of SOB, abnormal breath sounds, jugular engorgement; peripheral edema.

The client's skin integrity was maintained.

The client was unable to verbalize knowledge of how his weight, high-sodium diet, failure to take his heart medications, and chronic alterations caused the fluid excess. Was referred to home health for client teaching.

Nursing Process Highlight**Implementation**

Fluid replacement is based on weight loss. A 2.2-pound (1 kg) loss is equivalent to 1 liter (1000 ml) of fluid loss. First, convert Mrs. Gray's weight from pounds to kilograms. Then determine the fluid intake replacement needed on the basis of the weight loss: Include the IV lactated Ringer's solution and PO Gatorade in milliliters. On the basis of the intake, what should have been her output prior to discharge?

Nursing Process Highlight**Nursing Diagnosis**

The nursing diagnosis *EFV: Edema* usually has many accompanying secondary nursing diagnoses: *Breathing Patterns: Ineffective*, related to increased capillary permeability causing fluid overload in the lung tissue (pulmonary edema); *Skin Integrity: Impaired*, related to edematous tissues (peripheral edema); *Ineffective Tissue Perfusion*, related to hypervolemia as manifested by peripheral (tissue) edema; *Deficient Knowledge: EFV*, related to chronic alterations.

KEY CONCEPTS

- Health promotion requires a maintenance of body fluid and acid-base balance.
- There are two types of body fluid: intracellular and extracellular. Because intravascular and interstitial fluid are outside the cells, these fluids are called extracellular fluids.
- Water is the largest single constituent of the body, representing 45% to 75% of the body's total weight.
- Electrolytes have special physiological functions in the body that: promote neuromuscular irritability; maintain body fluid osmolarity; regulate acid-base balance; and distribute body fluids between the fluid compartments. The body has many regulators that maintain fluid balance: fluid and food intake, skin, lungs, gastrointestinal tract, and kidneys.
- When an extracellular fluid volume deficit occurs, hormones play a key role in restoring the extracellular fluid volume.
- Sodium is the main electrolyte that promotes the retention of water.
- Acid-base balance refers to the homeostasis of the hydrogen ion concentration in body fluids.
- When the number of free hydrogen ions in a solution increases to lower the pH value below 7.35, the body is in a state of acidosis. The opposite occurs with alkalosis; a pH value higher than 7.45 results from a low hydrogen ion concentration.
- The body has three main control systems to regulate acid-base balance: buffer systems, respiratory regulation; and renal control of hydrogen ion concentration.
- In health, normal homeostatic mechanisms function to maintain electrolyte and acid-base balance; in illness, one or more of the regulating mechanisms may be affected, or the imbalance may become too great for the body to correct without treatment.
- Disturbances in one of the body's electrolytes usually cause changes in other electrolytes and can alter the pH of the blood.
- The slightest decrease or increase in extracellular potassium can cause serious, adverse, or life-threatening effects on physiological functions.
- The client's health history, physical assessment, and biochemical data are used by the nurse in formulating nursing goals, expected outcomes, diagnoses, and interventions.
- Nursing interventions that promote the resolution of alterations in fluid balance are based on the principles of client safety and standards of care.
- Following institutional protocol and established procedures for IV therapy helps ensure client safety.
- Hospitalized clients, especially the elderly, are at risk for developing dehydration.
- Clients receiving intravenous therapy and blood transfusions require constant monitoring for complications.

- Evaluation of the achievement of client expected outcomes requires the interrelational analysis of weight, intake and output, vital signs, and biochemical results.

CRITICAL THINKING ACTIVITIES

1. What are the three sources of body water replacement?
2. Which electrolyte regulates the osmotic pressure of extracellular fluid?
3. Which electrolyte deficit are clients with draining wounds prone to develop?
4. Given that half of serum calcium is bound to another solute in the blood, which other serum level do you have to evaluate when monitoring the serum level of calcium?
5. What is the most common indication of a fluid volume deficit?
6. What effect does an acid-base imbalance have on the body's cells?
7. Jennifer has been vomiting for 3 days and is unable to keep any food or water in her stomach. Besides having a fluid volume deficit, what other alterations would you expect from the excessive loss of gastric juices?
8. All of the following are clinical manifestations of FVE, except:
 - a. Edema
 - b. Weight gain
 - c. Increased serum osmolality
 - d. Decreased serum osmolality
9. Besides potassium-wasting diuretics, what other drugs can cause hypokalemia?
10. What effect does potassium have on digitalis?
11. What is the maximum amount of intravenous potassium chloride (KCl) that can be infused per hour?
12. What is the first sign of phlebitis?
13. Why is a peripheral intravenous (PI) or heparin lock established?
14. Which type of intravenous solution is sodium chloride (0.45%)?
 - a. Hypotonic
 - b. Isotonic
 - c. Hypertonic
15. Which type of intravenous solution is dextrose 5% in water (D₅W)?
 - a. Hypotonic
 - b. Isotonic
 - c. Hypertonic
16. Gloria is receiving a blood transfusion. The nurse is about to take the first set of 15-minute vital signs. Gloria states, "I am cold. I think I am having chills, and my chest hurts." What should the nurse do?

WEB RESOURCES

Canadian Intravenous Nurses Association

web.indirect.com

Intravenous Nurses Society

www.insl.org

League of Intravenous Therapy Education

www.lite.org

Nutrition



“The human body is a complex organism with the ability to heal itself—if only you listen to it and respond with proper nourishment and care.”

—Balch and Balch (1997)

COMPETENCIES

1. Identify the physiological value of nutrients.
2. Describe the processes of digestion, absorption, and metabolism.
3. Describe how diet guidelines and menu planning promote nutrition and health.
4. Explain how culture influences food preferences and eating habits.
5. Explain the impact of age-related changes on nutritional status.
6. Describe the process of assessing a client’s nutritional status.
7. Identify common knowledge deficits related to nutrition.
8. Describe the expected outcomes of nursing interventions that promote optimum nutritional status.
9. Identify common nursing interventions for clients experiencing nutritional deficits.
10. Describe the role of nutritional support teams in managing the care of clients with nutritional deficits.

KEY
TERMS

absorption	fatty acids	monosaturated fatty acids
aerobic metabolism	free radicals	negative nitrogen balance
anabolism	free radical scavenger	nitrogen balance
anaerobic metabolism	gluconeogenesis	nonessential amino acids
anorexia nervosa	glycolysis	nutrition
anthropometric	high-biological-value	obligatory loss of proteins
measurements	proteins (complete	parenteral nutrition
antioxidants	proteins)	peristalsis
appetite	hyperglycemia	phospholipids
atherosclerosis	hyperthyroidism	polysaccharides
basal metabolic rate	hypoglycemia	polyunsaturated fatty acids
body mass index	hypothyroidism	positive nitrogen balance
bulimia nervosa	insulin	pre-albumin
calorie	ketogenesis	proteins
carbohydrate	ketones	recommended dietary
catabolism	kilocalorie	allowances
cholesterol	lipids	saccharides
chylomicrons	low-biological-value proteins	satiety
deamination	(incomplete proteins)	saturated fatty acids
deglutition	malnutrition	skinfold measurement
diabetes mellitus	mastication	total parenteral nutrition
dietary fiber	metabolic rate	transferrin
digestion	metabolism	triglycerides
disaccharides	mid-upper-arm	unsaturated fatty acids
enteral nutrition	circumference	vitamins
essential amino acids	minerals	water-soluble vitamins
fat-soluble vitamins	monosaccharides	

The body requires the consumption of nutrients to support physiological activities of digestion, absorption, and metabolism to maintain homeostasis. The metabolism of nutrients (carbohydrates, proteins, fats, vitamins, and minerals) plays an essential role in providing the body with the necessary substances to maintain internal homeostasis.

PHYSIOLOGY OF NUTRITION

Nutrition is the process by which the body metabolizes and utilizes nutrients. Nutrients are classified as energy nutrients, organic nutrients, and inorganic nutrients; see the accompanying display. Energy nutrients release energy for maintenance of homeostasis. Organic nutrients build and maintain body tissues and regulate body processes. Inorganic nutrients provide a medium for chemical reactions, transport materials, maintain body temperature, promote bone formation, and conduct nerve impulses.

In the body, essentially all carbohydrates are converted into glucose before they reach the cells, proteins are converted into amino acids, and fats are converted into fatty acids. These nutrients are digested, absorbed by the blood or lymphatic system, and transported to the body's cells. Inside the cells' mitochondria, the nutrients react chemically with oxygen and various enzymes to produce energy.

CLASSES OF NUTRIENTS

<i>Description</i>	<i>Classes</i>
Energy nutrients	Carbohydrates Proteins Fats
Organic nutrients	Carbohydrates Proteins Fats Vitamins
Inorganic nutrients	Water Minerals

Digestion

Digestion refers to the mechanical and chemical processes that convert nutrients into a physically absorbable state. Figure 38-1 shows the anatomical structures of the gastrointestinal (GI) tract (digestive tract). Figure 38-2 explains the physiological mechanisms that support the digestive process in each anatomical structure.

The mouth prepares foodstuffs for digestion by **mastication** (chewing, tearing, or grinding of food by the teeth into fine particles and the mixing with enzymes in saliva). The salivary glands release lubricating secretions that bind with food particles to facilitate swallowing.

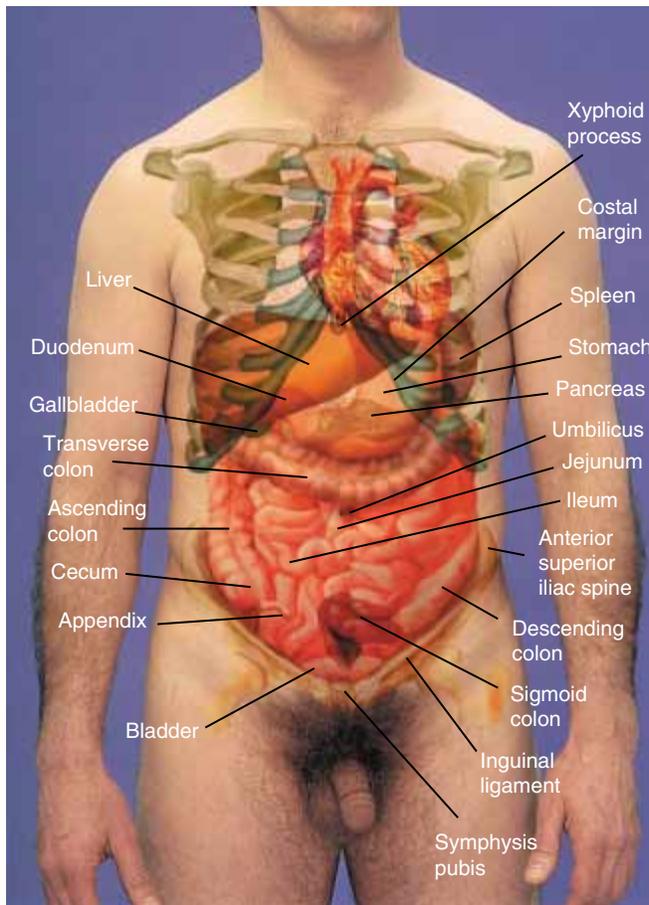


Figure 38-1 Gastrointestinal Tract

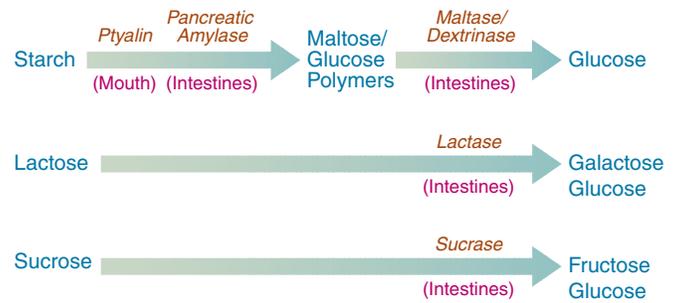
Deglutition (swallowing of food) begins in the mouth and continues in the pharynx and esophagus. Peristaltic waves and mucous secretions move food down the esophagus. Relaxation of the lower esophageal sphincter (gastroesophageal constrictor muscle) allows food to enter the stomach; contraction of this sphincter muscle prevents regurgitation (reflux) of stomach contents.

Digestion begins in the stomach and is completed in the small intestines. This is accomplished by specific substances entering the duodenum: pancreatic enzymes through the pancreatic duct, bile through the common bile duct, and intestinal enzymes produced in the jejunum. **Peristalsis** (coordinated, rhythmic, serial contraction of the smooth muscle lining of the intestines) forces chyme (an acidic, semifluid paste) through the small intestines to the large intestines and promotes the absorption of vitamins, minerals, and water. Only carbohydrates, proteins, and fats require chemical digestion by enzymatic activity for absorption.

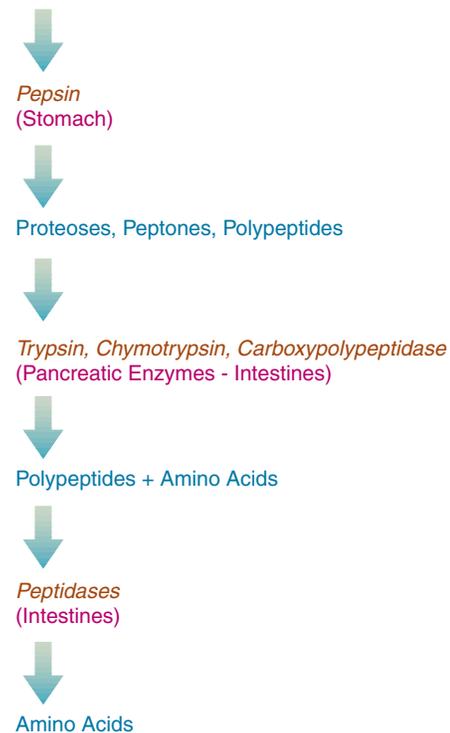
Absorption

Absorption is the process by which the end products of digestion—**monosaccharides** (simple sugars), amino acids, glycerol, fatty acid chains, vitamins, minerals, and water—pass through the epithelial membranes in the

A. Carbohydrates



B. Proteins



C. Fats

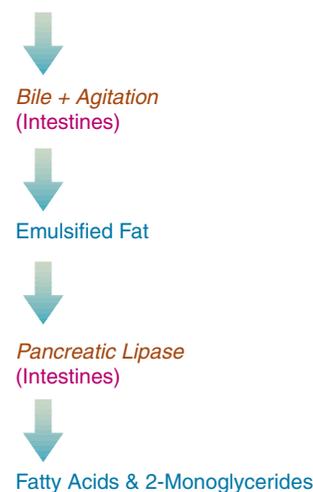


Figure 38-2 Digestion of Proteins, Carbohydrates, and Fats

small and large intestines into the blood or lymph systems. Most absorption occurs in the small intestines through the processes of osmosis, diffusion, and active transport; refer to Figure 38-3. Water absorption occurs throughout the digestive tract.

The main functions of the large intestines are to absorb water and collect food residue (dietary fiber). **Dietary fiber** is the part of food that body enzymes cannot digest and absorb, such as outer hulls of corn kernels, grains of wheat, celery strings, and apple skins. Dietary fiber absorbs water in the large intestine, promoting the formation of a soft, bulky stool that moves quickly through the large intestine; some fiber is believed to bind cholesterol in the colon, thus reducing the risk of heart attack (Townsend & Roth, 1999). In healthy individuals, most of the end products of digestion are absorbed (99% of carbohydrates, 95% of fat, and 92% of protein) and used by the body (Townsend & Roth, 1999).

Metabolism

Metabolism is the aggregate of all chemical reactions and processes in every body cell, such as growth, generation of energy, elimination of wastes, and other bodily functions as they relate to the distribution of nutrients in the blood after digestion.

The liver prepares nutrients for their role in energy production. The liver converts all monosaccharides to glucose and excess amino acids to urea, carbohydrates, or fats. Excess fats are converted in the liver to glycerol and fatty acids, then to acetyl coenzyme A (acetyl-CoA).

Glycolysis refers to the breakdown of glucose by enzymes located inside the cell's cytoplasm. This process produces adenosine triphosphate (ATP) and pyruvate, which provide the cell with energy. Pyruvate may be used

in two different metabolic functions. In **aerobic metabolism**, pyruvate enters the cell's mitochondria and in the presence of oxygen is converted to acetyl-CoA. In **anaerobic metabolism** (metabolism without the presence of oxygen) lactate is produced in the cytoplasm by an enzyme (lactate dehydrogenase); this type of metabolism takes place when the oxygen supply is limited, as in the muscles and red blood cells, which lack mitochondria.

When pyruvic acid is formed by glycolysis, it is then converted into acetyl-CoA. This conversion begins a cyclic metabolic pathway called the Krebs cycle (citric acid cycle or tricarboxylic acid cycle). The Krebs cycle extracts energy through oxidation of acetyl-CoA within the mitochondria of body cells. The Krebs cycle is a pathway common to all energy nutrients because acetyl-CoA may be formed from carbohydrates, proteins, and fats; refer to Figure 38-4.

Built into the inner mitochondrial membrane is a series of molecules that assist in electron transport during aerobic metabolism. The electron transport system converts energy released from the Krebs cycle into ATP for use by cells in anabolism and catabolism. **Anabolism** refers to the constructive phase of metabolism, in which smaller molecules, such as amino acids, are converted to larger molecules, such as proteins. **Catabolism** is the destructive phase in which larger molecules, such as glycogen, are converted to smaller molecules, such as pyruvic acid.

The rate of metabolism is governed primarily by the hormones triiodothyronine (T_3) and thyroxine (T_4) secreted by the thyroid gland. **Hyperthyroidism** refers to the increased secretion of these thyroid hormones, which increases the rate of metabolism. With **hypothyroidism**, a decrease in the secretion of thyroid hormones, the metabolic rate is decreased.

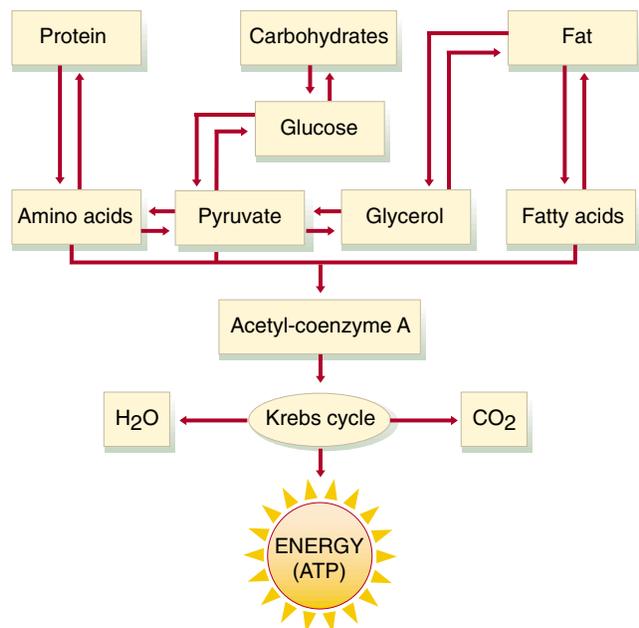
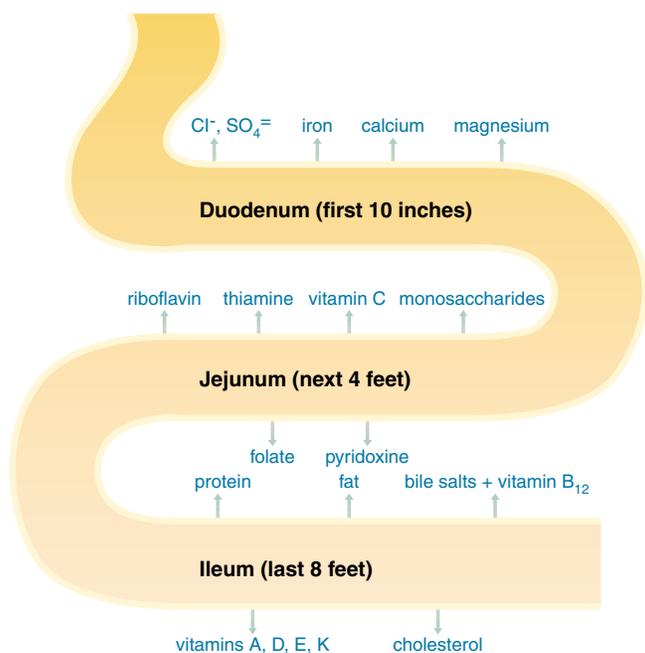


Figure 38-3 Nutrient Absorption in the Small Intestines

Figure 38-4 Energy Nutrients and the Krebs Cycle

Energy

Metabolic rate refers to the rate of heat liberation during chemical reactions; it is expressed in units called calories. A **calorie** is the quantity of heat required to raise the temperature of 1 gram of water 1°C; it is used to express the quantity of energy released from the different foods or expended by the different functional processes of the body. Because a large quantity of energy is released during metabolism, the energy is expressed in terms of **kilocalories** (kcal), each of which is equivalent to 1000 calories. The **basal metabolic rate (BMR)** refers to the energy needed to maintain essential physiological functions, such as respiration, circulation, and muscle tone, when a person is at complete rest both physically and mentally.

Excretion

Digestive and metabolic waste products are excreted through the intestines and rectum. Other excretory organs are the kidneys, sweat glands, skin, and lungs; refer to Chapter 39 for a complete discussion of elimination. The skin and sweat glands remove water, toxins, salts, and nitrogen wastes; the lungs remove carbon dioxide and water.

NUTRIENTS

Understanding the role of basic nutrients provides the foundation for selecting foods that promote health. There are six categories of nutrients: water, vitamins, minerals, carbohydrates, proteins, and lipids (fats). Selecting the healthiest forms of each of these nutrients and eating them in proper balance enables the body to function at its optimal level of health. Nutrients work synergistically; for example, there is a cooperative action between certain vitamins and minerals, that work as catalysts, promoting the absorption and assimilation of other vitamins and minerals.

Water

Water is the most abundant nutrient in the body and accounts for 60% to 70% of an adult's total body weight and 77% of an infant's weight. It is a major component of body fluids, secretions, and excretions. Body water decreases as body fat increases and with aging.

Water and electrolytes are substances that must be acquired from the diet. In the United States, much of water consumption is in the form of beverages (milk, coffee, tea, and soft drinks). The estimated water requirement for infants, children, and adults is 1.5 ml/kcal of energy expenditure. The water and electrolyte requirements for infants correspond to the water-to-energy ratio and the electrolyte composition in human milk and common formulas. Although pregnancy and lactation increase bodily demands for water and electrolytes, these demands are usually met with

normal ingested amounts; the one exception is in a lactating woman, who requires, on average, an additional 750 ml/day of water during the first 6 months to match the amount of milk secreted.

Normally, the body maintains a balance between the amount of fluid taken in and the amount excreted. The requirements for body water are met through the consumption of liquids and foods and the oxidation of food. Solid foods, especially fruits and vegetables, contain 85% to 95% water. The normal daily turnover of water is 4% of an adult's total body weight and 15% of an infant's total body weight; refer to Chapter 37 for a complete discussion of water's role in maintaining homeostasis.

Vitamins

Vitamins are organic compounds that regulate cellular metabolism, assisting the biochemical processes that release energy from digested food. Vitamins are called micronutrients because they are needed in small quantities when compared with other nutrients (water, carbohydrates, proteins, and fats). Vitamin requirements are dependent on many factors, such as body size, amount of exercise, rate of growth, and pregnancy; refer to Appendix B for the recommended dietary allowances (RDAs) of vitamins.

Of the major vitamins, some are classified as either fat-soluble or water-soluble. **Fat-soluble vitamins** (vitamins A, D, E, and K) require the presence of fats for their absorption from the GI tract and for cellular metabolism and can be stored for longer periods of time in the body's fatty tissue and the liver. **Water-soluble vitamins** (vitamin C and B-complex vitamins) require daily ingestion in normal quantities because these vitamins are not stored in the body.

Certain vitamins, mineral, and enzymes are classified as **antioxidants**, a substance that blocks or inhibits destructive oxidation reactions, such as vitamins C and E, the minerals selenium and germanium, and the enzymes catalase and superoxide dismutase, coenzyme Q₁₀, and some amino acids. Antioxidants help to protect the body from the formation of **free radicals**, atoms or groups of atoms that can cause damage to cells. Free radicals can impair the immune system and lead to infections and certain degenerative diseases such as heart disease and cancer. Free radicals are normally controlled by **free radical scavengers**, substances that remove or neutralize free radicals. Certain enzymes (superoxide dismutase, methionine reductase, catalase,

NURSING ALERT

Vitamin Toxicity

Megadoses of both types of vitamins (fat- and water-soluble) can cause toxicity. Once the catalytic demands have been met by these vitamins, the remaining vitamins act as free chemicals that may be toxic to the body.

and glutathione peroxidase) are free radical scavengers that are produced by the body. Besides vitamins C, E, A, and beta-carotene, certain herbs also act as antioxidants, such as bilberry, ginkgo, grape seed extract, green tea, and flavonoids. Sprouted grains and fresh fruits and vegetables contain antioxidants; however, in

order to provide the body with a sufficient quantity of antioxidants, supplements are often needed by the body to control the free radicals (Fontaine, 2000). The functions, clinical significance, and dietary sources of fat-soluble and water-soluble vitamins are presented in Table 38-1.

TABLE 38-1
Fat-Soluble and Water-Soluble Vitamins

Vitamin	Functions	Clinical Significance	Dietary Sources
Fat-Soluble			
Vitamin A (retinol, retinal, retinoic acid)	Epithelial tissue proliferation	Scaly skin, dry mucous membranes	Whole milk and products, eggs, fruits and vegetables (green leafy and yellow), fish, animal liver, fish liver oil <i>Caution:</i> Do not exceed a daily dose of over 10,000 international units if pregnant or history of liver disease
	Retinal pigmentation	Night blindness	
	Immune system (antigen recognition)	Increased risk for infections	
	Antioxidant	Cancer and other diseases	
Vitamin D (cholecalciferol, ergosterol)	Bone and tooth development	Children: rickets and delayed dentition	Fortified milk, margarine, eggs, fish, cod liver oil, oatmeal, sweet potatoes, vegetable oils
	Enhances immunity	Adults: osteomalacia	
Vitamin E (tocopherol)	Synthesis of heme	Premature infants: macrocytic anemia and hemolysis of RBCs	Cold-pressed vegetable oils, dark green leafy vegetables, milk, eggs, meats, legumes, nuts, seeds, whole grains
	Antioxidant, prevents oxidation of polyunsaturated fatty acids and of Vitamins A and C	Damage to red blood cells, destruction to nerves	
Vitamin K	Formation of prothrombin, blood clotting	Newborn: hemorrhagic disease	Dark green leafy vegetables, asparagus, broccoli, Brussels sprouts, cabbage, cauliflower, egg yolks, liver, oatmeal, oats, rye, safflower oil, soy beans, wheat
	Bone formation and repair	Adults: prolonged clotting times	
	Synthesis of osteocalcin	Osteoporosis	
Water-Soluble			
Vitamin C (ascorbic acid)	Formation of RBCs	Bleeding gums, bruising	Citrus fruits, strawberries, cantaloupe, fresh vegetables: potatoes, cabbage, tomatoes, broccoli, green peppers
	Production of collagen (capillary wall integrity) enzyme	Poor wound healing, retardation of bone growth, fragile blood vessel walls, gum lesions (referred to as scurvy)	
	Metabolism of amino acids		
	Prevention of oxidation of vitamins		

(continues)

TABLE 38-1 (continued)
Fat-Soluble and Water-Soluble Vitamins

Vitamin	Functions	Clinical Significance	Dietary Sources
B Complex Vitamin B ₁ (thiamine)	Metabolism of carbohydrates and some amino acids (energy), production of hydrochloric acid, enhances circulation and assists in blood formation	Degeneration of myelin sheath in CNS (paralysis) and in peripheral nerves (polyneuritis) Weakness of cardiac muscle: heart failure, peripheral vasodilatation and edema GI: indigestion, severe constipation, anorexia, gastric atony, hypochlorhydria (referred to as beriberi—all above systems involved)	Pork, fish, eggs, poultry, dried beans, whole grains, wheat germ, oatmeal, bread, pasta, brown rice, legumes, rice bran, peanuts
Niacin (nicotinic acid)	Coenzyme in energy metabolism	Muscular weakness, CNS lesions, dementia Skin: cracked, pigmented scaliness Irritation and inflammation of the mucous membranes of GI tract, producing GI hemorrhage (referred to as pellagra)	Meats, dairy products, whole grains, cereals, tuna, broccoli, carrots, cheese, corn flour
Vitamin B ₂ (riboflavin)	Oxidation and reduction of carbohydrates, fats, protein Red blood cell formation, antibody production	Digestive disturbances, burning sensations in eyes and skin, headaches, mental depression, forgetfulness (frequently occurs with thiamine or niacin deficiency), skin lesions, eye disorders (cataracts)	Milk, whole grains, green vegetables, liver, cheese, egg yolks, fish, legumes, meat, poultry, yogurt
Vitamin B ₁₂ (cobalamin compounds)	Metabolic functions as a coenzyme: hydrogen acceptor and replication of genes	Demyelination of large spinal cord nerves: loss of peripheral sensation and paralysis (usually the result of intrinsic factor deficiency)	Milk, eggs, cheese, meat, fish, poultry, brewer's yeast
Folic acid (pteroylglutamic acid)	Synthesis of purines and thymine (DNA formation) Maturation of RBCs Functions as coenzyme in DNA and RNA synthesis	Retarded growth Sore red tongue Macrocytic anemia	Liver, green leafy vegetables, meat, fish, poultry, whole grains, barley, bran, brewer's yeast, brown rice
Vitamin B ₆ (pyridoxine)	Functions as coenzyme to protein and amino acid metabolism, absorption of fats and protein	Convulsions, dermatitis, nausea, and vomiting, anemia, flaky skin	Whole grains, liver, fish, poultry, green beans, meats, nuts, potatoes, eggs, brewer's yeast

(continues)

TABLE 38-1 (continued)
Fat-Soluble and Water-Soluble Vitamins

Vitamin	Functions	Clinical Significance	Dietary Sources
Pantothenic acid	Metabolism of carbohydrates and fats	None known	Meats, whole grain cereals, legumes
Biotin	Synthesis of fatty acids	Infants: seborrheic dermatitis (cradle cap)	Liver, kidneys, dark green vegetables, egg yolk, green beans, brewer's yeast, milk, poultry, saltwater fish, whole grains
	Protein metabolism	Adults: rare	
	Utilization of glucose		

Minerals

Minerals (inorganic elements) serve as catalysts in biochemical reactions. Minerals are classified according to their daily requirement: macrominerals (quantities of 100 mg or greater) and microminerals (trace elements, quantities less than 100 mg). The major macrominerals required by the body are calcium, phosphorus, and magnesium; refer to Chapter 37 for a complete discussion of these minerals (electrolytes).

Microminerals such as copper, fluoride, iodine, iron, selenium, and zinc play an essential role in metabolism. For example:

- Copper and iron are needed for hemoglobin formation.
- Copper is needed for the synthesis of phospholipids and prostaglandin and for the formation of some enzymes.
- Iron is needed for the synthesis of vitamins, purines, and antibodies.
- Fluoride is required for teeth formation and the prevention of dental caries.
- Iodine is the basic component of thyroid hormones.
- Selenium enhances vitamin E absorption and stimulates antibody response to infection.
- Zinc plays a major role in wound healing, maintains connective tissue integrity, assists with the formation of enzymes and insulin, and boosts the immune response and maintains normal blood concentrations of vitamin E. Zinc also aids in the absorption of vitamin A, has antioxidant properties, and is a constituent of the antioxidant enzyme superoxide dismutase.

Other microminerals are arsenic, cadmium, nickel, silicon, tin, and vanadium; however, the specific roles that these microminerals play in metabolism have not been identified. Refer to Appendix B for the RDAs of minerals.

Carbohydrates

Carbohydrates are organic compounds composed of carbon, hydrogen, and oxygen. They play a significant role in providing cells with energy and supporting the normal functioning of the body. Table 38-2 identifies the functions of carbohydrates and the problems that result from insufficient intake.

Carbohydrates are classified according to the number of **saccharides** (sugar units):

- **Monosaccharides** (simple sugars) include glucose, galactose, and fructose.
- **Disaccharides** (double sugars) include sucrose, lactose, and maltose.
- **Polysaccharides** (complex sugars) include glycogen, cellulose (fiber), and starch.

Glucose supplies the major source of energy needed for cellular activity, such as muscle contractions and nerve impulse transmission. When metabolized, every gram of glucose yields 4 kcal. Glucose is also needed for the synthesis of fatty acids and amino acids.

Carbohydrates have a protein-sparing action, based on a minimum daily ingestion of 50 to 100 grams (200–400 kcal) to spare the metabolism of protein. When dietary intake is below minimum requirement, **triglycerides** (lipid compounds consisting of three fatty acids and a glycerol molecule) and proteins are metabolized to produce energy.

The three major sources of dietary carbohydrates are starches (nonanimal foods, primarily grains), lactose (milk), and sucrose (cane sugar). The ordinary diet contains far more starches than either lactose or sucrose. Refer to Figure 38-2A for information on the digestion of these sugars.

Cells are unable to store large quantities of carbohydrates. The liver converts excess galactose and fructose into glucose and stores it in the form of glycogen. **Insulin** (pancreatic hormone) aids in the diffusion of

TABLE 38-2
Normal Function and Deficiencies of Selected Nutrients

Nutrient	Functions	Deficiencies
Proteins	Growth and replacement: clotting factor production, collagen synthesis, epithelial cell proliferation, fibroblast proliferation	Increased risk of bruising and hemorrhage Muscular wasting Depigmentation of hair and skin Poor wound healing
	Immunity: antibodies, white blood cell production and migration, cell-mediated phagocytosis	Decreased enzyme production Lymphopenia Impaired cellular immunity
	Fluid balance: intracellular osmotic pressure, albumin, maintenance of blood volume	Edema Hypoalbuminemia
	Sodium and potassium balance	Impaired nerve impulse transmission and muscle function
	Buffer action	pH imbalances
	Energy source	Negative nitrogen balance
Carbohydrates	Primary source of energy	Impaired brain functions
	Sparing of protein	Increased ketone bodies, producing acidosis Poor wound healing
Fats	Source of concentrated energy and essential fatty acids	Inhibited tissue repair Irritated and reddened skin
	Cell membrane integrity	Deficit in fat-soluble vitamins
	Promotes absorption of fat-soluble vitamins	Impaired fat digestion
	Maintains body temperature	
	Synthesis of bile salts, steroid hormones, and Vitamin D	Electrolyte depletion
Vitamin A	Collagen synthesis	Poor wound healing
	Epithelialization	Dry, scaly skin
Vitamin C	Collagen synthesis	Poor wound healing
	Maintains capillary integrity	Increased risk of bruising and hemorrhage
Vitamin K	Coagulation	Increased risk of bruising and hemorrhage
Pyridoxine, riboflavin, and thiamine	Cofactors in cellular development	Irritated and reddened skin
	Red blood cell formation	Nerve and muscular weakness
	Immunity: antibodies and white blood cell formation	Anemia Increased risk of infection

(continues)

TABLE 38-2 (continued)
Normal Function and Deficiencies of Selected Nutrients

Nutrient	Functions	Deficiencies
Copper	Red blood cell and connective tissue formation	Decreased collagen synthesis Poor wound healing from local tissue ischemia (anemia)
Iron	Collagen synthesis Enhancement of leukocytic activity Hemoglobin synthesis	Impaired collagen cross-linkage Increased risk of infection Anemia
Zinc	Cell proliferation Cofactor in enzymes	Poor wound healing Increased risk of infection Alteration in taste

Adapted From: Townsend, C. E. & Roth, R. A. (1999). *Nutrition and Diet Therapy* (7th ed.). Albany, N.Y.: Delmar Thomson Learning.

glucose into the liver and muscle cells and in the synthesis of glycogen. Glucose metabolism is dependent on the availability of insulin, as shown in Figure 38-5.

An increase in blood glucose levels can cause **hyperglycemia** (a blood glucose level greater than 110 mg/dl). This occurs in **diabetes mellitus** (a disease in which the pancreas fails to secrete adequate levels of insulin to accommodate blood glucose levels). When hyperglycemia occurs, **ketones** (the end product of incomplete fat metabolism) build up in the bloodstream, causing metabolic acidosis.

In **hypoglycemia**, the blood glucose level is below normal (less than 80 mg/dl) because the supply of insulin is so high that most of the glucose moves from the blood into the cells. Because brain tissue requires a constant source of glucose for energy, hypoglycemia can alter the normal functions of the brain.

Glucose (dextrose) is a common substance in intravenous therapy (dextrose-5%-water) because it is readily absorbed into the body's cells. This solution provides

170 kcal/L; refer to Chapter 37 for a complete discussion of intravenous replacement therapy.

Proteins

Proteins are organic compounds that contain carbon, hydrogen, oxygen, and nitrogen atoms; some proteins also contain sulfur.

After water, proteins are the most abundant intracellular substance. Proteins are essential for almost every bodily function, beginning with the genetic control of protein synthesis, cell function, and cell reproduction; see Table 38-2. The end products of protein digestion are amino acids.

The normal blood concentration of amino acids is between 35 and 65 mg/dl. There are 20 identified amino acids, which are categorized as either essential or nonessential:

- **Nonessential amino acids** can be synthesized (manufactured) in the cells; see the accompanying display.
- **Essential amino acids** must be ingested in the diet because they cannot be synthesized in the body; see the accompanying display.

Proteins are also classified as complete or incomplete. **High-biological-value proteins (complete proteins)** contain all of the essential amino acids. Complete proteins are primarily animal proteins, such as those in meats, poultry, fish, dairy products, and eggs.

Low-biological-value proteins (incomplete proteins) lack one or more of the essential amino acids, usually lysine, methionine, and tryptophan. Most vegetables are incomplete proteins. By properly mixing complementary proteins in the diet, such as corn and beans, one can produce a complete protein.

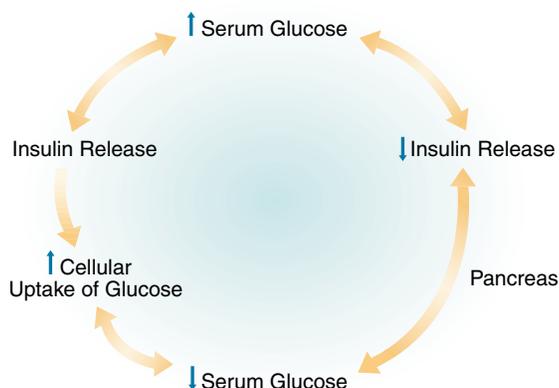


Figure 38-5 Serum Glucose–Insulin Feedback System

AMINO ACIDS

Nonessential Amino Acids

glycine	cysteine	glutamine
alanine	aspartic acid	tyrosine
serine	glutamic acid	proline
asparagine		

Essential Amino Acids

threonine	methionine	valine
leucine	isoleucine	lysine
arginine	phenylalanine	tryptophan
histidine		

All essential amino acids are needed by cells for anabolism and repair. The surplus amino acids are sent back to the liver, where they are degraded (nitrogen is split from the amino acid); the remaining parts are used for energy or converted to carbohydrate or fat and stored as glycogen or adipose tissue. Carbon dioxide, water, and nitrogen are the end products of amino acid metabolism.

The degradation of amino acids begins the process of **deamination**, the removal of the amino groups from the amino acids. During protein deamination, several other physiological processes of clinical significance occur:

1. **Gluconeogenesis**, the conversion of amino acids into glucose or glycogen
2. **Ketogenesis**, the conversion of amino acids into keto acids or fatty acids
3. **Nitrogen balance**, the net result of intake and loss of nitrogen that measures protein anabolism and catabolism
4. **Positive nitrogen balance**, the condition that exists when nitrogen intake exceeds output (protein anabolism exceeds catabolism)
5. **Negative nitrogen balance**, the condition that exists when nitrogen output exceeds intake (protein catabolism exceeds anabolism)
6. **Obligatory loss of proteins**, the degrading of the body's own proteins into amino acids, which are then deaminated and oxidized (occurs when a person fails to ingest adequate amounts of proteins)

Nitrogen balance measures protein equilibrium and is used to evaluate the client's nutritional status. Clients on bed rest or with a fever are in a catabolic state that produces a negative nitrogen balance. The muscle wasting that occurs with immobility causes negative nitrogen balance. Massive trauma and burns are other common examples of catabolic states that produce a negative nitrogen balance initially upon injury. Diet therapy is directed toward providing adequate amounts of proteins and kilocalories so that the body does not use its own protein as an energy source.

NURSING ALERT

Protein Ingestion

A person must ingest a minimum of 20 to 30 grams of protein each day to prevent a net loss of body proteins.



NURSING TIP

Electrolytes

Potassium and magnesium enhance the utilization of protein by the body. These electrolytes assist with the transport of amino acids into the cells.

Lipids

Lipids (fats) are organic compounds that are insoluble in water but soluble in organic solvents such as ether and alcohol. Lipids are composed of the same elements as carbohydrates (carbon, hydrogen, and oxygen) but have a higher hydrogen concentration. Refer to Table 38-2 for a discussion of the normal functions of fats and the problems that arise from insufficient intake.

Fatty acids are basic structural units of most lipids. They contain carbon chains and hydrogen. **Saturated fatty acids** form fats, glycerol esters of organic acids whose carbon atoms are joined by single bonds (all the carbon atoms are saturated with hydrogen). Diets high in saturated fats are associated with a high incidence of coronary heart disease. Foods high in such fats are animal meats (especially beef), whole-milk products, butter, most cheeses, and some plant fats, such as chocolate, coconut, and palm oils.

Unsaturated fatty acids form glycerol esters of organic acids whose carbon atoms are joined by double or triple bonds (at least two carbon atoms in the fatty acid chains in the esters are unattached to hydrogen atoms). **Monounsaturated fatty acids** are fatty acids that form esters with one double or triple bond; foods in this category are nuts, fowl, and olive oil. **Polyunsaturated fatty acids** form esters that have many carbons unbonded to hydrogen atoms. Foods such as fish, corn, sunflower seeds, soybeans, cottonseeds, and safflower oil contain such esters.

The most important lipids follow:

- **Triglycerides** are lipid compounds composed of three fatty acid molecules attached to a glycerol molecule.
- **Phospholipids** are composed of one or more fatty acid molecules and one phosphoric acid radical, and usually contain a nitrogenous base.

- **Cholesterol** (a lipid that is produced by the body and used in the synthesis of steroid hormones and excreted in bile), is considered a fat and is found in whole milk and egg yolk.



NURSING TIP

Blood Cholesterol

To decrease the blood cholesterol level, the client needs a diet low in saturated fat; a diet high in saturated fat increases the blood cholesterol level by 15% to 25%.

Phospholipids and cholesterol lipids constitute 2% of the total cell mass; they are basically insoluble in water and are used to form membranous barriers that separate the different intracellular compartments. The cell membrane is composed almost entirely of proteins and lipids (phospholipids and cholesterol).

Besides phospholipids and cholesterol, some cells contain triglycerides, which account for 95% of the fat cell mass. Triglycerides are the body's main storehouse of energy-giving nutrients; when dissolved, they can be used for energy as needed.

Most dietary fats are triglycerides, found primarily in animal food. Most plant foods contain trace elements of triglycerides. Other than butter fat, which is digested by gastric lipase (tributyrase), essentially all fat digestion occurs in the small intestines in the presence of pancreatic juices, as shown in Figure 38-2C.

When free fatty acids, monoglycerides, free cholesterol, and phospholipids are absorbed by the blood and lymph system, they are resynthesized into minute molecules called **chylomicrons** (lipoproteins, synthesized in the intestines, that transport triglycerides to the liver).

Low-density lipoproteins are responsible for the formation of **atherosclerosis** (a disease of the arteries in which fatty lesions called atheromatous plaques develop inside the wall of the arteries). A diet high in saturated fats and cholesterol causes the formation of atherosclerosis.

Almost half the deaths in the United States and Europe are attributed to atherosclerosis. These deaths are usually the result of coronary artery thrombosis.

PROMOTING PROPER NUTRITION

Hunger means a craving for food and is a subjective sensation. For example, when a person has not eaten for hours, the stomach undergoes intense rhythmic contractions called hunger contractions. These contractions sometimes cause pain, in the form of *hunger pangs*. Hunger is not only a physiological response; it also involves psychological sensations. For instance, with a total gastrectomy (surgical removal of the stomach) clients still report a *craving for food*.

Appetite means the desire for specific types of food instead of food in general. A person's appetite determines the type of foods he or she eats. **Satiety** means a feeling of fulfillment from food. It is the opposite of hunger and occurs when the person's nutritional stores have been replenished and psychological cravings have been met.

THINK ABOUT IT

Satiety

How does a person know when she has eaten enough food? What role do the *oral factors* of chewing, salivation, swallowing, and tasting play in satiety? How true is the saying that healthy eating habits require three meals a day and that each of those meals should be filling? How are lifelong eating habits developed in early childhood?

Daily food guides have been developed by various organizations to establish standards that promote nutrition and health. These guides assist healthy persons in meal planning; however, the guides do not take into account the nutritional needs arising from metabolic and other medical disorders. Besides the American food guides, there are guidelines developed by other countries—for instance, Canada's *Food Guide to Healthy Eating*—and by the World Health Organization.

THINK ABOUT IT

A Fatty Meal

What impact would it have on a person, especially a teenager, if he or she could see a blood sample drawn 30 minutes after eating a large quantity of fast foods? Do you think seeing the blood turn turbid or yellowish after a fatty meal would alter the person's eating habits?

Dietary Reference Intakes and Recommended Daily Allowances

The **recommended dietary allowances** (RDAs) are recommended allowances of essential nutrients (protein, fat-soluble and water-soluble vitamins, and minerals) by age category, inclusive of weight and height. RDAs are established by the National Nutrition Board of the National Academy of Sciences–National Research Council. See

Appendix B. RDAs represent the normal nutritional needs of 97% to 98% of the people in each specific category; the RDAs do not take into consideration an individual's specific needs or physiological disorders.

Although RDAs have been in existence for the past 20 years as a nutritional guide to support healthy persons, the Food and Nutrition Board, in partnership with Health Canada, has initiated an effort to define new nutrient reference values. The Dietary Reference Intake (DRI) is a generic term that refers to at least three types of reference values: Estimated Average Requirement (EAR), RDA, and Tolerable Upper Intake Level (UL). EAR is the intake value that is estimated to meet the requirement defined by a specific indicator of adequacy in 50% of an age-specific and gender-specific group. UL is the maximum level of daily nutrient intake that is unlikely to pose risks of adverse health effects to almost all of the individuals in the group for whom it is designed. The goal of DRI is to set nutrient reference values for all the nutrients; see the accompanying display for the first seven nutrient groups studied.

EVALUATION OF DIETARY REFERENCE INTAKES

The seven nutrient groups are as follows:

1. Calcium, vitamin D, phosphorus, magnesium, and fluoride
2. Folate and other B vitamins
3. Antioxidants (e.g., vitamins C and E, and selenium)
4. Macronutrients (e.g., protein, fat, carbohydrates)
5. Trace elements (e.g., iron, zinc)
6. Electrolytes and water
7. Other food components (e.g., fiber, phytoestrogens)

The Food Guide Pyramid

The food guide pyramid outlines in graphic presentation six groups of food and the number of servings based on the dietary guidelines and the basic four food groups, as shown in Figure 38-6. The pyramid suggests a variety of foods with the right amount of calories and nutrients to maintain a healthy weight. Canada's *Food Guide to Healthy Eating* offers a similar routine for a daily diet (Figure 38-7).

Societal Concerns

The Leading Health Indicators for Healthy People 2010 report recognizes that one-third of the U.S. population is considered overweight, while undernutrition is a specific problem for the elderly and for people with eating disorders. Although "weight" is one of the 10 indicators in the Health Determinants and Health Outcome Set (refer to Chapter 17 for a complete discussion of this

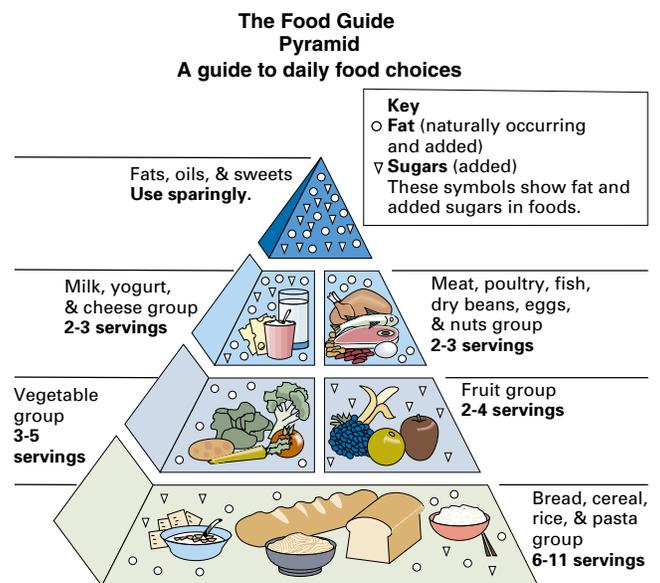


Figure 38-6 Food Guide Pyramid (Courtesy of the U.S. Departments of Agriculture and Health and Human Services, revised 1996)

indicator), diet and nutrition were excluded from the proposed set of indicators because of measurement challenges inherent in this indicator. The committee based this decision on the fact "that the state-of-art of dietary measurement has not yet achieved a level that would provide regular, timely, valid and reliable measurement for each indicator, for diverse population groups, and at multiple jurisdictional levels" (Leading Health Indicators for Healthy People 2010, Final Report, pp. 47–48).

Modern society has turned from a diet of whole grains, fruits, and vegetables to a diet of processed foods, fast foods, additives, preservatives, and hydrogenated oils that can have a damaging effect on a person's health. Processed foods usually contain excessive amounts of sodium that can cause fluid retention and lead to hypertension, aggravating many medical disorders such as congested heart failure, certain forms of kidney disorders and premenstrual syndrome (PMS). Additives are placed in foods for one or more of the following reasons: to lengthen shelf life; to make a food more appealing by enhancing color, texture, or flavor; to facilitate food preparation; or to otherwise make the product more marketable. Some additives are derived from natural sources such as sugar, while other additives are made synthetically like aspartame (NutraSweet). Although additives are usually identified on the "ingredient label" of a product, they are initially used without health warnings. For example, monosodium glutamate (MSG), and artificial sweeteners cyclamate, saccharin, and aspartame are used without warning, but have been known to cause headaches, diarrhea, confusion, memory loss, and seizures.

Genetically altering of the world's food has caused many persons to question the essential ingredients of nutrients and the role of the U.S. Food and Drug Administration (FDA) in regulating safe, healthy food

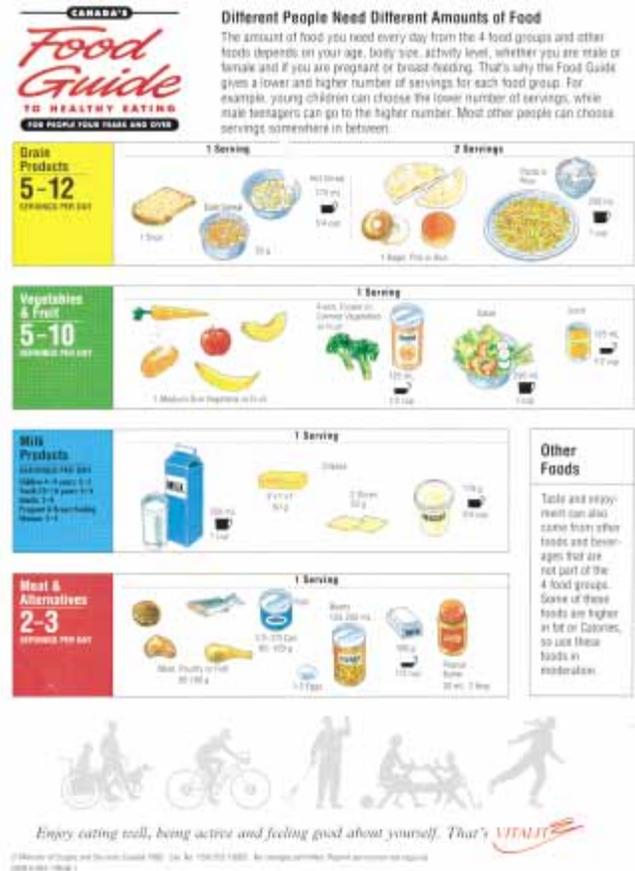


Figure 38-7 Canada's Food Guide (From *Canada's Food Guide to Healthy Eating*, Health, Canada, 1992, ©Minister of Public Works and Government Services Canada, 2001)

products. Although the FDA in 1993 approved the use of rBGH, a genetically engineered bovine growth hormone that makes dairy cows produce 100% more milk than normal, Canadian health officials rejected a major U.S. corporation's request for approval of rBGH because the product label acknowledges that it can cause udder infections, painful, debilitating foot disorders, and reduced life span in treated cows. Humans who drink the milk from cows treated with rBGH can develop breast or prostate cancer, as well as other reproductive disorders and diseases.

The European Union's Scientific Committee on Veterinary Measures reported that 17 beta-oestradiol, one of the six growth hormones that are used in 90% of all nonorganic beef raised in the United States, is "a complete carcinogen." American beef is banned in Europe because these hormones "may cause a variety of health problems, including cancer, developmental problems, harm to the immune system and brain disease" (Campaign for Food Safety News, 1999).

In 1995, no genetically modified crops were grown for commercial sale; however, these statistics have changed rapidly in the past three years: by 1998, 73 million acres of genetically modified crops were grown worldwide, more than 50 million acres of them in the United States; in 1999 an estimated 30,000 genetically modified products were in U.S. grocery stores; and in 2000, 100% of a major U.S. corporation's soybeans (60

million acres) were genetically modified (Rachel's Environment & Health Weekly, 1999). The FDA's position is that genetically modified foods do not need to be labeled; therefore, the consumer is deprived the opportunity to make an informed choice in the grocery store.

"Consumers are increasingly choosing organic products out of concern for the purity of their food and the health of the environment" (Long, p. 44, 1999). In 2000, new organic certification rules were passed in the United States. These new regulations prohibit organic farmers from using toxic synthetic pesticides and fertilizers, genetically engineered seeds or other materials, irradiation and sewage sludge. Organic farmers must adhere to strict standards regarding the use of fresh manure, animal confinement and antibiotics and hormones. For a product to be labeled "certified organic" on the front of the package, 95% or more of the ingredients must be organically grown. To indicate on the label "made with organic ingredients," the product must contain at least 50% organic ingredients.

Weight Management

Maintaining homeostasis requires a balance between intake of nutrients and energy expenditure. Average weight is relative to energy balance, the situation in which energy intake equals energy output.

Overweight

Overweight is an energy imbalance in which more food is consumed than is needed, causing a storage of fat. Overweight indicates a positive energy balance and is defined as weight 10% to 20% above average; obesity refers to weight 20% above average. Overweight may result from one or more factors: genetic, psychological, social, cultural, economic, or physiological. Genetically linked factors, such as a low BMR, excess fat distribution, and obese parents, place the person at risk for obesity. Some people overeat in response to emotional stress or whenever food is available rather than in response to hunger. Sociocultural norms influence eating habits; some cultures place a high value on excess weight. Hormonal imbalances, such as decreased thyroxin levels, can lower the BMR, causing weight gain if food intake remains constant.

THINK ABOUT IT

Vulnerability to Obesity

Cultural practices may encourage a calorie-dense diet. Some ethnic groups consider overweight and obesity acceptable or even desirable. An individual's emotional status affects eating. What implications do these factors have in teaching clients about weight in relation to health?

Underweight

An underweight person expends more calories than are consumed. Underweight, a negative energy balance, is weight at least 10% to 15% below average. Being underweight decreases the individual's resistance to infection and increases susceptibility to fatigue and sensitivity to cold environments.

Family dynamics and a fear of fatness are psychological conditions that can contribute to eating disorders. **Anorexia nervosa** (self-starvation) disrupts metabolism because of inadequate calorie intake and results in hair loss, low blood pressure, weakness, amenorrhea, brain damage, and even death (Townsend & Roth, 1999). **Bulimia nervosa** refers to food-gorging binges followed by purging of food, usually through self-induced vomiting or laxative abuse.

Underweight can also be caused by long-term conditions that deplete the body's resources, such as fever, infection, and cancer, or that prevent nutrient absorption, as occurs with diarrhea, metabolic or GI disorders, and laxative abuse. Other causes of underweight are hyperthyroidism and poverty.

FACTORS AFFECTING NUTRITION

Understanding the factors that may influence nutrition is essential in eliciting client and family cooperation in providing optimal nutritional care.



CLIENT TEACHING CHECKLIST

Tips to Reduce Dietary Fat

- Read the nutritional labels for fat content on products before buying.
- Substitute plant proteins for meat, and avoid chocolate.
- Use low fat dairy products, such as skim milk, instead of whole milk and low fat yogurt instead of sour cream.
- Use 1/4 cup of egg substitute or two egg whites for one whole egg.
- Substitute margarine that is low in saturated fat for butter on breads and use low-fat dressings for salads.
- Trim fats from meats and skin from poultry before cooking, and drain fat from meat after cooking.
- Include more fish and less red meat in your diet.
- Use herbs and spices instead of margarine, oil, and salt when cooking, to bring out the flavor in foods.
- Cook foods by baking, broiling, boiling, roasting, stewing, or microwaving to avoid additional fat from frying.
- Avoid adding flour, bread crumbs, and coating mixes when preparing foods.
- Use vegetable oils and sprays instead of shortening, lard, or butter when cooking and baking.
- Eat fresh fruits and vegetables instead of desserts high in fat.

Age

Infants and children vary in weight and energy requirements; refer to RDA, Appendix B. The infant's physiological development has implications for fluid, electrolyte, and food intake that can predispose this age group to various imbalances. These factors are directly related to the infant's total body surface area, immature physiologic development, and the rate of growth and development during the first year of life; refer to Chapter 17 for a complete discussion on growth and development.

From ages 1 to 6 years, nutritional intake varies in relation to growth rate, making the child's eating habits erratic. The child will usually select foods based on developmental nutritional needs in accord with:

- High kilocalorie intake to maintain energy requirements
- Adequate levels of protein, vitamin D, calcium, and phosphate to complement teeth eruption and an increase in muscle mass and bone density

School-age children can eat larger meals less frequently because of the digestive system's maturation

and the presence of permanent teeth. A diet that supplies the RDAs will promote optimal development and health and at the same time avoid weight gains during the preadolescent period.

Adolescence, a period of rapid growth and sexual maturation, requires guidance in dietary choices. Hormonal changes associated with menstruation make girls prone to fluid imbalance. Teenagers eat many of their meals away from home—for example, in fast-food restaurants.

Peer groups influence a teenager's choices, such as what, when, and where to eat; refer to Figure 38-8. At the same time, body image is of critical importance for teenagers. The social pressures and other emotional stressors of adolescence may have a negative effect on eating habits, leading to obesity, use of fad diets, and eating disorders such as anorexia nervosa and bulimia. See the accompanying display for some points about food related behaviors.

During adulthood, growth stops and metabolism declines, thereby decreasing the need for kilocalorie intake. With pregnancy and lactation, the nutritional needs once again increase. During pregnancy, changes occur that may result in fluid retention (dependent edema); for example, hormonal changes, pressure of the fetus on the inferior vena cava, vascular congestion, and increased capillary filtration pressure.

The aging process brings about structural and functional changes that may put older adults at risk. The older population cannot be classified as a homogeneous group, because people do not age physically at the same rate as they do chronologically (Hogstel, 2001); refer to the Client Teaching Checklist for dietary guidelines for the elderly.



Figure 38-8 Adolescents are vulnerable to peer influence.

Socioeconomic factors, access to a grocery store, and lifestyle may affect the nutritional status of older adults. Having to prepare their own food and eat alone are other challenges the elderly face. Refer to Chapter 18 for additional information on the elderly.

Lifestyle

Eating is a social activity in most cultures. A person's lifestyle may have a major impact on food-related behaviors. Families with both parents working or with children involved in sports and other activities might find it difficult to sit down at the dinner table together for a home-cooked meal. When meals are eaten on the run, they tend to be high in fat and carbohydrate content, and the family misses the opportunity to be together and share important events of the day.

Food preferences are usually developed in childhood and modified throughout the life span. Lifestyle nutritional behaviors often come from traditional family practices. These practices affect not only food-related behaviors but also the individual's beliefs regarding health and wellness. If a person gets sufficient rest, has the self-awareness to recognize stress, exercises regularly, and avoids addictive behaviors, such as smoking and alcohol, he or she will usually make healthy nutritional decisions.

Ethnicity, Culture, and Religious Practices

Dietary customs reflect the socialization and cultural patterns of ethnic groups (Figure 38-9). Culture is evidenced by patterns of values and behaviors that are characteristics of a particular group. Religious beliefs often dictate what types of foods may be eaten and how they should be prepared.

Although it is not possible to learn the nutritional behaviors for all ethnic groups, recognize the need to comply with the client's routine patterns (see the accompanying display for nutritional behaviors of some

NURSING TIP

Preventing Eating Disorders

- Encourage healthy dietary habits and adequate exercise.
- Emphasize a healthy lifestyle over physical appearance and weight loss.
- Encourage increased self-esteem and stress a positive self-worth.
- Avoid pressuring children to achieve perfection or to perform beyond their abilities.
- Recognize signs and symptoms of eating disorders, and seek professional help when suspected.

(From Estes, M. E. [2002]. *Health assessment and physical examination*. Albany, NY: Delmar Publishers.)



CLIENT TEACHING CHECKLIST

Special Dietary Considerations for the Elderly

- Special attention must be given to water needs, regardless of physical activity, because the thirst mechanism is less responsive than in younger people.
- Decrease the kilocaloric requirements in relation to activity: 10% for ages 51–75 and 20% to 25% for ages 75 and older. Bedridden and immobilized persons need a further reduction in kilocalories. Limit the quantities of empty kilocalorie foods (sugars, sweets, fats, oils, and alcohol).
- Maintain protein requirements, with 12% to 14% of the kilocalories being derived from protein food (meat, fish, eggs, poultry, milk, and cheese).
- Ensure adequate consumption of fats, especially unsaturated fats, to provide a source of energy, provide the essential amino acids, utilize the fat-soluble vitamins, and serve as a lubricating agent.
- Select carbohydrates as follows: limit concentrated sweets; use moderate amounts of simple sugars (candy, sugar, jams, jellies, preserves, and syrups); the main source should be complex carbohydrates (fruits, vegetables, cereals, and breads).
- Ensure adequate amounts of vitamin D, calcium, and phosphorus to maintain bone integrity (fortified milk is a good source).
- Ensure high-fiber foods (dried fruits, whole grain cereals, nuts, fresh fruit, and vegetables) to increase satiety and maintain intestinal mobility to avoid constipation.
- Ensure a safe, adequate intake of sodium, avoiding canned foods and salted or cured meats high in sodium content for those with cardiac problems and hypertension.
- Include foods from the food guide pyramid in the amounts that meet the RDAs for age 51 and older.

ethnic groups). Refer to Chapter 16 for additional cultural factors that are evidenced in food behaviors.

Other Factors

There are other factors that influence the types of foods selected and their nutritional value. Economics exert a major influence on food selection; fresh fruits and vegetables and lean meats are expensive and are often sub-

THINK ABOUT IT

Food-Related Behaviors

How are food *fads* developed? What lasting impact do these fads have on health? What role does the media play in forming an individual's food beliefs? Is the statement "Yogurt and vitamin E retard aging" related to a fad or a misconception, or is it a fact based on research? To answer this last question, refer to Table 38-1.

NUTRITIONAL BEHAVIORS OF SELECTED ETHNIC GROUPS

- Asians' main food types are rice, green tea, vegetables, and fish. A rice-and-water soup is often fed to the sick.
- The Islamic (Muslim) law does not permit the consumption of pork or alcohol or of meat that has not been slaughtered according to the Islamic code. The main meal is at midday.
- Orthodox Jews are not allowed to eat pig, rabbit, and shellfish; milk and meat are not taken at the same meal. A vegetarian diet is acceptable when kosher meat is not available. Strict guidelines dictate food preparation.

stituted with products that tend to be low in protein and high in starch.

Food preferences are an expression of an individual's likes and dislikes. They may be related to the texture of food, how it is prepared, or what was served to the individual during childhood. However, preferences can also be an expression of the person's economic, ecological, ethical, or religious beliefs. Vegetarians, for example, follow a diet of plant foods and may include eggs or milk, depending on preference. A vegetarian diet is healthy when it includes a wide variety of foods that supply adequate amounts of protein, vitamins, and minerals.



Figure 38-9 Family and cultural values often affect diet.

Gender may play a role in food selection, owing mainly to stereotyping (for example, the idea that males eat meat and potatoes and females eat salads). Peer pressures often dictate what teenagers eat. Stress, depression, and alcohol abuse alter the appetite. Medications can alter food absorption and excretion and affect the taste of food. GI disorders can cause anorexia, nausea, vomiting, diarrhea, constipation, discomfort, and pain, all of which may alter eating habits and food preferences.

ASSESSMENT

The goals of a nursing assessment are to collect subjective and objective data regarding the client's nutritional status and to determine what type of nutritional support is needed. Nurses are in a unique position to recognize **malnutrition**, or alterations related to inadequate intake, disorders of digestion or absorption, and overeating. Assessment must be performed in a logical fashion and should include three basic components: nutritional history, physical examination with anthropometric measurements, and diagnostic and laboratory data.

Nutritional History

The nutritional history of clients experiencing alterations in nutrition and metabolism is of critical importance in the development of the plan of care. Several methods can be used in collecting these subjective data: 24-hour recall, food frequency questionnaire, food record, and diet history; refer to Table 38-3 for an example of a nutritional history. Begin the history with a thorough exploration of the client's presenting problems as they relate to onset, duration, nature, pattern, severity, associated symptoms, and efforts taken to relieve the symptoms.

24-Hour Recall

The 24-hour recall requires client identification of everything consumed in the previous 24 hours. It is performed easily and quickly by asking pertinent questions. However, clients may be unable to recall their intake accurately or anything atypical for their diet. Family members can often assist with these data, if necessary.

THINK ABOUT IT

Personal Biases

Performing a nutritional history requires a questioning, nonjudgmental attitude. Examine your biases so that you can treat the viewpoints of all clients equally. To gain a sincere understanding of clients' perspectives, develop an open mind and listen with empathy.

Food-Frequency Questionnaire

The food-frequency method gathers data relative to the number of times per day, week, or month the client eats particular foods. The nurse can tailor the questions to particular nutrients, such as cholesterol and saturated fat. This method helps to validate the accuracy of the 24-hour recall and provides a more complete picture of foods consumed.

Food Record

The food record provides quantitative information regarding all foods consumed, with portions weighed and measured for three consecutive days. This method requires full client or family member cooperation.

Diet History

The diet history elicits detailed information regarding the client's nutritional status, general health pattern, socioeconomic status, and cultural factors, as presented in Table 38-3. This method incorporates information similar to that collected by the 24-hour recall and food-frequency questionnaire. Inform the client that the history might require more than one interview because of the amount of data to be collected.

Although the history data may indicate adequate nutrition, clients must be reassessed periodically to prevent nutritional problems from occurring. Fear, anxiety, or depression before or during hospitalization may lead to poor food intake, which is the leading cause of malnutrition.

Physical Examination

A physical assessment requires decision making, problem solving, and organization; refer to Chapter 27 for a complete discussion of physical assessment. This section presents the physical assessment findings that suggest nutrient imbalance. "The nurse should be aware of rapidly proliferating tissues such as hair, skin, eyes, lips, and tongue that usually show nutrient deficiencies sooner than other tissues" (Hammond, 1999, p. 355). Refer to Table 38-4. Essential components of anthropometric measurements (height, weight, and skinfolds) are also discussed.

Intake and Output (I&O)

Intake and output measurements and daily weights are critical components of a nutritional assessment; refer to Chapter 37, Procedure 37-1, intake and output measurements, and Chapter 27 for a complete discussion on weight measurement.

Anthropometric Measurements

Anthropometric measurements (measurement of the size, weight, and proportions of the body) evaluate the

TABLE 38-3
Health History Related to Nutrition and Metabolism

Environment and Lifestyle	Possible Findings
Employment	Exposure to heat, toxic chemicals Extent of physical exertion Degree of stress
Home environment	Central air/heat; lives alone or with other family members; ability to shop/cook
Tobacco use	Use of smokeless tobacco; cigarettes: number of years; packs per day; if quit, how long
Nutritional status	Weight changes: loss or gain Fluid consumption for 24 hours: number of glasses of water, cups of coffee or tea, soft drinks; amount of alcohol consumed Food preferences and restrictions Dietary restrictions (sodium) Use of supplements: vitamins, minerals, commercial liquids, herbs
Presenting Problem	Possible Findings
Weight loss	Onset: sudden or gradual, duration Pattern: decreased intake, increased activity Severity: how much, specific time frame Associated symptoms: anorexia, nausea, vomiting, diarrhea, dysphagia (difficulty in swallowing), odynophagia (pain in swallowing), polyuria (passage of excessive urine), fatigue, dyspnea, depression, cognitive impairment, motor weakness or paralysis Efforts to relieve weight loss: increased intake, decreased activity
Anorexia	Onset: sudden, gradual, duration Pattern: continuous, occasional, related to food intake—specific foods, time of day, activity, drugs, radiation or chemotherapy Severity: intake for 24 hours Associated symptoms: weight loss, nausea, vomiting, diarrhea, dysgeusia (distortion of sense of taste), fatigue, depression Efforts to relieve anorexia: dietary changes—types of foods and preparation, time of day, eating with others or alone
Nausea and vomiting	Onset: sudden, gradual, duration Nature of emesis: color, consistency, amount Pattern: continuous, occasional, related to food intake—specific foods, time of day, position or activity Severity: specific amount in a 24-hour period Associated symptoms: weight loss, anorexia, dysphagia, diarrhea, fatigue, motor weakness, pain Efforts to relieve nausea and vomiting: eliminating odors, certain foods, medications, changing position or activity after meals
Diarrhea	Onset: sudden or gradual, duration Nature of feces: color, consistency, amount Pattern: frequency, related to food intake Severity: number of times in 24 hours Associated symptoms: nausea, vomiting, pain, fatigue, motor weakness, weight loss Efforts to relieve: decrease fluid intake with meals, identify foods, medications, and other stressors that trigger diarrhea
Past Health History	Possible Findings
Previous or chronic illnesses	Allergies, anorexia, malnutrition, gastroenteritis, cancer, diabetes mellitus History of: heart disease, hypertension, renal disease, pulmonary disease History of trauma: head or crushing injuries
Medications and therapies	Diuretics, steroids, antacids, antihypertensives, digoxin IV therapy, total parenteral nutrition, chemotherapy

(continues)

TABLE 38-3 (continued)
Health History Related to Nutrition and Metabolism

Family History	Possible Findings
Illnesses in family members	Allergies, cancer, anorexia, diabetes mellitus, cardiovascular disease
Knowledge Level	Possible Findings
Client's knowledge of disease process	Ability to name illness Ability to identify current treatments (e.g., medications)
Coping Ability	Possible Findings
Client and family coping strategies	Client's and family's perception of impact of illness on lifestyle Presence of social support systems

client's calorie-energy expenditure balance, muscle mass, body fat, and protein reserves based on height, weight, skinfolds, and limb and girth circumferences. Chapter 27 discusses the assessment of height and weight; refer to Chapter 37 for additional nursing measures relative to daily weights.

The **body mass index (BMI)** determines whether a person's weight is appropriate for height and is calculated using a simple formula: $BMI = \frac{\text{weight (kg)}}{[\text{height (m)}]^2}$

For example, a person who weighs 65 kg and is 1.6 m tall would have a BMI of $\frac{65 \text{ kg}}{(1.6 \text{ m})^2}$, or 25.4. A BMI of 27

or greater indicates obesity. Height and weight tables are available in most health care settings; see Table 38-5.

Skinfold Measurements

Skinfold measurement indicates the amount of body fat. This information is beneficial in promoting health and determining risks and treatment modalities associated with chronic illness and surgery. This assessment is usually performed in an outpatient setting when the nurse develops a client's profile.

A special caliper is used to measure skinfolds. The caliper should grasp only the subcutaneous tissue, not the underlying muscle. Measurements can be taken of the triceps, subscapular, biceps, and suprailiac skinfolds.

1. To measure the triceps fold, locate the midpoint of the upper arm. Grasping the skin on the back of the upper arm, place the calipers 1 cm below your fingers (Figure 38-10), and measure the thickness to the nearest millimeter.
2. For a subscapular skinfold measurement, grasp the skin below the scapula with three fingers, angle the fold about 45° laterally to the scapula (Figure 38-11), place the caliper 1 cm above your fingers, and read the measurement.

It is essential to document the skinfold sites, the type of caliper used, and the measurement in millimeters.

Mid-Upper-Arm Circumference

The measurement of **mid-upper-arm circumference (MAC)** serves as an index for skeletal muscle mass and protein reserve. Instruct the client to relax and flex the forearm; with a measuring tape, measure the circumference at the midpoint of the upper arm (Figure 38-12).

Abdominal-Girth Measurement

When made repeatedly over a span of time, an abdominal girth measurement serves as an index as to whether abdominal distention is increasing, decreasing, or remaining the same. With an indelible pen, place an X on the client's abdomen at the point of greatest distention. Using a measuring tape, measure the abdomen's circumference. This measurement should be performed at the same time each day and consistently recorded in either inches or centimeters.

Diagnostic and Laboratory Data

Biochemical data assessment is another essential source of objective data. Trends revealed in laboratory results can be used to detect alterations in nutrition and metabolism before clinical symptoms are assessed in the examination. Refer to Chapter 28 for a detailed discussion of laboratory testing. No single laboratory test is diagnostic of malnutrition.

Protein Indices

Several tests that reflect protein synthesis can also reflect nutritional status. Serum levels of albumin and transferrin are used to identify protein-calorie malnutrition.

Serum Albumin

Albumin is synthesized in the liver from amino acids. Serum albumin plays an important role in fluid and electrolyte balance and the transport of nutrients, hormones, and drugs. However, serum albumin has a half-life of 21 days and fluctuates according to the level of hydration; therefore, it is not a good indicator of acute alterations in protein status. Clinically, this blood test is used to measure prolonged protein depletion that

TABLE 38-4
Adult Physical Assessment Findings: Nutrient Imbalance

Assessment Findings	Nutrient Deficiencies and Excesses	Assessment Findings	Nutrient Deficiencies and Excesses
Hair: Dull, dry, brittle Hair loss	Protein deficiency Protein, zinc, and biotin deficiency or vit A excess	Nails: Koilonychia (spoon-shaped nails) Brittle, fragile	Iron deficiency Protein deficiency
Loss of pigment in strips around hair line	Protein and copper deficiency	Heart: Tachycardia Hypertension	Vit B ₁ deficiency Calcium and potassium deficiency or sodium excess
Head and neck: Headache Epistaxis (nosebleed) Thyroid enlargement	Vit A and D excess Vit K deficiency Iodine deficiency	Abdomen: Ascites	Protein deficiency
Eyes: Pale conjunctiva Blue sclerae Conjunctival and corneal dryness Corneal vascularization	Iron deficiency Iron deficiency Vit A deficiency Vit B ₂ deficiency	Musculoskeletal: Muscle wasting Edema Calf tenderness Bone tenderness	Protein and vit B ₁ deficiency Vit B ₁ and C, biotin, selenium deficiency Vit D, calcium, and phosphorus deficiency or vit A excess
Mouth: Lesions at corners of mouth Glossitis (red, sore tongue) Gingivitis (inflamed gums) Hypogeusia (poor sense of taste) Dysgeusia (bad taste) Dental caries Mottling of teeth Atrophy of papillae on tongue	Vit B ₂ deficiency Niacin, folate, vit B ₁₂ , and other vit B deficiencies Vit C deficiency Zinc deficiency Zinc deficiency Fluoride deficiency Fluoride excess Iron and vit B deficiency	Knock knees, bowed legs, and fragile bones	Vit D, calcium, phosphorus, and copper deficiency
Skin: Dry, scaly Eczematous lesions Petechiae and ecchymoses Darkening and peeling of sun-exposed areas Poor wound healing	Vit A, zinc, and essential fatty acids deficiency or vit A excess Zinc deficiency Vit C and vit K deficiency Niacin deficiency Protein, zinc, and vit C deficiency	Neurologic: Paresthesia Weakness Ataxia Tremor Decreased tendon reflexes Disorientation Drowsiness, lethargy Depression	Vit B ₁ , B ₆ , B ₁₂ , and biotin deficiency Vit C, B ₁ , B ₆ , and B ₁₂ deficiency Vit B ₁ and B ₁₂ deficiency Magnesium deficiency Vit B ₁ deficiency Vit B ₁ deficiency or vit A and D excess Vit B ₁ and biotin deficiency

occurs in chronic malnutrition, liver disease, and nephrosis. Albumin levels below 3.5 g/dl may indicate some degree of malnutrition.

Pre-Albumin

Research has provided a newer, more accurate test to evaluate protein status. **Pre-albumin** (a precursor of

albumin) has a half-life of 2–3 days; it is used to determine protein depletion in acute conditions, such as trauma and inflammation, and serves as a guide for nutritional therapy. Pre-albumin levels between 15 mg/dl to 5 mg/dl reflect mild to moderate protein depletion while levels below 5 mg/dl indicate severe protein depletion.

TABLE 38-5
Adult Growth Chart*

Height	Metropolitan 1983 Weights For Ages 25–59**	
	Men (lb)	Women (lb)
4-10	—	100–131
4-11	—	101–134
5-0	—	103–137
5-1	123–145	105–140
5-2	125–148	108–144
5-3	127–151	111–148
5-4	129–155	114–152
5-5	131–159	117–156
5-6	133–163	120–160
5-7	135–167	123–164
5-8	137–171	126–167
5-9	139–175	129–170
5-10	141–179	132–173
5-11	144–183	135–176
6-0	147–187	—
6-1	150–192	—
6-2	153–197	—
6-3	157–202	—
6-4	—	—

*Values in this table are for height without shoes and weight without clothes. To convert inches to centimeters, multiply by 2.54; to convert pounds to kilograms, multiply by 0.455

**The weight range is the lower weight for small frame and the upper weight for large frame.

(Reproduced courtesy of Metropolitan Life Insurance Company *Statistics Bulletin*.)

Serum Transferrin

Transferrin (nonheme iron) is a blood protein in combination with iron; it is used to transport iron throughout the body to all cells. It is responsive to iron stores, increasing when iron stores are low and decreasing when iron stores are high. This test is considered a sensitive indicator of protein deficiency because it responds promptly to changes in protein intake. Levels below 200 mg/dl may indicate mild to moderate protein depletion and below 100 mg/dl may indicate severe depletion.

Hemoglobin Level

The hemoglobin test measures the oxygen- and iron-carrying capacity of the blood; the normal level is 12 to 15 g/100 ml. A decreased hemoglobin may indicate some form of anemia, such as microcytic iron deficiency anemia, or blood loss.

Total Lymphocyte Count

Another test that may be used to measure protein depletion is total lymphocyte count. Protein deficiency may cause a depression in the immune system, with a resultant



Figure 38-10 Measuring Triceps Skinfold, at Midpoint of the Upper Arm



Figure 38-11 Measuring the Subscapular Skinfold



Figure 38-12 Measuring the Mid-Upper-Arm Circumference

decrease in the total lymphocyte count; this can occur with severe debilitating diseases, such as cancer or renal disease.

Nitrogen Balance

Nitrogen balance studies indicate the degree to which protein is being depleted or replaced in the body. The *blood urea nitrogen (BUN)* is increased with severe dehydration, malnutrition, starvation, excessive protein intake, and most commonly in kidney disease (the kidneys fail to excrete urea). A decreased BUN results from a diet low in protein-rich foods.

Urine Creatinine Excretion

During skeletal muscle metabolism, creatinine is released at a rate in proportion to the total body mass. A 24-hour urine test is done to measure the total amount of creatinine excreted by the kidneys. In mal-

nutrition, the creatinine level is decreased as a result of muscle atrophy.

NURSING DIAGNOSIS

In order to make a nursing diagnosis, the nurse must interpret the subjective and objective data and draw conclusions from the client's assessment data obtained during a comprehensive health history and physical examination. The approved nursing diagnoses are discussed to assist with appropriate selection of primary and secondary nursing diagnoses for clients with nutritional alterations.

Imbalanced Nutrition: Less Than Body Requirements

An estimated 30% to 50% of hospitalized clients are at risk for malnutrition; increased morbidity and mortality rates are associated with malnutrition (McCloskey & Bulechek, 1999). The diagnosis *Imbalanced Nutrition: Less Than Body Requirements* exists when the client fails to ingest or digest food or absorb nutrients. The Nursing Process Highlight lists some possible causes of this nursing diagnosis.

Such clients may experience a weight loss of 20% or more from their ideal weight. The dietary history may reveal: inadequate food intake based on the RDAs; a lack of interest in or an aversion to eating; perceived inability to ingest food; and a reduced energy level. Clients have poor muscle tone, with skinfolds less than

Nursing Process Highlight

Nursing Diagnosis

Multiple factors can cause *Imbalanced Nutrition: Less Than Body Requirements*:

- **Biological:** Buccal cavity discomfort, pain; difficulty in swallowing; stomach strictures, ulcers; inflammation, obstruction of the biliary or intestinal system; chronic diarrhea; pulmonary disorders; postoperative status; transplantation candidate, pre- and post-surgery; cancer and radiation therapy; immunosuppression
- **Psychological:** Anorexia nervosa; bulimia; severe stress, anxiety, fatigue, or depression; prolonged grieving; lack of knowledge; extreme food fad and dieting practices.
- **Economic:** Inadequate finances to purchase protein-rich foods



NURSING TIP

Creatinine Excretion

Record the client's height and sex on the laboratory request for a creatinine excretion test because the normal values are standardized on the basis of these variables.

60% of standard measurement, and may experience difficulty in swallowing or masticating food, because of muscular weakness. The conjunctive and mucous membranes are usually pale, and the buccal cavity is sore and inflamed.

Imbalanced Nutrition: More Than Body Requirements or Risk for More Than Body Requirements

Imbalanced Nutrition: More Than Body Requirements exists when clients experience or are at risk for an intake of nutrients that exceeds metabolic needs. Clients may be at risk because of one or more of the following factors: hereditary predisposition or obesity in one or both parents; dysfunctional psychological conditioning in relationship to food, such as using food as a reward or comfort measure; and age-related factors, most notably early infancy, adolescence, and aging.

Clients with more than body requirements experience a weight gain of 10% to 20% over the ideal for height and frame and triceps skinfolds greater than 15 mm in men and 23 mm in women. The client's dietary history may reveal a sedentary activity level and one or more dysfunctional eating patterns: pairing food with other activities, such as watching TV; concentrating the intake of food at night; eating in response to internal cues (anxiety) or external cues (such as a social event) instead of in response to hunger.

Other Nursing Diagnoses

The client who is protein-depleted may also experience deficiencies in vitamins (especially A and C) and minerals (especially zinc, magnesium, and iron). Refer to the accompanying display for a listing of common secondary nursing diagnoses related to nutritional and metabolic problems. Because the secondary diagnosis is related to the nutritional/metabolic problem, it is written in terms of the etiology of the primary diagnosis, for example, *High Risk for Impaired Skin Integrity: related to inadequate intake of proteins, vitamins, and minerals*.

OUTCOME IDENTIFICATION AND PLANNING

The nurse relies heavily on the data obtained from the nutritional history and collaborates with the client and other health team members in formulating goals and expected outcomes to promote optimal nutritional care. Nursing diagnoses of life-threatening conditions, such as *Impaired Swallowing related to decreased or absent gag reflex*, are given first priority. Other diagnoses that are actual problems take priority over high-risk problems.

SECONDARY NURSING DIAGNOSES FOR CLIENTS WITH NUTRITIONAL PROBLEMS

Activity Intolerance: related to insufficient energy from protein depletion

Acute Pain: related to lactose intolerance

Ineffective Health Maintenance: related to excessive intake of nutrients

Impaired Oral Mucous Membrane: related to dehydration

Ineffective Breathing Pattern: related to decreased energy and fatigue from protein depletion

Constipation: related to inadequate dietary intake and fiber

Ineffective Health Maintenance: related to inadequate financial resources to purchase nutritious foods

Risk for Infection: related to nutrient replacement therapy

Deficient Knowledge: related to information of normal nutrition

Ineffective Therapeutic Regimen Management (individual): related to cultural influences on the client's food preferences

Impaired Swallowing: related to decreased strength of muscles involved in mastication

Chronic Low Self-Esteem: related to obesity

Risk for Impaired Skin Integrity: related to inadequate intake of proteins, vitamins, and minerals

(From NANDA [2001]. *Nursing diagnosis: Definitions & Classifications [2001–2002]*. Philadelphia: Author.)

In the planning phase, the nurse identifies and explains to the client the need for and basis of the therapy. The nurse takes into consideration the client's dietary habits, likes, dislikes, needs, and nutritional assessment data in defining goals and developing outcomes in collaboration with the client. Refer to the accompanying display for a sample list of expected outcomes for clients with imbalanced nutrition and the Research Focus, which concluded that obese binge-eating women had no weight loss with diet or non-diet therapies.

EXPECTED OUTCOMES FOR CLIENTS WITH IMBALANCED NUTRITION

- Client maintains intake and output balance.
- Client consumes the proper amounts of foods from the four food groups, as evidenced by the food-frequency record.
- Client complies with diet therapy, avoiding saturated fats.
- Client tolerates tube feeding without experiencing any vomiting and diarrhea.
- Client remains infection-free while receiving parenteral nutrition.

The nurse selects appropriate nursing interventions to match the client's routine patterns, as obtained in the health history, and to support achievement of the goals and outcomes. Proceeding in this fashion facilitates the client's adaptive capabilities through skillful interventions.

IMPLEMENTATION

The nurse is responsible for understanding the client's nutritional needs and for making clinical judgments relative to outcomes of therapy. This responsibility includes intervening to prevent the rapid depletion of the body's protein and energy reserves. Performance of nursing interventions to accomplish goals and outcomes includes monitoring the client's weight and intake, diet therapy, and feeding. Client teaching occurs with each intervention to maximize the effectiveness of nutritional therapy.

Monitoring Weight and Intake

Weight and intake measurements are used to assess the client's nutritional status and to monitor the effectiveness of therapy. Refer to Chapters 27 and 37 for nursing actions relative to daily weights and intake and output considerations.

Initiating Diet Therapy

Nutritional problems often require dietary modification. Therapeutic nutrition requires consideration of the client's total needs: cultural, socioeconomic, psychological, and physiological. Modified diets should promote effective nutrition within the client's lifestyle; this often requires client teaching regarding the avoidance of certain foods or adding food items to the diet, given the client's sociocultural context, economic restraints, and religious beliefs.

Nothing by Mouth

Placing the client on NPO (nothing by mouth) status is a type of diet modification as well as a fluid restriction; refer to Chapter 37 for a complete discussion of fluid restrictions. This intervention is prescribed prior to surgery and certain diagnostic procedures, to rest the GI tract (and prevent diarrhea or vomiting), or when the client's nutritional problem has not been identified.

Clear-Liquid Diet

Dairy products are not allowed on a clear-liquid diet. The client is allowed to ingest only liquids that keep the GI tract empty (no residue), such as water, apple juice, and gelatin. A clear-liquid diet is prescribed primarily for surgical clients.

Liquid Diet

A liquid (or full liquid diet) consisting of various types of liquids is prescribed mainly for postoperative clients because of calorie and nutrient considerations. If the client tolerates a liquid diet without nausea or vomiting and has normal bowel sounds, the diet is progressed to *as tolerated* (client eats whatever foods that cause no problems).

Soft Diet

A soft diet promotes the mechanical digestion of foods. It is prescribed for clients experiencing difficulty in chewing and swallowing. A soft diet is also therapeutic for clients with impaired digestion and/or absorption, due to conditions such as ulcerative colitis and Crohn's disease. Foods to be avoided on this diet include nuts, seeds (tomatoes and berries with seeds), raw fruits and vegetables, fried foods, and whole grains.

Mechanical Soft Diet

A mechanical soft diet is similar to a soft diet; however, it allows clients variation, permitting foods with different tastes, such as chili beans. It is prescribed for clients experiencing difficulty chewing or who are unable to chew food thoroughly, as may occur with poorly fitted dentures.

Pureed Diet

A pureed diet provides food that has been blenderized to a smooth consistency. It is prescribed for clients with dysphagia, or difficulty in swallowing. Special consideration needs to be given to meal preparation; when food has the same consistency, it is difficult to distinguish the taste of different foods.

Low-Residue Diet

A low-residue diet has reduced fiber and cellulose. It is prescribed to decrease GI mucosal irritation in clients with diverticulitis, ulcerative colitis, and Crohn's disease. Foods to be avoided are raw fruits (except bananas), vegetables, seeds, plant fiber, and whole grains. Dairy products are limited to two servings a day.

High-Fiber Diet

High-fiber-diet foods are the opposite of low-residue foods. A high-fiber diet is an integral part of the treatment regimen for diverticulosis because it increases the forward motion of the indigestible wastes through the colon. See the accompanying Research Focus for additional information.

Liberal Bland Diet

A liberal bland diet eliminates chemical and mechanical food irritants, such as fried foods, alcohol, and caffeine.



RESEARCH FOCUS

Title of Study

“Nondietering Versus Dietering Treatment for Overweight Binge-Eating Women”

Authors

Goodrick, G., Poston II, W. S. C., & Kimball, K. T.

Purpose

Randomized controlled trial of women who are overweight and binge-eat to measure the effectiveness of a nondieting intervention with a behavioral dieting intervention.

Methods

A total of 219 women who responded to media advertisement with the following characteristics were included in the study: 25–50 years of age; 14–41 kg overweight; scored 0.20 on the Binge Eating Scale; had no history of diabetes, cardiovascular or gastrointestinal diseases; had no purging behaviors within the previous 6 months; were not pregnant or breast feeding; had physician clearance for a walking regimen; were not enrolled in another weight loss program; and did not smoke. Participants were placed in a dieting treatment or nondieting treatment group or to a waiting list control group (WLC). Weight, eating dyscontrol, and physical activity were assessed in all groups after 6 months of treatment and in the two intervention groups at 18 months.

Findings

There was no weight loss in the two intervention groups at 6 months when compared with the WLC group; both interventions reduced binge eating. The two treatment groups at 18 months had similar weight gains and decreases in binge eating scores, and both maintained modest increases in exercise.

Implications

Professional nurses in ambulatory settings need to recognize the complexity of issues surrounding weight management.

Goodrick, G., Poston II, W. S. C., & Kimball, K. T. (1998). Nondietering versus treatment for overweight binge-eating women. *Journal of Consulting Clinical Psychology, 66*(4), 363–368.

Fat-Controlled Diet

Fat-controlled diets reduce the total fat ingested by replacing saturated fats with monounsaturated and polyunsaturated fats and restricting cholesterol. They are prescribed for clients with atherosclerosis, heart disease, and obesity. Saturated foods to be avoided include animal fats, gravies, sauces, chocolate, and whole-milk products.

Sodium-Restricted Diet

Sodium intake may be restricted as follows: mild, 2 to 3 g; moderate, 1000 mg; strict, 500 mg; severe, 250 mg. A sodium-restricted diet is prescribed for clients with excess fluid volume, hypertension, heart failure, myocardial infarction, and renal failure.

Lactose Intolerance Diet

A lactose intolerance diet eliminates milk and all dairy products except yogurt. **Lactose** is a sugar found in milk and aids the body absorption of calcium. Lactose intolerance is caused by a lack or deficiency of lactase, an enzyme normally made in the small intestines that splits lactose into glucose and galactose. Incomplete digestion of lactose results in diarrhea, gas, and abdominal cramps between 30 minutes and 2 hours after consumption of dairy foods.

Candidiasis Diet

The candidiasis diet is free of fruits, sugar, yeast, and fermented foods. *Candida albicans* is a normal parasitic yeast-like fungus that lives in healthy balance with other bacteria and yeasts in the body. In response to certain conditions or therapies such as antibiotics or chemotherapy, this fungus may multiply, weakening the immune system and causing an infection known as candidiasis. Candidiasis can infect any bodily structure that contains mucous membranes, the most common being the mouth, ears, nose, gastrointestinal tract, and vagina. Candidiasis may be characterized by many symptoms ranging from diarrhea, acne, muscle and joint pain to impotence, PMS, fatigue, vaginitis, kidney and bladder infections, arthritis, depression, and even diabetes (Balch & Balch, 1997).

Assistance with Feeding

Assessment data provide direction regarding how to assist the client with eating. Clients with difficulty in self-feeding, chewing, or swallowing will require assistance to promote safety and adequate intake of nutrients; see the Nursing Process Highlight.

Because eating is a social activity (Figure 38-13), it is important to encourage a family member or friend to be present at meals. If this is not possible, assess the avail-

This diet is prescribed for clients with gastritis and ulcers because it reduces GI irritation.

Nursing Process Highlight

IMPLEMENTATION

Nursing Measures That Promote Client Feeding

- Before bringing the meal tray into the room, ask whether the client needs to void or have a bowel movement.
- Provide hygiene measures before serving the meal tray.
- Position the client in a comfortable position, preferably in a chair, if not contraindicated.
- Ask about the client's eating habits, and as to the foods he or she prefers to eat first. Ask what help is needed. For instance, elderly people may want scrambled eggs placed in a sandwich to make them easier to handle.
- Make sure the foods are being served at the correct temperature.
- Provide assistance if the client is unable to handle eating utensils or open containers and packages.
- Provide adequate time for the client who has difficulty in chewing or swallowing. Make sure that someone is in the room while the client is eating.
- Document the type and amount of food taken at each meal.
- Remove the tray after the meal and provide hygiene measures.

ability of other resources to provide social stimulation during meals, such as watching TV, listening to music, or having a staff member remain with the client.

Providing Nutrition Support

Proper nutrition in hospitalized clients is necessary for wound healing, recovery, reduction in morbidity, and consequent reductions in length of stay and mortality.



Figure 38-13 Eating is a social activity.

NURSING TIP

Facilitating Feeding for the Client with Impaired Vision

Clients with impaired vision need established routines that facilitate feeding. For example, foods are usually placed on the plate in a clockwise order: bread at the 12 o'clock position, meat at 3 o'clock, starches at 6 o'clock, and vegetable at 9 o'clock. The plate should have a raised edge so that the food can be scooped to the outside of the plate. Serving liquids in either a glass or a cup with a plastic lid and straw may be helpful to avoid spills.

The most common nutritional deficiency in hospitalized clients is protein-energy malnutrition. This type of malnutrition depletes body cell mass and impairs tissue and organ function. When protein-energy malnutrition is left untreated, the following client negative outcomes may occur:

- Weakness
- Compromised immunity
- Decreased wound healing
- Increased risk for complications

Nutrition support is prescribed for those clients at risk for protein-energy malnutrition.

There are two routes for delivery of nutrition support (NS) in adult clients: enteral nutrition (EN) and parenteral nutrition (PN). **Enteral nutrition** includes both the ingestion of food orally and the delivery of nutrients through a gastrointestinal tube. **Parenteral nutrition** refers to nutrients bypassing the small intestine and entering the blood directly. EN is preferred over PN because of decreased bacterial translocation and reduced expense, and is usually delivered through a feeding tube (Figure 38-14).

Critical indicators for determining the feeding route and nutrition support formula include GI function, expected duration of therapy, aspiration risk, and the potential for or the actual development of organ dysfunction. For example, the decision to initiate PN or EN support is based on evidence that the client is unable to meet his or her own nutritional needs by oral intake and will therefore experience malnutrition. Refer to Figure 38-15 for a clinical-decision algorithm that outlines the selection process for choosing the route of nutritional support in adult clients. The client's nutrition support may be determined by a nutrition support team (NST) in accord with the American Society for Parenteral and Enteral Nutrition (ASPEN) guidelines.

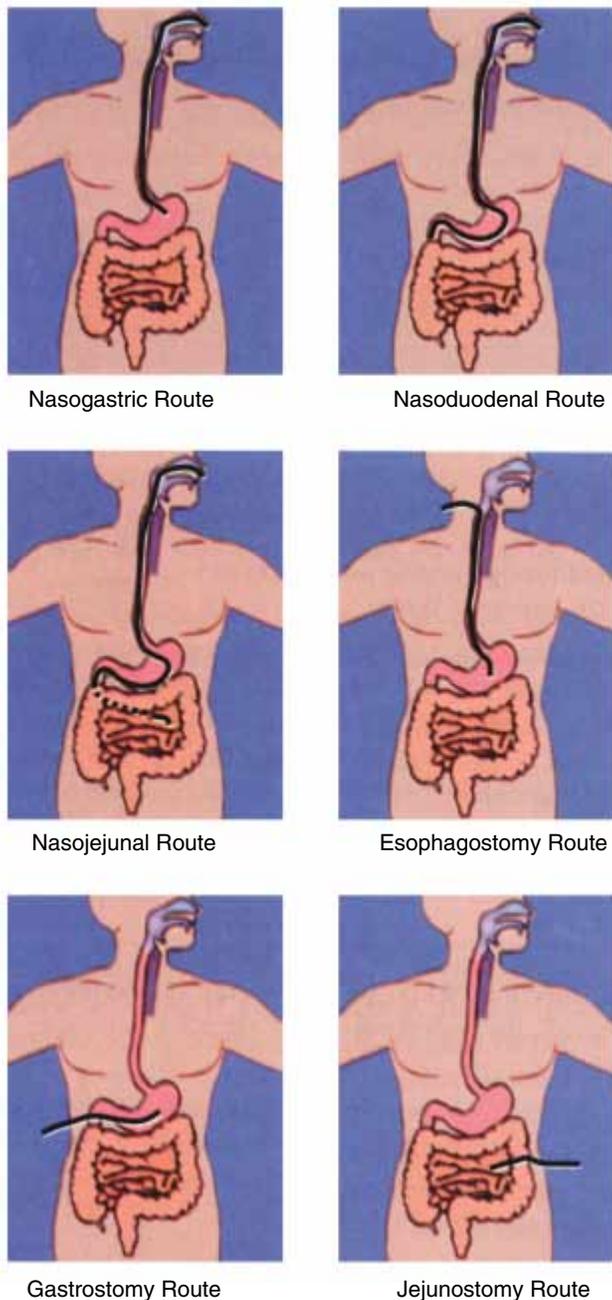


Figure 38-14 Enteral Feeding Routes

Nutrition Support Teams

Since the early 1980s, nutrition support teams (NSTs) were established to reduce the complications of PN. To achieve the expertise required for a consulting service, the teams have become multidisciplinary.

The nurse is seen as the vital link between the client and other team members to include a physician, nurse, pharmacist, and dietitian; see the accompanying display for the functions of NSTs. The nurse's role is critical, both for the implementation of nutritional support and for ongoing assessment, because the nurse administers and monitors nutritional therapies.

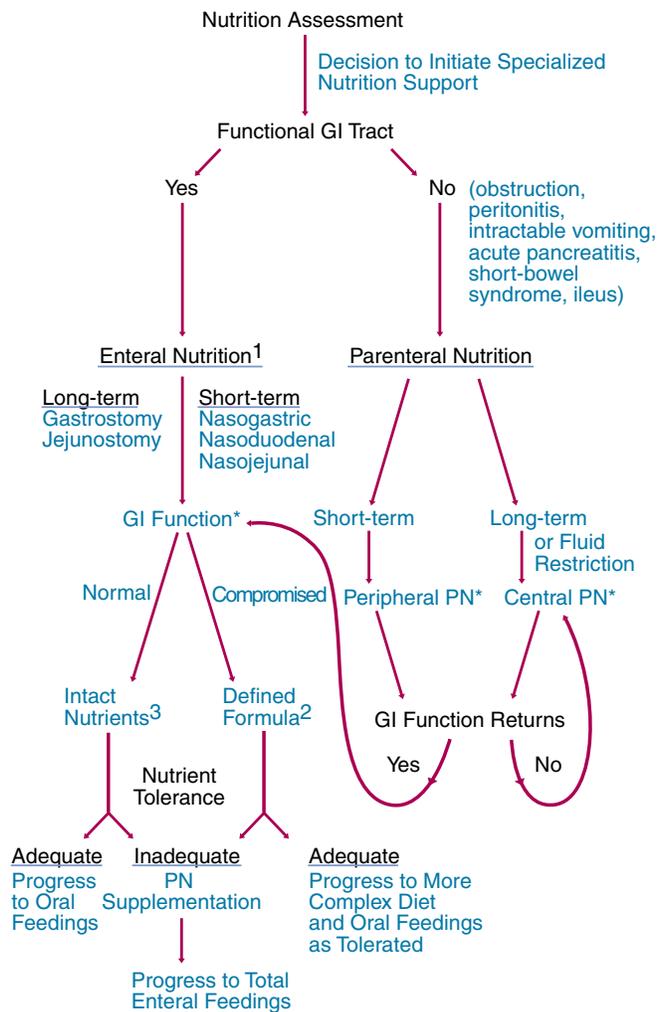


Figure 38-15 Clinical Decision Algorithm (Reprinted from the American Society for Parenteral and Enteral Nutrition [ASPEN], [1993]. Guidelines for the use of parenteral and enteral nutrition in adult and pediatric patients. *Journal of Parenteral and Enteral Nutrition*, 17, 15A–52SA. ASPEN does not endorse this material in any form other than its entirety. For information on ordering a complete set of guidelines, contact ASPEN, 8630 Fenton Street, Silver Spring, MD 20910, [301] 587-6315.)

CLINICAL FUNCTIONS OF NUTRITION SUPPORT TEAMS

- Identification of clients who are nutrition-impaired or at risk for malnutrition
- Performance of a nutritional assessment to guide nutritional therapy
- Provision of nutritional support that is safe and effective

The nurse is also responsible for eliciting the client's or family's continued consent and collaboration with the therapy. The physician obtains the client's informed consent for starting the therapy. The nurse teaches the

client and family about the nutritional support to restore a sense of independence and self-esteem. Many staff nurses are board-certified in nutrition support by ASPEN.

Providing Enteral Nutrition

Candidates for enteral tube feeding are clients who have a functional GI tract and will not, should not, or cannot eat. Therefore, tube feedings are used for clients who are (or may become) malnourished and in whom oral feedings are insufficient to maintain adequate nutritional status.

Enteral tube feedings maintain the structural and functional integrity of the GI tract, enhance the utilization of nutrients, and provide a safe and economical method of feeding. Enteral tube feedings are contraindicated in clients with the following:

- Diffused peritonitis
- Intestinal obstruction that prohibits normal bowel functioning
- Intractable vomiting; paralytic ileus
- Severe diarrhea

NURSING ALERT

Tube Feedings

An enteral tube feeding is used with caution in clients with severe pancreatitis, enterocutaneous fistulae, and GI ischemia. These feedings are not recommended during the early stages of short-bowel syndrome or in the presence of severe malabsorption.

Feeding Tubes

Most feeding tubes are made of silicone or polyurethane, which are durable and biocompatible with formulas. They vary in diameter (8 to 12 French) and length in accord with the route and formula. The physician selects the route (Figure 38-14) and type of feeding tube on the basis of the anticipated duration of feeding, the condition of the GI tract, and the potential for aspiration.

Insertion of Enteral Feeding Tubes

Nasoenteral insertion of a gastric feeding tube is the simplest and most often used method of tube feeding. It is used as a temporary measure for clients who are expected to resume oral feeding. Nasogastric intubation refers to insertion of a tube through the nostril into the stomach; refer to Procedure 38-1. Nasoduodenal or nasojejunal intubation allows nasal access to the duodenum and jejunum; it is done with a longer tube and

NURSING ALERT

Small-Bore Feeding Tube

When inserting a small-bore feeding tube with the guidewire or stylet, never attempt to reinsert the guidewire or stylet while the tube is in the client. The guidewire or stylet may perforate the GI mucosa, especially the esophagus, and injure the client.

decreases the client's risk of vomiting and aspiration. Radiographic visualization is used to confirm tube placement prior to feeding.

Enterostomy is the surgical creation of an artificial fistula (gastrostomy, jejunostomy) in the intestines by incision through the abdominal wall. Tube enterostomies can be placed at various points along the GI tract and are performed when long-term tube feeding is anticipated or when obstruction makes nasal intubation impossible.

Percutaneous endoscopic gastrostomy (PEG) tube placement is usually performed by the physician at the bedside or in the endoscopy room; *insertion of a PEG tube does not require surgery*. Endoscopy nurses are often trained to assist with PEG placement. PEG has become an accepted technique to provide enteral access for both children and adults (Wilson, 2000).

Enteral Formulas

Nutrients administered through tubes are liquefied so they can be easily digested and absorbed. Commercially prepared formulas are available and used in most health care settings. There are three basic types of formulas, which differ in osmolality, digestibility, kilocalories, lactose content, viscosity, and fat content; see the accompanying display.

Administration of Enteral Feedings

Once the feeding tube's position has been radiographically verified, the formula can be administered as prescribed; refer to Procedure 38-2. Most clients with a small-bore tube receive continuous feeding with a formula pump to regulate the rate. One of the advantages of continuous feeding is that it keeps gastric volume small, minimizing residual volume and reducing the risk of aspiration pneumonia; the client is less likely to experience bloating, nausea, abdominal distention, and diarrhea.

NURSING ALERT

Allergies

Before administering a tube feeding, determine whether the client has any food allergies. Clients may be lactose-intolerant or have an allergy to the formula.

PROCEDURE 38-1

Inserting a Nasogastric or Nasojejunal Tube for Suction and Enteral Feedings

Equipment

- Nonsterile gloves
- Cup of ice or water and straw
- Towel and tissues
- Flashlight or penlight
- Hypoallergenic tape, rubber band, safety pin
- 20-ml syringe or asepto syringe, 30 ml or larger with small bore tube
- Disposable irrigation set (optional)
- Wall mount or portable suction equipment as available
- Ice chips in an emesis basin
- Water-soluble lubricant
- Tongue blade
- pH chemstrip
- Number 6, 8, 12 French tube for gastric suction (Levine, Salem sump, or Anderson) or a small-bore feeding tube, 8 or 12 French tube (Keofeed, Dobbhoff, Moss)
- Administration set with pump or controller for feeding tube

Action

1. Review client's medical record.

Nasogastric Tube Insertion

2. Gather equipment. Wash hands.
3. Check client's armband; explain procedure, showing items.
4. Place client in Fowler's position, at least a 45° angle or higher, with a pillow behind client's shoulders; provide for privacy. *Place comatose clients in semi-Fowler's position.*
5. Place towel over chest, put tissues in reach. Don gloves.
6. Examine nostrils and assess as client breathes through each nostril.
7. Measure length of tubing needed by using tube as a tape measure:
 - Measure from bridge of client's nose to earlobe to xiphoid process of sternum (Figure 38-16A).
 - If tube is to go below stomach (nasoduodenal or nasojejunal), add an additional 15 to 20 cm (Figure 38-16B).
 - Place a small piece of tape on tube to mark length.



Figure 38-16A Measuring the Length of Nasogastric Tubing.

Rationale

1. Confirms physician's prescription for inserting a nasogastric tube; history of nasal or sinus problems.
2. Promotes efficiency. Reduces transfer of microorganisms.
3. Verifies correct client; reduces anxiety and increases client cooperation.
4. Facilitates passage of the tube into the esophagus and swallowing.
5. Prevents soiling of gown and bedding and protects nurse from contamination with bodily fluids; lacrimation can occur during insertion through nasal passages.
6. Determines the most patent nostril to facilitate insertion.
7. Approximates length of tube needed to reach stomach.

(continues)



Figure 38-16B Measuring Length of Nasoduodenal or Nasojejunal Tubing.

PROCEDURE 38-1

Inserting a Nasogastric or Nasointestinal Tube for Suction and Enteral Feedings (continued)

<i>Action</i>	<i>Rationale</i>
8. Have client blow nose and encourage swallowing of water if level of consciousness and treatment plan permit.	8. Clears nasal passage without pushing microorganisms into inner ear; facilitates passage of tube.
9. Lubricate first 4 inches of tube with water-soluble lubricant.	9. Facilitates passage into the nares.
10. Insert tube as follows: <ul style="list-style-type: none"> • Gently pass tube into nostril to back of throat (client may gag); aim tube toward back of throat and down. • When client feels tube in back of throat, use flashlight or penlight to locate tip of tube. • Instruct client to flex head toward chest. • Instruct client to swallow, offer ice chips or water, and advance tube as client swallows. • If resistance is met, rotate tube slowly with downward advancement toward client's closest ear; do not force tube. 	10. Promotes passage of tube with minimal trauma to mucosa. <ul style="list-style-type: none"> • Ensures tip's placement. • Opens esophagus and assists in tube insertion after tube has passed through nasopharynx and reduces risk of tube entering trachea. • Assists in pushing tube past oropharynx. • Tube may be coiled or kinked or in the oropharynx or trachea.
11. Withdraw tube immediately if changes occur in respiratory status.	11. Indicates placement of tube in the bronchus or lung.
12. Advance tube, giving client sips of water, until taped mark is reached.	12. Assists with tube insertion.
13. Check placement of tube: <ul style="list-style-type: none"> • Attach syringe to free end of tube and aspirate sample of gastric contents and measure with chemstrip pH (Figure 38-17). 	13. Ensures proper placement in the stomach; pH below 3, tube is in stomach; a pH range of 6 to 7 indicates intestinal sites.



Figure 38-17 For Measuring the pH of Aspirate

- Leave syringe attached to free end of tube.
 - If prescribed, obtain x-ray; keep client on right side until x-ray is taken.
14. Secure tube with tape as shown in Figure 38-18 or use a commercially prepared tube holder.
- Prevents leakage of gastric contents.
 - Confirms correct placement; if nasoduodenal or nasojejunal feedings are required, passage through pylorus may require several days.
14. Prevents tube from becoming dislodged.

(continues)

PROCEDURE 38-1

Inserting a Nasogastric or Nasointestinal Tube for Suction and Enteral Feedings (continued)

Action



Rationale

Figure 38-18 Securing Tube to the Client's Nose with Tape

- Split a 4-inch piece of tape to a length of 2 inches and secure tube with tape by placing the intact end of the tape over the bridge of the nose. Wrap split ends around the tube as it exits the nose.
 - Place a rubber band, using a slip knot, around the exposed tube (12–18 inches from nose toward chest); after x-ray, pin rubber band to client's gown.
15. Instruct client about movements that can dislodge the tube.
 16. Gastric decompression:
 - Remove syringe from free end of tube and connect tube to suction tubing; set machine on type of suction and pressure as prescribed.
 - Levine tubes are connected to intermittent low pressure.
 - Salem sump or Anderson's tube is connected to continuous low suction.
 - Observe nature and amount of gastric tube drainage.
 - Assess client for nausea, vomiting, and abdominal distention.
 17. Provide oral hygiene and cleanse nares with a tissue.
 18. Remove gloves, dispose of contaminated materials in proper container, and wash hands.
- Prevents trauma to nasal mucosa by reducing pressure on nares.
 - Allows client movement without causing friction on nares; metal devices are removed for x-rays to prevent artifacts.
15. Reduces anxiety and teaches client how to prevent tugging on tube with head movement.
 16. Provides for decompression as prescribed by physician; intermittent or continuous suctioning is determined by type of tube inserted.
- Provides information about patency of tube and gastric contents.
 - Indicates effectiveness of intervention.
17. Promotes comfort.
 18. Reduces transmission of microorganisms; protects other workers from coming into contact with objects contaminated with body fluids.

(continues)

PROCEDURE 38-1

Inserting a Nasogastric or Nasointestinal Tube for Suction and Enteral Feedings (continued)

<i>Action</i>	<i>Rationale</i>
19. Position client for comfort, and place call light in easy reach.	19. Promotes comfort and safety.
20. Document: <ul style="list-style-type: none"> • The reason for the tube insertion • The type of tube inserted • The type (intermittent or continuous) of suctioning and pressure setting • The nature and amount of aspirate and drainage • The client's tolerance of the procedure • The effectiveness of the intervention, such as nausea relieved 	20. Promotes continuity of care and shows implementation of intervention.
Insertion of a Small-Bore Feeding Tube	
21. Repeat steps 1 through 8 as stated earlier.	21. See steps 1 through 8.
22. Open adapter cap on tube, snap off end of water vial, and inject water into feeding tube adapter.	22. Activates Keolube lubricant in tube's lumen.
23. Close adapter cap.	23. Ensures a tight fit so water does not leak from adapter site.
24. Check that stylet does not protrude through holes in feeding tube; adjust as necessary.	24. Prevents mucosa trauma.
25. Repeat steps 9 through 12 as stated earlier.	25. See steps 9 through 12.
26. Check placement of tube: <ul style="list-style-type: none"> • Aspirate gastric contents with Luerlock syringe; see Figure 38-19. • Measure pH of aspirate with chemstrip pH. 	26. Assures correct placement has been achieved; provides measurement of pH of secretions, as explained in step 13. <i>Note:</i> May not be able to aspirate contents from small bore tubes.



Figure 38-19 Aspirating Gastric Contents with Luerlock Syringe with Stylet in Place

(continues)

PROCEDURE 38-1

Inserting a Nasogastric or Nasointestinal Tube for Suction and Enteral Feedings (continued)

Action

27. Leave stylet in place until x-ray confirms that placement in case tube needs to be advanced into the duodenum or jejunum.
28. Obtain x-ray. Remove stylet from feeding tube after x-ray, and plug open end of tube until feeding.
29. Repeat steps 17 through 20.
30. Replace small-bore tube every 3 to 4 weeks.

Rationale

27. Provides a safety measure. See the Nursing Alert on small-bore feeding tubes on p. 1165.
28. Confirms placement of tube prior to instilling formula; prevents gastric juices from seeping out of the tube.
29. See steps 17 through 20.
30. Prevents obstruction and sepsis of small-bore tubes.

PROCEDURE 38-2

Administering Enteral Tube Feedings

Equipment

- | | |
|--|------------------------------------|
| ■ Asepto syringe or 20- to 50-ml syringe | ■ Emesis basin |
| ■ Clean towel | ■ Disposable gavage bag and tubing |
| ■ Formula | ■ Infusion pump for feeding tube |
| ■ Water to follow feeding | ■ Nonsterile gloves |

Action

1. Review client's medical record.
2. Gather equipment.
3. Check client's armband.
4. Explain procedure to client.
5. Assemble equipment. If using a bag, fill with prescribed amount of formula.

Rationale

1. Verifies physician's prescription for appropriate formula and amount.
2. Promotes efficiency during procedure.
3. Verifies correct client.
4. Reduces anxiety and increases client cooperation.
5. Ensures efficiency when initiating feeding.



Figure 38-20 Preparing Formula

(continues)

PROCEDURE 38-2

Administering Enteral Tube Feedings (continued)

<i>Action</i>	<i>Rationale</i>
<ol style="list-style-type: none"> 6. Place client on right side in high Fowler's position. 7. Wash hands and don nonsterile gloves. 8. Provide for privacy. 9. Observe for abdominal distention; auscultate for bowel sounds. 10. Check feeding tube: Insert syringe into adapter port, aspirate stomach contents, and determine amount of gastric residual. <ul style="list-style-type: none"> • If residual is greater than 50 to 100 ml (or in accordance with agency protocol), hold feeding until residual diminishes. • Instill aspirated contents back into feeding tube. 11. Administer tube feeding: 	<ol style="list-style-type: none"> 6. Reduces risk of pulmonary aspiration in event client vomits or regurgitates formula. 7. Reduces transmission of pathogens from gastric contents. 8. Places client at ease. 9. Assesses for delayed gastric emptying; indicates presence of peristalsis and ability of GI tract to digest nutrients. 10. Indicates whether gastric emptying is delayed. <ul style="list-style-type: none"> • Reduces risk of regurgitation and pulmonary aspiration related to gastric distention. • Prevents electrolyte imbalance. 11. Provides nutrients as prescribed.
Intermittent—Bolus	
<ul style="list-style-type: none"> • Pinch the tubing. • Remove plunger from barrel of syringe and attach to adapter. • Fill syringe with formula; see Figure 38-21. • Allow formula to infuse slowly; continue adding formula to syringe until prescribed amount has been administered. • Flush tubing with 30 to 60 ml or prescribed amount of water. 	<ul style="list-style-type: none"> • Prevents air from entering tubing. • Provides system to delivery feeding. • Allows gravity to control flow rate, reducing risk of diarrhea from bolus feeding. • Prevents air from entering stomach and reduces risk for gas accumulation. • Maintains patency of feeding tube.



Figure 38-21 Adding Formula to Nasogastric Tube

(continues)

PROCEDURE 38-2

Administering Enteral Tube Feedings (continued)

<i>Action</i>	<i>Rationale</i>
Intermittent—Gavage Feeding	
<ul style="list-style-type: none"> • Hang bag on IV pole so that it is 18 inches above the client's head. • Remove air from bag's tubing. • Attach distal end of tubing to feeding tube adapter and adjust drip to infuse over prescribed time. • When bag empties of formula, add 30 to 60 ml or prescribed amount of water; close clamp. • Change gavage bag every 24 hours or wash reusable gavage bag with soap and hot water every 24 hours. 	<ul style="list-style-type: none"> • Allows gravity to promote infusion of formula. • Prevents air from entering stomach. • Decreases risk of diarrhea. • Ensures that remaining formula in tubing is administered and maintains patency of tube; prevents air from entering the stomach. • Decreases risk of multiplication of microorganisms in bag and tubing.
Continuous Gavage	
<ul style="list-style-type: none"> • Check tube placement at least every 4 hours. • Check residual at least every 8 hours. • If residual is above 100 ml, stop feeding. • Add prescribed amount of formula to bag for a 4-hour period; dilute with water if prescribed. • Hang gavage bag on IV pole. • Prime tubing. • Thread tubing through feeding pump and attach distal end of tubing to feeding tube adapter; keep tubing straight between bag and pump. • Adjust drip rate. • Monitor infusion rate and signs of respiratory distress or diarrhea. • Flush tube with water every 4 hours as prescribed or following administration of medications. • Replace disposable feeding bag at least every 24 hours, in accord with agency's protocol. • Turn client every 2 hours. • Provide oral hygiene every 2 to 4 hours. 	<ul style="list-style-type: none"> • Ensures that feeding tube remains in stomach. • Indicates ability of GI tract to digest and absorb nutrients. • Reduces risk of regurgitation and pulmonary aspiration related to gastric distention. • Provides client with prescribed nutrients and prevents bacterial growth (formula is easily contaminated). • Removes air from tubing. • Provides for controlled flow rate; prevents loops in tubing. • Infuses formula over prescribed time. • Prevents complications associated with continuous gavage. • Maintains patency of tube. • Decreases risks of microorganisms. • Promotes digestion and reduces skin breakdown. • Provides comfort and maintains the integrity of buccal cavity.

(continues)

PROCEDURE 38-2

Administering Enteral Tube Feedings (continued)

Action	Rationale
12. Administer water as prescribed with and between feedings.	12. Ensures adequate hydration.
13. Clamp proximal end of feeding tube after formula has been administered.	13. Prevents air from entering the tube.
14. Remove gloves and wash hands.	14. Reduces risk of transmission of microorganisms.
15. Record total amount of formula and water administered on I&O form and client's response to feeding.	15. Documents administration of feeding and achievement of expected outcome; for example, client tolerates feeding and weight is maintained or increased.

BASIC TYPES OF FORMULAS

- *Isotonic formula* contains proteins, fats, and carbohydrates with a high molecular weight and an osmolality equal to that of the body (300 mOsm). Isocal and Osmolite are isotonic formulas that supply 1 kcal/ml and are lactose-free.
- *Elemental (monomeric) formula* contains monosaccharides and amino acids with minimal triglyceride content in hypertonic concentrations. Vivonex and Vivonex HN are elemental formulas that supply 1 kcal/ml; they are started at half strength or less and gradually increased to full strength due to their hypertonic concentration.
- *Fluid restriction formula* contains a highly concentrated source of kilocalories (2 kcal/ml). Magnacal is a fluid restriction formula that is started at half strength or less and gradually increased to full strength due to the hypertonic concentration.

Safety Considerations

Clients receiving EN through a feeding tube are at risk for aspiration. The prevalence of tube placement errors, as reported in the literature, varies from 1.3% to 50% in adults (Cirgin & Marsha, 1997). Tube feeding aspiration can result from several factors: displacement of the tube into the esophagus, large amounts of gastric residual, and lowered intestinal motility and delayed gastric emptying, which may occur in clients who are on bed rest or receiving narcotics for pain relief (Pratt & Tolbert, 1996). Auscultate for bowel sounds to determine gastric motility. If the bowel sounds are hypoactive or absent, stop or withhold additional feeding and notify the physician.

Always assess placement of the feeding tube before administering any liquids. Clients who are receiving continuous gastric feeding should be assessed every 4 hours for tube placement and residual gastric contents. Aspirate gastric contents with a syringe. This is done

more easily with a large-bore tube than a small-bore tube. The lumen of a small-bore tube collapses easily, making aspiration difficult and sometimes impossible. Observe and check the pH of the aspirate as explained in Procedure 38-1; refer to the Research Focus. Replace stomach contents after checking the residual to prevent fluid and electrolyte imbalance.

Another way of determining tube placement is to visually examine the aspirate; refer to the accompanying display. If the pleural aspirates contain blood, they will fail to show their normal characteristics.

Client safety and comfort require daily cleansing of the feeding tube's exit site. Cleanse the skin with a clean washcloth, soap, and water. Nasal feeding tubes require daily removal of the tape from the nose, cleansing, and inspection of the skin for irritation, inflammation, and infection and the nares for erosions, ulcers, or abscesses.

CHARACTERISTICS OF ASPIRATES

Gastric Aspirates

Cloudy and green, tan or off-white, or bloody or brown (fresh or old blood)

Intestinal Aspirates

Basically clear and yellow to bile-colored

Pleural Aspirates

Tan or off-white mucus, may be pale yellow and serous (indicating blood)

NURSING ALERT

Gastric Resection

Never insert, manipulate, or remove a nasogastric tube on gastric resection clients; *the suture line could easily be interrupted, causing hemorrhage.*



RESEARCH FOCUS

Title of Study

“pH and Concentration of Bilirubin in Feeding Tube Aspirates as Predictors of Tube Placement”

Authors

Metheny, N. A., Stewart, B. J., Smith, L., Yan, H., Diebold, M., & Clouse, R. E.

Purpose

This is a descriptive study to correctly predict feeding tube placement based on pH and the concentration of bilirubin in feeding tube aspirates.

Methods

Over a 3-year period, a total of 587 samples were collected and analyzed for concurrent pH and bilirubin from adult clients in a variety of acute care settings. A total of 437 gastrointestinal samples were obtained for pH and bilirubin testing from newly inserted small-bore feeding tubes; 125 tracheobronchial secretions were obtained by suctioning clients with artificial airways, and 24 pleural fluid samples were obtained at the time of thoracenteses to provide additional respiratory samples. Certain clients were excluded from the study based on previous gastric surgery or trauma, oral or tube-administered medications prior to sample collection, and samples that were grossly bloody. Data from the pH and bilirubin tests were compared with tube location as determined by radiography.

Findings

Samples from concurrent pH and bilirubin testing could significantly decrease the number of x-rays needed to exclude respiratory placement and to distinguish between gastric and intestinal placement.

Implications

The professional nurse needs quantifiable methods at the bedside to determine placement of feeding tubes. Although the pH is measurable at the bedside, research needs to address a clinical laboratory testing product for measuring bilirubin content in gastrointestinal and respiratory aspirates at the bedside.

Metheny, N. A., Stewart, B. J., Smith, L., Yan, H., Diebold, M., & Clouse, R. E. (1999). pH and concentration of bilirubin in feeding tube aspirates as predictors of tube placement. *Nursing Research*, 48(4), 189–197.

Enterostomy tubes require surgical asepsis of the exit site until the incision heals; rotate the tubes within the stoma to promote healing. Report any observations of redness, irritation, or gastric leakage at the site. Once the stoma has healed, the tube can be removed and reinserted for each feeding. Between feedings, a prosthetic device may be used to cover the ostomy opening.

PEG tubes require daily rotation to relieve pressure on the skin. Notify the physician if you are unable to rotate the PEG; it may be an indication of internal embedding of the tube into the gastric wall. When the tube is internally embedded, it can cause gastric acid reflux, which results in skin breakdown, sepsis, and cellulitis. Care must be taken to avoid dislodgment of the tube. Keep it secured to the client’s abdomen with tape, being careful not to use excessive tension. PEG tubes require frequent flushing to prevent clogging. These tubes have small lumens. If a tube becomes clogged, flush it with 60 ml of lukewarm tap water.

APPLICATION: HOME CARE

Clients with feeding tubes may be discharged to the home. The NST evaluates these clients to determine:

- Ability to meet nutrient requirements orally
- Clinical status relative to home discharge
- Tolerance of prescribed nutritional therapy
- Willingness and ability to perform the necessary tasks of tube feeding
- Benefits of continuing therapy at home

The NST works with the client and caregiver to secure the necessary supplies prior to discharge from the hospital. Clients on home feedings require monitoring by nurses and nutritional support specialists who are familiar with the procedure and complications of enteral tube feeding.

Potential Complications

Clients receiving EN need to be monitored closely to prevent complications. The nurse should perform the following actions:

1. Assess the client for signs of gastric retention: nausea, vomiting, and cramping. Palpate the abdomen for distention; auscultate for bowel sounds with a stethoscope; and aspirate the gastric contents every 4 hours. If the aspirate exceeds 100 ml in a 4-hour period or if bowel sounds are absent (indicating an ileus), discontinue the feeding and notify the physician. *Do not remove the feeding tube.*
2. Monitor the feeding tube placement every 4 hours by checking for any coils or kinks in the back of the throat and measuring the length of tubing outside the body.
3. Assess the client for pulmonary aspiration by checking the gag reflex. If the reflex is absent, suction the client.

Discontinue the feeding and remove the tube if signs of respiratory distress are present and notify the physician.

4. Keep the client in a high Fowler's position to prevent aspiration if vomiting should occur. If vomiting does occur, suction client immediately and assess the formula amount and rate at which it was given.
5. Dilute feedings to half strength and slow the feeding time to prevent diarrhea.
6. To maintain or achieve patency of gastric and/or jejunostomy feeding tubes, a medical device called a DeClogger may be used as prescribed by the client's physician to maintain the patency of these tubes.

Teach the client and caregiver how to monitor for complications prior to discharge for home treatment. The client and caregiver should be given the opportunity to practice these assessment measures and demonstrate competency in performing the actual procedures.



NURSING CHECKLIST

Use of a DeClogger

1. Gather equipment: towel, receptacle for used items, nonsterile gloves, appropriate size DeClogger that corresponds to the size of the feeding tube as prescribed by the physician.
2. Verify the health care practitioner's prescription.
3. Review the agency's policy.
4. Check the client's armband, and explain the procedure.
5. Provide for privacy.
6. Wash hands.
7. Turn the enteral feeding pump to the PAUSE mode; if feeding to gravity, clamp the tubing.
8. Don nonsterile gloves.
9. Place the clean towel under the tube to protect the bed linens.
10. Disconnect tubing, and place cap on delivery tube to prevent contamination.
11. Attempt to flush tube with 30–60 cc of water.
12. Gently insert the appropriate size DeClogger into the opening of the tube.
13. Slowly rotate the DeClogger in a clockwise fashion until the stop disc meets the opening of the tube.
14. To remove, slowly rotate the DeClogger in a counter-clockwise fashion as you pull back on the device.
15. Flush the feeding tube with 30–60 cc of water.
16. Reconnect the delivery tube, and restart enteral feedings.
17. Discard the DeClogger into the receptacle, remove gloves, place in receptacle, and dispose of receptacle in accord with agency policy.
18. Wash hands, and document procedure in the client's medical record.



NURSING CHECKLIST

Removal of a Nasogastric Tube

1. Gather equipment: tube plug or clamp, towel, washcloth, paper towel, receptacle for contaminated items, and nonsterile gloves.
2. Verify the physician's prescription.
3. Check the client's armband and explain the procedure.
4. Provide for privacy.
5. Wash hands and don gloves.
6. Place the client in a high Fowler's position and adjust the height of the bed to a comfortable working position.
7. Place the towel across the client's chest.
8. Clamp or plug the tube and unpin the tube from client's gown.
9. Remove the tape securing the tube from the client's nose.
10. Hold the paper towel open in your nondominant hand under the client's chin; with your dominant hand, grasp and pinch the tube near the nostril, and remove the tube with a steady, continuous pull, allowing the tube to fall into the paper towel.
11. Dispose of the tube and paper towel in the receptacle.
12. Clean the client's nares and provide oral hygiene.
13. Position the client comfortably, place call light in easy reach, and return bed to a low position.
14. Remove gloves, place in receptacle, and dispose of receptacle in accord with agency policy.
15. Wash hands and document procedure in the client's medical record.

Removal of a Nasogastric Tube

When the physician determines that the client's nutritional status no longer warrants EN therapy or the need to provide decompression of the gastric contents, the nasogastric tube is removed; refer to the nursing checklist. If the client is connected to suction for decompression, the physician may prescribe clamping the tubing for several hours prior to removal, to ensure a functioning GI tract.

Providing Parenteral Nutrition

Parenteral nutrition is the infusion of a solution directly into a vein to meet the client's daily nutritional requirements. Formerly called hyperalimentation, it is frequently referred to as **total parenteral nutrition (TPN)**, the intravenous infusion of a solution containing

Nursing Process Highlight

IMPLEMENTATION

Malnourished clients are prone to infections because their immune systems have been compromised. EN and PN provide a positive medium for potential growth of microorganisms. To decrease the risk of infection, institute the following nursing measures:

1. Verify placement of feeding line prior to administration of liquids.
2. Administer nutrients in accordance with the prescribed time interval.
3. Add small quantities of enteral formula to the bag.
4. Wash reusable EN feeding bag with warm water and soap after each use, at least every 24 hours.
5. Keep PN refrigerated; remove from refrigerator 30 minutes prior to administration.
6. Change EN and PN tubing every 24 hours.

dextrose, amino acids, fats, essential fatty acids, vitamins, and minerals. Other terms used interchangeably with *TPN* are *3 in 1* (dextrose, amino acids, and fats) and *total nutrient admixtures* (TNA).

PN is used to treat malnourished clients or clients who have the potential for becoming malnourished and who are not candidates for enteral support. PN can be prescribed for either short-term or long-term use, as previously discussed in the decision algorithm (Figure 38-15).

The type of device used for the PN therapy is determined by the duration of the therapy and the osmolality of the solution. Peripheral parenteral nutrition (PPN) is used for short-term treatment to deliver isotonic or mildly hypertonic solutions into a peripheral vein; the volume is usually limited to between 2,000 and 3,000 ml/day, providing a caloric value of about 2,000 kcal/day.

Central parenteral nutrition (CPN) is used for long-term therapy to infuse highly hypertonic solutions directly into the superior vena cava. The delivery of highly hypertonic solutions into peripheral veins can cause sclerosis, phlebitis, or swelling; refer to Chapter 37 for a complete discussion of intravenous therapy complications. Specific client populations that benefit from PPN or TPN are described in the accompanying display.

Components of Parenteral Nutrition

PN solutions are predigested or chemically prepared nutrients that can be administered singly or as admixtures. The basic components of PN are:

1. Carbohydrates, primarily in the form of monohydrous glucose, ranging from 5% solution for PPN to 50% to 70% hypertonic solution for CPN; provides the client with 60% to 70% of caloric (energy) needs.
2. Amino acids, in the form of synthetic crystalline amino acid solutions; provides 5% to 15% of the total calories (CPN solutions contain sufficient amino acids for tissue synthesis).
3. Lipid (fat emulsions), prepared from safflower and soybean oil with egg phospholipids; supply up to 30% of the client's caloric (energy) intake; additional lipid emulsions and glucose or amino acids provide for a TNA isotonic solution.

Other ingredients, called admixtures, provide for the client's biochemical needs (electrolytes, vitamins, and trace elements such as zinc, selenium, chromium, magnesium, iodine, copper, iron, and molybdenum).

Medications, such as heparin, may also be added to the TPN solution. Heparin is commonly added to reduce the buildup of a fibrinous clot at the catheter's tip. When the TPN catheter is the only available venous access, TPN may be used to deliver antibiotics. The TPN solution should be prepared only by a pharmacist using sterile technique and a laminar flow hood to reduce the risk of contamination.

CANDIDATES FOR PPN OR CPN THERAPY

Short-Term (up to 2 weeks) PPN

1. Preoperative for severely depleted clients
2. Postoperative for abdominal surgery clients who have been NPO for several days because of an ileus
3. Inflamed or ulcerated bowel needing 1 or more weeks of rest: acute exacerbations of Crohn's disease and colitis, radiation enteritis, acute or necrotizing pancreatitis, or an enterocutaneous or high-output fistula
4. Congenital anomalies before surgical repair: intestinal obstruction, tracheo-esophageal fistula, midgut malrotation, volvulus, and omphacele
5. Short-bowel syndrome: small-bowel resection of 75% or more to control diarrhea and prevent dehydration and malnutrition
6. Cancer clients receiving chemotherapy or radiation therapy

Long-Term (greater than 2 weeks) CPN

1. Hyperemesis gravidarum
2. Low-birthweight neonates
3. Failure to thrive
4. Intractable diarrhea
5. Severely burned clients

**NURSING CHECKLIST****Interventions for Client Receiving TPN**

1. Monitor weight: baseline and daily weight for 1 week and twice a week thereafter. The ideal weight gain for a client is 1 pound per week. Rapid weight gain may be indicative of fluid overload; monitor such a client for peripheral and pulmonary edema.
2. Monitor I&O: record daily intake and output and compare these data with the client's weight. Closely monitor the infusion rate with an infusion pump (preferably a volumetric pump for the greatest accuracy).
3. Monitor biochemical lab values:
 - Electrolytes, especially magnesium and calcium, if these have been added to the PN solution, day 1 and once a week thereafter while on PN. With severely malnourished clients, observe for "refeeding syndrome" (a rapid drop in potassium, magnesium, and phosphate serum levels). Initiate feeding slowly to avoid cardiac overload.
 - Pre-albumin serum levels: check on day 1 and once a week while on PN. In clients who are severely dehydrated, the albumin levels may drop initially as treatment restores hydration.
 - Glucose (capillary): check every 6 hours for the first week, then once daily while on PN. Monitor for signs of hyperglycemia (thirst and oliguria) and confirm weekly blood glucose meter levels with laboratory tests.
 - Bleeding indices (PT) on day 1 and once a week while on PN, indicated for clients receiving heparin therapy.
 - Liver function tests, especially enzymes, bilirubin, triglycerides, and cholesterol on day 1 and once a week for clients on PN with lipids; abnormal values may indicate an intolerance to or an excess in lipid emulsions or problems with the metabolism with glucose and protein.
 - Renal function tests, especially blood urea nitrogen and creatinine and a 24-hour urinary urea nitrogen, days 2–5; abnormal values indicate an excess of amino acids.
 - Transferrin should be measured on day one and every 2 weeks thereafter.
4. Administer solution with an IV tubing filter to remove crystals from the solution, vent air, and trap microorganisms.
5. Change IV tubing, using aseptic technique, as indicated by the agency's protocol; most infection control guidelines recommend changing the tubing every 24 hours.
6. Use a volumetric pump to ensure accurate infusion rates.

**NURSING CHECKLIST****Interventions for Client Receiving TPN (continued)**

7. Monitor for common complications of PN therapy:
 - Phlebitis or thrombosis at the IV site, as indicated by tenderness and redness
 - Catheter tip sepsis, as indicated by fever and other signs and symptoms of sepsis
 - Liver, renal, and metabolic complications (as discussed in monitoring the biochemical laboratory values)
8. Wean the client from PN, documenting the dietary intake of total calories and protein.
9. Teach the client and the caregiver about the management of PN therapy and arrange for a home health care consult; if possible, have the home health nurse consult with the client while the client is still in the hospital, to promote continuity of care.

THINK ABOUT IT**Withholding NS**

The obligation to promote the good of the patient is basic to being a health care provider and is part of each professional's duty to the patient. This obligation underlies the requirement to evaluate the benefits and burdens of a treatment from the patient's perspective.

When and by whom should a decision be made to withhold or withdraw nutritional support in the absence of an advance directive? Consider the benefits to the clients and the burdens nutritional support places on the client, family, and caregiver.

NURSING ALERT**Egg Allergy**

Clients with a known egg allergy should not receive TPN with lipid emulsions.

NURSING ALERT**Quality Controls**

It is the responsibility of the nurse to perform daily equipment quality controls to ensure that the volume is being delivered as indicated by the setting on the infusion pump. *If the pump fails and delivers the wrong amount of fluid, the nurse is responsible.*

Administering Medication through a Feeding Tube

Refer to agency protocol regarding medication administration and contraindications. Feeding tubes with a double lumen have two separate ports; read the manufacturer's instructions to determine which port to use to administer the medication. Administering medications through the wrong port may cause the tube to clog.

Check for tube placement, clear the tubing of formula, and check the patency of the tube by flushing it with water before administering the medication. It is advisable to use the liquid form of any medications when possible. After administering each medication, flush the port to prevent clogging. Measure the aspirates removed, all liquids instilled into the tube, and the water used for flushing and medications, and record them on the client's intake and output record. Refer to Chapter 29 for additional information on administering medication through a feeding tube.

Complementary Therapy

Holistic nursing recognizes wellness as a state of harmony among mind, body, and spirit. To nourish means to provide that which is necessary for life, health, and growth; to nourish also means to cherish, to strengthen, and to promote (Jackson, 2000). Nourishment encourages expansion and growth, supporting each being as unique, whole, and individual. The following discussion provides a broad perspective regarding the use of nutrients in complementary therapies and how herbal medicine incorporates certain plants for their specific properties in order to treat digestive symptoms/diseases.

APPLICATION: HOME CARE

Client assessment for home parenteral nutrition (HPN) should consider the physical, psychosocial, and financial resources of the client and the caregiver. Maintaining a client on HPN is challenging because of the expense, technology, and required changes in lifestyle. When the PN is prescribed daily, it is usually administered overnight to minimize disruption to the client's lifestyle. Home health nurses should visit the client daily until the client and caregiver demonstrate proficiency in handling the equipment and maintaining aseptic technique.

Clients receiving PN in the home environment require close monitoring to prevent catheter sepsis and cardiac overload. The PN solution should be administered with a volumetric infusion pump. If the home does not have air conditioning to maintain the proper temperature of the solution during infusion, the solution can be divided into two bags. The second bag can be refrigerated while the first bag is infusing. The same schedule is followed for monitoring the biochemical effectiveness of PN, as discussed above for the hospitalized client.

Although there are numerous types of complementary therapies, they all integrate, to some degree, nutrition as part of their therapeutic regimen. Diet and nutrition are used by many alternative modalities for the prevention and treatment of chronic diseases:

1. *Ayurvedic Medicine*, India's ancient system of healing, treats the whole person with diet, nutrition, and lifestyle recommendations to promote health and spiritual development.
2. *Traditional Chinese Medicine*, one of the oldest systems of healing, incorporates acupuncture, Chinese herbs, massage, food therapy, exercise, and lifestyle changes into prevention and treatment.
3. *Chiropractic Medicine*, an American heritage, relies on a sound nutritional program as adjunct therapy to support the body's inherent ability to heal itself by reestablishing an unobstructed flow of nerve impulses between the brain and the rest of the body.
4. *Naturopathic Medicine*, an ancient form of healing that was formalized in America into a system of preventive and restorative treatments around the early 1900s, uses clinical nutrition as a main cornerstone of therapy to achieve and maintain health.
5. *Osteopathic Medicine*, founded by Dr. Andrew Taylor Still, a medical surgeon for the Union Army during the Civil War, integrates into conventional medicine nutritional recommendations for prevention. For example, to prevent coronary heart disease, a diet low in saturated fats is combined with antioxidants (vitamins C, A, and E) to help prevent free radical formation, thus preventing tissue breakdown as well as the accumulation of plaque in the arteries.
6. *Herbal Medicine* recognizes food as medicine, ensuring that the unique healing properties of specific herbs have a direct effect upon tissue. The healing effect is through direct contact with the tissue and the effects caused by the metabolism and absorption of the chemicals present in the various plants. Based on a holistic context, herbal medicine recognizes that true healing must involve all dimensions of the person to change whatever dietary indiscretions exist as well as to make other adjustments in one's lifestyle.

Many herbal products are available in various forms such as teas, extracts, capsules, and tablets to provide nutrients that nourish our bodies and relieve digestive symptoms. The following discussion addresses the digestive and nondigestive actions of certain herbs: bitters, chamomile, dandelion, peppermint, rosemary, and slippery elm.

Bitters is a term used to describe a group of herbs that have a bitter taste. The taste of bitterness on the tongue sends a message to the brain through the nervous system to stimulate the secretion and activity of the esophagus, and the secretions of the stomach, duodenum, and gallbladder, and to stimulate the production of insulin by the pancreas. The bitterness promotes appetite and in a complex way aids digestion. Bitter

NURSING CARE PLAN**Client with Imbalanced Nutrition:
More Than Body Requirements****Case Presentation**

Mrs. Jones, age 55, was diagnosed 2 years ago with type II (non-insulin-dependent) diabetes. She is being seen in the clinic for her 6-month visit. She says, “I hardly have the energy to get up and dress in the morning. I am thirsty all day and awaken several times during the night, having to go to the bathroom.” She does not work and hasn’t been involved in community activities for the past 5 years since her youngest child graduated from high school. Her daily routine involves cooking for her husband and brother, reading, and watching the TV for 6–8 hours. She loves to bake fresh breads and pastry. She has a history of obesity and does not exercise. She says, “I eat because I have nothing else to do.”

Assessment

- Weight, 80.6 kg
- Height, 5’4”
- Triceps skinfold, 28 mm
- Elevated blood glucose
- Weight gain, 3.6 kg
- Sedentary lifestyle
- Eats in response to boredom

Nursing Diagnosis

Imbalanced Nutrition: More Than Body Requirements, related to excess intake of high-calorie foods, eating in response to boredom, and sedentary lifestyle.

Expected Outcomes

The client will

1. Verbalize factors contributing to excess weight
2. Lose 1–2 lbs/week while eating well-balanced meals
3. Engage in 20–30 minutes of exercise 3 times a week
4. Explore outside interests to decrease boredom and increase feeling of self-worth

Interventions/Rationales

1. Conduct a dietary history, using open-ended statements to assist client in exploring psychological factors that may contribute to eating.
Nonjudgmental approach to acquiring information will encourage client trust and honesty.
2. Adapt eating habits to decrease amount of intake (smaller servings, taking small bites and chewing each bite 12 times, putting the fork on the plate between bites, drinking water with meals, eating only at mealtime, chewing sugar-free gum when watching TV).
Healthy eating habits and tips on recognizing fullness during a meal will help the client eat to satisfy hunger, not boredom.
3. Assess client’s motivation to lose weight.
Having client’s support for care plan will influence success.
4. Discuss risk factors and symptoms (thirst and urination) of diabetes.
Client understanding of her disease may increase motivation to manage it.
5. Instruct client to maintain a daily dietary intake log: time, type, and amount.
Helps client recognize her eating patterns and note healthy and unhealthy behaviors.
6. Provide with dietary materials, review the Food Pyramid and Diabetic Exchange List; plan with client an 1800-kilocalorie diet for a week, taking into consideration food preferences.
Ensures client has information necessary to plan healthy meals within recommended guidelines.
7. Return visit with nurse in one week. Monitor progress and assess plan of care. Review with client age-appropriate exercises; emphasize need for daily walking.
Changing sedentary lifestyle will increase self-esteem, burn calories, and increase energy level.
8. Review with client community and church interests outside the home, unrelated to cooking and eating.
Helps client focus on activities not involving food to decrease boredom and to increase self-esteem. (continues)

NURSING CARE PLAN**Client with Imbalanced Nutrition:
More Than Body Requirements (continued)****Evaluation**

The client verbalized boredom as the main reason for eating; she said, “I have nothing else to do with the children gone, except cook and eat.”

On return visit, the client reported drinking water with meals, chewing her food slowly, and chewing gum while watching TV.

Make clinic appointment; client has phone number of the nurse and dietitian to answer questions;

1800-kilocalorie meal plan made for one week.

On return visit, the client was found to have lost 1.8 lbs.

On return visit, the client indicated that she now walks to the store 4–5 times a week (40 minutes round trip).

The client reported on return visit that she is now volunteering 2 hours 3 times a week at the church’s child care center.

Nursing Process Highlight**IMPLEMENTATION**

Planning interventions to assist clients with their nutritional problems requires consideration of the specific contributing factors, food preferences and beliefs, and chronic conditions related to the problem. Changing eating patterns requires client motivation and desire to change. No one can make another person change his or her behavior, but nurses can assist their clients with the “why” and “how” regarding change. Reinforce all positive changes.

herbs are considered digestive stimulants because they stimulate various parts of the digestive system to increase or improve digestive activity. The most valuable bitter herbs are barberry, centaury, gentian root, golden seal, mugwort, white horehound, and wormwood (Hoffmann, 1998).

Chamomile contains calcium, essential oils, iron, magnesium, manganese, potassium, tannic acid, vitamin A, apigenin (a sedative compound), and other nutritive ingredients. Chamomile possesses the following actions: anti-inflammatory, appetite stimulant, digestive aid, diuretic, nerve tonic, and sleep aid. Traditionally, Chamomile is used for stress and anxiety, indigestion, and insomnia, and it is often used to treat colitis, diverticulosis, fever, headaches, and pain. It is effective as a gargle or mouthwash for treating gingivitis. *Caution:* This herb should not be taken over long periods of time, as it may lead to a ragweed allergy; it should not be used by those who are allergic to ragweed (Balch & Balch, 1997).

Dandelion leaves and roots are high in iron, manganese, phosphorus, protein, aluminum, and vitamin A with trace amounts of calcium, chromium, niacin, riboflavin, silicon, zinc, and vitamin C. It is a potent digestive tonic that may be used in conditions that affect the gastrointestinal tract such as heartburn, gas, gastroesophageal reflux, and constipation. Dandelion has a toning effect on the liver, gallbladder, and pancreas, providing relief from gallstones or gallbladder attacks, as well as diabetes and hypoglycemia. Dandelion is considered safe and may be taken as often as needed. *Caution:* Due to its laxative effects, large sudden intake may result in diarrhea; start with smaller doses and gradually increase over time.

Peppermint contains essential oils, tannic acid, vitamin C, and other ingredients. It is one of the best carminative agents (stimulates and soothes the digestive system, removes gas), and it enhances digestion by increasing stomach acidity. It is often recommended for chills, colic, diarrhea, headache, heart trouble, indigestion, nausea, poor appetite, rheumatism, and spasms. *Caution:* This herb may interfere with iron absorption.

Rosemary is often used as a natural food preservative because of its chemical and nutritive content. It is considered a circulatory and digestive bitter; it fights bacteria, relaxes the stomach and acts as a decongestant; it also helps prevent liver toxicity, and has anticancer and antitumor properties. It relieves intestinal colic, flatulent dyspepsia, headaches, high and low blood pressure, circulatory problems, and menstrual cramps, and it is used to treat ulcerative colitis, Crohn’s disease, and fevers, especially colds and influenza (Hoffmann, 1998; Balch & Balch, 1998).

Slippery elm bark contains calcium, phosphorus, polysaccharides, starch, tannins, and vitamin K. It soothes inflamed mucous membranes of the stomach, bowels, and urinary tract. It may be used to treat gastritis, gastric or duodenal ulcer, enteritis, colitis, diarrhea, and colds, flu, and sore throat.

NURSING CARE PLAN**Client with Imbalanced Nutrition:
Less Than Body Requirements****Case Presentation**

Jim, age 28, has been HIV-positive for 4.5 years. He went to the clinic complaining of diarrhea and cramping for 3 weeks and a burn wound on his right forearm that would not heal. He stated, “I do not have the energy to eat or get dressed.” The past month, he has eaten mainly bread, cereal, milk, and potatoes.

Assessment

- Weight loss
- Dry, scaly skin
- Pale conjunctiva
- Decreased Hbg, Hct, MCV
- Triceps skinfold, 7.2 mm
- Gingivitis
- Decreased Na, K, Fe, zinc
- Decreased serum albumin, pre-albumin, transferrin, nitrogen balance, zinc, and TLC; urine creatinine excretion

Nursing Diagnosis

Imbalanced Nutrition: Less Than Body Requirements, related to inability to absorb nutrients because of HIV enteropathy.

Expected Outcomes

The client will

1. Receive adequate nutrients to meet metabolic needs
2. Stabilize weight within 24–48 hr after initiation of TPN
3. Gain 0.25–0.5 kg/wk
4. Select a diet high in calcium, iron, protein, and calories

Interventions/Rationales

1. Weigh daily; record hourly I & O; Monitor q h BP, P, R rate, breath sounds, edema.
Monitors overall health status for changes, balance of fluid intake and output, and signs of deterioration.
2. NPO until diarrhea subsides; record frequency and consistency of stools (weight and measure).
As prescribed, monitors progression of diarrhea.
3. Administer TPN as ordered, implement TPN protocol.
Maintains calorie intake needs safely.
4. Monitor daily laboratory data: glucose, vitamins, minerals, trace elements, electrolytes; monitor pre-albumin and BUN every other day.
Assesses nutritional effect of TPN.
5. Mouth care every 2–4 hours to keep mucous membranes moist.
Provides for client comfort.
6. Collaborate with the nutritional support team for a progressive diet postdiarrhea, taking into consideration client’s food preferences.
Outlines appropriate diet; client is most likely to eat foods he prefers.
7. Offer small, frequent feedings.
Facilitates digestion and maintains constant energy levels.
8. Provide oral hygiene before and after meals.
Enhances taste sensation.
9. Assist the client with meals as needed. Provide rest periods 1 hour before and after meals.
Surrounds eating with quiet time to focus; improves digestion.

(continues)

NURSING CARE PLAN**Client with Imbalanced Nutrition:
Less Than Body Requirements (continued)**

10. Gradually wean the client off TPN as ordered.
Begin return to oral nutrition intake.
11. Monitor daily calorie count for 3 days and stool counts daily.
Gives indication of amount eaten versus amount excreted; monitors diarrhea.
12. Allow client to select food high in protein and calories.
Client involvement in diet planning increases compliance.
13. Administer drugs between meals.
Helps avoid nausea at mealtime.
14. Provide positive reinforcement for increased food intake and weight gain.
Helps client acknowledge progress; shows support for plan of care.
15. Assess the client's knowledge of the RDAs.
Current knowledge levels will determine learning needs.
16. Instruct the client on dietary planning based on the Food Guide Pyramid, as directed by the nutritional support team.
Client involvement in dietary planning increases likelihood of success.

Evaluation

Fluid intake and output balanced; diarrhea subsided in 24 hours; afebrile.

Laboratory values with normal limits 48 hours postadmission.

Weight stabilized in 48 hours, with the client tolerating clear liquids.

The client is unable to independently select foods to increase body weight; no nausea reported for routine scheduled medications.

The client was able to select food items as prescribed by the nutritional support team and gained 0.45 kg in 8 days.

THINK ABOUT IT**Assumptions and the Provision of Care**

Did you make any assumptions when you read the case presentation and nursing diagnosis? Did you assume that Jim was a homosexual? Were any data presented to substantiate that assumption? Jim's sexual preference would not have made any difference in how his care was planned, but could it have made a difference in how the nursing care was administered?

EVALUATION

Evaluation of nutritional therapy is ongoing. The nurse uses current data to measure the achievement of goals and outcomes; once they are achieved, the plan of care is revised accordingly. If goals are not met, the nurse should determine whether the nursing diagnosis was accurate or whether the nursing interventions were appropriate and the outcomes achievable.

The plan of care should be modified to maximize the client's response to therapy. For example, if the home health client states compliance with diet therapy to

maintain the HDL, LDL, and cholesterol levels within normal limits, but the values are not within normal limits, institute a food record to monitor cholesterol and fat intake for three consecutive days. Visit the client on the fourth day and review the record. Provide teaching as necessary to assist the client in changing eating patterns.

KEY CONCEPTS

- The metabolism of nutrients (carbohydrates, proteins, fats, vitamins, and minerals) plays an essential role in providing the body with the substances necessary for maintaining homeostasis.
- Most nutrients are absorbed in the small intestines through the processes of osmosis, diffusion, and active transport.
- The intracellular productions of energy from carbohydrates, proteins, and fats are interrelated and depend on other physiological processes, such as conversions that take place in the liver, glycolysis, Krebs cycle, and electron transport system.
- A calorie is the quantity of heat required to raise the temperature of 1 gram of water 1°C.
- There are six categories of nutrients: water, carbohydrates, proteins, fats, vitamins, and minerals.

- Carbohydrates have a protein-sparing action, based on a minimum daily ingestion of 50 to 100 grams (200–400 kcal).
- Proteins are essential for almost every bodily function, beginning with the genetic control of protein synthesis, cell function, and cell reproduction.
- Diets high in saturated fats are associated with an increased incidence of coronary heart disease.
- Low-density lipoproteins are responsible for the formation of atherosclerosis, which develops from a high blood plasma level of cholesterol and usually results from a diet high in saturated fats.
- Daily food guides assist healthy persons in meal planning.
- The recommended dietary allowance represents the dietary intake of essential nutrients by age category, inclusive of weight and height.
- The Food Guide Pyramid outlines the number of servings in each of the six food groups needed to maintain a healthy weight.
- Peer-group influence, social pressures, and other emotional stressors of adolescence may have a negative effect on eating habits, leading to obesity, fad diets, anorexia nervosa, and bulimia.
- Food preferences are usually developed in childhood, are modified throughout the life span, and are an expression of an individual's likes and dislikes.
- Malnutrition refers to alterations relative to inadequate intake, disorders of digestion or absorption, and overeating.
- Assessment includes three basic components: nutritional history, physical examination with anthropometric measurements, and diagnostic and laboratory data.
- Anthropometric measurements evaluate the client's calorie-energy expenditure balance, muscle mass, body fat, and protein reserves, based on height, weight, skinfold, and limb and girth circumferences.
- The blood urea nitrogen (BUN) is increased with severe dehydration, malnutrition, starvation, excessive protein intake, and, most commonly, in kidney disease.
- The nurse is responsible for understanding the client's metabolic needs and for making clinical judgments relative to nutritional outcomes.
- Therapeutic nutrition requires consideration of the client's total needs: cultural, socioeconomic, psychological, and physiological.
- Protein-energy malnutrition is the most common nutritional deficiency in hospitalized clients.
- Enteral and parenteral nutrition are two methods of delivering nutrition support in adult clients.
- Clients receiving PN in the home environment require close monitoring to prevent catheter sepsis and cardiac overload.

CRITICAL THINKING ACTIVITIES

1. Which mineral is important in the formation of collagen?
 - a. Calcium
 - b. Iron
 - c. Phosphorus
 - d. Zinc
2. Why does the body need dietary fiber?
3. Atherosclerosis may result from an excessive ingestion of which nutrient?
4. Which of the following produces a negative nitrogen balance?
 - (1) Fever
 - (2) Immobility
 - (3) Reducing diets
 - (4) Moderate exercise
 - a. 1 and 2
 - b. 1, 2, and 3
 - c. 1, 2, and 4
 - d. 4 only
5. Which of the following provides the best approach for assisting a client to change eating behaviors?
 - a. Explaining the functions of each of the nutrients
 - b. Relating the changes to the client's culture and lifestyle
 - c. Identifying those conditions that result from poor nutrition
 - d. Curtailing the kind and amount of food served at meals
6. What is the most accurate test to determine whether a person is overweight or obese?
 - a. Weight in relation to height
 - b. Body composition
 - c. Triceps skinfold measurement in millimeters
 - d. Waist size in centimeters
7. How frequently should you assess a client who is receiving a continuous tube feeding? What nursing measures are included in such an assessment?
8. Which of the following expected outcomes is most appropriate for a client receiving a nasogastric tube feeding?
 - a. Intake and output balance is maintained.
 - b. Insertion site remains free of infection.
 - c. Minimal residual is obtained from aspiration of stomach contents.
 - d. Nutritional needs are met for client who is unable to digest nutrients.
9. Which nursing actions should be instituted when a client with a continuous-feed nasogastric tube vomits?
10. What is the main advantage of CPN over PPN?

WEB RESOURCES

American Association of Diabetes Educators

www.aadenet.org

American Liver Foundation

www.liverfoundation.org

HerbalDave's Notebook

www.herbaldave.com

National Academy Press

www4.nationalacademies.org

The Holistic Haven

www.holistichaven.com

The Online Journal of Issues in Nursing

www.nursingworld.org/OJIN

Elimination



There are so many things we do, from treatments and antibiotics to laughter, prayer, and collaboration. Our purpose is to facilitate healing.

—Winslow (In Gray, Rayome, & Anson, 1995)

COMPETENCIES

1. Describe the normal urinary elimination process.
2. Explain age-related changes that affect elimination.
3. Assess the critical elements of urinary structures.
4. Relate the principles of asepsis to urinary catheterization.
5. Discuss normal bowel elimination.
6. Assess the critical elements of bowel function.
7. Describe the expected outcomes of nursing interventions that promote normal elimination.
8. Discuss nursing interventions for selected alterations in bowel function.

KEY
TERMS

bacteriuria	functional incontinence	stoma
constipation	hematuria	stool
defecation	hemorrhoids	stress urinary incontinence
detrusor muscle	impaction	urge urinary incontinence
diarrhea	instability incontinence	urinalysis
dysuria	nocturia	urinary incontinence
extraurethral incontinence	peristalsis	urinary retention
fecal incontinence	pyuria	voiding
flatulence	specific gravity	

Elimination patterns are essential to maintain health. The urinary and gastrointestinal systems together provide for the elimination of body wastes. The urinary system filters and excretes urine from the body, thereby maintaining fluid, electrolyte, and acid-base balance. Normal bowel function provides for the regular elimination of solid wastes.

During periods of stress and illness, clients experience alterations in elimination patterns. Nurses assess for changes, identify problems, and intervene to assist clients with maintaining proper elimination patterns. The nurse's role encompasses teaching clients self-care activities to promote independence and health.

PHYSIOLOGY OF ELIMINATION

The urinary system is composed of the kidneys, ureters, bladder, and urethra. The kidneys form the urine, the ureters carry urine to the bladder, the bladder acts as a reservoir for the urine, and the urethra is the passage-way for the urine to exit the body.

The gastrointestinal tract is composed of the stomach, small intestine, large intestine, and rectum. The small intestine absorbs nutrients, the large intestine absorbs fluids and the remaining nutrients, and the distal portion of the large intestine collects and stores the remaining solid waste until elimination occurs.

Urinary Elimination

The physiological mechanisms that govern urinary elimination are complex and not yet completely understood. Continence in the adult requires anatomic integrity of the urinary system, nervous control of the detrusor muscle, and a competent sphincter mechanism. **Urinary incontinence** occurs when abnormalities of one or more of these factors causes an uncontrolled loss of urine that produces social, physiological, or hygienic difficulties for the client.

Structures of the Urinary Tract

The urinary system is typically divided into upper and lower tracts. The upper urinary tract includes the kid-

neys, renal pelves, and ureters; the lower urinary tract includes the urinary bladder, urethra, and pelvic muscles (Figure 39-1).

Upper Urinary Tract

The kidneys are a pair of reddish brown, bean-shaped organs located in the retroperitoneal space, adjacent to vertebral bones T-12 to L-2. The right kidney lies slightly lower than the left because of the presence of the liver. The periphery of the kidney contains approximately 1 million nephrons; collectively this aspect of the organ is called the parenchyma. The hilus of the kidney (its convex surface) contains the renal pelvis and the ureters, which connect the kidneys and the bladder. The primary function of the kidney is to maintain internal homeostasis through filtration of the blood and production of urine. In addition, the kidney is an endocrine organ (producing erythropoietin, a hormone that aids in the production of red blood cells), and it plays a role in vitamin D synthesis.

After production within the nephron, urine passes through the calyceal system of the kidneys into the renal pelvis. The renal pelvis is shaped like a funnel, holds approximately 15 ml of urine, and serves as a temporary storage area for urine before transport to the lower urinary tract. The ureter is a long tube, shaped like an inverted S, that begins at the renal pelvis, passes under the psoas muscle of the back, and enters the pelvis near the sacroiliac junction. When entering the pelvis, the ureters curve medially to end in the base of the bladder. The union between bladder and ureter is called the ureterovesical junction.

Both the renal pelvis and ureters consist primarily of smooth muscle, and they move urine from the upper to the lower urinary tract by muscular contraction. This process is called **peristalsis**, and it is similar to the peristaltic waves of the gastrointestinal system used to digest food and produce fecal waste. The process of peristalsis occurs during the prolonged phases of bladder filling and storage, but it is temporarily interrupted during micturition.

Lower Urinary Tract

The bladder is a hollow, muscular organ located in the pelvis. It has a fixed base and a distensible upper portion composed of multiple bundles of smooth muscle. Collectively, the smooth muscle bundles are called the detrusor muscle.

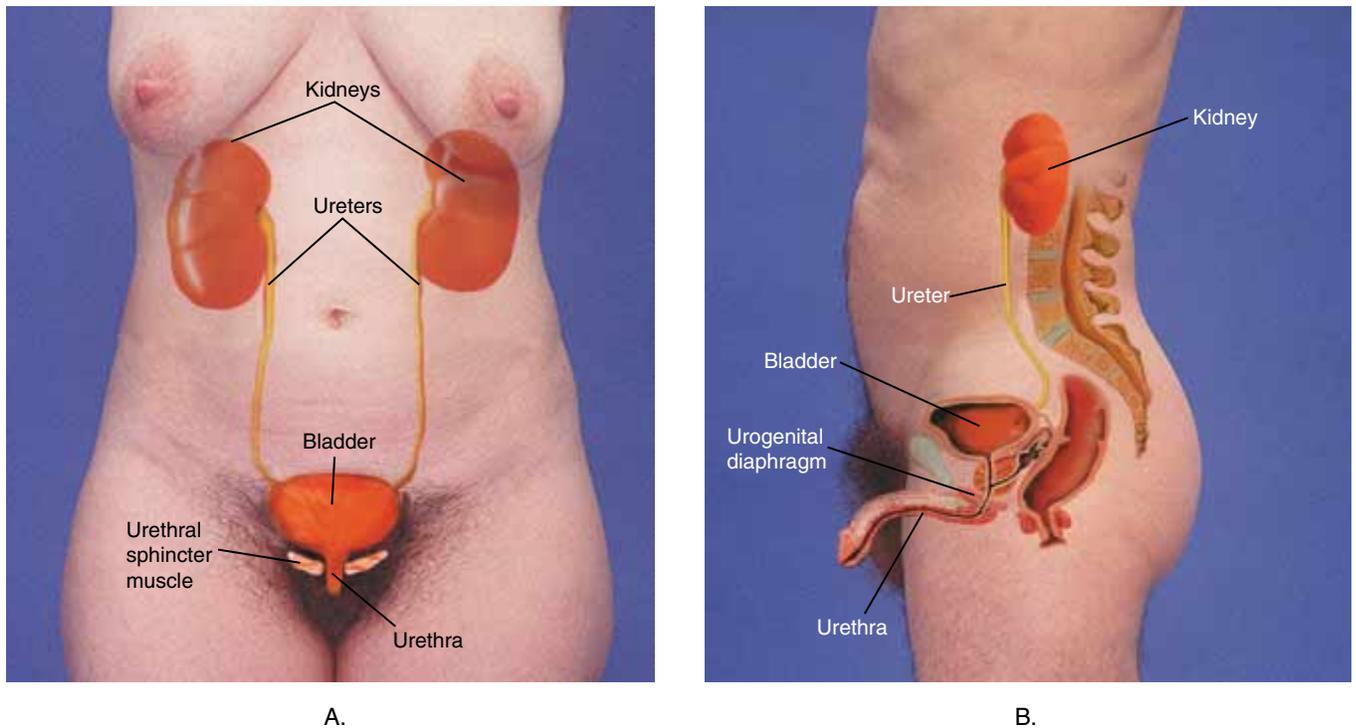


Figure 39-1 Urinary tract: A. Female, B. Male

The urethra is a tube that is a conduit for urinary elimination. The urethra differs significantly in women and men. In women, the urethra exits the bladder base and travels at a 16° angle to the external meatus located at the vestibule. The female urethra is approximately 3.5 to 5.5 cm long, and the distal third is histologically fused with the vaginal wall (Figure 39-1). The entire length of the urethra forms a sphincter mechanism with elements of compression and elements of tension.

In men, the urethra is approximately 23 cm long. It begins at the bladder base, pierces the anterior portion of the prostate, and turns to exit the body through the penis. The proximal third of the male urethra forms a sphincter mechanism comparable to the female urethra. The distal two-thirds is a conduit for the expulsion of urine or semen.

The pelvic muscles connect the anterior and posterior aspects of the bony pelvis, support the organs of the true pelvis, and contribute to the urethral sphincter mechanism in both women and men. The pelvic muscles contain primarily slow-twitch fibers that are physiologically suited for prolonged periods of tone. In addition, fast-twitch fibers within the pelvic muscles respond rapidly to sudden increases in abdominal pressure, although they soon fatigue. Fibers from the pelvic muscles surround the membranous urethra of the male and the proximal two-thirds of the female urethra. In both sexes, the urethra pierces the muscular diaphragm of the pelvic muscles.

Nervous Control of the Detrusor Muscle

The **detrusor muscle**, the smooth muscle of the bladder, is under indirect voluntary control, allowing the continent adult to postpone urination until a “socially appro-

priate” time and location for bladder evacuation is identified. Specific areas of the brain, spinal cord, and peripheral nervous system modulate the reflex activity of the detrusor muscle.

Central nervous control of the bladder begins in several modulatory centers in the brain. A neurologic lesion affecting one or more of these areas causes hyperactive detrusor contractions and a loss of bladder control. The primary areas in the brain that modulate the detrusor muscle are located in the frontal lobes, the thalamus, hypothalamus, basal ganglia, and cerebellum. The limbic system, which controls many aspects of autonomic nervous function, also influences continence.

A micturition center, located near the base of the brain, has two groups of neurons that mark the origin of the urination (micturition), the evacuation of urine from the bladder. In the infant, urinary elimination is controlled entirely by the micturition center, which evacuates the bladder when a specific “threshold” volume is reached or when the bladder is stimulated in another way. In the adult, however, the micturition center is controlled by the multiple centers of the brain, and urination usually occurs when the individual wishes to empty the bladder.

Reticulospinal tracts in the spinal cord transmit messages from the brain and brain stem to the peripheral nerves of the bladder. Bladder filling and urinary storage are promoted by excitation of the sympathetic nervous system via efferent, sympathetic spinal nuclei at spinal segments T-10 to L-2. Excitation of these neurons relaxes the detrusor muscle and contracts the muscular elements of the sphincter mechanism. Urinary evacuation is accomplished through the parasympathetic nervous system. Excitation of neurons located at segments

S-2 to S-4 causes **voiding** (urination) by contraction of the detrusor muscle and relaxation of muscular elements of the sphincter mechanism.

Two peripheral nerves transmit messages from the central nervous system to the detrusor muscle. The pelvic plexus transmits parasympathetic impulses to the smooth muscle of the detrusor. Nervous excitation of the parasympathetic nerves causes release of a neurotransmitter, acetylcholine, which produces contraction of detrusor muscle cells. Other substances also affect contraction of the detrusor muscle, but all act under the influence of the central nervous system.

The inferior hypogastric nerves provide the majority of sympathetic tone to the bladder wall and sphincter mechanism. In the detrusor muscle, excitation of β -adrenergic receptors causes release of norepinephrine, which inhibits detrusor muscle contraction. In addition, stimulation of α -adrenergic (excitatory) receptors at the bladder neck, proximal urethra, and in the prostatic urethra in men causes contraction of muscular components of the sphincter mechanism, promoting urethral closure and continence.

Urethral Sphincter Mechanism

The urethral sphincter is traditionally divided into two muscles, an internal (smooth muscle) and external (striated) sphincter. Unfortunately, this schema leads to more confusion than it addresses, and it should be discarded for a conceptualization of the sphincter as a single mechanism, comprising elements of compression and elements of tone, with essential supportive structures.

Urethral compression relies on three components: urethral mucosa softness, mucous secretions, and a vascular cushion. During bladder filling and urinary storage, the epithelium must fill in the gaps of the collapsed (closed) urethral lumen, creating a watertight seal through which no urine can escape. Coaptation requires a pliable, soft, and nonscarred urethra, with adequate mucous secretions to reduce surface tension and to fill in the microscopic gaps left by the epithelium. These elements of compression are supplemented by a rich network of vascular connections in the submucosal space. This vascular network promotes urethral closure by nourishing the epithelium and mucous production cells and by serving as a cushion for the transmission of force exerted by the muscular elements of the sphincter mechanism. In women, all the elements of compression are directly influenced by the presence of estrogens.

Elements of urethral tension protect the individual from urinary leakage during physical exercise or exertion. Smooth muscle bundles at the bladder neck and proximal urethra (and prostatic urethra of the male) close the urethra during bladder filling and urinary storage. The urethral wall also contains a set of highly specialized, triple-innervated striated muscle fibers that form a rhabdosphincter. It is crucial for maintaining continence during normal exertion. Striated muscle fibers from the pelvic muscle surround the urethra and

contribute to the sphincter. These muscles are particularly needed when abdominal pressure changes from sneezing, coughing, or lifting a heavy object.

The muscular elements of the urethra rely on supportive structures to provide an optimal configuration allowing them to contract and relax efficiently. Loss of support interferes with efficient urethral sphincter function.

Bowel Elimination

The process of normal fecal elimination is not completely understood. Continence primarily relies on the consistency of the **stool** (fecal material), intestinal motility, compliance and contractility of the rectum, and competence of the anal sphincters.

Structures of the Gastrointestinal Tract

The gastrointestinal system (alimentary canal) begins at the mouth and ends at the anus. The small intestine in the adult is approximately 22 feet long. The small intestine is primarily responsible for the digestion and absorption of nutrients, vitamins, minerals, fluids, and electrolytes. The digestive chyme (mixture of partially digested food and secretions) travels through the small bowel by a combination of segmental contractions and peristaltic waves. Substances that are well tolerated move through the bowel relatively slowly; foods or drugs that are toxic or irritable to the small bowel are evacuated rapidly. The small intestine joins the large bowel (colon) at the ileocecal valve. This valve works in conjunction with the ileocecal sphincter to control emptying of contents from the small intestine into the colon and to prevent regurgitation of digestive chyme from the large to small bowel (Figure 39-2).

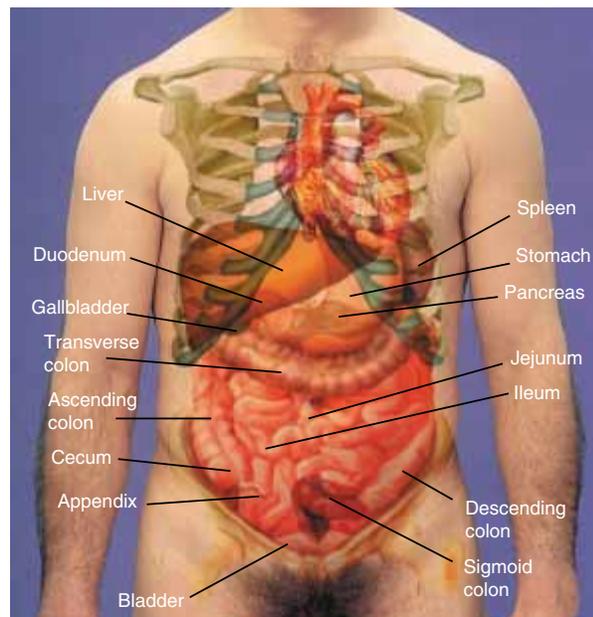


Figure 39-2 Gastrointestinal Tract

The colon is approximately 5 to 6 feet long in adults. It is divided into six segments: the cecum, ascending colon, transverse colon, descending colon, sigmoid colon, and anal canal. The primary functions of the colon are to collect, concentrate, transport, and eliminate waste materials (feces). The anal sphincter consists of smooth and skeletal muscles that line the distal portion of the anal canal. It works with the anus to store and to eliminate feces under voluntary control.

Intestinal Motility and Rectal Accommodation

Fecal continence relies on regular delivery of small boluses of stool that are stored in the rectum before elimination. The transit time from ingestion of food to passage of stool from the bowels varies. Typically, at least 80% of intake that is not absorbed by the body is excreted from the bowel within 5 days following ingestion. Transit time is significantly affected by the type of foods ingested, subsequent dietary intake, exercise, and stress-related factors.

Filling of the rectum causes a growing awareness of the presence of stool, which is stored until an appropriate opportunity for **defecation** (evacuation of stool from the rectum) is identified. In the continent individual, an initial awareness of stool in the rectum is identified at 150 ml. The desire to defecate is typically transient, diminishing as the rectum accommodates larger volumes of stool. When 400 ml or more of stool is collected in the rectum, this urge becomes strong, and the call to defecate becomes more persistent. Failure to heed the call to defecate may lead to overdistension of the rectum with hardening of the stool and subsequent constipation.

Anal Sphincter Mechanism

The anal sphincter is divided into two mechanisms, called the internal and external sphincters (Figure 39-3). An internal anal sphincter is primarily made up of smooth muscle bundles that are connected to the smooth muscle of the rectum. It begins in the distal portion of the rectum and extends approximately 3 cm into the anal canal. The internal sphincter mechanism is primarily innervated by sympathetic nerves that promote smooth muscle contraction and by parasympathetic nerves that cause sphincter relaxation.

The external sphincter is composed of striated muscle fibers that are divided into deep and superficial components. The deep portion of the external anal sphincter comprises muscle fibers that encircle the proximal aspect of the anal canal and attach to the symphysis pubis, forming a U shape. The superficial portion of the anal sphincter also encircles the anal canal, forming a U shape; however, it attaches to the coccyx and postanal plate rather than to the anterior aspect of the pelvis. Like the periurethral muscles, the striated com-

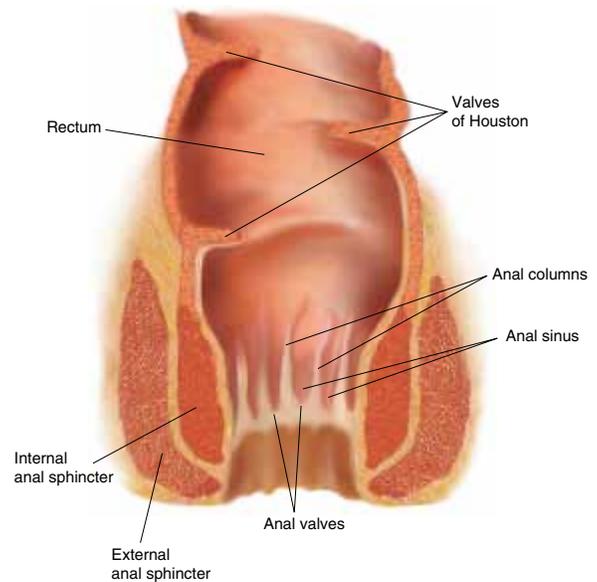


Figure 39-3 Anal Sphincter

ponent of the external anal sphincter contains both fast- and slow-twitch fibers that allow sustained tone over a period of time before voluntary defecation.

Sensory receptors located at the proximal anal canal affect anal function. These specialized sensory receptors are able to “sample” fecal contents, allowing the individual to differentiate among solid stool, liquid stool, and gas.

Distension of the rectum causes a reflex inhibition of the internal anal sphincter and contraction of the external sphincter. The proximal anal sphincter then samples the contents of the rectum, and the individual perceives the desire to defecate. If the person postpones defecation, rectal accommodation occurs and the desire to defecate is postponed. If the desire to defecate is heeded, the person voluntarily relaxes the external anal sphincter and evacuates the bowel of feces.

The significance of rectal contractions during defecation remains unclear. Many persons strain to defecate, and abdominal force is readily transmitted to the rectum, creating an effective expulsive force. The continent individual is able to simultaneously increase abdominal pressure by straining and maintain external anal sphincter relaxation, allowing effective evacuation of feces from the bowel.

FACTORS AFFECTING ELIMINATION

Age

A client’s age or developmental level will affect control over urinary and bowel patterns. Infants initially lack a pattern to their elimination. Control over bladder and bowel movements can begin as early as 18 months of age

but is typically not mastered until age 4. Nighttime control usually takes longer to achieve, and boys typically take longer to develop control over elimination than girls.

Control of elimination is generally constant throughout the adult years, with the exception of illness and pregnancy stages, when temporary loss of control, urgency, and retention may develop. With increasing age comes loss of muscle tone and therefore bladder control; this is usually accompanied by the urge to void more frequently.

Diet

Adequate fluid and fiber intake are critical factors to a client's urinary and bowel health. Inadequate fluid intake is a primary cause of constipation, as is ingestion of constipating foods such as certain dairy products. Diarrhea and **flatulence** (discharge of gas from the rectum) are a direct result of foods ingested, and clients need to be educated as to which foods and fluids promote healthy elimination and which foods may inhibit it.

Exercise

Exercise enhances muscle tone, which leads to better bladder and sphincter control. Peristalsis is also aided by activity, thus promoting healthy bowel elimination patterns.

Medications

Medications can have an impact on a client's elimination health and patterns and should be assessed during the health history interview. Cardiac clients, for instance, are commonly prescribed diuretics, which increase urine production. Antidepressants and antihypertensives may lead to urinary retention. Some over-the-counter (OTC) cold remedies, especially antihistamines, may also result in urinary retention. Other OTC medications are designed specifically to promote bowel elimination or to

soften stools; the nurse needs to inquire about all medications being taken in order to provide proper care for a client experiencing alterations in elimination patterns.

COMMON ALTERATIONS IN ELIMINATION

Urinary Elimination

Urinary incontinence and urinary retention are the most common causes of altered urinary elimination patterns. Urinary incontinence is the uncontrolled loss of urine that constitutes a social or hygienic problem. **Urinary retention** is the inability to completely evacuate urine from the bladder during micturition. There are two primary types of urinary incontinence, acute and chronic. In addition, chronic urinary incontinence can be subdivided into several distinctive types. Because each has its own etiology and management, it is important to determine the type of incontinence before subjecting the client to the expense, potential risks, and rigors of a treatment program.

Acute Urinary Incontinence

Acute urinary incontinence is a transient and reversible loss of urine. It may occur during an acute illness or after an injury. Common causes of acute urinary incontinence include urinary tract infection, atrophic vaginitis, polyuria related to diabetes, acute confusion, immobility, and sedation. Medications that increase or decrease bladder or urethral sphincter tone also may contribute to acute incontinence.

Chronic Urinary Incontinence

Acute incontinence is distinguished from established or chronic incontinence. There are four predominant types of chronic urine loss: stress urinary incontinence, instability incontinence, functional incontinence, and extraurethral incontinence.

Stress Urinary Incontinence

Stress urinary incontinence (SUI) is the uncontrolled loss of urine caused by physical exertion in the absence of a detrusor muscle contraction. SUI is associated with urethral hypermobility or with intrinsic sphincter deficiency.

Urethral hypermobility is the abnormal movement of the bladder base and urethra during physical exertion. The relationship between urethral hypermobility and SUI is not entirely understood, although several mechanisms have been proposed. Descent of the urethra into the lower portion of the pelvis may cause a loss of abdominal pressure transmission when compared with forces that affect the bladder. In addition, muscular contraction is compromised in the hypermobile urethra.

THINK ABOUT IT

Sensitivity During the Genital Exam

Assessment of the genital area can produce feelings of anxiety and embarrassment in both clients and nurses. Before beginning the genital examination, consider your client's cultural background and what beliefs or attitudes he or she may have about having the examination. Does the client's culture prohibit a female nurse from examining a male client? Does the client's culture prohibit a male nurse from examining a male client? Remember that you are assessing a person, not just a body part.

Loss of the normal anatomical relationships between the urethral sphincter and related structures also may contribute to SUI by reducing the efficiency of the muscular elements of the sphincter. The contribution of estrogen deficiency, which compromises the elements of urethral coaptation in the woman, remains unclear. Table 39-1 identifies common factors that contribute to SUI.

Intrinsic sphincter deficiency is a disorder of the muscular components of the urethral sphincter. Sphincter closure is compromised, and urinary leakage is often severe. Severe urine loss caused by intrinsic sphincter deficiency is defined as *Total Incontinence* by the North American Nursing Diagnosis Association (NANDA) system. Unlike urethral hypermobility, which is a women's health concern, intrinsic sphincter deficiency occurs in both genders and is related primarily to iatrogenic or neuropathic causes. Table 39-1 identifies common causes of intrinsic sphincter deficiency. It is important to note that intrinsic sphincter deficiency and urethral hypermobility frequently coexist in women.

Instability Incontinence

Instability incontinence is the loss of urine caused by a premature or hyperactive contraction of the detrusor. In the person with normal sensations of the lower urinary tract, these unstable detrusor contractions initially cause a precipitous desire to urinate, followed by urinary leakage unless the opportunity to toilet is immediately available. In those without sensations of bladder filling and impending urination, the contraction is followed by urinary incontinence that is often described as unpredictable. The NANDA classification schema divides this type of incontinence into two forms: *Urge Incontinence* and *Reflex Incontinence*. This distinction is clinically relevant because reflex incontinence is commonly associated with detrusor sphincter dyssynergia, an uncontrolled

contraction of striated muscle of the sphincter mechanism during micturition. Dyssynergia, or a loss of coordination between the bladder and sphincter mechanism, causes a functional obstruction of the bladder outlet and urinary retention. Table 39-2 outlines common causes of instability incontinence of urine.

Functional Incontinence

Functional incontinence is the loss of urine caused by altered mobility, dexterity, access to the toilet, or changes in mentation. Altered mobility and dexterity produce incontinence when the individual is unable to reach the toilet within a reasonable time after the onset of the urge to urinate. These conditions are worsened in an unfamiliar environment, such as a hospital, where side rails are raised on beds and sedatives are used to enhance sleep. Difficulty in reaching the toilet due to environmental factors, such as stairs, poor lighting, toilet height, narrow doors that are impassable to wheelchairs or walkers, or other conditions also produce

TABLE 39-1
Common Causes of Stress Urinary Incontinence

Urethral hypermobility	<p>Multiple vaginal deliveries</p> <ul style="list-style-type: none"> • Forceps-assisted deliveries • Pelvic muscle denervation • Estrogen deficiency • Obesity (exacerbating factor)
Intrinsic sphincter deficiency	<p>Iatrogenic</p> <ul style="list-style-type: none"> • Multiple bladder suspensions (women) • Radical prostatectomy (men) • Transurethral resection of prostate (rare in men) • Y-V plasty surgery (both genders) <p>Neuropathic</p> <ul style="list-style-type: none"> • Lesion of lumbosacral spine • Cauda equina syndrome • Pelvic fracture

TABLE 39-2
Common Causes of Instability Incontinence

Urge urinary incontinence	<p>Neuropathic (sensations preserved)</p> <ul style="list-style-type: none"> • Cerebrovascular accident • Brain tumor • Hydrocephalus • Organic brain syndrome (also associated with functional urinary incontinence) • Incomplete spinal lesions (when sensations of bladder filling are preserved) <p>Bladder inflammation</p> <ul style="list-style-type: none"> • Bladder calculi • Bladder tumor (particularly carcinoma in situ) • Cystitis (may exacerbate subclinical instability) • Atrophic vaginitis <p>SUI (39% of women with SUI experience instability and urge incontinence; cause of relationship unclear)</p> <p>Bladder outlet obstruction</p> <p>Idiopathic (may represent subtle neuropathy or other undiagnosed disorder)</p>
Reflex incontinence	<p>Spinal lesions above neurologic level S-2</p> <ul style="list-style-type: none"> • Complete cord injury • Transverse myelitis • Multiple sclerosis

functional incontinence when they render the person unable to enter the bathroom with reasonable ease. Acute confusion or dementia causes urinary incontinence when the signals to toilet become unclear. Functional incontinence exists as a separate entity from stress or instability urinary leakage. Nonetheless, it is important to remember that functional limitations also exacerbate these forms of urine loss.

Functional incontinence related to dementia may be managed by a prompted voiding technique. Prompted voiding is a technique of providing the opportunity to toilet on the basis of an individualized urge response toileting program (PURT) or using a routine schedule. A PURT program is based on knowledge of the individual's typical voiding pattern. The client's voiding pattern is assessed by the use of a specially designed device to monitor urinary elimination patterns or by routine assessment of containment devices for wetness. The client is then placed on a prompted voiding schedule requiring the nurse or other caregiver to approach the client, offer the opportunity to urinate, and assist with toileting. Voiding is praised, as is dryness during the period before voiding. PURT is limited to clients with adequate cognitive awareness to respond to the prompted voiding and to those with caregivers willing to comply with the demands of this ongoing program. Prompted voiding programs also may be instituted using a more arbitrary schedule for toileting, usually every 2 to 3 hours.

Extraurethral Incontinence

Extraurethral incontinence is the uncontrolled loss of urine that exists when the sphincter mechanism has been bypassed. According to the NANDA classification system, extraurethral leakage is termed *Total Incontinence*, although that term is also applied to severe SUI. The three causes of extraurethral incontinence are ectopia (a congenital defect in which leaks occur from a source outside the urethra), a fistula (acquired passage allowing urinary leakage), or a surgical bypass of the urinary bladder (such as the ileal conduit). The severity of extraurethral incontinence varies from a dribbling leakage superimposed on an otherwise normal voiding pattern to a continuous urine loss that replaces any recognizable voiding pattern.

Urinary Retention

Urinary retention is caused by two conditions: bladder outlet obstruction and deficient detrusor muscle contraction strength. Bladder outlet obstruction causes incomplete bladder evacuation by blocking the outflow of urine through the sphincter mechanism or the urethra. Deficient detrusor muscle contraction strength occurs when contractions are insufficient to maintain urethral opening long enough for complete emptying of the bladder's contents. Because the management of each condition is different, it is important to differentiate between these disorders during evaluation. Table 39-3 describes common causes of urinary retention.

TABLE 39-3
Common Causes of Urinary Retention

Bladder outlet obstruction	Prostatic enlargement <ul style="list-style-type: none"> • Benign prostatic hyperplasia • Prostate cancer • Prostatitis Bladder neck dyssynergia (dyssynergia of the smooth muscle of the sphincter mechanism) Detrusor sphincter dyssynergia (typically indicates dyssynergia between detrusor and striated muscle of sphincter) Urethral stricture Urethral tumor (rare)
Deficient detrusor contraction strength	Transient conditions <ul style="list-style-type: none"> • Fecal impaction • Acute immobility • Side effects of drugs including anticholinergics, tricyclic antidepressants • Side effect of recreational drugs including hallucinogens • Herpes zoster of sacral dermatomes Established conditions <ul style="list-style-type: none"> • Lesions of sacral spine • Cauda equina syndrome • Diabetes mellitus (late stages) • Tabes dorsalis • Poliomyelitis

Bowel Elimination

Many diseases and conditions affect bowel function. Although many alterations in bowel elimination patterns may be observed, this discussion is limited to three common alterations: constipation, diarrhea, and fecal incontinence.

Constipation

Colonic **constipation** is the infrequent and difficult passage of hardened stool. (Perceived constipation, influenced by psychological and emotional stress, is not included in this discussion.)

Dietary factors may contribute to constipation. Dehydration causes drying of the stool as the body increases the reabsorption of water and sodium from the bowel. Inadequate dietary bulk also dehydrates the stool. Diverticular disease, a common problem in the elderly, also reduces colonic transit, further increasing the risk of constipation.

Neuropathic conditions promote constipation by diminishing the efficiency of gastric motility. They also weaken the abdominal muscles, reducing the efficiency of straining and rectal evacuation. Lesions of the brain, such as cerebrovascular accident, and spinal disorders, disc problems, or spinal stenosis contribute to constipation by reducing mobility, weakening the abdominal muscles, and diminishing the motility of the smooth muscle of the colon and rectum. Functional limitations, particularly impaired mobility, predispose elderly clients to constipation; they perceive a diminished desire to defecate and have prolonged colonic transit time. Multiple medications, particularly narcotics, sedatives, anticholinergics, antidepressants, antiparkinsonian drugs, and iron, also contribute to constipation.

In women, mechanical factors may exacerbate constipation. A rectocele is the herniation of the rectum and surrounding tissues into the potential space of the vagina (Figure 39-4). A significant rectocele causes a mechanical obstruction to defecation and subsequent constipation. Both women and men may experience constipation because of incomplete control of the anal sphincter. In this case, failure of complete relaxation of the anal sphincter causes fecal retention, drying of stool, and constipation.

In severe cases, the hardened stool may consolidate into an **impaction**. This bolus of stool serves as a nidus for bacterial overgrowth and produces an obstruction that further slows colonic transit time and the passage of further fecal contents.

Diarrhea

Diarrhea is the passage of liquefied stool that, because of its increased frequency and consistency, represents a change in the person's bowel habits. The primary causes of diarrhea include infectious agents, malabsorption disorders, inflammatory bowel disease, short bowel syndrome, side effects of drugs, and laxative or enema misuse.

Infectious diarrhea occurs when overgrowth of a pathogen produces osmotic diarrhea via toxins or reduced absorptive ability due to mucosal damage. Common pathogens include *Clostridium difficile*, entero-

toxigenic *Escherichia coli*, *Salmonella*, *Shigella*, *Entamoeba histolytica*, and *Giardia*.

Malabsorption syndromes produce diarrhea when nonabsorbed substances in the diet create an osmotic imbalance and liquefaction of the stool. Lactose intolerance, sorbitol intolerance, and celiac sprue syndrome are examples of common malabsorption syndromes that predispose clients to diarrhea. Persons with inflammatory bowel disease or short bowel syndrome are predisposed toward diarrhea because of a reduced surface area for reabsorption.

Specific drugs may cause diarrhea as a side effect. Administration of multiple antimicrobial agents may indirectly predispose the client to diarrhea by promoting an overgrowth of *C. difficile* in the bowel. Cholinergic drugs increase motility and reduce reabsorption of water and electrolytes from the stool. Other drugs produce osmotic diarrhea, primarily because of the vehicle for delivery, which frequently contains sorbitol and a high osmolality.

Enteral feedings contain a relatively high osmolality that frequently predisposes the client to diarrhea. These formulas may contain lactose, which causes intolerance in some people. The risk of diarrhea is further enhanced in the critically ill who have highly catabolic states and decreased absorptive ability and among those receiving bolus administration of intravenous fluids.

The misuse of laxatives and enemas is frequently associated with diarrhea among clients living at home. Overuse of saline cathartics may produce osmotic diarrhea, and the chronic misuse of laxatives may alter motility patterns and cause an osmotic shift in the bowel.

Secretory diarrhea occurs when the normal mechanisms that produce intestinal fluid are hyperactivated, causing excessive production and movement of food through the intestinal system. Zollinger-Ellison syndrome, pancreatic cholera, carcinoid syndrome, and villous adenoma may produce severe, chronic diarrhea.

Fecal Incontinence

Fecal incontinence is the involuntary loss of stool of sufficient magnitude to create a social or hygienic problem. The primary mechanisms that predispose the adult to incontinence of stool are dysfunction of the anal sphincter, disorders of the delivery of stool to the rectum, disorders of rectal storage, and anatomic defects.

A disorder of stool volume and consistency is typically not enough to produce fecal incontinence in the otherwise normal individual. Instead, the person is likely to perceive a precipitous urgency to defecate, an impulse that is heeded rapidly. However, if the volume of stool is sufficient and the storage capacity of the rectum is compromised, or sphincter function is suboptimal, fecal incontinence may result. When severe constipation leads to an impaction of stool, bacteria in the rectum overgrow, producing a liquefied medium. The toxins

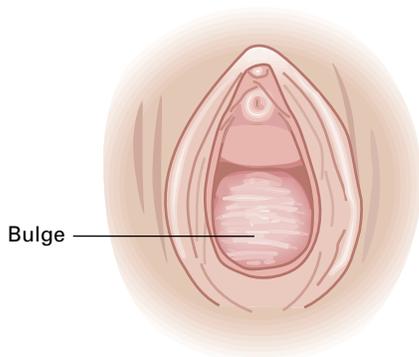


Figure 39-4 Rectocele

produced by this liquefied stool are likely to stimulate the bowel and may produce transient seepage of stool in the normally continent client.

Low compliance of the rectum also predisposes the client to fecal incontinence. In the normal individual, the rectum is able to accommodate 400 ml of feces at low pressure. However, clients with radiation proctitis, rectal wall fibrosis due to inflammatory disorders, infectious proctitis, chronic obstruction, or malignancies store lower volumes of stool at higher pressures. Low rectal compliance diminishes storage capacity and causes greater than normal urgency to defecate when

stool enters the rectum. When a large volume of stool enters the rectum rapidly, the urgency to defecate is likely to be overwhelming, and the risk of incontinence is significant.

Anal sphincter dysfunction is likely to cause incontinence when both the internal and external mechanisms are compromised. Neurologic lesions are the most common cause of anal sphincter dysfunction. Typically, the client is able to compensate for sphincter weakness, provided the rectum is presented with a normal delivery of solid stool. However, in the presence of diarrhea, significant fecal incontinence may occur.

Sensory disorders also predispose the client to fecal incontinence. Loss of the sensitive epithelium in the proximal anal canal interferes with the client's ability to differentiate gas and solid and liquid contents in the rectum. In addition, loss of proprioception in the rectum disturbs the client's ability to detect rectal fullness. These individuals are particularly prone to incontinence when a large bolus of stool enters the rectum rapidly or when an impaction occurs.

Anatomic disorders also may compromise sphincter function and predispose the individual to fecal incontinence. Among women, the most common risk factor is obstetric trauma. Vaginal deliveries, particularly those requiring the use of forceps and those complicated by third-degree tearing, are likely to damage the anal sphincter mechanism.

RESEARCH FOCUS

Title of Study

"Fecal Incontinence in Hospitalized Patients Who Are Acutely Ill"

Authors

Bliss, D. Z., Johnson, S., Savik, K., Clabots, C. R., & Gerding, D. N.

Purpose

To determine the incidence of fecal incontinence in acutely ill hospitalized patients, and to ascertain the relationship between fecal incontinence and stool consistency, and between diarrhea and two well-known nosocomial or iatrogenic etiologies of diarrhea: *Clostridium difficile* and tube feeding.

Methods

Rectal swabs and stool specimens were obtained weekly from 152 patients on acute or critical care units; information regarding tube feeding and medications, severity of illness, and nutritional data were prospectively recorded on each patient.

Findings

A total of 33% of the patients had fecal incontinence. Although a greater percentage of patients with diarrhea had fecal incontinence than patients without diarrhea, the condition was not associated with any specific cause of diarrhea.

Implications

Even though treatments may be beneficial in managing fecal incontinence, treatments that slow intestinal transit should be avoided in patients with *Clostridium difficile*-associated diarrhea.

Bliss, D. Z., Johnson, S., Savik, K., Clabots, C. R., & Gerding, D. N. (2000). Fecal incontinence in hospitalized patients who are acutely ill. *Nursing Research*, 49(2), 101.

ASSESSMENT

The nursing assessment of elimination is based on a client interview, evaluation of an objective log or record of urinary or fecal elimination patterns, focused physical examination, and review of diagnostic laboratory

THINK ABOUT IT

Assessment of Elimination Patterns

Consider your feelings about urinary and fecal incontinence. Many people, including health care professionals, consider incontinence to be a hygienic rather than a health concern. Parents may view incontinence in children to be a form of misbehavior. Some adults consider incontinence to be a form of childlike or infantile behavior, or they may believe that urinary or fecal leakage is an inevitable consequence of aging. Consider your feelings if you lost control of your bowels or your bladder. Would you not wish your health care providers to consider this a significant problem worthy of aggressive treatment? Would you feel embarrassed about bringing up this problem to a nurse or physician? Would you be relieved when a nurse or physician asked you about this problem? Would you desire privacy when discussing this health care issue?

NURSING ALERT

Spotting Sexual Abuse

Suspect abuse if you note any of the following during inspection of a client's genital area: bruises, cuts, tears, or bleeding, especially around the genitals, anus, buttocks, hips, and thighs. Emotional signs such as refusing a rectal examination, lack of eye contact during the examination, or extreme anxiety or guarding of body parts during the assessment may all be indicators of abuse. Document all signs of suspected abuse, and know your state's and institution's policies regarding reporting abuse. Remember that no client, regardless of age or gender, should be excluded from evaluation for sexual abuse.

data. When altered patterns of elimination indicate a significant health problem, additional diagnostic information is used to formulate a plan of care.

Health History

Because issues of elimination may produce feelings of anxiety, guilt, or shame among clients, the interview must be instigated by the nurse and conducted in a setting that provides adequate privacy. Clients are asked to describe their usual elimination habits. Table 39-4 presents the typical questions asked when assessing urinary and fecal elimination patterns.

When screening questions concerning altered patterns of elimination reveal significant findings, the interview should be expanded to include specific questions about the nature of the elimination disorder. These questions explore the type of incontinence, complicating factors, and bladder (Table 39-5) and bowel management strategies currently used by the client.

Physical Examination

The physical examination for elimination patterns focuses on functional issues associated with urinary or fecal incontinence and assesses the perineal and perianal areas. Functional evaluation begins with the interview and continues throughout the physical examination. Mental status can be evaluated by listening to the client's responses to questions and by observing interactions with others. When mental assessment reveals changes from normal or expected function, a more specific tool, such as the Mini-Mental Status Examination may be administered (see Chapter 36 for a complete discussion of the Mini-Mental Status Examination).

Mobility and dexterity are evaluated by observation or by asking the client to perform simple tasks. Mobility may be evaluated by observing the client undress or move onto a table, chair, or bed. Dexterity is assessed by observing the client remove clothing; particular attention is paid to the manipulation of zippers, buttons, shoestrings, and snaps.

TABLE 39-4
Health History Questions for Clients with Altered Elimination

Area of Inquiry	Sample Question	Significant Findings
Determine duration of problem	How long have you been bothered with problems controlling your bladder or bowel?	Association of onset of urinary or fecal incontinence with injury; disorder of central nervous system, brain, or spine; pelvic trauma; vaginal delivery; onset of climacteric.
Determine type of urinary incontinence	What activities make you leak? Do you leak when you cough, sneeze, laugh, exercise, walk? Do you leak with a strong urge to urinate? Do you leak with no sensation or warning? How much do you typically leak? Is it enough to dampen your underclothing? Is it enough to saturate your underclothing, dress, or pants? Is it enough to run down your legs and require a change of clothing?	Leakage with physical exertion is related to SUI. Leakage associated with a sudden urge to urinate is related to detrusor hyperactivity (urge incontinence). Leakage associated with no sensation or warning is generally associated with bypassing of sphincter (extraurethral incontinence). SUI is typically associated with smaller volumes of leakage with each episode. Urge incontinence often produces larger-volume leakage.

(continues)

TABLE 39-4 (continued)
Health History Questions for Clients with Altered Elimination

Area of Inquiry	Sample Question	Significant Findings
Determine type of fecal incontinence	Do you have trouble controlling gas or liquid stool?	Fecal incontinence associated with motility disorders (dietary intolerance), low compliance of the rectal vault, or rectal urgency is associated with diarrhea. Intermittent fecal incontinence associated with mild anal sphincter intolerance may cause loss of control only when coping with liquid stool or gas. Regular loss of solid stool is typically associated with central nervous system disorders or significant dysfunction of the anal sphincter mechanism.
Identify complicating factors of urinary incontinence	Do you ever experience bladder (urine or urinary tract) infections? Do you feel you completely empty your bladder? Do you ever lose control of your bowels? Do you ever seep stool?	Urinary tract infections are commonly associated with incontinence complicated by obstruction or urinary retention. Combined fecal and urinary incontinence typically implies neurologic disorders, including altered mentation.
Identify complicating factors of fecal incontinence	Are there any foods that routinely cause you to experience nausea, vomiting, or diarrhea? Do you experience constipation? Do you pass hardened stool? How frequently do you move your bowels?	Intolerance of specific dietary elements (such as lactose) increases small bowel motility and the subsequent risk of incontinence. The infrequent, difficult passage of hardened stool (constipation) increases the bacterial load within the rectum, creating a liquid stool around the hardened stool. This bacteria-laden, liquefied stool increases both rectal urgency and the risk of fecal incontinence.
Identify bladder management program	How do you manage your leakage?	Clients often experience complications of urinary incontinence, including altered skin integrity, shame, and humiliation. These can be prevented by using better containment devices.
Identify the bowel management program	How do you evacuate (move) your bowels? Do you regularly use laxatives, suppositories or other stool softeners, or an enema to assist with a bowel movement?	The normal individual may move the bowels as frequently as once each day or as little as once every 2 to 3 days. Clients with perceived or organic constipation frequently use laxatives, stool softeners, or enemas to assist with bowel movements. Clients with paralyzing neurologic lesions often must use a digital stimulation, an enema, or a suppository to stimulate a bowel movement.

The perineum is initially inspected for skin integrity. Among clients with severe urinary leakage, the characteristic odor of urine may be present, and the skin may show signs of a monilial rash (maculopapular, red rash with satellite lesions) or an ammonia contact dermatitis (papular rash with saturated, macerated skin). Among patients with severe fecal incontinence, the skin is fre-

quently denuded, red, and painful to touch, particularly if it has been exposed to liquid stool. The integrity of the skin typically remains intact with mild to moderate fecal or urinary incontinence, although a monilial rash may be present. This monilial rash may involve the inner aspect of the thighs, and it frequently extends throughout the skin surface covered by a containment device.

TABLE 39-5
Questions for Clients with Altered Patterns of Urinary Elimination

Area of Inquiry	Sample Question	Significant Findings
Diurnal voiding habits	How long can you postpone urination? Can you postpone urination for 2 hours?	Diurnal frequency greater than every 2 h
Nocturia (awakening from sleep to urinate)	How many times do you wake up at night and urinate? Does the urge to urinate interrupt your sleep?	Nocturia greater than once per night in adults less than 65 years old Nocturia greater than twice per night in older adults
Urinary incontinence	Do you leak urine or lose bladder control? Does this leakage cause any problems for you?	Any leakage sufficient to be defined as a problem by the client or significant others
Urinary retention	Do you feel you completely empty your bladder? Have you ever been unable to urinate at all?	Any episode of acute urinary retention; suspicion of chronic retention (incomplete emptying) significant when complicated by urinary tract infections or incontinence

The vaginal vault of the woman is inspected for signs of atrophic vaginitis and for bladder and urethral support. The atrophic vagina has a dry, thin, friable mucosa with a loss of rugae (regular folds of tissue observed in the normal vagina). It is tender to touch, pale, and cracks or bleeds easily. The vaginal introitus and vault may be quite small, and the client may be intolerant of even gentle efforts to distend the vagina for examination. Atrophic vaginal changes are important to assess because they are associated with SUI, irritative voiding symptoms, and urge incontinence.

Pelvic support is assessed in the woman because it is associated with pelvic muscle weakness. Loss of pelvic muscle tone is associated with pelvic descent, increasing the risk of urethral hypermobility or intrinsic sphincter deficiency. Both can lead to SUI or defects of the anal sphincter or rectocele, causing chronic constipation and incomplete evacuation of stool with defecation. Paravaginal support is assessed using a gloved hand or speculum. The posterior vaginal wall is supported using either a Sims' speculum or a gloved finger gently inserted into the vagina. The woman is asked to cough or strain down, and movement of the posterior vaginal wall is evaluated. Bulging of the anterior wall indicates a cystocele or loss of support of the bladder base. This maneuver is repeated, and the posterior vaginal wall is evaluated for the presence of a rectocele. Uterine prolapse is noted when the uterus or cervix migrates toward the vaginal introitus in response to physical exertion.

The sensations of the perineal area are assessed, using a small needle to evaluate sharp versus dull stimuli and using two probes to determine one- versus two-point discrimination. The bulbocavernosus reflex (BCR) is evaluated by gently tapping on the clitoris while observing the anal sphincter. A positive reflex will produce an anal "wink" or contraction of the perianal

muscle. A weaker response is assessed by placing a gloved finger at the anus or by pelvic muscle electromyogram using patch or needle electrodes. Loss of sensations or absence of the BCR indicates neurologic damage associated with urinary incontinence or retention.

Careful inspection of the perianal area and a digital rectal examination are particularly important for men and women. The cheeks of the buttocks should be pulled apart and the anus and surrounding area visually inspected. The client may be asked to bear down and the anus inspected for prolapse or for gaping, indicating significant weakness of the anal sphincter. In both genders, the anal sphincter is assessed for tone and symmetry. The gloved, lubricated finger is gently inserted into the anal sphincter. The finger is rotated 360° and the tone of the external sphincter is assessed. In addition, the rectum is palpated for evidence of stool or the hardened, large mass of feces characteristic of fecal impaction. **Hemorrhoids** (perianal varicosities of the hemorrhoidal veins) may also be identified. The prostate is examined for size, consistency, and induration when urinary retention is suspected. Benign prostatic hyperplasia, a common cause of urinary retention in older men, produces a uniform enlargement of the prostate. In contrast, prostate cancer causes asymmetric enlargement or discrete, hard nodules.

When altered patterns of urinary or fecal elimination are suspected from the health history, a log or diary should be completed. The simple bladder log is kept over a long period of time to determine patterns of urinary elimination and patterns of incontinence. A more detailed log allows the nurse to evaluate fluid intake, client responses to prompted toileting, functional bladder capacity, and the estimated volume of an incontinent episode.

THINK ABOUT IT

Professionalism During the Rectal Assessment

The rectal examination may cause the client to feel uncomfortable or embarrassed. How would you handle the following situations if they were to occur during the rectal assessment?

- The client has an erection during the examination.
- The client loses bowel control.
- The client passes flatus during the examination.

Diagnostic and Laboratory Data

When significant urinary or fecal elimination problems are observed, further testing is needed to evaluate the underlying cause of the condition and to determine treatment options. When urinary incontinence exists, a dipstick **urinalysis** is obtained and evaluated for nitrites, leukocytes, hemoglobin, glucose, and specific gravity. When nitrites or leukocytes are present, a microscopic analysis is completed to determine the presence of white blood cells in the urine (**pyuria**) and bacteria in the urine (**bacteriuria**). Urine culture and sensitivity testing are completed and the client is treated for a urinary tract infection. If glucose is noted in the urine, the patient may undergo further evaluation for diabetes mellitus, or methods of glucose control may be reviewed and adjusted in the client with known diabetes. If the **specific gravity** (weight of urine compared with weight of distilled water) of the urine is abnormally low (below 1.010), the volume of fluid consumed by the client over a 24-hour period is evaluated further. **Hematuria** (blood in the urine) may be noted.

More detailed diagnostic testing of lower urinary tract function may be obtained in cases of complex urinary retention or incontinence. Urodynamics is a set of tests that measure bladder and surrounding abdominal pressures. Pressure data are combined with electromyography of the pelvic muscles and urinary flow rate to determine lower urinary tract function during bladder filling and micturition.

Laboratory tests also may be obtained for select cases of fecal incontinence. A stool culture may be analyzed for ova and parasites, electrolytes, or culture when dietary intolerance or a gastrointestinal infection is thought to be causing diarrhea and related incontinence. When anal sphincter weakness is suspected as a cause of fecal incontinence, anorectal manometry may be completed to further evaluate anal sphincter and rectal vault function. When pelvic muscle weakness and descent are thought to cause fecal incontinence, defecography (x-ray images of the rectal vault and anal sphincter obtained during defecation) or anorectal ultrasonography may be completed.

NURSING DIAGNOSIS

The following nursing diagnoses are frequently encountered in clients experiencing changes in urinary and bowel habits.

Impaired Urinary Elimination

Impaired Urinary Elimination is the state in which the individual experiences a disturbance in urine elimination. Defining characteristics include **dysuria** (painful urination), frequency, hesitancy, incontinence, nocturia, retention, and urgency. Altered urinary elimination patterns can result from multiple causes, including anatomic obstruction, sensory motor impairment, and urinary tract infection.

Stress Urinary Incontinence

Stress urinary incontinence is the state in which an individual experiences a loss of urine less than 50 ml occurring with increased abdominal pressure. Major characteristics include reported or observed dribbling with increased abdominal pressure. Minor characteristics may include urinary urgency and urinary frequency (more often than every 2 hours). The client may also be experiencing related factors such as degenerative changes in pelvic muscles and structural supports associated with increased age, high intra-abdominal pressure (e.g., obesity, gravid uterus), incompetent bladder outlet, overdistension between voidings, or weak pelvic muscles and structural supports.

Reflex Urinary Incontinence

The state in which an individual experiences an involuntary loss of urine, occurring at somewhat predictable intervals when a specific bladder volume is reached, is known as *Reflex Urinary Incontinence*. Major characteristics include no awareness of bladder filling, no urge to void or feelings of bladder fullness, and uninhibited bladder contraction or spasm at regular intervals. Related factors include a neurologic impairment (e.g., spinal cord lesion that interferes with conduction of cerebral messages above the level of the reflex arc).

Urge Urinary Incontinence

Urge Urinary Incontinence is the state in which an individual experiences involuntary passage of urine occurring soon after a strong sense of urgency to void. Major characteristics include urinary urgency, frequency (voiding more often than every 2 hours), and bladder contraction or spasm. Minor characteristics include nocturia (more than two times per night), voiding small amounts (less than 100 ml) or large amounts (more than 550

ml), and inability to reach the toilet in time. Urge incontinence may be related to decreased bladder capacity (e.g., history of pelvic inflammatory disease, abdominal surgeries, indwelling urinary catheter), irritation of bladder stretch receptors causing spasm (e.g., bladder infection), alcohol, caffeine, increased fluids, increased urine concentration, or overdistension of the bladder.

Functional Urinary Incontinence

The state in which an individual experiences an involuntary, unpredictable passage of urine is called *Functional Urinary Incontinence*. Major characteristics include urge to void or bladder contractions sufficiently strong to result in loss of urine before reaching an appropriate receptacle. Altered environment, sensory, cognitive, or mobility deficits may contribute to functional incontinence.

Total Urinary Incontinence

Total Urinary Incontinence is the state in which an individual experiences a continuous and unpredictable loss of urine. Major characteristics include constant flow of urine occurring at unpredictable times without distension, uninhibited bladder contractions or spasms, unsuccessful incontinence refractory treatments, and nocturia. Related factors include neuropathy that prevents transmission of the reflex that indicates bladder fullness, neurologic dysfunction causing triggering of micturition at unpredictable times, independent contraction of the detrusor reflex owing to surgery, trauma, or disease that affects spinal cord nerves, or anatomy (fistula).

Urinary Retention

The state in which the individual experiences incomplete emptying of the bladder is known as *Urinary Retention*. Major characteristics for urinary retention include bladder distension and small, frequent voiding or absence of urine output. Minor characteristics include sensation of bladder fullness, dribbling, residual urine, dysuria, and overflow incontinence. High urethral pressure caused by weak detrusor, inhibition of reflex arc, strong sphincter, and blockage are related factors for urinary retention.

Constipation

A state in which an individual experiences a change in normal bowel habits characterized by a decrease in frequency or passage of hard, dry stools is called *Constipation*. Defining characteristics include decreased activity level, frequency less than usual pattern, hard-formed stools, palpable mass, reported feeling of pres-

sure and fullness in rectum, and straining at stool. Other possible characteristics include abdominal pain, appetite impairment, back pain, headache, interference with daily living, and use of laxatives. Related factors for constipation are still under development by NANDA; some possible considerations may be change in daily routine and less than adequate fluid and dietary intake.

Perceived Constipation

Perceived Constipation is the state in which an individual makes a self-diagnosis of constipation and ensures a daily bowel movement through abuse of laxatives, enemas, and suppositories. Major characteristics include expectation of daily bowel movement, with the resulting overuse of laxatives, enemas, and suppositories, and expected passage of stool at the same time every day. Related factors may include cultural or family health beliefs, faulty appraisal, or impaired thought processes.

Diarrhea

Diarrhea is the state in which an individual experiences a change in normal bowel habits characterized by the frequent passage of loose, fluid, unformed stools. Defining characteristics include abdominal pain, cramping, increased frequency, increased frequency of bowel sounds, loose or liquid stools, and urgency. Other possible characteristics include change in color of stools. Gastrointestinal, metabolic, nutritional, or endocrine disorders; infectious processes; tube feedings; fecal impaction; change in dietary intake; adverse effects of medications; and high stress levels may all contribute to diarrhea.

Bowel Incontinence

A state in which an individual experiences a change in normal bowel habits characterized by involuntary passage of stool is called *Bowel Incontinence*. Related factors may include gastrointestinal and neuromuscular disorders, colostomy, loss of rectal sphincter control, and impaired cognition.

Other Diagnoses

Other nursing diagnoses that may be important for clients experiencing alterations in elimination patterns include *Situational Low Self-Esteem*, *Deficient Knowledge*, *Risk for Infection*, *Risk for Impaired Skin Integrity*, and *Toileting Self-Care Deficit*. Nursing diagnoses and the resulting plan of care need to be developed to ensure delivery of thoughtful nursing care for both the physical and psychosocial aspects of altered elimination patterns that may affect a client's well-being.

OUTCOME IDENTIFICATION AND PLANNING

The targeted outcomes for clients with alterations in elimination patterns center around restoring and maintaining regular elimination habits and preventing potential associated complications such as infections and altered skin integrity. Interventions to respond to the client's physical needs relating to maintaining skin health and fluid volume balance need to be developed, as well as strategies to address the client's psychosocial needs, such as countering deficient knowledge, enhancing self-esteem, and reducing or controlling anxiety.

Client teaching is also a critical factor in planning care for clients with urinary and fecal complications. The nurse's role in educating clients concerning proper diet and exercise regimens to maintain urinary and fecal health is also an important aspect of planning care. When ostomies are involved, clients and their families will need instruction and demonstration on proper care and the warning signs of infection.

IMPLEMENTATION

Maintain Elimination Health

The nursing management of altered patterns of urinary and bowel elimination begins with an understanding of the principles for general bladder and bowel health and by primary prevention of problems whenever feasible. All clients should be taught basic principles of fluid intake and urinary output, regular bowel evacuation, stool consistency, and altered patterns of elimination. The Client Teaching Checklists offer suggestions for maintaining urinary and bowel elimination patterns.

Fluid Intake

Clients should be taught to drink an adequate volume of fluid each day. The recommended daily allowance (RDA) for fluids is 30 ml/kg body weight, or roughly 1/2 oz/lb body weight. In the average-sized adult, this equals 1500 to 2000 ml/d, although obese and thin individuals will vary from this range. Manipulation of the volume of fluid intake showed only a weak correlation with voluntary or incontinent episodes in the classical research regarding elderly women (Wyman, Elswick, Ory, Wilson, & Fantl, 1991). A person who experiences altered patterns of urinary elimination, particularly incontinence, is likely to reduce fluid intake in an attempt to manage the problem. Many clients reason that curtailing fluid intake will reduce urinary output and the risk of incontinence. Unfortunately, it will not. Systematic dehydration may increase rather than diminish the risk of urinary incontinence by promoting bacteriuria and by concentrating the urine, thereby enhancing its irritative properties



CLIENT TEACHING CHECKLIST

Managing Altered Urinary Elimination

- Ensure adequate daily fluid intake (15 ml/lb body weight).
- Reduce or avoid bladder irritants.
- Reduce alcohol consumption.
- Stop smoking.
- Teach pelvic muscle exercises to women (Kegel exercises).



CLIENT TEACHING CHECKLIST

Managing Altered Fecal Elimination

- Understand the relationship between dietary and fluid intake and stool consistency.
- Understand the relationship between altered stool consistency and altered patterns of bowel elimination, including incontinence.
- Ensure adequate daily fluid intake (15 ml/lb body weight).
- Ensure adequate intake of dietary fiber.
- Establish regular schedule of defecation.
- Heed the urge to defecate.

when stored in the bladder. Dehydration also causes the body to compensate for a shortage of available fluids by reabsorbing fluids and sodium from the bowel, causing drying of the stool and constipation.

Diet

Persons with urinary incontinence or frequent urination associated with urgency should be taught to recognize potential bladder irritants. Specific foods and beverages irritate the bladder and produce frequent urination and bladder discomfort in certain persons, while exerting relatively little effect among others. Foods or substances that may irritate the bladder are:

- Caffeinated beverages, carbonated drinks, and acidic fluids (including coffee and tea)
- Aspartame, particularly when added to a caffeinated or carbonated beverage
- Citrus fruits or juices
- Foods containing tomatoes or tomato-based sauces
- Chocolate
- Greasy or spicy foods

Dietary fiber may prevent constipation and increase the desire to defecate. The client is advised to increase

the amount of fiber-rich foods in the diet, including grains, fruits, and vegetables (Table 39-6). Remind the client that dietary fiber should be increased gradually; a sudden increase in fiber may produce bloating and abdominal discomfort.

Lifestyle and Prevention

For many clients, lifestyle and habits affect normal elimination patterns. Individual, social, family, and cultural variables play an important role in elimination. Proper nutrition, adequate rest and sleep, and regular exercise help maintain healthy elimination patterns. Clients with elimination problems can take measures to correct or alter the problem by modifying their lifestyle.

Alcohol and Tobacco Use

Consumption of alcohol exerts significant effects on the bladder. Alcohol suppresses antidiuretic hormone (ADH) excretion by the hypothalamus, causing polyuria and increasing the risk of urinary leakage. In addition, the sedative effects of alcohol increase the risk of urinary incontinence, both while awake and during sleep. Alcohol irritates the intestines and bowels, causing inflammation. The irritant effect causes increased elimination of fluid in the stool, resulting in diarrhea. With chronic use of alcohol, inflammation results, causing enteritis or colitis.

Cigarette smoking also may irritate the bladder. Cigarette smoke may increase the risk of SUI because of

its association with a chronic cough, and smoking is a significant risk factor for the development of bladder cancer. Smoking stimulates the bowel through the action of nicotine, present in tobacco, causing increased bowel tone and motility. The result is diarrhea.

Stress Management

Managing stress promotes healthy bowel and urinary elimination patterns. Acute and chronic stress affect both elimination systems. The bowel responds by increasing activity when the parasympathetic nervous system is stimulated. However, the longer lasting effect of norepinephrine causes slowing of the gastrointestinal tract. In response to the effect of ADH, the kidneys retain fluid. The effect of ADH in combination with the effect of norepinephrine and epinephrine elevates the blood pressure. Using education and support, nurses can help clients manage stress. See Chapter 20.

Elimination Habits

The client is urged to establish a regular schedule of bowel elimination and to answer the desire to defecate. In the normal individual, the desire to move the bowel is transient and lost when avoided or ignored. Although occasional avoidance of the urge to defecate is a useful tool for continence, routine avoidance may predispose the client to constipation and reduce the efficiency of bowel evacuation. The urge to defecate is typically greatest after a meal, and it may be enhanced by dietary stimulants such as fiber or a caffeinated beverage or by light exercise. In an unfamiliar setting, such as the hospital, it is important to provide adequate privacy so that the client can heed the urge to defecate without undue interruption or embarrassment.

Encourage the client to establish a regular elimination pattern to prevent urinary incontinence. This can be successfully accomplished by using techniques such as relaxation and timing. The client, with the assistance of the nurse, establishes a voiding schedule. Once the client has met the goal of staying continent for the established time period, the interval between voidings can be lengthened. Within the interval between urinations, the client can use relaxation exercises to help manage the feelings of urgency.

Positioning

Positioning of the client plays an important role in elimination. Sitting is the usual position for both men and women for bowel elimination. Sitting is also the usual position for women to urinate; standing is the position preferred by some men. Clients unable to use the toilet require assistance in accomplishing elimination. Devices such as the bedpan, commode, or urinal can be substituted (Figures 39-5 and 39-6).

Clients who use a bedpan need as comfortable a setting as possible, therefore, after placement of the

TABLE 39-6
Common Dietary Fiber Sources

Whole grains	Wheat, rye, oat, millet, buckwheat All bran cereal Shredded wheat cereal Popcorn Brown rice
Fruits	Apple Blackberries Raspberries Strawberries Peach Pear Bananas Apricot
Vegetables	Beans Asparagus Carrots Garlic Broccoli Brussels sprouts Acorn squash Zucchini squash



Figure 39-5 Types of Bedpans: A. Fracture, B. Regular



Figure 39-6 Male Urinal

bedpan the head of the bed should be elevated to a 45° angle, unless contraindicated. The nurse may need to assist the client to cross the legs in order to create somewhat of a sitting position. Male clients who are unable to stand should have the head of the bed elevated to a 45° angle, unless contraindicated, while using the urinal. Procedure 39-1 outlines the steps in positioning and removing a bedpan.

Clients who are able to get out of bed but are unable to ambulate to the toilet can use a bedside commode, which resembles a toilet but is portable. Typically, the client is assisted to stand and pivot to the commode from the bed.

Initiate Exercise Regimen

Regular exercise leads to good muscle tone and body metabolism. Exercise also stimulates the bowels to move regularly and leads to good urine production. Poor muscle tone can lead to impaired bladder muscle contraction and poor urination control. Pelvic muscle exercises are taught to manage SUI, and a strength training program is begun using principles of exercise physiology. Clients are taught to identify, isolate, and contract the pelvic muscles and to avoid contraction of distant

PROCEDURE 39-1

Positioning and Removing a Bedpan

Equipment

- Bedpan (regular or fracture)
- Disposable gloves
- Bedpan cover
- Toilet paper
- Washcloth and towel

Action

Rationale

Positioning a Bedpan

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Close curtain or door. 2. Wash hands, apply gloves. 3. Lower head of bed so client is in supine position. 4. Assist client to side-lying position using side rail. 5. Warm bedpan under warm water if needed, powder if necessary. 6. Place bedpan under buttocks, with lower end near the lower back region (Figure 39-7). 7. While holding the bedpan with one hand, help the client to roll onto her back (Figure 39-8). 8. Check placement of bedpan by looking between client's legs. | <ol style="list-style-type: none"> 1. Provides for privacy. 2. Prevents transmission of microorganisms. 3. The supine position will increase ability of client to move to side-lying position. 4. Provides for best position for proper placement of bedpan. 5. For comfort, prevents bedpan from sticking to the skin. 6. Ensures proper placement of the bedpan before client rolls on top of bedpan. 7. Prevents dislocation or alignment of bedpan. 8. May prevent spillage due to misalignment of bedpan. |
|--|--|

(continues)

PROCEDURE 39-1

Positioning and Removing a Bedpan (continued)

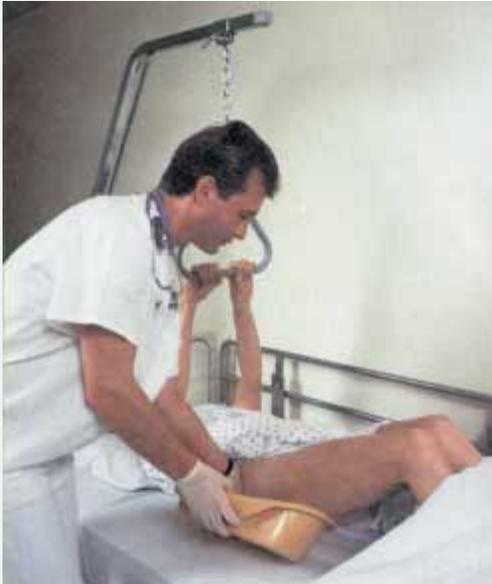
Action

Figure 39-7 Slip the bedpan under the client's buttocks while client lifts herself with the trapeze.

9. If indicated, elevate head of bed to 45° angle.
10. Place call light within reach of patient; place side rails in upright position and allow for privacy.

Removing a Bedpan

11. Wash hands, don gloves.
12. Lower head of bed to supine position.
13. While holding bedpan with one hand, roll client to side.
14. Assist with cleaning or wiping; always wipe with a front to back motion.
15. Empty bedpan, clean it, and store it in proper place; if bedpan is to be emptied outside client's room, cover it during transport.
16. Remove gloves and wash hands.
17. Allow client to wash hands.
18. Place call light within reach; recheck that side rails are in the upright position.

Rationale

Figure 39-8 Place the bedpan against the client's buttocks while rolling client to side.

9. Check physician order; bed remains flat if patient has a spinal cord injury or spinal surgery. Elevating the head of bed creates a more normal elimination position.
10. Privacy allows for a more comfortable elimination environment; elevated side rails provide for safety.
11. Prevents transmission of microorganisms.
12. Increases patient's ability to move to side-lying position.
13. Prevents possible spillage of bedpan contents.
14. Client may not be able to clean herself; wiping from front to back decreases chances of cross-contamination from anus to urethra.
15. Promotes privacy and decreases the chance of spilling contents.
16. Prevents transmission of microorganisms.
17. Provides for physical hygiene and comfort.
18. Ensures client safety and comfort.



NURSING TIP

Assisting with Elimination

Elimination is normally a private function done without assistance. However, during periods of immobility and illness, assistance is needed. The main focus of the nurse is to provide maximum comfort and privacy to lessen the client's embarrassment.

muscles groups such as the thigh or abdominal muscles. Because clients frequently have difficulty isolating the pelvic muscles, biofeedback may be helpful. The nurse teaches the client to perform a single exercise that combines maximal strength and endurance. The client is asked to perform a maximal strength contraction of the muscles “surrounding the urethra and vagina or rectum” for a count of 10, or approximately 6 seconds, followed by a rest period of equal length. The program begins with few contractions (typically 10 or fewer), and the number of repetitions is increased to a maximum of 35 to 50. The exercise regimen must be integrated into activities of daily living for maximal effectiveness. Pelvic muscle exercises, particularly when combined with biofeedback techniques, are typically taught by a specialty practice or advanced practice nurse with specific education in the management of the client with SUI.

Other management techniques are administered by the advanced practice or specialty practice nurse. These include transvaginal or transrectal electrical stimulation and placement of a vaginal pessary (a supportive device).

Inadequate tone in the abdominal muscles, diaphragm, and the perineal muscles can cause difficulty in defecating. If a client is suffering from constipation, a regimen of walking or light recreational exercise should be recommended to promote peristalsis and defecation.

Suggest Environmental Modifications

Functional incontinence is managed by removing the barriers to toileting. The environment is manipulated to maximize opportunities for toileting, to minimize the impact of poor mobility, and to remove any environmental barriers. Clothing is carefully evaluated, and buttons, zippers, and multiple layers of clothing are exchanged for items that are simpler to remove. Mobility is maximized by selection of shoes with nonskid soles, and Velcro straps are preferred over strings when dexterity is compromised. The accompanying display

APPLICATION: HOME CARE

Mr. M is a 79-year-old with Parkinson's disease and altered cognition. His home health care nurse was consulted for management of his incontinence. A recent medical evaluation had shown mild sensory urgency but failed to demonstrate significant urge or SUI. He is cared for primarily by Mrs. M, his 70-year-old wife. She reports using paper towels and baby diapers to contain his urinary leakage. She notes that he is wet every 2 to 3 hours and that he awakens her at night to urinate, but he is unable to postpone voiding long enough to reach the toilet.

On the basis of this health history, his home health care nurse diagnosed functional incontinence. She inspected the home and found that the bathroom was 35 steps from the couch and 15 steps from the bed. Mr. M walks with some difficulty, requiring a walker for assistance. He usually wears slick-soled shoes and trousers with two buttons and a zipper. The home health nurse recommended alterations in clothing and the addition of a hand-held urinal for rapid urination. Mr. M has begun to wear stretchband trousers that can be easily lowered for urination. A hand-held urinal was offered when the urge to urinate was perceived, thereby dramatically reducing the number of incontinent episodes. Because of these interventions, no containment device was required for urination, and his incontinent episodes were reduced from 2 to 3 per day to fewer than one per week.

describes the effectiveness of environmental modifications in managing functional incontinence.

The nursing management of fecal incontinence begins with measures to normalize stool consistency because constipation and diarrhea increase the risk of incontinent episodes. The environment is also manipulated to minimize functional limitations to bowel elimination. Mobility is enhanced by assistive devices (canes, walkers) as needed, and by altering seating and toilets to a height that allows optimal ease when transferring. Clothing is altered to minimize the time required for removal in preparation for defecation. Environmental barriers including poor lighting, narrow doorways, and slippery flooring are removed, or portable toileting facilities are made available.

Initiate Behavioral Interventions

A scheduled defecation program is used for clients with either a diminished ability to sense rectal distension or altered cognition who are unable to adequately respond to the presence of a bolus of stool in the rectum. The colon is cleansed of any excess stool, using an oral laxative or enema. The diet is altered to enhance the formation of a soft, solid stool, and supplemental bulk is added if indicated. Patterns of bowel elimination are evaluated,

and the client is encouraged to defecate on this schedule if feasible. Otherwise, bowel elimination is scheduled after either a meal or another stimulant, such as a caffeinated beverage or a pharmacologic agent. The importance of heeding the urge to defecate is emphasized, and the client with altered cognition is prompted to defecate.

Clients with significant sensory and motor deficits of the rectum and anus typically require a scheduled defecation program combined with vigorous stimulation of defecation. Persons with a paralyzing neurologic disorder have significant loss of anal sphincter control, poor abdominal muscle control, and altered colonic mobility. As a result, defecation must be scheduled and vigorously stimulated to avoid impaction and fecal incontinence. The colon is cleansed and stool consistency is normalized at the outset of the program. A timetable for bowel elimination is identified. Because of the need for an extensive process for effective defecation, this program must consider the schedule of the client and significant others, as well as premorbid defecation patterns. The bowel is stimulated by a pharmacologic device, such as bisacodyl or a mini-enema.

Behavioral interventions play a primary role in the management of urge incontinence. Methods of biofeedback are used to teach the client to perform either a “quick flick” maneuver or a sustained contraction in response to an episode of precipitous urgency. The quick flick is a rapid, maximal contraction of the pelvic muscles held for 3 to 4 seconds, and a sustained contraction is held for 6 to 10 seconds. The client is instructed to stop, rather than rush to the bathroom, thus decreasing the risk of falling. Several quick flicks or a sustained contraction are then performed until the precipitous urge is controlled. At this point, the client is instructed to proceed to the bathroom at a normal pace, but without further delays.

Other techniques, including electrical stimulation and more extensive biofeedback training, also may be used for urge incontinence. These treatment programs are typically managed by the advanced practice or specialty practice continence nurse.

The management of urinary retention is influenced by the underlying cause and the severity of the symptom. Mild urinary retention caused by poor detrusor contractility or obstruction may be managed by timed voiding or by double voiding. Timed voiding is a strategy to reduce overdistension and loss of muscle tone in clients with diminished sensations of urinary urgency. The client is taught to urinate at specific intervals, typically every 3 to 4 hours. Double voiding is an attempt to increase the efficiency of urine evacuation by contracting the detrusor twice during micturition. The client is taught to void, rest on the toilet for 2 to 5 minutes, and void again.

Intermittent catheterization is used for moderate to severe urinary retention, when the residual urine volume is 50% or more of the total bladder capacity. Intermittent self-catheterization is taught using a clean

technique. The client is taught to wash his hands and to locate and catheterize the urethra using a water-based soluble lubricant. Catheters may be cleaned and reused, and the client or significant other may catheterize without applying sterile gloves.

Monitor Skin Integrity

Because problems with urinary functioning may result in disturbances in hydration and excretion of body wastes, the skin should be carefully assessed for color, texture, turgor, and the excretion of any wastes. The integrity of the skin in the perineal area also should be assessed. Problems with incontinence may result in severe excoriation.

The risk of altered skin integrity is significant. The client is taught to regularly clean and thoroughly dry the skin. Clients with fragile skin are advised to use a skin cleanser; otherwise, use of soap and water is adequate. After cleansing, the skin should be dried thoroughly. A hair dryer set on the low (cool) setting may be recommended.

When monitoring a client with diarrhea, the nurse should assess the perineal skin for altered integrity. After each defecation, the skin is routinely cleansed with tap water or a gentle cleanser specifically designed for incontinence. Soap and water and abrasive cleaning techniques are avoided because they increase discomfort and the risk of altered skin integrity. The skin is then protected by application of a sealant or moisture barrier. Denuded skin is first treated with a pectin-based powder, followed by a skin sealant or moisture barrier.

Apply a Containment Device

Condom Catheter

The condom catheter is a device that resembles a condom with a large-caliber connector at its distal end (Figure 39-9). This is connected to a drainage bag via a leg bag or bedside container for urinary containment. Procedure 39-2 discusses the application of a condom catheter. Several types of condom catheters are available. The ideal device adheres to the penile skin without



Figure 39-9 Condom Catheter

producing irritation and has sufficient elasticity to maintain its watertight seal whether the penis is in an erect or a flaccid state. Because of the potential for altered skin integrity, the condom catheter is reserved for severe SUI.

Men without adequate upper extremity dexterity may manage urine containment using a condom catheter. The bladder outlet resistance caused by detrusor sphincter dyssynergia must be managed by pharmacotherapy or by transurethral or laser sphincterotomy. A special device, the Urolume, also may be inserted. This device consists of a wire mesh that is inserted into the urethra via a special cystoscopic device and expanded at the membranous urethra. The wire mesh of the Urolume gently holds the sphincter open, promoting urine evacuation and preventing the deleterious effects of sphincter dyssynergia.

Incontinent and Dribble Pads

Many women attempt to contain urine with feminine hygiene pads. Although these pads effectively contain menstrual flow, they are not designed for urine loss. As a result, they must be changed frequently, and the risk of odor and soiling outer clothing is enhanced. Women with mild SUI typically benefit from a small incontinent pad that adheres to the undergarments. Unlike the feminine hygiene pad, the ideal incontinent pad contains Superabsorbents[®] that increase the product's absorptive ability. Women with more severe SUI also may use a device that adheres to the undergarments. However, larger pads that are capable of absorbing up to 500 ml are recommended (Figure 39-10). Only women with very severe leakage are advised to use an incontinent brief. It is important to remember that containment devices are considered temporary, and the ultimate goal is reduction or ablation of urinary leakage so that pads are not needed.

Men with mild SUI may use a “dribble pad,” a device that adheres to the undergarments and holds the penis in a specially designed pouch. More absorptive pads or incontinent briefs are reserved for severe cases. Two additional devices, the penile clamp and condom



Figure 39-10 Incontinent Pads

Nursing Process Highlight

IMPLEMENTATION

Teach the client and significant others to remove and reapply the condom. Teach skin inspection and care during routine changes for the hospitalized client. Advise the client to seek care if erosions, rashes, or other lesions are noted on the penis.

catheter, are also used for men with SUI. The penile clamp is a constrictive device that mechanically closes the pendulous urethra. The device is worn for a brief period and removed to prevent ischemia to local tissues. Because of the risk of necrosis and discomfort associated with the clamp, its use is limited.

Rectal Pouch and Rectal Tube

Severe diarrhea may justify the use of a rectal pouch or rectal tube to contain leakage and to protect the surrounding skin. The rectal pouch is a drainable pouch attached to an adhesive skin barrier that conforms to the perianal region. The pouch is attached to the perianal area and any exposed skin surfaces are carefully protected with a skin sealant. Attachment to intact skin is relatively straightforward; however, application to denuded skin is difficult, and consultation with an enterostomal therapist or incontinence nurse specialist is recommended.

The rectal tube is an alternative to the rectal pouch. A larger catheter (30 French) is passed into the rectum and attached to a large bedside drainage bag. Although the rectal tube is effective for short-term use, its safety when used over longer periods of time is uncertain.

Initiate Diet and Fluid Therapy

It is important to remember that foods and beverages affect each client differently and that a very restrictive diet, designed to remove all potential irritants, is not reasonable for most clients. Therefore, nurses can teach the client to eliminate potential irritants one at a time and to judge the effects on patterns of voiding and urinary leakage.

Dietary fiber and fluid intake can be increased to promote the passage of soft, hydrated stool. The client who is unable or unwilling to obtain adequate fiber from the diet may be given a bulk laxative (such as Metamucil) or a bran mixture as a specific dietary supplement. The nurse should present options for taking this supplement, honoring the client's preferences whenever feasible. Initially, 3 to 6 grams of the supplement is

PROCEDURE 39-2

Applying a Condom Catheter

Equipment

- Bedpan (regular or fracture)
- Disposable gloves
- Bedpan cover

- Toilet paper
- Washcloth and towel

Action

1. Wash hands and apply gloves.
2. Select an appropriate condom catheter.
3. Cleanse the penile shaft.
4. Inspect the penile shaft for excessive hair.
5. Inspect the penis for altered skin integrity.
6. Stretch the shaft of the penis and unroll the condom to the base of the penis (Figure 39-11). Follow product directions for the application of the sealant (Figure 39-12).
7. Attach the condom to the drainage apparatus, either a leg bag or bedside drainage bag.
8. Remove gloves and wash hands.
9. Remove and reapply the condom catheter every 24 to 48 hours, or when leakage occurs.

Rationale

1. Reduces risk of contamination.
2. The condom catheter must be sized correctly (refer to manufacturer's recommendations), contain a distal tip that resists twisting and occlusion, and contain an adhesive that prevents leakage; latex condom catheters are avoided in men who are allergic to latex and in boys with myelodysplasia.
3. Reduces surface dirt and pathogens.
4. Excessive penile hair is shaved to provide a watertight seal when the condom is applied.
5. Small lesions may be protected by the use of a skin sealant; significant erosions or rashes require consultation with the enterostomal nurse specialist or a dermatologist.
6. The condom is applied over the entire penile shaft to maximize a watertight seal; the adhesive may be built into the wall of the condom, or a dual-sided sealant strip may be used to prevent leakage.
7. Ensures adequate urine containment.
8. Reduces the risks of contamination.
9. Regular reapplication allows routine inspection of the penile skin and avoids bacterial overgrowth and altered skin integrity under the condom.



Figure 39-11 Unroll condom catheter to the base of the penis.



Figure 39-12 Secure the condom catheter with a strap.

administered, and the dosage is gradually increased until a soft, well-formed stool is obtained.

The initial management of diarrhea involves the removal of factors that predispose the individual to the condition and the maintenance of adequate fluid and electrolyte balance. The nurse collaborates with the client, physician, and dietitian to determine foods that contribute to diarrhea by malabsorption or inflammation of the gastrointestinal tract. These foods are then eliminated from the diet or given with a substance (such as Lactaid) that renders them tolerable to the client. Persons with infectious diarrhea are given antimicrobials to destroy the pathogens that produce diarrhea. Anti-inflammatory drugs are administered as directed for diarrhea caused by inflammatory disorders of the bowel (see the accompanying Nursing Checklist).

Bulking agents may be used for clients with watery diarrhea. These agents absorb water in the stool and improve the consistency of feces. Antidiarrheal drugs, including diphenoxylate and loperamide, may be administered to reduce intestinal motility and increase absorption of water from the stool. However, these drugs are contraindicated in patients with infectious diarrhea because the diminished motility would enhance overgrowth of pathogens in the gastrointestinal tract.

Clients who have significant diarrhea may experience mild to severe dehydration and electrolyte imbalances. Oral fluids are given as tolerated; beverages containing glucose and electrolytes are encouraged. In contrast, beverages that contain caffeine are avoided because they stimulate colonic motility. Individuals with severe fluid volume deficits and large-volume diarrhea may require intravenous fluid and electrolyte support until the diarrhea subsides.



NURSING CHECKLIST

Managing Diarrhea

- Eliminate from the diet foods and beverages that contain malabsorbed substances.
- Administer antimicrobials for infectious diarrhea.
- Administer anti-inflammatory agents for irritative disorders of the bowel.
- Administer bulking agents for watery stools.
- Provide oral fluids as tolerated; offer fluids rich in electrolytes.
- Administer intravenous fluids and electrolytes as directed for clients unable to tolerate oral fluids.
- Monitor perianal skin for integrity.
- Apply skin barriers for altered integrity.
- Apply a rectal pouch or insert a rectal tube for severe, large-volume diarrhea.

Administer Medications

Constipation is initially managed by assisting the individual to pass hardened stool or by removing any impacted feces (see the accompanying Nursing Checklist). Bowel evacuation is encouraged by an oral laxative, such as psyllium, a bulk-forming agent. Constipation resulting in an impaction requires mechanical disruption and removal, followed by a cleansing enema or an oral laxative. As an alternative, a pulsed irrigation enhanced evacuation (PIEE) system can be used to remove severe impaction. The PIEE uses gravity to deliver intermittent pulses of warmed saline to break up and remove hardened and impacting fecal material.

The medical management of SUI includes both OTC and prescription drugs. OTC medications such as Dexatrim without caffeine and Sudafed contain the α -adrenergic agonists phenylpropanolamine and pseudoephedrine, respectively, which increase urethral sphincter tone and relieve urinary leakage. Nurses teach the client the specific purpose of these medications, and they advise clients to ignore the dosage and scheduling recommendations on the medication container. Instead, the client is taught to take the medication only during waking hours rather than around the clock to reduce the risk of associated insomnia. Potential side effects associated with these medications, such as restlessness and hypertension, are discussed with the client, and blood pressure is monitored regularly.

Stress urinary incontinence also may be managed by prescription medications including imipramine (Tofranil) and topical estrogens, often administered in combination. The client is taught the dosage and administration of each of these agents. Because imipramine has anticholinergic as well as α -adrenergic



NURSING CHECKLIST

Managing Constipation

- Remove hardened or impacted stool by mechanical means, cleansing enema, stimulant or laxative, or pulsed irrigation enhanced evacuation (PIEE).
- Increase dietary fiber and fluid until soft, formed stool is obtained.
- Administer supplemental bulk laxative for client intolerant of dietary fiber.
- Encourage light exercise to stimulate defecation.
- Encourage regular pattern of defecation.
- Teach client to stimulate defecation by mini-enema, oral laxative or stimulant, or digital stimulation as needed.

effects, clients are advised of additional side effects including dry mouth, the potential for constipation, and mydriasis. Women who are placed on topical or systemic estrogens are advised to seek ongoing care from their gynecologist, including routine vaginal examinations and Papanicolaou (Pap) smears.

Medications are often prescribed for urge urinary incontinence. Anticholinergics or antispasmodics relax detrusor muscle contractions by blocking the action of acetylcholine, by a local anesthetic effect, or by a direct effect on the detrusor muscle. Common agents, their actions, and potential side effects are described in Table 39-7. None of these agents will be effective unless the client is taught to adhere to a timed voiding schedule and to identify and limit the intake of bladder irritants.

Several pharmacologic agents may be used in the management of urinary retention. Finasteride, a 5- α -reductase inhibitor, is used to reduce prostatic size and related urinary retention. Men who take finasteride are taught the dosage and administration of the drug and its potential side effects, including impotence and loss of libido. Caregivers are cautioned to refrain from handling the drug without gloves because transdermal absorption and irritation of the skin have been reported.

Alpha-adrenergic blocking agents also may be used to manage urinary retention caused by prostatic hyperplasia, bladder neck dyssynergia, or detrusor striated sphincter dyssynergia. Because of the risk of postural hypotension when the medication reaches a peak

plasma level, the client is taught to take these drugs before bedtime. Clients are also taught to monitor for medication side effects, including postural dizziness during waking hours, fatigue, and headache. The significance of titrating the dosage of an α -blocking agent is emphasized, and the client is reminded that the dosage must be retitrated if the medication is inadvertently stopped for a period of more than 72 hours.

Perform Catheterization

Occasionally, an indwelling urethral or suprapubic catheter may be used to provide continuous drainage for reflex incontinence (Figure 39-13). An indwelling catheter may be inserted for an acute episode of urinary retention or when other strategies to manage retention are ineffective. A catheter is chosen that minimizes urethral irritation and maximizes drainage from the bladder. A silicone or other inert-material catheter is preferred over a Silastic catheter coated with Teflon. A Lubricious-coated catheter (Bard Urological, Covington, Georgia) also may be used because of its hydrophilic nature and its low friction coefficient. The client is provided with a drainage bag with adequate storage capacity for overnight use (typically 2000 ml) and a leg bag with non-latex straps when indicated.

The use of a coudé catheter is indicated when intermittent catheterization is needed. The coudé catheter works much like the other catheters; however, a

TABLE 39-7
Common Anticholinergic/Antispasmodic Medications

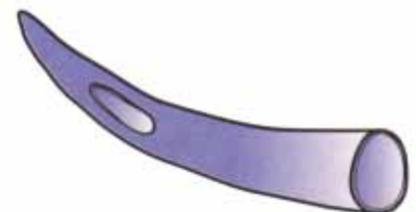
Agent	Effect	Common Side Effects
Oxybutynin (Ditropan)	Relaxation of unstable detrusor contractions Reduces urgency Maximal therapeutic response requires 5 to 7 days	Dry mouth Slightly blurred vision Constipation Nightmares, confusion may occur in elderly client
Propantheline (Pro-Banthine)	Relaxation of unstable detrusor contractions Maximal therapeutic response requires 3 to 5 days	Similar to oxybutynin effects
Hyoscyamine (Levsin)	Relaxation of unstable detrusor	Similar to oxybutynin effects, but dry mouth less pronounced



A.



B.



C.

Figure 39-13 Types of Catheters: A. Foley Catheter; B. Three-Way Foley Catheter with Balloon Inflated; C. Coudé Catheter

distinguishing feature is that the tip of the catheter is more pointed and curved. The coude catheter does not have a balloon; therefore it cannot be used for a procedure requiring an indwelling catheter. Procedures 39-3 and 39-4 discuss catheterization. Procedures 39-5 and 39-6 discuss irrigation of catheters.

Intermittent Self-Catheterization

Women with reflex incontinence have more-limited options for management because no effective condom device has been designed for women. Intermittent self-catheterization is chosen whenever feasible. This option

PROCEDURE 39-3

Performing Urinary Catheterization: Male Client

Equipment

- | | |
|---|---|
| <ul style="list-style-type: none"> ■ Indwelling catheter with drainage system ■ Adequate lighting source ■ Blanket or drape ■ Warm water ■ Forceps | <ul style="list-style-type: none"> ■ Sterile catheterization kit ■ Disposable gloves ■ Soap and washcloth ■ Towel |
|---|---|

Action

1. Provide for privacy and explain procedure to client.
2. Set the bed to a comfortable height to work, and raise the side rail on the side opposite you.
3. Assist the client to a supine position with legs slightly spread.
4. Drape the client's abdomen and thighs, and place the penis over the thighs.
5. Ensure adequate lighting of the penis.
6. Wash hands, don disposable gloves, and wash perineal area.
7. Remove gloves and wash hands.
8. Prepare a sterile field, apply sterile gloves, and connect the catheter and drainage system (if necessary).
9. Gently retract the foreskin (if present) and, using forceps, cleanse the glans penis with a povidone-iodine solution or other antimicrobial cleanser (see Figure 39-14).
10. Inject 10 ml water-soluble lubricant (use a 2% xylocaine lubricant whenever feasible) into the urethra *before* catheter insertion; generously coat the distal portion of the catheter with water-soluble, sterile lubricant.
11. Hold the penis perpendicular to the body and pull up gently.
12. Steadily insert the catheter about 8 inches, until urine is noted. Continue inserting until the hub of the catheter (bifurcation between drainage port and retention balloon arm) is met.

Rationale

1. Promotes cooperation and client dignity.
2. Promotes proper body mechanics and assures client safety.
3. Relaxes muscles to facilitate insertion of the catheter.
4. Promotes client comfort and warmth.
5. Facilitates proper execution of technique.
6. Reduces transfer of microorganisms.
7. Reduces transfer of microorganisms.
8. The catheter and drainage system may be pre-connected; otherwise it is connected before catheterization to avoid exposing the client to ascending infection from an open-ended catheter.
9. Removes dirt and minimizes the risk of urinary tract infection by removing surface pathogens.
10. Avoids urethral trauma and discomfort during catheter insertion and facilitates insertion.
11. Facilitates catheter insertion by straightening urethra.
12. Ensures adequate catheter insertion before retention balloon is inflated.

(continues)

PROCEDURE 39-3

Performing Urinary Catheterization: Male Client (continued)

Action

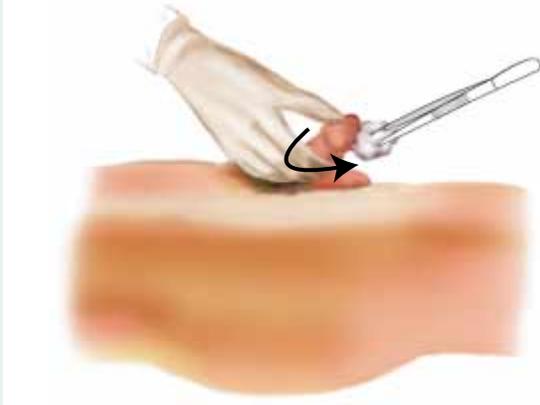


Figure 39-14 Cleanse the glans penis with a cotton ball held with forceps.

13. Inflate the retention balloon using manufacturer's recommendations or according to physician orders.
14. Instruct the client to immediately report discomfort or pressure during balloon inflation; if pain occurs, discontinue the procedure, deflate the balloon, and insert the catheter farther into the bladder.
15. Gently pull the catheter until the retention balloon is snugged against the bladder neck (resistance will be met) (Figure 39-15).



Figure 39-15 Correct Catheter Placement: Male Client

16. Secure the catheter to the abdomen or thigh.
17. Place the drainage bag below the level of the bladder.
18. Remove gloves, dispose of equipment, and wash hands.
19. Help client adjust position.
20. Assess and document the amount, color, odor, and quality of urine.

Rationale

13. Ensures retention of the balloon; up to twice the recommended volume of fluid may be inserted safely into the retention balloon if needed.
14. Pain or pressure indicates inflation of the balloon in the urethra; further insertion will prevent misplacement and further pain or bleeding.
15. Maximizes continuous bladder drainage.

16. Prevents excessive traction from the balloon rubbing against the bladder neck, inadvertent catheter removal, or urethral erosion.
17. Maximizes continuous drainage of urine from the bladder (drainage is prevented when the drainage bag is placed above the abdomen).
18. Prevents transfer of microorganisms.
19. Promotes client comfort.
20. Monitors urinary status.



NURSING TIP

Catheterization Procedure

1. Prepare the client for catheterization by reviewing the procedure. Reassure the client that catheterization will not produce a sharp pain; instead, inform the client that catheterization will produce sensations of intense urgency to urinate and pressure centered on the urethral and suprapubic area.
2. Documentation of the amount of water used to inflate the retention balloon assists when removing the indwelling catheter.
3. A Silastic catheter with Teflon is used only for short-term catheterization. Otherwise the catheter should be constructed of silicone or a Lubricious coating to minimize urethral trauma and irritation.
4. Clients with myelodysplasia should be routinely catheterized with nonlatex products.

is typically used in combination with pharmacotherapy for detrusor hyperreflexia. Indwelling catheterization is used only when other means of bladder management are not feasible.

Of the bladder management programs available for the client with a spinal injury or multiple sclerosis and reflex incontinence, intermittent self-catheterization is preferred when feasible. The nurse teaches the client with adequate upper extremity dexterity to perform self-catheterization, and the skill is also taught to significant others. Pharmacotherapy, consisting of an anticholinergic agent, imipramine, or (rarely) a calcium channel blocker, is frequently required to control hyperreflexic detrusor contractions.

Administer Enemas

Enema administration is a procedure used to introduce fluid into the lower bowel. The purpose of an enema is to cleanse the lower bowel, to assist in the evacuation of stool or flatus, or to instill medication. Table 39-8 outlines four types of enemas, along with the solutions and the indications for use of each.

Enemas can be large or small depending on their purpose. Large-volume enemas, which typically contain 500 to 1000 ml fluid, are administered to cleanse the

PROCEDURE 39-4

Performing Urinary Catheterization: Female Client

Equipment

See Procedure 39-3

Action	Rationale
1. See Procedure 39-3, steps 1 and 2.	
2. Assist the client to a supine position with legs spread and feet together or to a side-lying position with upper leg flexed.	2. Facilitates visualization of area and promotes client comfort.
3. Drape client's abdomen and thighs.	3. Promotes client comfort and warmth.
4. Ensure adequate lighting of the perineum.	4. Facilitates proper execution of technique.
5. Refer to Procedure 39-3, steps 6, 7, and 8.	
6. Separate the perineum and, using forceps, cleanse the periurethral mucosa with a povidone-iodine or other antimicrobial cleanser (Figure 39-16).	6. Removes dirt and minimizes the risk of urinary tract infection by removing surface pathogens.
7. Generously coat the distal portion of the catheter with water-soluble, sterile lubricant.	7. Avoids urethral trauma and discomfort during catheter insertion.
8. Gently insert the catheter into meatus until urine is noted. Continue inserting for 1 to 3 additional inches.	8. Ensures adequate catheter insertion before retention balloon is inflated.

(continues)

PROCEDURE 39-4

Performing Urinary Catheterization: Female Client (continued)

Action



Figure 39-16 Cleanse the labia minora with a cotton ball held with forceps.

9. Inflate the retention balloon using manufacturer's recommendations or according to physician orders.
10. Instruct the client to immediately report discomfort or pressure during balloon inflation; if pain occurs, discontinue the procedure, deflate the balloon, and insert the catheter further into the bladder.
11. Gently pull the catheter until the retention balloon is snugged against the bladder neck (resistance will be met) (Figure 39-17).
12. Secure the catheter to the abdomen or thigh.
13. Place the drainage bag below the level of the bladder.
14. See Procedure 39-3, steps 18–20.

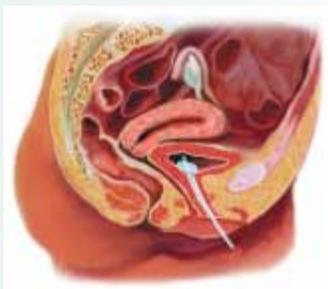


Figure 39-17 Correct Catheter Placement: Female Client

Rationale

9. Ensures retention of the balloon; up to twice the recommended volume of fluid may be inserted safely into the retention balloon if needed.
10. Pain or pressure indicates inflation of the balloon in the urethra; further insertion will prevent misplacement and further pain or bleeding.
11. Maximizes continuous bladder drainage.
12. Prevents excessive traction from the balloon rubbing against the bladder neck, inadvertent catheter removal, or urethral erosion.
13. Maximizes continuous drainage of urine from the bladder (drainage is prevented when the drainage bag is placed above the abdomen).

PROCEDURE 39-5

Irrigating an Open Catheter

Equipment

- | | |
|--|--|
| <ul style="list-style-type: none"> ■ Catheter tip irrigation syringe ■ Sterile gloves ■ Sterile basin | <ul style="list-style-type: none"> ■ Solution in amount ordered by physician ■ Sterile drape ■ 5–10 alcohol wipes |
|--|--|

Action

Rationale

- | Action | Rationale |
|---|---|
| 1. Introduce yourself, explain procedure. | 1. Awareness of procedure and what to expect may relax client. |
| 2. Wash hands. | 2. Decreases chance of contamination. |
| 3. Open sterile drape and form a sterile field. | 3. Promotes sterile environment. |
| 4. Using sterile technique, open and place basin on sterile field. | 4. Using sterile technique decreases the chances of bacteria being introduced into the bladder. |
| 5. Pour solution into sterile basin. | 5. Solution should be no warmer than 99° to 102°F. |
| 6. Open syringe, remove tip and fill with solution, then place at opposite end of sterile field away from basin and solution. | 6. Maintains sterile environment. |
| 7. Open alcohol wipes exposing only half a wipe. | 7. Facilitates handling of wipe. |
| 8. Don sterile gloves. | 8. Prevents or inhibits contamination. |
| 9. Clean junction between catheter and drainage tube with alcohol wipes. | 9. Prevents contamination when juncture is disconnected. |
| 10. Simultaneously twist and pull catheter and drainage tube apart. | 10. Twisting and pulling makes disconnections easy. |
| 11. Hold both drainage tube and catheter in non-dominant hand; with dominant hand take catheter tip syringe and place into catheter opening. Depending on the amount, syringe may need to be refilled and procedure repeated. | 11. Holding both drainage and catheter tubing decreases the chances of falling and cross-contamination. |
| 12. Gently squeeze solution into the catheter using plunger. | 12. Rapid infusion may cause bladder spasms. |
| 13. Clean both tips with alcohol and reconnect. | 13. Avoids reintroducing bacteria into catheter system. |
| 14. Drain solution via gravity. | 14. Pulling back solution through syringe may cause damage to bladder. |
| 15. Clean work area and dispose of contaminated supplies properly. | 15. Maintains safe, clean work environment. |
| 16. Remove gloves and wash hands. | 16. Prevents spread of bacteria. |
| 17. Document amount of solution given; amount, color, and clarity of return; and client's response. | 17. Provides record of procedure and client's status. |

PROCEDURE 39-6

Irrigating a Closed Catheter

Equipment

- Three-way indwelling catheter
- Sturdy IV pole
- Gloves

- Irrigation solution
- Large drainage bag
- Wipes

Action

1. Explain procedure and provide for privacy.
2. Obtain irrigation solution from pharmacy as prescribed by the physician.
3. Hang solution (1–3 L) from a sturdy IV pole (depending on anticipated rate of irrigation) using one-, two-, or three-port irrigation tubing.
4. Connect the irrigation infusion tubing to the third irrigation port of the three-way catheter; refer to the product for instructions and identification of the irrigation port (Figure 39-18).



Figure 39-18 Connect the irrigation tubing to the irrigation port of the catheter.

5. Consult the physician concerning the rate of irrigation; *never* slow the irrigation rate because “pink urine” has been observed unless directed by the physician or urologic nurse specialist.
6. Regularly check the drainage container; empty the bag when filled two-thirds or more.

Rationale

1. Promotes cooperation and client dignity.
2. Irrigation solutions are selected for their antimicrobial properties or to remove clots and debris; a hypotonic or hypertonic solution may be absorbed through resected tissue causing fluid and electrolyte imbalances.
3. Relatively rapid irrigation may be used to remove debris or clots from the bladder; slower irrigations are used to treat local infection.
4. Ensures proper irrigation and simultaneous drainage from the bladder.
5. Clotting and catheter obstruction following transurethral resection of the prostate or transurethral sphincterotomy frequently occur because the nurse has prematurely slowed the irrigation; a pink solution is expected when an adequate irrigation is being performed; this finding does not mean that all bleeding has stopped.
6. Filling of the drainage bag occurs rapidly and can obstruct the irrigation.

TABLE 39-8
Types of Enemas

Type	Solution	Indication
Cleansing	Tap water Soap suds Normal saline	Evacuate lower bowel before diagnostic studies or surgery
Retention (should be retained for at least 30 min)	Emollient (oil)	Soften and lubricate stool for easy evacuation
Carminative (return flow)	Tap water Normal saline	Relief of distension due to flatus
Medication	Normal saline Sterile water mixed with prescribed medication	Will depend on what medication is introduced

bowel. Small-volume enemas are used for the purpose of evacuating stool or instilling medications in the lower bowel. These are usually found as prepackaged solutions, which contain 150 to 240 ml fluid. Refer to Procedures 39-7 and 39-8 for guidelines on enema administration.

Caution should be used when administering large-volume enemas, because fluid and electrolyte imbalance can occur. This is related to the volume, frequency, and type of solution used. Table 39-9 lists the types of enema solutions and their effects.

NURSING ALERT

Enema Administration

If “enema till clear” is ordered, no more than 3 L fluid should be administered in any one series of enemas. Repeated enemas produce irritation of bowel mucosa and perianal area, as well as electrolyte loss and exhaustion. If returns are not clear, consult physician for further instructions.

NURSING ALERT

Effects of Enemas

Large-volume enemas disrupt the normal flora of the bowel, predisposing the client to diarrhea as the bowels recover from this traumatic event. Provide yogurt with active cultures or buttermilk to help the client restore normal flora. Antibiotic enemas may disrupt vitamin K synthesis by intestinal flora. Supplemental vitamin K may be required until normal intestinal flora is restored.



NURSING TIP

Small and Mini-Enemas

Small enemas come premixed and in their own receptacle containing about 150 to 240 ml solution. Mini-enemas usually contain 4 to 10 ml liquid. Clients should be instructed to call for assistance immediately if light-headedness, dizziness, or faint feeling occur.

TABLE 39-9
Solutions Used for Enemas

Solution	Action	Class
Tap water	Stimulates, dilates bowel	Hypotonic
Soap suds	Dilates, stimulates, and irritates bowel	Hypotonic
Normal saline	Dilates, simulates, irritates bowel	0.9% (isotonic) <0.9% (hypotonic) >0.9% (hypertonic)
Oil	Lubricates, softens	
Sodium polystyrene sulfonate (Kayexalate)	Medication reduces serum potassium	Hypertonic
Antibiotic	Cleansing	Antibacterial, may be hypertonic or hypotonic

Initiate Rectal Stimulation

As an alternative to a scheduled defecation program, digital rectal stimulation may be used to regulate fecal elimination patterns. This process requires circular palpation of the anal sphincter and distal anus for 2 to 3 minutes. This process is repeated in 20 minutes if defecation does not occur. Deep breathing is encouraged during defecation because it drops the diaphragm and partially compensates for the client's inability to effectively strain.

Persons with chronic fecal incontinence due to anal sphincter incompetence may be managed with biofeedback techniques. These techniques are typically taught by a specialty or advanced practice nurse with specific

PROCEDURE 39-7

Administering a Large Enema

Equipment

- Enema bag (disposable comes with rectal tip catheter; reusable may need to have rectal tip catheter checked for damage and rectal tip may need to be replaced)
- Towel and washcloth
- Solution per physician's order
- Water-soluble lubricant
- Clean gloves
- Bedpan, commode, or toilet

Action

1. Introduce yourself and explain procedure.
2. Prepare the solution, assure temperature within range of 99° to 102°F by using a thermometer or placing a few drops on your wrist.
3. Wash hands and don gloves.
4. Assist patient to left side-lying position, with right knee bent.
5. Hang bag of enema solution 12 to 18 inches above anus.
6. Lubricate 4 to 5 inches of catheter tip.
7. Place bedpan, commode, robe and slippers within easy reach.
8. Separate buttocks, insert catheter tip into anal opening, slowly advance catheter approximately 4 inches.
9. Slowly infuse solution via gravity flow; bag height may be increased but not to exceed 18 inches above anal opening (Figure 39-19).

Rationale

1. Client may be more relaxed if prepared for procedure and told what to expect.
2. Avoids harming the intestinal mucosa.
3. Protects from contamination.
4. Lying flat on left side allows fluid to flow through to colon with contour of bowel.
5. This height allows for steady flow of fluid into the patient by gravity; a bag placed at a height greater than 18 inches allows for too rapid an infusion rate and could result in cramping or discomfort for the client.
6. Eases catheter tip insertion.
7. Urgent evacuation of bowels or inability to retain fluid may occur.
8. Further catheter advancement could cause damage to bowel.
9. Rapid infusion caused by bag height over 18 inches may cause cramping and discomfort. Bowel perforation is also a risk.



Figure 39-19 Raise the height of the enema container to allow infusion of the solution.

(continues)

PROCEDURE 39-7

Administering a Large Enema (continued)*Action**Rationale*

- | | |
|--|---|
| <p>10. If client complains of increased pain or cramping, or if fluid is not being retained, stop procedure, wait a few minutes, then restart.</p> <p>11. Clamp tubing when fluid finishes infusing; remove catheter tip.</p> <p>12. Assist client to bedpan, commode, or toilet; refer to Procedure 39-1 for giving and removing bedpan.</p> <p>13. Discard equipment in proper place. If equipment is reusable, properly clean and store it.</p> <p>14. Remove gloves and wash hands.</p> <p>15. Instruct client to call for assistance when finished eliminating, or if untoward feeling occurs, such as lightheadedness or dizziness.</p> <p>16. Assist client with washing if needed.</p> | <p>10. Discomfort may cause poor retention of fluid.</p> <p>11. Stops flow of fluid.</p> <p>12. If bedpan is used, place client in sitting position. Clients should be instructed to retain fluid for as long as possible.</p> <p>13. Prevents spread of microorganisms.</p> <p>14. Reduces spread of microorganisms.</p> <p>15. Provides assistance and avoids potential harm to client.</p> <p>16. Promotes client comfort.</p> |
|--|---|

PROCEDURE 39-8

Administering a Small (Mini-)Enema*Equipment*

- | | |
|---|--|
| <ul style="list-style-type: none"> ■ Enema—small and mini-enemas come premixed ■ Disposable gloves ■ Washcloth and towel | <ul style="list-style-type: none"> ■ Lubricant ■ Bedpan, commode, toilet |
|---|--|

*Action**Rationale*

- | | |
|---|--|
| <p>1. Introduce yourself, explain procedure, close door or curtain.</p> <p>2. Place commode next to bed; have robe and slippers available.</p> <p>3. Wash hands and don gloves.</p> <p>4. Lower head of bed to flat position.</p> <p>5. Assist client to roll to left side-lying position with right knee slightly bent.</p> <p>6. Place bedpan slightly under buttocks.</p> <p>7. Remove catheter tip guard; gently squeeze bottle until fluid drips (for mini-enemas tip needs to be punctured with needle or pin).</p> | <p>1. Client may be more relaxed with privacy and knowing what to expect.</p> <p>2. If client is able to use commode, easy access is necessary due to urgency after enema administration.</p> <p>3. Prevents cross-contamination of bacteria.</p> <p>4. Easier for client to roll to left side.</p> <p>5. Lying on left side helps solution flow with the contour of the bowel.</p> <p>6. Have bedpan ready if client is unable to retain fluid.</p> <p>7. Most prepared enemas have perforated tips; a gentle squeeze will ensure this.</p> |
|---|--|

(continues)

PROCEDURE 39-8

Administering a Small (Mini-)Enema (continued)

<i>Action</i>	<i>Rationale</i>
8. Lubricate catheter tip.	8. Most premixed solutions are prelubricated; however, additional lubrication may be needed.
9. Separate buttocks and insert enema tip into anal opening; gently squeeze contents into rectum.	9. Gentle insertion and infusion lessens risk of undue discomfort and damage to colon.
10. Remove tip and assist to bedpan, commode, or toilet. Ask client to retain fluid for as long as possible, at least 30 minutes.	10. Assistance ensures safe transfer for client. Better results occur when enema has been retained for longer period of time.
11. Dispose of contaminated material in proper receptacles.	11. Prevents contamination.
12. Remove gloves and wash hands.	12. Reduces risk of contamination.
13. Assist client with cleaning if needed.	13. Illness or fatigue may cause some clients to require assistance for cleaning.

training in the field of gastrointestinal disorders and biofeedback techniques.

Monitor Elimination Diversions

Urinary Diversions

Surgically created extraurethral incontinence is managed by a pouch. The ileal conduit is, by design, an incontinent stoma constructed from a 10-cm segment of ileum. The ileum is isolated from the fecal stream and connected to the ureters using a refluxing end-to-end anastomosis. A small incision is made in the abdominal wall, and a stoma is constructed from the distal portion of the ileal segment. An enterostomal nurse is consulted to advise the surgeon on stoma site selection and to assist the client to adapt to and learn to manage the stoma.

The continent urinary diversion is an alternative to the ileal conduit. It contains a reservoir for urinary storage and gains continence from various mechanisms. The urinary reservoir may be created from small or large bowel. The Kock Indiana and Florida pouches are types of pouches created from intestinal material. Continence is obtained by forming an abdominal reservoir. Continence also may be preserved by the Mitrofanoff technique, which uses a segment of appendix or ureter to create a continent stoma. Evacuation of urine from the reservoir relies on intermittent catheterization of these continent mechanisms. Orthotopic urinary diversions have been described in which the bladder is attached to the urethra, and its sphincter mechanism is relied on for continence. Urine may be evacuated from the urinary reservoir by catheterization of the urethra or by strain voiding.

Bowel Diversions

The fecal stream is diverted when tissue damage from trauma or inflammation necessitates the temporary bypassing of a segment of bowel or when permanent resection of malignant or irreversibly damaged tissue is necessary. Several techniques are used to create a fecal diversion; some require a pouch to contain fecal contents, whereas others maintain continence. Continent diversions rely on catheterization of an abdominal stoma or evacuation of stool from a pouch reservoir reattached to the anal sphincter.

Virtually any portion of the large and small intestine can be diverted or used to form a fecal reservoir. Some diversions rely on a **stoma** (surgically created opening) for the evacuation of fecal contents. Stomas are primarily constructed in three ways. An *end stoma* is created by dividing the bowel and bringing the proximal segment to the abdominal wall. The end is rolled and attached to the skin of the abdomen, creating a red rosette of intestinal mucosa. A *double-barrel stoma* is constructed by dividing the bowel and bringing both the proximal and distal ends to the abdominal wall. The proximal end is used to evacuate stool. The distal stoma is typically referred to as a mucous fistula. The double-barrel stoma is designed for temporary diversion of the fecal stream. A *loop stoma* is created by opening the anterior aspect of the bowel either longitudinally or transversely. The resulting stoma has both proximal and distal openings that are separated by the posterior wall of the bowel loop. It is designed for temporary fecal diversion.

The fecal stream is diverted at the most distal point possible to maximize the absorption of food, fluid, and electrolytes and to preserve continence. The *ileostomy* (diversion of the bowel at the level of the ileum) is more

uncommon than it was during earlier decades. A permanent ileostomy is typically reserved for clients with severe Crohn's colitis, familial adenomatous polyposis, or chronic ulcerative colitis. A loop (temporary) ileostomy may be created as one stage in an ileoanal reservoir procedure or as a staged procedure for the relief of obstruction of the ascending colon.

The colostomy is created as a permanent or temporary fecal diversion (Figure 39-20). Among adults, it may be created in cases of severe diverticulitis or trauma. The most common indication for a permanent colostomy among adults is an abdominoperineal resection for lower rectal cancer. A temporary colostomy may be created from the transverse colon or (rarely) from the cecum. The descending or sigmoid colon may be temporarily diverted because of radiation proctitis or low rectal carcinoma. Procedure 39-9 outlines steps for changing a colostomy pouch.

Continent diversions of the bowel may incorporate the anus and sphincter or may be constructed with an abdom-



Figure 39-20 Colostomy. What are some major nursing implications when caring for this client?

inal stoma. The ileoanal reservoir is created in a staged approach. In the first stage an abdominal colectomy is completed, followed by a rectal mucosectomy, creation of a J- or S-shaped pouch comprising anus and ileum, and a temporary end or loop ileostomy. In the second stage the

PROCEDURE 39-9

Changing a Colostomy Pouch

Equipment

- Appropriate pouch
- Skin barrier (Figure 39-21)
- Pouch clip or rubber band
- Skin paste
- Disposable gloves
- Soap and washcloth
- Warm water



A.

B.

Figure 39-21 Equipment for Application of a Colostomy Pouch: A. Colostomy Pouch; B. Skin Barrier

Action

1. Explain the procedure to client and provide for privacy. Include caregivers in instruction if indicated.
2. Assist client to a standing (preferable) or sitting position.
3. Wash hands and don gloves.
4. Remove the soiled pouch by gently pressing on the skin while pulling the pouch.
5. Dispose of the pouch in a plastic bag after removing the clip used to seal the pouch.
6. Cleanse the skin with soap and water.

Rationale

1. Promotes cooperation and boosts caregiver confidence in ability to perform procedure.
2. Facilitates application of pouch by reducing wrinkles.
3. Reduces risk of contamination.
4. Avoids trauma to the peristomal skin.
5. Minimizes odor associated with the pouch change.
6. Removes fecal material and pathogens and prepares the skin for pouch reapplication.

(continues)

PROCEDURE 39-9

Changing a Colostomy Pouch (continued)

Action

7. Inspect the peristomal skin for redness, altered skin integrity, or rashes; consult the enterostomal nurse if lesions of the peristomal skin are observed.
8. Remove excessive hair with a safety razor or electric razor.
9. Inspect the pouch opening and ensure that it fits the stoma; use a pouch pattern to customize the fit if indicated (Figure 39-22).
10. Apply a skin sealant or skin paste if indicated; apply skin barrier (Figure 39-23).
11. Gently apply the pouch and press into place (Figure 39-24). Seal the inferior opening with the clip or a rubber band.
12. Remove gloves and discard; wash hands.
13. Note type and size of pouch; condition of stoma (drainage amount and odor; surrounding skin); and client response.



Figure 39-22 Measure the stoma for the colostomy pouch.

Rationale

7. Peristomal skin conditions cause morbidity and problems with pouch application unless managed promptly.
8. Excessive hair is removed to promote the seal between pouch adhesive and peristomal skin.
9. Ensures appropriate-sized pouch and protects the peristomal skin.
10. Promotes an effective seal and protects the peristomal skin.
11. Prevents leakage of effluent from the pouch.
12. Reduces risk of transfer of microorganisms.
13. Documents client status and condition of stoma.



Figure 39-23 Apply the skin barrier to the stoma.



Figure 39-24 Press the pouch into place.

temporary ileostomy is taken down and the ileoanal reservoir is reattached to the rectal stream.

The Kock continent ileostomy is performed as a single procedure. A colectomy and proctectomy are performed, and the distal 45 cm of the ileum is used to form the reservoir for the ileostomy and the abdominal stoma. The abdominal stoma is rendered continent by intussusception of the bowel that is stabilized to the abdominal wall by stapling or suturing the nipple valve. A polyglycolic acid mesh may be incorporated to provide further support if necessary. Effluent gathered in the reservoir is evacuated by catheterization through the abdominal stoma.

Monitor Surgical Management

The surgical management for SUI differs for urethral hypermobility as compared with intrinsic sphincter deficiency. Urethral hypermobility is managed by a bladder suspension designed to prevent descent of the bladder base and urine loss during physical exertion. The selection of the procedure depends on the severity of the incontinence and client and surgeon preference.

Clients with adequate urethral support and intrinsic sphincter deficiency may be managed with a urethral bulking agent, such as Contigen (Bard Urological, Covington, Georgia). This product is a glutaraldehyde cross-linked collagen that improves continence by enhancing compressive elements of the urethral sphincter mechanism. It is injected transurethrally, and local anesthesia with systemic sedation is often used in preference to general anesthesia. Women with a combination of urethral hypermobility and intrinsic sphincter deficiency may undergo a suburethral sling procedure, in which the proximal third of the urethra is supported with fascia or a synthetic material.

An artificial urinary sphincter device also may be used to manage intrinsic sphincter deficiency. This mechanical device allows the client to mechanically inflate and deflate a cuff that compresses underlying urethral tissues. Each of these procedures requires specific nursing care and instruction. See a urologic nursing text for a detailed discussion of the nursing care for urologic surgery.

Surgery plays only a limited role in the management of urge incontinence. Surgical procedures designed to denervate the bladder (sever nerves needed for contraction of the detrusor muscle) have had little success because of significant complications, including fecal incontinence and impotence among men. A surgically implanted device designed to deliver electrical stimulation to the lower urinary tract has been approved for use in the United States. Refer to a urologic nursing text for management of these clients.

The management of reflex incontinence is complicated by the combination of urine leakage and urinary retention caused by detrusor sphincter dyssynergia. A bladder management program is chosen that both protects the upper urinary tracts from serious damage and maximizes continence.

Surgical reconstruction is sometimes used in the long-term management of reflex incontinence. An augmentation enterocystoplasty enlarges bladder capacity and alleviates reflex incontinence by converting the hyperreflexic bladder into a large, atonic bladder with improved storage ability. Unfortunately, the augmented bladder rarely empties efficiently, and clients are advised that lifelong intermittent self-catheterization will be necessary after augmentation surgery. A continent or incontinent urinary diversion is occasionally used to manage urine elimination in the patient with reflex incontinence. However, urinary diversion is completed only when bladder function threatens the normal function of the upper urinary tracts.

Fistulae and ectopia are managed by surgical closure whenever possible. When surgery is not feasible, a fistula may be treated by careful application of a sclerosing agent, such as tetracycline or doxycycline in suspension. The solution is applied monthly, and a skin barrier is used on the area surrounding the fistula to prevent scarring. The fistula that cannot be closed surgically or by sclerosing therapy must be managed by application of a urinary containment device and a preventive skin program.

Surgery or endoscopic procedures alleviate urinary retention caused by bladder outlet obstruction. Transurethral resection of the prostate, open prostatectomy, VaporTrode, visual ablation of the prostate, and other procedures are used to alleviate obstruction caused by benign prostatic hyperplasia. Transurethral incision of the bladder neck or transurethral sphincterotomy may be used for bladder neck or striated sphincter dyssynergia. Refer to a textbook of urologic nursing for the care following these specialized procedures.

Complementary Therapies

“One of the largest health problems in the western world is in the area of elimination” (Barney, 1996, p. 57). When the body fails to eliminate waste that is full of toxic substances, other systems are compromised and the person becomes prone to illness. Herbalists view the role of the kidneys and the intestines in a holistic manner. The proper function of any part of the body is dependent on the effective elimination of waste products and toxins.

“Considering the importance of the kidneys, it is not surprising that nature is abundant in herbs that can aid their functions” (Hoffmann, 1998, p. 109). Herbs that aid the functions of the urinary system are:

- *Diuretics*: Dandelion root and leaf (refer to Chapter 38 for a full discussion of this herb) and cleavers
- *Antiseptics*: bearberry, birch, boldo, buchu, celery seed, couchgrass, juniper, and yarrow
- *Antimicrobials*: Echinacea root (refer to Chapter 31 for a full discussion of this herb) and wild indigo root
- *Demulcents*: corn silk, couchgrass, and marshmallow leaf

NURSING CARE PLAN**The Client Experiencing Constipation****Case Presentation**

Mrs. M is a 30-year-old woman who sustained a complete spinal cord injury of the seventh cervical vertebra 2 years before this hospital admission. She currently manages her bowels by enemas every 5 to 7 days when she notes pressure and distension of her abdomen. She has frequent episodes of fecal incontinence, described as passage of moderate amounts of black, watery stool. She manages these episodes by administering one or two enemas, followed by passage of a large volume of odorous, dark feces. Before her spinal injury she denied problems with her bowel control. She states that she moved her bowels every other day, typically after breakfast. Currently, she reports fluid intake of 3 to 4 glasses per day. She eats primarily meats, white breads, some pastas, and one portion of vegetables per day. She does not routinely eat cereals or fruits or supplement her diet with bulk laxatives.

Assessment

- Inadequate fluid intake
- Inadequate fiber intake
- Presence of large impaction in the rectum

Nursing Diagnosis #1

Constipation, related to spinal cord injury and neurogenic bowel.

Nursing Diagnosis #2

Bowel Incontinence related to fecal impaction, altered stool consistency, and neurogenic bowel.

Expected Outcome

The rectum will be cleansed of impaction.

Intervention/Rationale

1. Administer PIEE until impaction is disrupted.
Bowel is clear of impacted stool as assessed by digital examination.

Expected Outcome

Stool will be soft and formed.

Interventions/Rationales

1. Encourage dietary intake of fiber-rich foods, including one serving of cereal per day, one serving of fruit, and two servings of vegetables.
2. Increase fluid intake to 15 ml/lb body weight; encourage water intake to equal at least 50% of fluids.
3. Administer supplemental bulk laxatives (Metamucil) if client is unable to alter diet to meet needs for fiber.
Stool will be soft, formed feces, without impacted or dry, hardened material.

Expected Outcome

A regular routine for bowel elimination will be established.

Interventions/Rationales

1. Begin a bowel program every other day.
2. Determine time for evacuation with client; encourage defecation after breakfast, based on premorbid bowel elimination pattern.
3. Encourage bowel evacuation program after meal if premorbid schedule is not feasible with current activities.
Bowel evacuation will occur every other day after a meal, based on client's activities of daily living, preferences, and premorbid bowel elimination patterns.

(continues)

NURSING CARE PLAN**The Client Experiencing Constipation (continued)****Expected Outcome**

Bowel management program will cause completed elimination of feces from rectum.

Interventions/Rationales

1. Begin stimulated, scheduled bowel evacuation program using oral laxative, mini-enema, digital stimulation program.
2. Discuss program with client, significant others, giving description of each stimulation program, time required, cost implications, and advantages and disadvantages.
Client will completely evacuate the bowel using a stimulation or timed management program.

Expected Outcome

Fecal incontinent episodes will be alleviated.

Interventions/Rationales

1. Teach client relationship among stool consistency, regularity of evacuation, fecal impaction, and fecal continence.
2. Advise client to consult nurse specialist or gastroenterologist if fecal incontinent episodes persist despite regulation of bowel management program.
3. Warn client that occurrence of diarrhea may predispose to acute transient fecal incontinence.
Fecal incontinent episodes will be reduced by greater than 50%.

Herbs that possess other properties may also be used, such as urinary astringents (beth root, horsetail, and plantain tormentil), to treat blood in the urine caused by minor problems, and to aid the healing of lesions, and antilithics (gravel root, hydrangea, and stone root), to prevent the formation of or aid in the removal of calculi (stones or gravel) in the urinary system.

Both urinary and fecal elimination are reliant upon sufficient amounts of fiber and fluids in the diet. Poor nutrition is the most common cause of chronic constipation (Barney, 1996). The following herbs are helpful in relieving constipation: *Cascara sagrada* bark, senna, ginger root, butternut root bark, burdock root. Also, milk thistle, a cholagogue, may be used to aid liver function and to enhance bile flow to soften stools.

Cascara sagrada bark is an old Indian remedy to encourage peristalsis and tone relaxed muscles of the digestive tract. Senna is the most widely used stimulant laxative when compared to synthetic drugs (Barney, 1996). *Cascara* and senna should be combined with aromatics and carminatives such as licorice and ginger root to increase palatability and reduce gripping. Ginger root aids in digestion and enhances bile flow from the liver. Burdock root is a mild laxative and an effective diuretic; its cleansing effect goes beyond its diuretic and laxative properties as it promotes perspiration and strengthens the liver.

Psyllium seed and flaxseed are also helpful for constipation. Psyllium seed must be taken with a full glass of water. Mineral oil should not be taken on a regular basis because, if inhaled, it can damage the lungs, and it reduces the absorption of fat-soluble vitamins (Balch & Balch, 1997).

EVALUATION

Evaluating the effectiveness of the nursing interventions is an ongoing process. The client's level of maintenance or restoration of elimination patterns and return to an appropriate level of independence are indicators of success. When evaluating these aspects, it is important for the nurse to reassess how realistic the original identified outcomes were, especially for goals that were not met, and to modify the target outcomes accordingly. Prevention of skin breakdown and infection can also be used to determine the appropriateness of the plan of care. Client understanding of procedures and self-care should be evaluated to determine the effectiveness of teaching plans, and modifications should be made to address deficiencies and ongoing learning needs. If support persons were included in the teaching process, their understanding of skills and competence with procedures should also be measured. If additional care or teaching is deemed necessary, clients should be given referrals for community and other resources to support their continuing learning needs.

KEY CONCEPTS

- Normal urination requires anatomic integrity of the lower urinary tract, nervous control of the detrusor muscle, and competence of the urethral sphincter mechanism.

- Normal bowel evacuation relies on motility factors, the storage abilities of the rectum, and competence of the internal and external sphincter mechanisms.
 - Common alterations in urinary elimination include SUI, instability incontinence (urge and reflex incontinence), functional urinary incontinence, extrarethral incontinence, and urinary retention.
 - Constipation and diarrhea are common alterations in stool consistency that cause changes in fecal elimination patterns and predispose clients to bowel incontinence.
 - Clients with altered patterns of urinary and bowel elimination are evaluated with a detailed historical interview, focused physical examination, record of bladder and bowel elimination patterns, and review of laboratory values.
 - Multiple options, including behavioral management strategies, pharmacotherapy, and surgical interventions are used to manage clients with altered patterns of elimination.
 - Altered stool consistency is prevented or alleviated by managing malabsorption syndromes, maintaining a regular pattern of elimination, ensuring dietary intake of adequate fluid and fiber, and heeding the urge to defecate.
 - Bowel incontinence is managed by normalization of stool consistency, maximization of rectal storage abilities, and management of anal sphincter incompetence.
8. What is the primary behavioral intervention for urge incontinence? Teach yourself to perform a quick flick contraction of the pelvic muscles.
 9. Identify at least six strategies to reduce environmental barriers to toileting. Develop a checklist when assessing the client with urinary incontinence.
 10. What are the two elements of the anal sphincter?
 11. What are the primary causes of diarrhea? Differentiate the treatment of secretory, malabsorptive, and inflammatory diarrhea. Determine which forms of diarrhea are likely to respond to antidiarrheal agents. Determine which forms of diarrhea are likely to be exacerbated by antidiarrheal agents.
 12. What are the indications for consultation with the enterostomal technician for a client experiencing diarrhea? Identify and introduce yourself to the enterostomal nurses in your health care facility.
 13. What is the purpose of regulating fluid and fiber intake when managing constipation? Determine your daily intake of fluids using a record. Determine the servings of fiber-rich foods in your diet and observe the consistency (and pattern) of your bowel elimination. Slowly add fluids and fiber to your diet and note changes in your bowel elimination patterns.
 14. Why does diarrhea or constipation increase the risk of bowel incontinence?
 15. What are the indications for referral for a client with bowel elimination problems?

CRITICAL THINKING ACTIVITIES

1. Which central nervous system structures regulate detrusor muscle contractions?
2. How do urethral support mechanisms help prevent stress urinary incontinence?
3. What are the causes of stress urinary incontinence?
4. How do urge and reflex incontinence differ? Why are clients with reflex incontinence at greater risk for urinary retention than those with urge incontinence?
5. What are the primary causes of functional incontinence?
6. What are the general principles of bladder health? What is the RDA for fluid intake in an adult? Calculate the RDA for fluids for yourself, for a 110-lb client, for a 379-lb client.
7. What is the primary behavioral intervention for the management of stress urinary incontinence? Teach yourself to perform a pelvic muscle contraction. Test yourself by performing 10, 20, or 35 repetitions. Can you detect fatigue of the muscles as you exercise? Do you find yourself using distant muscle groups, such as the abdominal or thigh muscles?

WEB REFERENCES

- Continent Ostomy Centers
www.ostomy.com
- Society of Urologic Nurses and Associates
www.inurse.com
- United Ostomy Association
www.ostomy.evansville.net
- United Ostomy Association of Canada, Inc.
www3.ns.sympatico.ca/canada.ostomy
- Wound, Ostomy, and Continence Nurses Society
www.wocn.org

NANDA Nursing Diagnoses 2001–2002

Activity intolerance
 Activity intolerance, Risk for
 Adjustment, Impaired
 Airway clearance, Ineffective
 Allergy response, Risk for latex
 Anxiety
 Anxiety, Death
 Aspiration, Risk for
 Body image, Disturbed
 Body temperature, Risk for imbalanced
 Bowel incontinence
 Breastfeeding, Effective
 Breastfeeding, Ineffective
 Breastfeeding, Interrupted
 Breathing pattern, Ineffective
 Cardiac output, Decreased
 Caregiver role strain
 Caregiver role strain, Risk for
 Communication, Impaired verbal
 Confusion, Acute
 Confusion, Chronic
 Constipation
 Constipation, Perceived
 Constipation, Risk for
 Coping, Community, Ineffective
 Coping, Community, Readiness for enhanced
 Coping, Defensive
 Coping, Family, Compromised
 Coping, Family, Disabled
 Coping, Family, Readiness for enhanced
 Coping, Ineffective
 Conflict, Decisional (specify)
 Conflict, Parental role
 Denial, Ineffective
 Dentition, Impaired
 Development, Risk for delayed
 Diarrhea
 Disuse syndrome, Risk for
 Diversional activity, Deficient
 Dysreflexia, Autonomic
 Energy field, Disturbed
 Environmental interpretation syndrome, Impaired
 Failure to thrive, Adult
 Falls, Risk for
 Family processes, Dysfunctional: Alcoholism
 Family processes, Interrupted
 Fatigue
 Fear
 Fluid volume, Deficient
 Fluid volume, Excess
 Fluid volume, Risk for deficient
 Fluid volume, Risk for imbalanced
 Gas exchange, Impaired
 Grieving, Anticipatory
 Grieving, Dysfunctional
 Growth and development, Delayed
 Growth, Risk for disproportionate
 Health Maintenance, Ineffective
 Health-seeking behaviors (specify)
 Home maintenance, Impaired
 Hopelessness
 Hyperthermia
 Hypothermia
 Identity, Disturbed personal
 Incontinence, Functional urinary
 Incontinence, Reflex urinary
 Incontinence, Stress urinary
 Incontinence, Total urinary
 Incontinence, Urge urinary
 Incontinence, Urge urinary, Risk for
 Infant behavior, Disorganized
 Infant behavior, Readiness for enhanced organized
 Infant behavior, Risk for disorganized
 Infant feeding pattern, Ineffective
 Infection, Risk for
 Injury, Perioperative positioning, Risk for
 Injury, Risk for
 Intracranial adaptive capacity, Decreased
 Knowledge, Deficient
 Loneliness, Risk for
 Memory, Impaired
 Mobility, Impaired bed

Mobility, Impaired physical
 Mobility, Impaired wheelchair
 Nausea
 Noncompliance (specify)
 Nutrition, Imbalanced: Less than body requirements
 Nutrition, Imbalanced: More than body requirements
 Nutrition, Imbalance: More than body requirements,
 Risk for
 Oral mucous membrane, Impaired
 Pain, Acute
 Pain, Chronic
 Parent/infant/child attachment, Risk for impaired
 Parenting, Impaired
 Parenting, Impaired, Risk for
 Peripheral neurovascular dysfunction, Risk for
 Poisoning, Risk for
 Post-trauma syndrome
 Post-trauma syndrome, Risk for
 Powerlessness
 Powerlessness, Risk for
 Protection, Ineffective
 Rape-trauma syndrome
 Rape-trauma syndrome, Compound reaction
 Rape-trauma syndrome, Silent reaction
 Relocation stress syndrome
 Relocation stress syndrome, Risk for
 Role performance, Ineffective
 Self-care deficit, Bathing/hygiene
 Self-care deficit, Dressing/grooming
 Self-care deficit, Feeding
 Self-care deficit, Toileting
 Self-esteem, Low, Chronic
 Self-esteem, Low, Situational
 Self-esteem, Low, Situational, Risk for
 Self-mutilation
 Self-mutilation, Risk for
 Sensory perception, Disturbed (specify)
 (Visual, auditory, kinesthetic, gustatory, tactile,
 olfactory)

Sexual dysfunction
 Sexuality patterns, Ineffective
 Skin integrity, Impaired
 Skin integrity, Impaired, Risk for
 Sleep deprivation
 Sleep pattern, Disturbed
 Social interaction, Impaired
 Social isolation
 Sorrow, Chronic
 Spiritual distress
 Spiritual distress, Risk for
 Spiritual well-being, Readiness for enhanced
 Suffocation, Risk for
 Suicide, Risk for
 Surgical recovery, Delayed
 Swallowing, Impaired
 Therapeutic regimen management, Effective
 Therapeutic regimen management, Ineffective
 Therapeutic regimen management, Ineffective
 community
 Therapeutic regimen management, Ineffective family
 Thermoregulation, Ineffective
 Thought process, Disturbed
 Tissue integrity, Impaired
 Tissue perfusion, Ineffective (specify type)
 (Renal, cerebral, cardiopulmonary, gastrointestinal,
 peripheral)
 Transfer ability, Impaired
 Trauma, Risk for
 Neglect, unilateral
 Urinary elimination, Impaired
 Urinary retention
 Ventilation, Impaired spontaneous
 Ventilatory weaning response, Dysfunctional
 Violence, Risk for other-directed
 Violence, Risk for self-directed
 Walking, Impaired
 Wandering

Source: North American Nursing Diagnosis Association. (2001). *Nursing Diagnoses: Definitions and Classifications, 2001–2002*. Philadelphia, PA: Author.

Symbols and Abbreviations

Symbol	Meaning
~	similar
≅	approximately
@	at
√	check
Δ	change
↑	increased
↓	decreased
=	equals
#	pounds
>	greater than
<	less than
%	percent
+	positive
-	negative
♀	female
♂	male
△△△	trimester of pregnancy (one triangle for each trimester)

Abbreviations

2,3-DPG	2,3-diphosphoglycerate	AHA	American Hospital Association
AACN	American Association of Colleges of Nursing	AHNA	American Holistic Nurses Association
AAOHN	American Association of Occupational Health Nurses	AHRQ	Agency for Health Care Research and Policy
AARP	American Association of Retired Persons	AIDS	acquired immunodeficiency syndrome
ABG	arterial blood gases	AJN	American Journal of Nursing
A/C	alternative/complementary	AMB	as manifested by
Acetyl-CoA	acetyl coenzyme A	ANA	American Nurses' Association
ADA	Americans with Disabilities Act	ANS	autonomic nervous system
ADAMHA	Alcohol, Drug Abuse, and Mental Health Administration	AONE	Association of Nurse Executives
ADH	antidiuretic hormone	AORN	Association for Operating Room Nurses
ADL	activities of daily living	APN	advanced practice nurse
ADP	adenosine diphosphate	APRN	advanced practice registered nurse
ADR	adverse drug reactions	APTT	activated partial thromboplastin time
AEB	as evidenced by	AST	aspartate aminotransferase
AGF	angiogenesis factor	AT	axillary temperature
		ATP	adenosine triphosphate
		ATSDR	Agency for Toxic Substances and Disease Registry

BCR	bulbocavernosus reflex	EPA	Environmental Protection Agency
BMI	body mass index	EPO	exclusive provider organization
BMR	basal metabolic rate	ESR	erythrocyte sedimentation rate
BN	Bachelor in Nursing	ET	ear canal temperature
BP	blood pressure	F	Fahrenheit
BScN	Bachelor of Science in Nursing (in Canada)	FAF	fibroblase activating factor
BSE	breast self-examination	FAS	fetal alcohol syndrome
BSN	Bachelor of Science in Nursing	FDA	Food and Drug Administration
BUN	blood urea nitrogen	FiO ₂	fraction of inspired oxygen
C	Celsius; also called centigrade	ft	feet
CAT	computerized adaptive testing	g	gram
CAUSN	Canadian Association of University Schools of Nursing	GAS	general adaptation syndrome
CBC	complete blood count	GCS	Glasgow Coma Scale
CBE	charting by exception	gH	drop
CDC	Centers for Disease Control and Prevention	GI	gastrointestinal tract
CEUs	continuing education units	GNP	gross national product
CHD	coronary heart disease	HBD	alpha-hydroxybutyrate dehydrogenase
CLIA	Clinical Laboratory Improvement Act	HBV	hepatitis B virus
cm	centimeter	HCFA	Health Care Financing Administration
CNA	Canadian Nurses Association	Hct	hematocrit
CNATS	Canadian Nurses Association Testing Service	HDL	high-density lipoprotein
CNM	certified nurse midwife	HEPA	high-efficiency particulate air
CNO	community nursing organization	Hgb	hemoglobin
CNS	central nervous system	HIS	hospital information system
CNS	clinical nurse specialist	HIV	human immunodeficiency virus
CO ₂	carbon dioxide	HMO	health maintenance organization
COBRA	Consolidated Omnibus Budget Recon- ciliation Act	HPN	home parenteral nutrition
COPD	chronic obstructive pulmonary disease	HQIA	Healthcare Quality Improvement Act
CPK	creatine phosphokinase	HRSA	Health Resources and Services Administration
CPM	continuous passive motion	HSV-2	herpes simplex virus 2
CPN	central parenteral nutrition	HT	healing touch
CPR	cardiopulmonary resuscitation	IHS	Indian Health Service
CPT	chest physiotherapy	IM	intramuscular
CQI	continuous quality improvement	in	inch
CRNA	certified registered nurse anesthetist	I&O	intake and output
CSF	cerebrospinal fluid	IOM	Institute on Medicine
CST	computerized clinical simulation testing	IPPB	intermittent positive-pressure breathing
CT	computed tomography	IRA	individual retirement account
CVA	cerebral vascular accident	IV	intravenous
DDS	doctor of dental science	IVP	intravenous pyelogram
DHHS	Department of Health and Human Services	JCAHO	Joint Commission on Accreditation of Healthcare Organizations
dl	deciliter	kcal	kilocalorie
DNR	do not resuscitate	kg	kilogram
DNSc	Doctorate of Nursing in Science	LAS	localized adaptation syndrome
DRGs	diagnosis-related groups	lb	pound
DSN	Doctorate of Science in Nursing	LDH	lactic dehydrogenase
DUS	Doppler ultrasound stethoscope	LDL	low-density lipoprotein
DVT	deep vein thrombosis	LLQ	left lower quadrant
ECG	electrocardiogram (also known as an EKG)	LOC	level of consciousness
EEG	electroencephalogram	LPN	licensed practical nurse
EN	enteral nutrition	LUQ	left upper quadrant
		LVN	licensed vocational nurse
		m	meter
		MA	Master of Arts
		MAC	mid-upper-arm circumference

MAR	medication administration record	PC	potential complication
MD	doctor of medicine	PCA	patient-controlled analgesia
MDR	multi-drug-resistant	PCO ₂	partial pressure of carbon dioxide dissolved in arterial blood plasma
mEq	milliequivalent	PCP	primary care provider
mEq/L	milliequivalent per liter	PEG	percutaneous endoscopic gastrostomy
mg	milligram	PERRLA	pupils equal, round, reactive to light, and accommodation
MH	malignant hyperthermia	pH	hydrogen ion concentration of a solution
MI	myocardial infarction	PID	pelvic inflammatory disease
ml	milliliter; also abbreviated mL	PIE	problem, intervention, evaluation
mm	millimeter	PIEE	pulsed irrigation enhanced evacuation
mm Hg	millimeters of mercury	PKU	phenylketonuria
MN	Master in Nursing	PMR	progressive muscle relaxation
mOsm	milliosmole; also spelled milliosmol	PMS	premenstrual syndrome
mOsm/L	milliosmole per liter	PN	parenteral nutrition
MRI	magnetic resonance imaging	PNI	psychoneuroimmunology
MRSA	methicillin-resistant <i>Staphylococcus aureus</i>	PNS	peripheral nervous system
MSN	Master of Science in Nursing	PO	(<i>per os</i>) by mouth
NACGN	National Association of Colored Graduate Nurses	POMR	problem-oriented medical record
NANDA	North American Nursing Diagnosis Association	POR	problem-oriented record
NCEP	National Cholesterol Education Program	PPN	peripheral parenteral nutrition
NCLEX	National Council Licensing Examination	PPO	preferred provider organization
NCLEX-PN	National Council Licensure Examination for Practical Nurses	PPS	prospective payment system
NCLEX-RN	National Council Licensure Examination for Registered Nurses	prn	(<i>pro re nata</i>) as needed
NCNR	National Center for Nursing Research	PRO	peer review organization
NCSBN	National Council of State Boards of Nursing	PSRO	professional standards review organization
NIC	Nursing Interventions Classification	PT	physical therapist
NIH	National Institutes of Health	PT	prothrombin
NINR	National Institute of Nursing Research	PT	prothrombin time
NLN	National League for Nursing	PTSD	post-traumatic stress disorder
NMDS	Nursing Minimum Data Set	PTT	partial thromboplastin
NP	nurse practitioner	PURT	prompted urge response toileting
NPO	(<i>non per os</i>) nothing by mouth (to eat or drink)	q	every
NS	nutrition support	QA	quality assurance
NST	nutritional support team	R	respiration
OAM	Office of Alternative Medicine	RAS	reticular activating system
OBRA	Omnibus Budget Reconciliation Act	RBC	red blood cell
OR	operative room	RD	registered dietitian
OSHA	Occupational Safety and Health Administration	RDA	recommended dietary allowance
OT	occupational therapist	RDDA	recommended daily dietary allowances
OT	oral temperature	RHC	Rural Health Clinic
OTC	over-the-counter drugs	RLQ	right lower quadrant
oz	ounce	RN	registered nurse
P	pulse	RNA	registered nurse's assistant
PO ₂	partial pressure of oxygen in a mixture of gasses, or in solution	ROM	range-of-motion
PO ₂	partial pressures of oxygen	RPCH	rural primary care hospital
PA	physician's assistant	RPh	registered pharmacist
PaO ₂ (PAO ₂)	partial pressure of oxygen dissolved in arterial blood plasma	RT	rectal temperature
PAP	Papanicolaou test	RT	related to
PAT	pulmonary artery temperature	RT	respiratory therapist
		RUQ	right upper quadrant
		S-CDTN	Self-Care Deficit Theory of Nursing
		SA	sinoatrial node
		SAECG	signal-averaged electrocardiography
		SaO ₂	percent saturation of arterial blood (hemoglobin) with oxygen

SBC	school-based clinic	TENS	transcutaneous electrical nerve stimulation
SI	<i>le Systeme International d'Unites</i> (the international system of units)	TMJ	temporomandibular joint
SL	sublingual	TNA	total nutrient admixture
SLT	social learning theory	TPN	total parenteral nutrition
SMDA	Safe Medical Devices Act	TQM	total quality management
SMI	sustained maximum inspiration	TSE	testicular self-examination
SO	source-oriented charting	TT	therapeutic touch
SOAP	Subjective data, Objective data, Assessment, Plan	UAP	unlicensed assistive personnel
SOAPIE	Subjective data, Objective data, Assessment, Plan, Implementation, Evaluation	UHDDS	uniform hospital discharge data set
STD	sexually transmitted disease	USPHS	United States Public Health Service
SUI	stress urinary incontinence	VA	Veterans Affairs
SW	social worker	VLDL	very low density lipoprotein
T	temperature	V/Q	ventilation/perfusion mismatch
TEFRA	Tax Equity Fiscal Responsibility Act	VRE	vancomycin-resistant enterococci
		WBC	white blood cell
		WIC	Women, Infants, and Children

Recommended Dietary Allowances

Recommended Dietary Allowances^a

Category	Age (yr) or Condition	Weight ^b		Height ^b		KCal per Day	Protein (g)	Vita- min A ($\mu\text{g RE}$) ^c	Fat-Soluble Vitamins		
		(kg)	(lb)	(cm)	(in)				Vita- min D (μg) ^d	Vita- min E (mg α -TE) ^e	Vita- min K (μC)
Infants	0.0–0.5	6	13	60	24	650	13	375	7.5	3	5
	0.5–1.0	9	20	71	28	850	14	375	10	4	10
Children	1–3	13	29	90	35	1300	16	400	10	6	15
	4–6	20	44	112	44	1800	24	500	10	7	20
Men	7–10	28	62	132	52	2000	28	700	10	7	30
	11–14	45	99	157	62	2500	45	1000	10	10	45
	15–18	66	145	176	69	3000	59	1000	10	10	65
	19–24	72	160	177	70	2900	58	1000	10	10	70
	25–50	79	174	176	70	2900	63	1000	5	10	80
	Over 51	77	170	173	68	2300	63	1000	5	10	80
Women	11–14	46	101	157	62	2200	46	800	10	8	45
	15–18	55	120	163	64	2200	44	800	10	8	55
	19–24	58	128	164	65	2200	46	800	10	8	60
	25–50	63	138	163	64	2200	50	800	5	8	65
	Over 51	65	143	160	63	1900	50	800	5	8	65
Pregnant						2200	60	800	10	10	65
Lactating:	1st 6 mo					2700	65	1300	10	12	65
	2nd 6 mo					2700	62	1200	10	11	65

(continues)

Recommended Dietary Allowances^a (continued)

Vita- min C (mg)	Thia- min (mg)	Ribo- flavin (mg)	Water-Soluble Vitamins				Minerals						
			Niacin (mg NE) ^f	Vita- min B ₆ (mg)	Fo- late (μg)	Vita- min B ₁₂ (μg)	Cal- cium (mg)	Phos- phorus (mg)	Mag- nesium (mg)	Iron (mg)	Zinc (mg)	Iodine (μg)	Selenium (μg)
30	0.3	0.4	5	0.3	25	0.3	400	300	40	6	5	40	10
35	0.4	0.5	6	0.6	35	0.5	600	500	60	10	5	50	15
40	0.7	0.8	9	1.0	50	0.7	800	800	80	10	10	70	20
45	0.9	1.1	12	1.1	75	1.0	800	800	120	10	10	90	20
45	1.0	1.2	13	1.4	100	1.4	800	800	170	10	10	120	20
50	1.3	1.5	17	1.7	150	2.0	1200	1200	270	12	15	150	40
60	1.5	1.8	20	2.0	200	2.0	1200	1200	400	12	15	150	50
60	1.5	1.7	29	2.0	200	2.0	1200	1200	350	10	15	150	70
60	1.5	1.7	19	2.0	200	2.0	800	800	350	10	15	150	70
60	1.2	1.4	15	2.0	200	2.0	800	800	350	10	15	150	70
50	1.1	1.3	15	1.4	150	2.0	1200	1200	280	15	12	150	45
60	1.1	1.3	15	1.5	180	2.0	1200	1200	300	15	12	150	50
60	1.1	1.3	15	1.6	180	2.0	1200	1200	280	15	12	150	55
60	1.1	1.3	15	1.6	180	2.0	800	800	280	15	12	150	55
60	1.0	1.3	13	1.6	180	2.0	800	800	280	10	12	150	55
70	1.5	1.6	17	2.2	400	2.2	1200	1200	320	30	15	175	65
95	1.6	1.8	20	2.1	280	2.6	1200	1200	355	15	19	200	75
90	1.6	1.7	20	2.1	260	2.6	1200	1200	340	15	16	200	75

^a The allowances, expressed as average daily intakes over time, are intended to provide for individual variations among most normal persons as they live in the United States under usual environmental stresses. Diets should be based on a variety of common foods to provide other nutrients for which human requirements have been less well defined.

^b Weights and heights of Reference Adults are actual medians for the U.S. population of the designated age.

^c Retinol equivalents. 1 RE = 1 μg retinol or 6 μg β-carotene.

^d As cholecalciferol. 10 mg cholecalciferol = 400 U of vitamin D.

^e Tocopherol equivalents. 1 mg d-α-tocopherol = 1 α-TE.

^f Ne Niacin equivalent = 1 mg of niacin or 60 mg of dietary tryptophan.

(From Food and Nutrition Board, National Academy of Sciences—National Research Council: *Recommended dietary allowances*, ed. 10, Washington, DC, 1989, The Council.)

D

Educational Resources for Caregivers

The following groups provide information about specific disorders. Instruct the caller to request any written materials that are available.

Acquired Immunodeficiency Syndrome (AIDS)

National AIDS Hotline—(800) 342-AIDS
National Association of People with AIDS—
(202) 898-0414

Alcoholism

Alcoholics Anonymous—(212) 647-1680
Al-Anon Family Group Headquarters—(757) 563-1600

Alzheimer's

Alzheimer's Disease and Related Disorders
Association—(800) 621-0379

Arthritis

The Arthritis Foundation—(404) 872-7100

Blindness or Visual Impairment

American Council for the Blind—(800) 424-8666
National Federation of the Blind—(301) 588-6545

Breast Cancer

American Cancer Society—(800) 227-2345
YME Breast Cancer Support—(800) 221-2141

Breastfeeding

La Leche League International—(800) 525-3243
(800 LaLeche)

Cancer

American Cancer Society—(800) 227-2345
Candlelighters Childhood Cancer Foundation—
(800) 366-2223
Leukemia Society of America—(800) 955-4LSA

Cerebral Palsy

United Cerebral Palsy—(800) 872-5827

Chronic Pain

American Chronic Pain Association—(301) 652-4948

Cystic Fibrosis

Cystic Fibrosis Foundation—(800) FIGHT-CF or
(301) 951-4422

Deafness/Hearing Impairment

National Association for Hearing and Speech Action
Line—(800) 638-8255
American Society for Deaf Children—(800) 942-2732
National Information Center on Deafness—
(202) 651-5051

Diabetes

American Diabetes Association—(800) 342-2383
Juvenile Diabetes Foundation International—
(800) 223-1138

Drug Abuse

Cocaine Hot-Line—(800) COCAINE
Narcotics Anonymous—(919) 755-5391

Epilepsy

Epilepsy Information Line—(800) 332-1000

Genetic Diseases

Alliance of Genetic Support Groups—(301) 652-5553
National Foundation for Jewish Genetic Diseases—
(212) 682-5550 or (212) 371-1030

Head Injury

National Head Injury Foundation—(800) 444-6443

Heart Disease or Surgery

American Heart Association—(214) 750-5300

Hemophilia

National Hemophilia Foundation—(212) 219-8180

Herpes

Herpes Resource Center—(800) 230-6039

Huntington's Disease

Huntington's Disease Society of America—
(800) 345-HDSA

Hypertension

High Blood Pressure Information Center—
(800) 444-6472

Incontinence

The Simon Foundation—(800) 23SIMON

Kidney Disease

National Kidney Foundation—(212) 889-2210
The Kidney Transplant/Dialysis Association—
(703) 549-1500

Laryngectomy

International Association of Laryngectomies—
(800) 231-2300

Lung Conditions

American Lung Association—(212) 315-8700
The Lung Line Information Service—(800) 222-LUNG

Lupus Erythematosus

The American Lupus Society—(800) 331-1802
The Lupus Foundation of America—(800) 558-0121

Mental Illness

The National Alliance for the Mentally Ill—
(800) 950-NAMI
National Mental Health Association—(703) 684-7722

Multiple Sclerosis

National Multiple Sclerosis Society—(212) 986-3240

Muscular Dystrophy

Muscular Dystrophy Association—(212) 689-9040

Osteoporosis

National Osteoporosis Foundation—(202) 223-2226

Parkinson's Disease

American Parkinson's Disease Association—
(800) 223-APDA
National Parkinson's Foundation—(800) 327-4545
Parkinson's Education Program—(800) 344-7872

Psoriasis

National Psoriasis Foundation—(503) 297-1545

Reye's Syndrome

National Reye's Syndrome Foundation—(800) 233-7393

Scleroderma

United Scleroderma Foundation, Inc.—(800) 722-
HOPE

Scoliosis

The National Scoliosis Foundation—(617) 341-6333

Sickle Cell Disease

National Association for Sickle Cell Disease—
(800) 421-8453

Spina Bifida

Spina Bifida Association of America—(800) 621-3141

Spinal Cord Injuries

National Spinal Cord Injury Association—
(800) 962-9629
Spinal Injury Hotline—(800) 526-3456
Neurological Recovery Foundation—(800) 624-1698

Stroke

National Stroke Association—(303) 762-9922

Tay-Sachs Disease

National Tay-Sachs and Allied Diseases Association—
(212) 371-1030

Tourette Syndrome

Tourette Syndrome Association—(800) 237-0717

To locate further information on any of the included Educational Resources, please refer to their specific Web Sites. Because URLs can change, we opted not to include them here. To find the site, simply search under the appropriate heading; for example, *hypertension*.

E

LEARN WHEN TO USE—NOT ABUSE—A GOOD THING

Do you use gloves when you turn a patient? How about when changing I.V. bags? If you answered yes, take a moment to reevaluate your use of this form of barrier protection. The Centers for Disease Control and Prevention's new standard precautions recommend using gloves when handling any body fluids or items contaminated with body fluids. But overusing gloves—as in the two situations just mentioned—can lead to problems as well: latex allergies, hospital environmental contamination, and increased glove disposal, to name a few. To make sure you're using gloves correctly, follow the chart below. You should also review your hospital policy to make sure it's up-to-date. Wear gloves whenever soilage of hands with body fluids is likely. Wear *clean, nonsterile* gloves when handling body fluids and contaminated items. Wear *sterile* gloves for all invasive procedures, such as inserting urinary catheters.

	When to use gloves	When NOT to use gloves
Bathing and turning	<ul style="list-style-type: none"> • Bathing a patient's genitalia; bathing patient when contact with body fluids is possible • Cleaning patient after bowel movement 	<ul style="list-style-type: none"> • Routine bathing or turning of patient (when not in contact with genitalia) • Washing patient's hair
Bowel and bladder	<ul style="list-style-type: none"> • Turning incontinent patient • Handling such items as urinary drainage bags, bedpans, and urinals. Change gloves between patients when collecting urine output at end of shift. • Cleaning incontinent patient • Inserting rectal probes and tubes • Inserting, caring for, or removing external urinary catheters 	<ul style="list-style-type: none"> • Assisting patient to bathroom or bedside commode • Ambulating patient with an indwelling urinary catheter
Cleaning	<ul style="list-style-type: none"> • Routine environmental cleaning with disinfectants 	<ul style="list-style-type: none"> • Confining spill (for example, with towel) until housekeeping removes it
Environment	<ul style="list-style-type: none"> • Removing body-fluid spills • Working with patient who has antibiotic-resistant organisms and handling anything in patient's environment 	<ul style="list-style-type: none"> • Handling items or surfaces for patient not colonized with antibiotic-resistant organisms, such as bed, stretcher, or chair, as long as no body fluids are present

(continues)

Fluids and skin	<ul style="list-style-type: none"> • Handling or touching any patient's body fluids or mucous membranes • Handling items or surfaces soiled by body fluids • Handling soiled sanitary napkins 	<ul style="list-style-type: none"> • Touching intact skin • Taking blood pressure, pulse, or respirations where there is no obvious soiling by body fluids
I.V. lines and sharps	<ul style="list-style-type: none"> • Procedures involving inserting needles or catheters into patient (such as starting I.V. lines) • I.V. dressing changes • Discontinuing I.V. line or applying pressure to vascular access site • Performing finger sticks for blood studies 	<ul style="list-style-type: none"> • Changing I. V. fluid bags • Connecting secondary I.V. sets to primary tubing
Linen and supplies	<ul style="list-style-type: none"> • Changing linen grossly contaminated with body fluids • Handling soiled supplies such as instruments 	<ul style="list-style-type: none"> • Routine changing of linen without gross spillage • Removing hamper to place in laundry chute (unless fluid leakage is visible) • Handling clean supplies
Oral care, suctioning, and feeding	<ul style="list-style-type: none"> • Routine oral care and suctioning • Tracheal, nasopharyngeal, and mouth suctioning 	<ul style="list-style-type: none"> • Handling used suction container, as long as no drainage is outside the container • Feeding patient • Taking body to morgue
Postmortem care	<ul style="list-style-type: none"> • Routine postmortem care 	<ul style="list-style-type: none"> • Handling clean plastic bags with specimen containers confined inside
Specimens	<ul style="list-style-type: none"> • Obtaining specimens from patients • Emptying specimens into other containers 	<ul style="list-style-type: none"> • Assessing axillary and tympanic membrane temperatures
Temperatures	<ul style="list-style-type: none"> • Assessing rectal temperature • Assessing oral temperature when herpetic lesions are present 	<ul style="list-style-type: none"> • Transporting patients when no body fluids are obvious
Transportation	<ul style="list-style-type: none"> • Transporting patients when body fluids can't be confined or contained 	<ul style="list-style-type: none"> • Routine enteral feedings
Tubes, drains, and catheters	<ul style="list-style-type: none"> • Inserting or removing enteral or endotracheal tubes, urinary catheters, and surgical drains 	
Wound care and dressing changes	<ul style="list-style-type: none"> • All wound care and dressing changes 	<ul style="list-style-type: none"> • Care of Stage I pressure ulcer (intact skin)

(Reprinted with permission of Sue Crow RN, CIC, MSN.)

STANDARD PRECAUTIONS

FOR INFECTION CONTROL



Wash Hands (Plain soap)

Wash after touching **blood, body fluids, secretions, excretions**, and **contaminated items**. Wash immediately **after gloves are removed** and **between patient contacts**. Avoid transfer of microorganisms to other patients or environments.



Wear Gloves

Wear when touching **blood, body fluids, secretions, excretions**, and **contaminated items**. Put on **clean gloves just before touching mucous membranes** and **nonintact skin**. Change gloves between tasks and procedures on the same patient after contact with material that may contain high concentrations of microorganisms. Remove gloves promptly after use, before touching noncontaminated items and environmental surfaces, and before going to another patient, and wash hands immediately to avoid transfer of microorganisms to other patients or environments.



Wear Mask and Eye Protection or Face Shield

Protect mucous membranes of the eyes, nose and mouth during procedures and patient-care activities that are likely to generate **splashes** or **sprays** of **blood, body fluids, secretions**, or **excretions**.



Wear Gown

Protect skin and prevent soiling of clothing during procedures that are likely to generate **splashes** or **sprays** of **blood, body fluids, secretions**, or **excretions**. Remove a soiled gown as promptly as possible and wash hands to avoid transfer of microorganisms to other patients or environments.



Patient-Care Equipment

Handle used patient-care equipment soiled with **blood, body fluids, secretions**, or **excretions** in a manner that prevents skin and mucous membrane exposures, contamination of clothing, and transfer of microorganisms to other patients and environments. Ensure that reusable equipment is not used for the care of another patient until it has been appropriately cleaned and reprocessed and single use items are properly discarded.



Environmental Control

Follow hospital procedures for routine care, cleaning, and disinfection of environmental surfaces, beds, bedrails, bedside equipment and other frequently touched surfaces.



Linen

Handle, transport, and process used linen soiled with **blood, body fluids, secretions**, or **excretions** in a manner that prevents exposures and contamination of clothing, and avoids transfer of microorganisms to other patients and environments.



Occupational Health and Bloodborne Pathogens

Prevent injuries when using needles, scalpels, and other sharp instruments or devices; when handling sharp instruments after procedures; when cleaning used instruments; and when disposing of used needles.

Never recap used needles using both hands or any other technique that involves directing the point of a needle toward any part of the body; rather, use either a one-handed "scoop" technique or a mechanical device designed for holding the needle sheath.



Do not remove used needles from disposable syringes by hand, and do not bend, break, or otherwise manipulate used needles by hand. Place used disposable syringes and needles, scalpel blades, and other sharp items in puncture-resistant sharps containers located as close as practical to the area in which the items were used, and place reusable syringes and needles in a puncture-resistant container for transport to the reprocessing area.



Use **resuscitation devices** as an alternative to mouth-to-mouth resuscitation.



Patient Placement

Use a **private room** for a patient who contaminates the environment or who does not (or cannot be expected to) assist in maintaining appropriate hygiene or environmental control. Consult Infection Control if a private room is not available.

The information on this sign is abbreviated from the HCIC/NC Recommendations for Isolation Precautions in Hospitals.

Appendix

G

Clinical pathways are designed to be used when providing care for clients with specific health problems. The form may vary among institutions. This pathway is an example of a hospital setting and a client with congestive heart failure (CHF) in the acute phase, emergency department and the first day, in the improving phase and discharge phase. Courtesy of St. Francis Hospital, Wilmington, Delaware.

Clinical Pathway -

DRAFT

CONGESTIVE HEART FAILURE

ACUTE PHASE - EMERGENCY DEPARTMENT		DATE ____/____/____		
<small>Disclaimer for Pathways and Guidelines: Clinical Pathways and Guidelines are developed by a multidisciplinary team. They are guidelines for care. They are not compulsory or mandatory plans of treatment or standards of care. When considering individual patient needs, alternative independent clinical assessments and judgements may be necessary.</small>				
		BELOW: SELECT SHIFT & INITIAL		
		0700-1500	1500-2300	2300-0700
Assessment	H&P per ED Protocol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Vital signs & multisystem assessment per ED protocol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Advanced directives addressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Guideline I: S&S Diagnosis of CHF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Guideline II: CHF Pathway/Risk Stratification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Guideline VI: Level of Care for CHF Patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Treatments	Continuous cardiac monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Weight prior to diuresis (if appropriate)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Foley catheter as indicated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tests/Labs	Guideline III / IV: Diagnostic Procedures in New Onset/Established CHF (EKG,CXR,CBC, complete chemistry profile, Mg, thyroid function, other as indicated)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Pulse Oximetry per protocol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	IV access	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Medications/IVs	Oxygen therapy per protocol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Guideline IX: Diuresis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Evaluate patient's routine medications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consults	Cardiology consult as indicated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nutrition	NPO except for medications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Activity/Safety	Bedrest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	High Fowlers position	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discharge Planning	Responsible support person identified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Residence prior to admission identified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patient/Family Teaching Outcomes	Verbalizes understanding of: Treatment plan and need for admission.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Importance of notifying the staff when experiencing SOB or chest pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Need for limited activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	If patient meets criteria, meds given in ED: • Furosemide • Bumetanide. • Morphine. • Nitrates • Heparin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clinical Processes/ Outcomes	Documentation of support person on record. Residence and telephone documented on record	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	INITIAL SIGNATURE TITLE INITIAL SIGNATURE TITLE			

PHYSICIAN SIGNATURE: _____

Clinical Pathway -

DRAFT

CONGESTIVE HEART FAILURE

ACUTE PHASE - DAY 1 (ICU/TELEMETRY/MS UNIT) DATE ____/____/____
 (ADMISSION DAY or OBSERVATION DAY (0-24 hrs))

Disclaimer for Pathways and Guidelines: Clinical Pathways and Guidelines are developed by a multidisciplinary team. They are guidelines for care. They are not compulsory or mandatory plans of treatment or standards of care. When considering individual patient needs, alternative independent clinical assessments and judgements may be necessary.

		BELOW: SELECT SHIFT & INITIAL		
		0700-1500	1500-2300	2300-0700
Assessment	Vital signs & systems assessment per unit protocol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Advanced directives addressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Monitor for signs & symptoms of SOB, JVD, rales, peripheral edema, S3,S4, murmur, arrhythmias	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Guideline VI: Level of Care for CHF Patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Treatments	Continuous cardiac monitoring as indicated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Weight q AM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Intake & output	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tests/Labs	Pulse Oximetry per protocol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Guideline III: Diagnostic Procedures in New Onset CHF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Guideline IV: Diagnostic Procedures in Established CHF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Guideline V: Assessment of LV Function in CHF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Medications/IVs	IV access	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Oxygen therapy per protocol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Guideline IX: Diuresis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Guideline X: ACE Inhibitors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Guideline XII: Digoxin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Guideline XIII: Indications for Anticoagulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Guideline XIV, XV, XVI and XVII	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patient's routine medications as indicated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Consults	Cardiology consult as indicated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nutrition	Cardiac diet as tolerated, (additional Na and fluid restrictions as indicated)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Nutrition screen, Diet Teaching Needs Assessment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Activity/Safety	Bedrest with BRP/bedside commode	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fall risk assessment completed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Maintain semi-Fowlers position	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discharge Planning	• Care management assessment:			
	• Evaluation of support system and discharge needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Preadmission compliance with diet and medication evaluated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Initial discharge plan addressed, with patient and care giver	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Need for DME and home weight scale identified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patient/Family Teaching Outcomes	• Verbalizes basic understanding of disease process, (reason for SOB and decreased activity level etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Decreasing SOB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clinical Processes/ Outcomes	• JVD decreasing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Improved breath sounds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Negative fluid balance >500(8hr), 750(12hr)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• LV Function ordered or documented in record (as appropriate)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• O ₂ Sat maintained > 92%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
INITIAL SIGNATURE	TITLE	INITIAL SIGNATURE	TITLE	

PHYSICIAN SIGNATURE: _____

Clinical Pathway -

DRAFT

CONGESTIVE HEART FAILURE

IMPROVING PHASE - DAY 2 ICU/TELEMETRY/MS UNIT		DATE ____/____/____		
Disclaimer for Pathways and Guidelines: Clinical Pathways and Guidelines are developed by a multidisciplinary team. They are guidelines for care. They are not compulsory or mandatory plans of treatment or standards of care. When considering individual patient needs, alternative independent clinical assessments and judgements may be necessary.				
		BELOW: SELECT SHIFT & INITIAL		
		0700-1500	1500-2300	2300-0700
Assessment	Vital signs & multisystem assessment per unit protocol Monitor for signs & symptoms SOB, JVD, rales, peripheral edema Guideline VI: Level of Care for CHF Patients	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Treatments	Continuous cardiac monitoring as indicated Weight AM Intake & output q 8 hours D/C foley if indicated	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Tests/Labs	Guideline III: Diagnostic Procedures in New Onset CHF Guideline IV: Diagnostic Procedure in Established CHF Guideline V: Assessment of LV Function in CHF Pulse Oximetry per protocol	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Medications/IVs	Oxygen therapy per protocol Guideline IX: Diuresis Guideline X: ACE Inhibitors Guideline XII: Digoxin Guideline XIII: Anticoagulation in CHF Guideline XIV, XV, XVI and XVII. Patient's routine medications as indicated	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Consults	Nutrition for Level 4 Malnutrition Risk and diet teaching	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Nutrition	Cardiac diet (additional Na and fluid restrictions as indicated)	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Activity/Safety	OOB X 3 with assistance, (meals in chair, remain up for 30 minutes) Encourage high to semi-Fowlers position when in bed and during meals	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Discharge Planning	• Care manager reassessment of discharge plan, assess needs for Home O ₂ and refer as indicated. • Assess need for Home Health, Telemanagement, Cardiac Rehab referral.	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Patient/Family Teaching Outcomes	• Demonstrates understanding of activity level. • Medication instructions initiated. • Verbalizes understanding of relationship of increased Na and fluid intake with SOB, weight gain and peripheral edema. • Verbalizes rationale for daily weight monitoring.	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____
Clinical Processes/ Outcomes	• Decreased weight • Increased activity without increased SOB. • Negative fluid balance. • ECHO completed. • Receiving Ace inhibitors. • Receiving Digoxin. • Receiving diuretics.	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____
INITIAL	SIGNATURE	TITLE	INITIAL	SIGNATURE

PHYSICIAN SIGNATURE: _____

Clinical Pathway -

DRAFT

CONGESTIVE HEART FAILURE

DISCHARGE PHASE - DAY 3, 4, _____ (TELEMETRY/MS UNIT) DATE ____/____/____

Disclaimer for Pathways and Guidelines: Clinical Pathways and Guidelines are developed by a multidisciplinary team. They are guidelines for care. They are not compulsory or mandatory plans of treatment or standards of care. When considering individual patient needs, alternative independent clinical assessments and judgements may be necessary.

		BELOW: SELECT SHIFT & INITIAL		
		0700-1500	1500-2300	2300-0700
Assessment	Vital signs & system assessment per unit protocol Advanced directives addressed Guideline VI: Level of Care for CHF Patients Guideline VIII: NYHA Classification Circle - I, II, III, IV)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Treatments	Continuous cardiac monitoring as indicated ... Weight q AM Intake and output q 8 hours	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tests/Labs	Pulse Oximetry per protocol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Medications/IVs	Oxygen Therapy per protocol Guideline IX: Diureses Guideline X: Ace Inhibitors Guideline XII: Digoxin Guideline XIII: Anticoagulation in CHF Guideline XIV, XV, XVI and XVII. Patient's routine medications as indicated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consults	High risk patients meeting nutrition needs. Diet education completed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nutrition	Cardiac diet (additional Na and fluid restrictions as indicated)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Activity/Safety	OOB and ambulating as tolerated Meals in chair, remain up for 30 minutes Encourage self care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discharge Planning	Discharge resources identified and referrals made as indicated: • Smoking cessation program • Home Health referral. • Cardiac Rehabilitation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patient/Family Teaching Outcomes	Verbalizes understanding of: • Discharge medication regimen, action, side effects, drug and food interaction. • Importance of monitoring daily wt - notify MD with increase of 3lbs in weight and or increasing SOB. • Cardiac diet as indicated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clinical Processes/ Outcomes	Resp. rate at baseline with increased activity. ... Stable rate, rhythm, &BP with increased activity. • Receiving ACE Inhibitors. • Receiving digoxin • Receiving diuretics. • Guideline VII: Discharge Criteria met : (Y = D/C) (N= reapply next day)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
INITIAL	SIGNATURE	TITLE	INITIAL	SIGNATURE

PHYSICIAN SIGNATURE: _____

Answers to Review Questions

Chapter 1

1. “Using their own history” means to learn from the past, to avoid repeating mistakes, and to learn new solutions for problems. Some major lessons nurses can learn from history are to promote higher education, actively participate in politics (from having ongoing dialogue with legislators to campaigning for office), and function as client advocates.
2. The answer will vary according to the history of each nursing program.
3. Contemporary nursing leaders and their contributions include Ruth Gordon, development of functional health patterns; Delores Kreiger, Therapeutic Touch as nursing intervention; Hildegard Peplau, interpersonal theory of nursing; Jean Watson, theory of caring; Martha Rogers, nursing theory (exchange of energetic fields); Helen Yura, pioneer work in nursing process.
4. c.
5. The Health Maintenance Organization Act, 1973; Nurse Training Act, 1964; Rural Health Clinic Service Act, 1977; Omnibus Reconciliation Act, 1980.

Chapter 2

1. Concepts are the basic elements of theories; concepts are vehicles of thought that help us to label and name phenomena. Propositions, another structural element of theories, are statements that propose a relationship between two or more concepts.
2. A theory is a set of concepts and propositions that provides an orderly way to view phenomena. The purpose of theory in a scientific discipline such as nursing is to describe, explain, predict, and control phenomena of concern to the discipline.
3. Nursing practice is central to the relationship between practice, theory, and research. Nursing practice provides the raw material for the ideas that are systematically developed and organized into nursing theories. Theories are tested and validated through nursing research. Further, new knowledge that results from nursing research is used to transform and inform nursing practice. Alternatively, nursing practice generates research questions. Nursing research influences the development of nursing theory which, in turn, illuminates nursing practice.
4. A metaparadigm is the unifying force in a discipline that names the phenomena of concern to that discipline. Metaparadigm concepts provide the boundaries and limitations of a discipline, identify the common viewpoint that all members of a discipline share, and help to focus the activities of the members of that discipline. By consensus, the metaparadigm elements in nursing are person, environment, health, and nursing. The metaparadigm of medicine focuses on pathophysiology and the curing of disease. Nursing’s metaparadigm is a broader one and focuses on caring for people, their health, and their environment.
5. A paradigm is a particular way of viewing the phenomena of concern that have been delineated by the metaparadigm of the discipline. A paradigm provides a worldview, or a lens, through which to view and explore phenomena.
6. The two paradigms in nursing identified by Parse are the Totality Paradigm and the Simultaneity Paradigm. In the Totality Paradigm, the person is viewed as a bio-psycho-social-spiritual being who is in constant interaction with the environment in order to accomplish goals and maintain balance. In this paradigm, the goals of nursing are health promotion, care and cure of the sick, and prevention of illness. Recipients of nursing care are those individuals designated by society as ill. In the Simultaneity Paradigm, the person is viewed as mutually and simultaneously changing with the environment. A freely choosing being, the person is considered to be more than and different from

the sum of the parts. Nursing focuses on quality of life as viewed from the person's perspective. The primary decision maker in the nurse-person relationship is the person.

7. Nightingale provided the nursing profession with the philosophical basis from which other theories have emerged and developed.
8. False. The early nursing theorists working in the 1950s were not attempting to address the meta-paradigm concepts; initial consensus on these was not achieved until 1984.
9. Levine developed the conservation theory. Levine believed in the wholeness of the human being and that the primary focus of conservation is to maintain that wholeness. Nursing is viewed as assisting clients with the conservation of their uniqueness by helping clients to adapt appropriately. Levine's four principles of conservation provide structure for the theory.

In Roy's view, the person is a bio-psycho-social being in constant interaction with a changing internal and external environment. Nursing attempts to alter the environment when the person is not adapting well or has ineffective coping responses. Stimuli are classified as either focal, contextual, or residual. Adaptation to these stimuli is accomplished through coping mechanisms which are broadly categorized as either the cognator or the regulator subsystem. The person responds to stimuli in the environment in four ways, or modes: physiological, self-concept, role function, and interdependence. Nursing care needs to be provided when a person has unusual stressors or when usual coping mechanisms are ineffective.

Orem's self-care deficit theory of nursing comprises three interconnecting theories: theory of self-care; theory of self-care deficit; and theory of nursing systems. According to the theory of self-care, self-care requisites can be classified as either universal, developmental, or health-deviation self-care requisites. According to the theory of self-care deficit, nursing care is needed when a self-care deficit exists. The theory of nursing systems unifies the two other theories. According to the theory of nursing systems, if a deficit exists, then the nurse plans care (what is to be done and by whom) using three types of actions or nursing systems: wholly compensatory, partly compensatory, and supportive-educative.

Watson developed the theory of human caring, which focuses on the art and science of human caring. Watson's theory is composed of 10 carative factors, which are nursing actions or caring processes. According to Watson, the goal of nursing is to help persons improve and enhance harmony between mind, body, and spirit.

Rogers developed the science of unitary human beings. According to Rogers, both the person and the environment are viewed as energy fields. The whole of the person's energy field interacts with the whole of the environmental energy field, which results in the process of life. There is a constant exchange of matter and energy between the person and the environment. Nursing identifies the patterns and organization of the person-environment unit and aims to repattern the rhythm and organization of these energy fields so that the person's integrity is heightened.

10. Answers will vary.

Chapter 3

1. **a.** By having one licensure examination that is administered to associate, baccalaureate, and diploma graduates, the nursing profession is stating that there are no differences in the educational preparation, clinical expectations, and utilization of nurses. "A nurse is a nurse is a nurse" is the message.
 b. Regardless of the entry into practice issue, educational preparation is different among the three entry-level programs as documented by curricula comparison. Nursing has always had greater role expectations of the BSN nurse relative to nursing theory and research as scientific bases of decision making and leadership skills. However, job descriptions fail to differentiate practice on the basis of education. The challenge to change rests with licensure and accreditation bodies in collaboration with educational programs.
2. Nursing education will use nontraditional methods to promote student mastery of technical skills so that time with clients focuses on implementation of the nursing process. It will use cost-effective care settings for learning experiences; for example, transitional services between acute care and home settings or transitional services provided in the home setting. It will collaborate with other health care disciplines for multicompetency education. Curriculum content about client and family teaching will be increased to produce graduates who are effective in this realm of practice. Students will be able to choose tracks such as informatist, primary care, health promotion, and genetic or ethical counseling in their senior year.
3. Example: Why are nursing students required to spend laboratory time learning how to make a bed and bathe a client in bed (these are basic skills performed daily by most people)? Design an experimental research study and randomly assign half the students to the experimental group, which will only read the reasons why bed baths and clean, tightly fitted bed linen are important. The control

group will be exposed to the normal rigors of learning how to bathe a client and make a bed according to procedure. Outcome data will be collected by observing both groups performing these skills and outcomes will be measured on the basis of the critical elements of the skill.

4. c.
5. Ensures that the client understands what to expect regarding the proposed interventions and possible risk factors.
6. The focus of research is on preventive medicine.

Chapter 4

1. Rapidly escalating costs; limited access for many Americans; quality that is being threatened by cost-containment measures; oversupply of hospital beds; inability of many Americans to obtain health care insurance.
2. Canada

<ul style="list-style-type: none"> • Universal access • Single-payer system 	United States <ul style="list-style-type: none"> • Limited access • Dual-payment system (public and private payers) • No provision for catastrophic events • Managed care is predominant method of reimbursement
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3. Answers will vary. Some suggestions are: advanced practice nurses provide quality care in a cost-effective manner; APNs must be reimbursed directly by third-party payers; prescriptive authority for APNs will enhance accessibility to care for many Americans; cost-containment measures must not affect the quality of health care services provided.
4. *Nursing's Agenda for Health Care Reform:*
 - Universal access to care: Provide a package of essential health care services to all.
 - Wellness and health as priorities: There would be incentives for employees and insurers to participate in health-promoting behaviors.
 - Empowerment of consumers: Nurses will educate consumers about self-care activities for health promotion.
5. Ways in which nurses can address the challenge of shorter length of hospital stays: involvement in home health care; provision of preventive health care services such as client teaching; promotion of healthy lifestyles such as smoking cessation programs; establishment of nurse-managed clinics to care for clients with chronic health care problems such as diabetes mellitus and hypertension; expanded use of nurse practitioners; delivery of services in outpatient settings.

Chapter 5

1. Examples of information collected by each of the senses follow. There are many others. *Vision:* Inspecting the skin; evaluating a wound; reading a thermometer; identifying body language. *Hearing:* Listening to the client tell current and past problems; evaluating heart sounds, bowel sounds, and blood pressure. *Smell:* Identifying breath odor; evaluating wound and urine odor. *Touch:* Evaluating skin temperature, texture, contour, moisture; measuring size and assessing mobility of masses; identifying pulsations, vibrations.
2. Subjective data are given by the client. Objective data are collected by the health care professional using the senses of vision, hearing, smell, and touch.

O Temperature 102°F	O Pulse 98, irregular
S "My head hurts."	O Red maculopapular rash
S Nausea	S Vomiting for 3 days
O Grimaces when blinds open	S Skin flushed, hot
3. Answers to the matching:

1. b	6. d
2. c	7. a
3. a	8. e
4. a	9. b
5. c	10. c
4. d.

Chapter 6

1. O Temp 103.2 S Right upper quadrant pain
S Nausea O Swelling in ankles
O Hematocrit 33% S Itching
2. a. Tell me how you manage your care at home.
b. Describe your cough.
c. How do you feel about your health?
d. Describe your chest pain.
3. Previous illnesses, hospitalizations, and surgeries; client and family medical history; immunizations; allergies; home medications; developmental level; psychosocial history; sociocultural history; activities of daily living.
4. *Inspection:* General appearance; examination of skin color or lesions; facial expressions; movement.
Palpation: Skin temperature; texture; pulses; swelling; to determine size, shape, and consistency of masses.
Percussion: To determine location of organs; assess relative amount of air in a cavity. *Auscultation:* Breath sounds; heart sounds; bowel sounds.
5. "Mr. Robbins, although you state that you have taken your blood pressure medicine as prescribed, your wife does not remember having your prescription refilled. Can you help to clarify this?"
6. Focused assessment (with focus on elimination).

Chapter 7

1.
 - a. Correct
 - b. Blaming
 - c. Blaming
 - d. Medical Diagnosis
 - e. Circular
2. Initial nursing diagnoses based on the data may include *Activity Intolerance*, *Risk for Pain*, *Acute*; *Altered Nutrition: More Than Body Requirements*; *Impaired Physical Mobility*.
3. Possible sources of errors may include (a) Incomplete collection of assessment data. This error may be avoided by Nurse Smythe continuing the initial assessment started by Nurse Jones. (b) Failure to validate data. This error may be avoided by Nurse Smythe confirming previously collected data. (c) Faulty writing of the diagnosis statement. This error may be avoided by following guidelines for writing the statement and being sure that the medical diagnosis is not listed as an etiology.
4. Etiologies may include: related to decreased strength and endurance; related to edema; related to fatigue; related to pain; related to motivation. An example of a two-part diagnostic statement would be: *Impaired Physical Mobility* RT decreased strength and endurance.
5. One strategy to overcome barriers to using nursing diagnoses might include using the NANDA approved list to ensure a common language. This could be done by duplicating a copy of the NANDA list for each nurse or nursing student on the assigned clinical unit and having a reference book available that would list and describe how to use the specific diagnosis.
6. Nursing diagnoses are the logical conclusion to data that have been collected. Using nursing diagnoses provides the profession with a common language, which may enhance communication among nurses.
7. Nursing diagnoses assist in clarifying what the nurse is doing for the client; clarification could support reimbursement just as reimbursement for a medical diagnosis is based on DRGs. Once it is known what the nurses do, personal and professional power can coexist within the discipline of nursing.

Chapter 8

1. Number 3 is the only client-centered goal, because it clearly describes that the client will perform the action of describing the purposes of a low-fat diet. Number 1 is nursing assistant-centered, because the nursing assistant is the subject who will perform the action. Numbers 2 and 4 have omitted a subject, but the nurse is the implied subject.

2. Number 3 is the only objective stated correctly with an action verb. Numbers 1, 2, and 4 do not contain action verbs; “will know,” “will be able to,” and “will understand” are vague and not measurable. How can one measure what one knows, understands, or what one is able to do? However, one can identify, state, explain, demonstrate, or list. These verbs are more specific and clearly identify what individual skills are necessary to perform the assignment and reach the goal.
3. Number 1 is the only one with criteria. The standards include a time frame (“by Friday”).
4. None of the above. Not every goal will necessitate a condition.
5. Number 1 has a time frame (“by Friday”). The other numbers do not have a time frame.
6. d.
7. b.
8. b.
9. d.
10. b.

Chapter 9

1.
 - a. dep.
 - b. dep.
 - c. ind.
 - d. ind.
 - e. ind.
 - f. int.
 - g. int.
 - h. dep.
2. Examples are numerous and will vary by respondent. *Ongoing assessment*: A nurse gives a medication for pain and returns in 20 minutes to assess the effectiveness of the medication. *Setting priorities*: A nurse has been assigned five patients for the day (7–3). One of the patients is to go to surgery at 7:30 AM. The nurse’s first priority might be to assess the patient going to surgery in order to determine if all needed preparations have been made. *Allocation of resources*: In reviewing a list of activities, the nurse finds that two patients need discharge instructions and teaching, one needs a catheter inserted, one needs pain medication, and one needs to be turned and positioned. The nurse delegates the pain medication and catheter insertion to the LPN, turning and positioning to the nursing assistant, and does patient teaching and discharge herself. *Nursing interventions*: Monitoring of client progress; skilled interventions (medications, IVs, and so on). *Documentation of interventions*: At the beginning of each shift, the nurse documents a head-to-toe assessment.
3. Communication, legal record, research, reimbursement.
4. (a) Teach proper use and storage of nitroglycerin tablets. (b) Monitor (and teach Ms. Long to

monitor) type and frequency of chest pain. (c) Discuss purpose and procedures related to prescribed diagnostic tests. (d) Arrange consultation with dietitian concerning weight reduction and low-fat diet. (e) Assist Ms. Long in developing long-term plan to incorporate exercise into daily activities.

5. Answers will be individualized, but should incorporate the following guidelines: (a) List all activities to be completed; (b) Determine priorities (what must be done in what time period); (c) Determine if any activities can be delegated and, if so, to whom.
6. Answers will vary, but should incorporate brief, concise, complete, and accurate descriptions.
7. Answers will vary with each student.
8. Answers will vary with each state.
9. 8:00 Assist with breakfast
8:30 Assist with bed bath
8:55 Give routine medications
9:00 Up in chair and observe response to strengthening exercises with physical therapist; change linen
9:50 Prepare for transport for CT
12:00 Assist with lunch
1:00 Give routine medications
2:00 Up in chair at bedside

Chapter 10

1. Evaluation is an ongoing process performed at every stage of the nursing process.
2. *Structure evaluation:* Examines the agency's ability to provide the services offered to its client population. Evaluates the physical facilities, resources, equipment, staffing patterns, organizational patterns, and staff qualifications. *Process evaluation:* Examines each phase of the nursing process to judge the quality of nursing care in terms of adequacy, appropriateness, effectiveness, and efficiency. *Outcome evaluation:* Compares the client's current status with the expected outcomes to determine whether expected changes have occurred.
3. Evaluation provides a mechanism for comparing one's actions with standards.
4. Ask the client about his or her health status. Observe the client for behavior change (e.g., increased self-care ability, decreased anxiety). Monitor for physiological signs of improvement (e.g., stabilized vital signs, improved cardiovascular functioning).
5. Promotes professional growth. Improves quality of care.
6. Policy and procedure manuals and client's chart reflect evidence of the following: (1) Side rails up if client is confused or has received medication such as narcotics; (2) Call light is easily accessed

by the client; (3) Floors and passageways are kept free of obstacles; (4) Clients are educated on the safe and effective use of medication and equipment.

Chapter 11

1. Answers will vary according to nurses interviewed. Some ways of demonstrating caring are active listening, offering self (presence), use of touch, empathy, meeting basic needs (such as safety and comfort), spending time with clients and families answering their questions, serving as client advocate, educating clients and families.
2. Students' philosophies will vary. Some beliefs about healing and caring may include concepts related to the interwoven nature of bodymind (effect of physical and emotional health on one another), the holistic nature of individuals, healers seeking to help individuals tap into their inner healing reserves, caring and curing being different.
3. Answers will vary according to individual interviewed.
4. a. Attending behaviors include maintenance of appropriate eye contact, sitting in a position facing the client, nodding your head.
b. Other actions that indicate active listening include stating "Uh huh...", asking relevant questions, restating, reflecting.
c. Ways to demonstrate therapeutic use of self include spending time with the client, being available to listen and answer questions, being sensitive to nonverbal messages.

Chapter 12

1. Communication requires active involvement of all participants. It is difficult to undo a previously sent message. Communication is ongoing, always occurring. For example, even when people remain silent, they are still sending out messages through nonverbal cues.
2. Sender, receiver, message, channel.
3. Nonverbal cues speak louder than words and therefore convey the most accurate meaning of the intended message.
4. Active listening, observation of behavior.
5. Communication that is directed toward helping a client with needs, concerns, or problems.
6. Plan to interview at an appropriate time; ensure privacy; establish guidelines for the therapeutic interaction; provide for comfort during the interaction; accept the client exactly as is; encourage spontaneity; focus on the client and on the leads and cues presented; encourage the expression of feelings; be aware of your own feelings during the interaction.

7. Judging, blaming, belittling, rejecting, disapproving, probing.
8. Reflection, restating, focusing, directing, observing.

Chapter 13

1. *Cognitive*: Client states the name and purpose of prescribed medications. *Affective*: Client accepts limitations imposed by an injury (evidenced by stating, "I'll just have to learn to use those crutches."). *Psychomotor*: Client self-administers insulin injection.
2. Barriers to learning include *Physiological*—pain, fatigue, sensory deprivation, oxygen deprivation; *Environmental*—interruptions, lack of privacy, multiple stimuli; *Psychological*—anxiety, fear, anger, depression; *Sociocultural*—language, value system, educational background.
3. To promote learning by accessing a variety of learning styles (auditory, visual, kinesthetic); to reinforce learning by repeating information via the different learning styles.
4. Answers will vary: some key concepts that should be included are: Learning is a lifelong process; learning is a mutual process; individuals learn in a variety of ways and at their own pace; learning is an effective way to promote wellness.
5. Answers will vary.
6. Examples of answers, which will vary: Nurses in hospitals focus on immediate needs such as treatment modalities (including medications and procedures), diagnosis-specific information, and improving self-care abilities. Nurses in extended care facilities focus on self-care abilities and skills for coping with stressors, including relaxation and problem-solving skills. The focus of nurses in clinics depends on the type of clinic; for example, in a prenatal clinic, topics will include preparation for labor, signs and symptoms of impending labor, caring for a newborn, and nutritional guidelines. Information taught by nurses in schools will depend on the specific health-related and age-related needs. For example, a high school nurse will provide information on substance abuse, sexual health issues, suicide prevention, and self-esteem issues. Industrial nurses focus on prevention of exposure to toxins (including noise pollution), safety information (accident prevention), and wellness promotion (exercise, stress management). In the home environment, nurses focus on follow-up to promote self-care activities such as medication information, nutritional guidelines, and lifestyle modifications. Nurses in health maintenance organizations focus on recommended schedule for screening examinations, recommended schedule for immunizations, disease

prevention and health promotion activities, lifestyle modifications (e.g., diet, exercise), and stress management. *Note*: Regardless of practice setting, nurses teach families and significant others, as well as clients.

7. Answer will vary according to client needs and type of setting (see number 6 for some suggested content areas).
8. Answer will vary according to client needs. The nursing actions must be relevant to the client's identified learning needs.

Chapter 14

1. *Physical dimension*: hypnosis, imagery, biofeedback, meditation, relaxation, chiropractic, yoga, tai chi, therapeutic touch, healing touch, massage, acupuncture, acupressure, reflexology. *Emotional dimension*: hypnosis, imagery, meditation, relaxation, yoga, tai chi, therapeutic touch, healing touch, massage, faith healing, prayer, humor, pet therapy, music, aromatherapy. *Social dimension*: all may lead to improved social health. *Spiritual dimension*: faith healing, prayer, laying on of hands, shamanistic practices.
2. Answers will vary according to the community.
3. Balloons, bubble gum, bubble solution, comic books, Nerf squeeze balls, Koosh balls, crayons and markers, paper for drawing, smiley face stickers, cartoon books, joke books, jacks, marbles, kaleidoscope, spinning top, clay. These are only suggestions; use your imagination and creativity when answering this question.
4. Answer will vary with each individual and the individual's experience with the imagery exercise.
5. Appropriate therapies include music, massage, therapeutic touch, healing touch, pet therapy, humor (especially nonverbal expressions). A physician's order is not required as these are independent nursing interventions.

Chapter 15

1. Assist clients to meet lower-level (more basic) needs first. Provision of food, water, oxygen, shelter, and comfort must be attended to before addressing self-esteem and belonging needs.
2. Individual answers will vary but may include topics such as legislative proposals to cut health care financing; controversy over establishing a new landfill in the community; detection of toxins in the water supply; the unhealthy smog index reported in air quality reports; the closure of a community hospital.
3. Answers will vary depending upon the interviewee. In general, individuals do experience a

positive correlation between emotional and physical health.

4. Answers will vary depending upon the interviewee. Common determinants of health are ability to do what one needs or wants to do; absence of painful or debilitating symptoms; ability to care for self.
5. Answers will vary. Common motivators are to be free of pain; to remain independent; a desire to stay healthy throughout one's life; decreased health insurance premiums for health-promoting behaviors (e.g., no cigarette smoking, consistent use of seat belts); ability to work without missing any time.
6. Important issues that affect the health of Americans are lack of cost-effective, easily accessible basic health care services; the current health care delivery system, which is driven primarily by economics; the AIDS epidemic; increasing number of adolescent pregnancies; resurgence of communicable diseases, such as tuberculosis; high incidence of alcohol and drug abuse; cigarette smoking; violence.
7. Answers will vary. Some examples may include Meals on Wheels for the elderly; Women, Infants, and Children (WIC) food program; shelters for the homeless; public health clinics.

Chapter 16

1. Answers will vary depending on the person interviewed. Ideally, the discussion will provide information about cultural beliefs relative to definition of health and illness, folk remedies, folk healers used (if any), beliefs and rituals related to birth and death.
2. Stereotypes can affect nursing care by influencing perceptions formed during assessment; affecting the types of nursing diagnoses formulated; determining the behavioral responses of nurses to clients from varying cultural backgrounds.
3. Services for the homeless population vary greatly from community to community. Some examples of such services may include shelters, soup kitchens, indigent clinics, mobile clinics (medically equipped vans). These may be funded by the local governing agencies, private endowments, volunteers, or churches.
4. The answers for this question are highly personal in nature and therefore will vary. It is most important to think about the last question, which focuses on your assumptions and attitudes about people of other racial and ethnic groups because such assumptions and attitudes affect behavior.
5. Even though the answers will vary with each student, some things for all to consider include:
 - What lessons were learned from the most important book read?

- Is there congruence between your values and your behavior? For example, if you value your health over your appearance yet spend more time every day on improving your appearance than on your health, incongruence exists.
- How many qualities of a "good nurse" do you possess? What can you do to develop others?

Chapter 17

1. Because growth can occur at any time in the life span, recognize that every client, regardless of age, has the ability to learn and to change. Nurses can intervene to help clients successfully master developmental conflicts at any stage.
2. Some ways in which nurses demonstrate their faith are: respecting the dignity of each client; treating clients as equals; spending time with each client; providing information; honoring the client's decisions; involving the client in the care provided.
3. Storybooks, puzzles (10–25 pieces), large crayons, finger painting materials, clay, balls, simple computer games, sandbox, toy telephones.
4. STD education should include basic information about the disease, type of treatment and consequences, notification of sexual partners.
5. Answer will vary depending on each student's value system.

Chapter 18

1. Old age can be viewed as a result of physical changes, psychosocial development, or a combination of the two. No one theory is successful at explaining all the changes of the aging process; a holistic approach that considers all the client's characteristics, including values, self-concept, cultural background, and family status, will give a more complete picture of the aging adult.
2. The section on physiological changes outlines the many changes the older adult will experience; specific tips on helping the client manage these are given in the related boxes.
3. An older adult's reaction to the psychosocial changes of aging will mirror the development of his or her psychosocial health over the years. Individuals who have a positive outlook on the aging process and who are mentally and financially prepared for old age are likely to have fewer health alterations and needs than those individuals who resist the aging process and view it only in terms of the negative changes and limitations it introduces.
4. Polypharmacy refers to the concurrent use of several medications; because the elderly in general take multiple medications, the nurse must be aware of side effects, contraindications, and other

medication alerts to protect the health of the elderly client.

5. Elder abuse can manifest in both physical and psychological symptoms; refer to the displays outlining these signs.
6. Home environment evaluations focus on removing safety hazards such as poor lighting, loose throw rugs, and the like; see the chapter displays for complete outlines of safety hazards.
7. Remember that older adults are persons of dignity and value who deserve your respect and thoughtful nursing care. Teaching guidelines should be clear, concise, and targeted to the client's level of understanding and functioning. Visual and auditory aids will help enhance comprehension and retention of material.
8. It is important to describe the purpose of the class. In order to prepare, get to know the social history of each client who will be in the group. This involves establishing a therapeutic relationship, reviewing the social history on the medical record, and interviewing the family/significant others if available. The agenda for the class should include the class purpose and a simple explanation of life review. The group norms would also be explained. Evaluation of the class efficacy should focus on behavioral changes of the clients; for example, smiling and verbalizing pleasant memories.

Chapter 19

1. Self-concept is determined in large part by familial and cultural influences, so these may help determine if one factor is more important than another. Also, because self-concept changes with developmental level, the strength of one component over another may increase or decrease over time. For instance, body image may predominate in the formulation of self-concept for the teenager, whereas role performance or identity may be more important to the new parent.
2. *Childhood:* Family experiences, interactions with parents and siblings, degree to which needs are met, development of new skills, sense of autonomy, development of language, awareness of emotions and empathy, interactions with peers and teachers at school. *Adolescence:* Body image and appearance, physical changes, impressions of childhood, interactions with peers and friends, association with role models, social status. *Adulthood:* Physical changes, changes in energy levels, changing roles, changes in skill competencies, professional status, life review.
3. Provide privacy, encourage client to relate stories and personal anecdotes, encourage client to keep personal items at bedside, involve client in care decisions to promote independence and feeling of

self-worth, fully explain all procedures, involve family members or significant others in care.

4. Additional assessments could include: loss of former role of income provider; loss of professional status; anxiety over meeting financial goals given change in income status; changes in self-esteem based on new roles; need to find and accept a modified identity based on new life situation. Nursing care would be directed at helping the client identify these additional concerns; working together to find means to manage them in a way that would help the client boost self-confidence; assisting the client in seeing the changes as positive challenges; helping the client to emphasize not just the differences but the similarities between his former roles and his new roles.

Chapter 20

1. Answers will vary.
2. Answers will vary.
3. The “fight-or-flight” response occurs during the resistance stage of GAS; is a physiological response to stress in which the autonomic nervous system and endocrine system are aroused to prepare the body for defense against a stressor by either fighting or fleeing.
4. People who experience chronic, prolonged periods of stress have impaired immune systems as a result of the stress response. Clients are *not* responsible for causing the illness; however, they can help the recovery process by learning to deal with stress effectively.
5. Answers will vary.
6. Possible answers: by being active in student government association; by questioning; by being assertive, not aggressive or passive.
7. Possible answers: By continuously adding to your knowledge base; by increasing your skill level; by asking questions; by encouraging clients to speak up for themselves.
8. Answers will vary.
9. Answers will vary.
10. Answers will vary.
11. c.

Chapter 21

1. Interventions for the client focus on providing physical comfort, meeting psychosocial needs, and assisting with fulfillment of spiritual needs. Interventions for the family focus on providing support and education. One of the most important nursing roles in caring for the dying client and family is to provide support.
2. Keep the client clean and dry; provide a safe, nonthreatening environment; demonstrate a

- respectful, caring attitude; teach the client relaxation techniques (deep breathing, imagery, progressive muscle relaxation); touch; massage; music.
3. The stages of grief are met in varying degrees by each individual. Not every person will progress through each stage of grief.
 4. Intense preoccupation with the deceased; treasuring the deceased's possessions; inability to resume normal activities.
 5. Answers will vary.
 6. Subjective: Client verbalizes the presence of pain. Objective: Tense muscles, guarding a certain part of the body, facial grimacing, frowning, elevated pulse, diaphoresis, increased respiratory rate.
 7. Answers will vary.

Chapter 22

1. Answers will vary according to program availability. Programs sponsored by state nurses associations, district or provincial nursing associations, and nursing schools are all aimed at promoting the integrity of the nursing profession.
 2. Qualifications, member selection, and duties of the board of nursing vary from state to state.
 3. Answers will vary depending upon the association officers interviewed.
 4. The definition of nursing varies slightly from state to state. The authority for APRNs also varies according to state regulations.
 5. Ways to gain competency after graduation include participating in continuing education programs; attending employee-sponsored in-service and orientation programs; reading current journal articles related to your area of practice and about the profession of nursing in general; enrolling in postgraduate courses; networking with colleagues to discuss the latest advances; continuing to practice as a licensed professional.
 6. Answers will vary depending upon the identified leaders; however, some qualities of leaders are communication skills, credibility, delegation skills, critical-thinking ability, ability to initiate action, effective risk-taking skills, and ability to use persuasiveness and influence appropriately.
 7. Ways to increase personal power include maintain competence and knowledge base to build credibility, associate with powerful people, develop the skill of persuasion, share power with others, share information with others, encourage peers to develop, demonstrate self-confidence.
- individuals stating what each individual must do or not do; mutual understanding of the terms and obligations the contract imposes on each individual; and compensation for lawful actions performed.
4. Types of intentional torts are assault and battery, defamation, fraud, invasion of privacy, and false imprisonment.
 5. Proof of liability depends on four elements: duty, breach of duty, injury, and causation.
 6. A reasonable nurse is obligated by the courts to follow the institution's policies and procedures for how client care is to be performed in that facility and to notify the physician of changes in the client's condition. In addition, in the determination of a breach of a duty, the actions of the nurse are compared against the professional standards of nursing care.
 7. Complaints against nurses are in one of the following categories: client falls, medication errors, failure to monitor a client in restraints, improper technique in giving treatment, failure to follow hospital procedures, and failure to supervise non-licensed employees.
 8. Actions or omissions by the nurse that constitute unprofessional conduct are: breach in client confidentiality; failure to use sufficient knowledge, skills, or nursing judgment when practicing nursing; physically or verbally abusing a client; assuming duties without sufficient preparation; knowingly delegating nursing care to unlicensed personnel, which places the client at risk for injury; failure to accurately maintain a record for each client or falsifying a client's record; and leaving a nursing assignment without properly notifying appropriate personnel.
 9. Nursing students, when employed as caregivers, must act as reasonably prudent persons, equivalent with education and experiences, and assume only those duties that they are competent to perform, as stated in their job description.
 10. The nurse administered the enema without the client's consent, which constitutes battery. The client proved that the enema was offensive, insulting, or physically intimidating and that the client did not agree to the touching that occurred. The client had a heart attack and injury was incurred.

Chapter 24

Chapter 23

1. a.
2. b.
3. A legal contract has three essential elements: promise(s) between two or more legally competent

1. See Table H-1 for some suggested answers.
2. *Assessment* (Determination of claims and parties): Mary Washington, the newborn, health care providers.
Analysis and diagnosis (Problem identification: statement of the ethical dilemma): Length of life versus quality of life; parents' right to refuse treatment for their child. Ethical principles: Mother's

TABLE H-1
Answers for question 1, Chapter 24

Tenet	Actualizing Behaviors	Ethical Principle
1. Respect every client's human dignity and uniqueness.	<ul style="list-style-type: none"> a. Call each client by name. b. Be sensitive to client's cultural background. c. Establish a trusting relationship with client. d. Recognize and honor each client's individuality. e. Develop an individualized plan of care based on each client's unique situation. 	Autonomy
2. Safeguard client's right to privacy.	<ul style="list-style-type: none"> a. Share client information only with members of the health care team involved in that client's care. b. Do not discuss clients or families in public areas (e.g., hallways, cafeterias, elevators). 	Nonmaleficence and fidelity
3. Protect clients and the public from incompetent, unethical, or illegal practice of any person.	<ul style="list-style-type: none"> a. Report incompetent, unethical, or illegal practice by health care providers. b. Know the criteria of your state or provincial nurse practice act as it relates to whistleblowing. c. Adhere to facility policy for whistleblowing. 	Nonmaleficence, fidelity, and veracity
4. Be responsible and accountable for your own nursing judgments and actions.	<ul style="list-style-type: none"> a. Demonstrate accountability by admitting mistakes instead of blaming others or "the system." b. Make decisions through use of critical-thinking skills, as opposed to rash impulsive decisions. 	Beneficence, nonmaleficence, and fidelity
5. Maintain competence in nursing.	<ul style="list-style-type: none"> a. Maintain current knowledge base and expertise by participating in educational activities. b. Achieve certification in area of practice. 	Beneficence and nonmaleficence
6. Exercise informed judgment and use individual competence and qualifications as criteria in seeking consultation, accepting responsibilities, and delegating nursing activities to others.	<ul style="list-style-type: none"> a. Use critical-thinking skills when making decisions about delegation. b. Determine the qualifications of a delegatee prior to making assignments. c. Ask questions as needed. d. Demonstrate competency for assigned tasks. 	Nonmaleficence and beneficence
7. Participate in activities that contribute to the development of nursing's body of knowledge.	<ul style="list-style-type: none"> a. Conduct research studies. b. Assist in research studies. c. Use research findings in practice. 	Beneficence and fidelity
8. Participate in the profession's efforts to implement and improve standards of nursing.	<ul style="list-style-type: none"> a. Be active in professional associations. b. Communicate with legislators about nursing and health care issues. 	Beneficence
9. Participate in the profession's efforts to establish and maintain conditions of employment conducive to high-quality nursing care.	<ul style="list-style-type: none"> a. Adhere to agency's policies on staffing. b. Communicate to nursing management when low staff:client ratio interferes with delivery of quality care. c. Communicate with legislators and other policy makers about the relationship between work environment and client safety. 	Nonmaleficence, beneficence, fidelity, and justice
10. Protect the public from misinformation and misrepresentation; maintain the integrity of nursing.	<ul style="list-style-type: none"> a. Provide client and family with factual information. b. Maintain membership in professional association. 	Nonmaleficence, fidelity, and veracity
11. Collaborate with members of the health professions and other citizens to promote health of the public.	<ul style="list-style-type: none"> a. Maintain open lines of communication with other health care providers. b. Teach clients and families health-promoting activities. 	Nonmaleficence, beneficence, fidelity, and justice

autonomy, nonmaleficence; infant's right to non-maleficence, beneficence.

Planning (Consideration of priorities of claims; generation of alternatives for resolving the dilemma; consideration of the consequences of alternatives): Whose claim should take precedence? Alternatives: Withhold treatment, which would result in newborn's death; Provide extraordinary treatment and send the child home with the mother; Provide extraordinary treatment and have the child become a ward of the state if the mother abandons the child or gives up parental rights.

Implementation (Carrying out selected moral actions): Select one of the alternatives and perform it.

Evaluation (Assessing the outcome of moral actions. "Were the actions ethical? What were the consequences?"): Answers will vary.

Assessment (Determination of claims and parties): the 80-year-old client, her family, health care providers.

Analysis and diagnosis (Problem identification: statement of the ethical dilemma): Length of life versus quality of life; client's right to refuse treatment versus family's desire for extraordinary treatment. Ethical principles: Client's autonomy, nonmaleficence, fidelity. Family's right to nonmaleficence, beneficence.

Planning (Consideration of priorities of claims; generation of alternatives for resolving the dilemma; consideration of the consequences of alternatives): Whose claim should take precedence? Alternatives: Withhold treatment, which would result in client's death; Provide extraordinary treatment.

Implementation (Carrying out selected moral actions): Select one of the alternatives and perform it.

Evaluation (Assessing the outcome of moral actions; "Were the actions ethical? What were the consequences?"): Answers will vary.

3. The answer regarding values will vary with each student. Some of the ethical implications for each situation follow.
 1. Autonomy, nonmaleficence, beneficence
 2. Autonomy, nonmaleficence
 3. Nonmaleficence
 4. Autonomy and nonmaleficence
4. Answers will vary to question 1. In the situation of the young sexually active female who is diagnosed as HIV-positive, the client's right to privacy conflicts with the public's right to safety. Laws concerning confidentiality vary from state to state. Generally, the need to inform the public overrides the client's right to privacy in cases of STDs. This is based on the ethical theory of teleology in which utility states that an act must result in the greatest

amount of good for the greatest amount of people.

5.
 - Answers will vary based on individual opinion.
 - Examples of support for a client's right to refuse treatment: fully explaining the consequences of no treatment, complete discussion of all treatment options, acting as an advocate for the client who refuses.
 - Responses to a client's decision to continue self-harmful practices: recognize that the client who is an adult and competent has the right to engage in practices as long as they are within legal parameters. For example, the client who is diagnosed with emphysema and continues to smoke must be treated as an individual worthy of respect.
6. Answers will vary based on individual belief systems.
7. Each of the situations will evoke a variety of emotional responses. However, as a professional nurse, it is imperative to provide respectful, compassionate care to all clients.

Chapter 25

1.
 - a. Lab personnel, courier, physician, unit secretary.
 - b. Send a copy to physician for initialing and immediately file original on chart. Have physician go to lab to sign results. Fax results to physician, who initials and then forwards report to unit.
2.
 - a. The following processes can be analyzed: orientation for new staff regarding medication administration; the process for documenting medication errors; the process for reporting medication errors; the way in which medication is administered; the mechanism for providing coverage during vacation time.
 - b. Possible solutions for each variation: increased orientation about medication administration and documentation for newly hired staff; ongoing education with all staff about medication administration; provide more staff for vacation coverage.
3. The phrase "doing the right thing" refers to efficacy and appropriateness. The phrase "doing the right things well" involves the dimensions of availability, timeliness, effectiveness, continuity, safety, efficiency, and respect and caring.
4. Quality assurance is an older term, retrospective, focused on individual performance. Quality improvement is a newer concept that is more encompassing; is focused on present and future; emphasizes process, not individual performance.
5. Nurses improve quality of care by maintaining competence (through ongoing educational activities); listening to clients; focusing on client's perceived needs; looking for one thing every day to do better.

Chapter 26

1. All the documentation tools should form a system that reflects the nursing process. The assessment data should identify the client's specific alteration, which leads to the formulation of a nursing diagnosis. The nursing diagnosis then triggers the client's plan of care with expected outcomes and the specific nursing interventions to assist the client in achieving those outcomes, as well as the criteria for evaluation, which determines the need for subsequent reassessment and revision of the plan of care. The system itself becomes a vehicle for expressing each phase of the nursing process without duplication of information.
2. The client's medical record contains documents for record keeping that provide written evidence of what was done for the client and the client's response to the interventions.
3. The critical elements of assessment should be reviewed to determine the client's condition as presented in the chart. This information should identify what specifically helped the client in each particular situation.
4. Mrs. White's medical record must provide documentation that supports her medical diagnosis of diabetic ketoacidosis and the appropriateness of care to maximize reimbursement. Documentation on the flowsheet should reflect routine interventions such as the frequency of vital sign measurements, telemetry, daily weight and intake and output measurement, hourly specific gravity results, and blood glucose levels. Nursing documentation must also show evidence of client and family education and discharge planning.
5. Mrs. White is an insulin-dependent diabetic admitted on 10/14/97 with diabetic ketoacidosis. On admission she was hyperventilating, vomiting, and hypotensive. The results of her laboratory tests indicated that she was hyperglycemic, hypokalemic, and dehydrated. Interventions were directed toward restoring a normal blood glucose level and correcting the hyperglycemia, hypokalemia, and dehydration. As a safety measure, fall precautions were instituted. Client teaching focused on diet, activity and exercise, and insulin. Her husband was present for the teaching sessions. She was referred to home health to monitor the effectiveness of teaching and her ability to manage her diabetes.
6. 10/15/97, 1500: Mrs. White, room 402, 56 years old, admitted on 10/14 by Dr. Smith with an admit diagnosis of diabetic ketoacidosis. She has a history of diabetes mellitus, insulin-dependent. Her husband has been with her all day and has a dinner tray ordered for this evening; their daughter will bring him home after dinner.

Mrs. White is on bed rest and hourly vital signs, which have stabilized (T 98.6°F; P 88/min and regular; R 18/min, and BP 146/84). She is on telemetry, normal sinus rhythm. Hourly output, ranging from 80 to 100 ml/h per Foley catheter, total for this shift, 750 ml/8 h. The hourly specific gravity was discontinued last evening at 2100. The urinalysis report is on the chart, results were called to Dr. Smith at 1035.

Daily weights at 0600; she weighed 61 kg this morning. She was NPO until this morning; started on a 1600-calorie diet at breakfast. She ate 60% of her breakfast and 80% of lunch; she refuses to drink the skim milk. Dietary has been contacted and the calories will be adjusted to allow for 2% low-fat milk as requested by the client. No complaints of nausea. Hourly blood glucose, ranging from 350 to 320 mg, 1400 glucose was 322 mg. Notify Dr. Smith if the blood glucose is less than 300 mg.

She has a triple lumen catheter in the right subclavian, IV fluids are infusing as prescribed. Line 1: 1000 ml of 0.9% normal saline at 125 ml/h per pump, a new bag was hung at 1100, claim 625 ml for your shift; Line 2: 500 ml of 0.9% normal saline with 50 U of regular insulin at 7 ml/h per pump, a new bag was hung at 1400, claim 500 ml. Her total intake for this shift was 1230 ml/8 h. IV tubing was changed when new bags of fluids were hung. Sterile dressing was changed this morning, it is dry and intact. The third port is flushed with heparin every 8 h, it is patent.

Oral hygiene has been done hourly, mucous membranes moist, without lesions. Fall precautions implemented since admission.

7. The nurse should document in the progress notes changes that occur in the client's condition, the client's response to an intervention or the expected outcome, and all client or family members' complaints.
8. O, A, S, P.
9. Focus charting uses a columnar format within the progress notes to distinguish the entry from other recordings in the narrative notes; it is a method of identifying and organizing the narrative documentation of client concerns that includes data, action, and response.
10. The advantages of computerized charting are: saves documentation time; increases legibility and accuracy; provides clear, decisive, and concise key words; enhances implementation of the nursing process; enhances decision making; supports multidisciplinary networking. The disadvantages of computerized charting are: cost of installation, which limits the number of terminals at nursing stations; too slow at peak usage times; downtime (time for routine servicing or sudden unexpected failure); nurses' resistance, not wanting to change

long-practiced documentation behaviors; risk of loss of client confidentiality of information contained in the medical record and personnel sharing of access codes (passwords); need to determine who should have access to and how the clinical database should be used.

Chapter 27

1. Respirations and blood pressure are above the normal limits for Ms. Reynolds' age.
2. You would expect to find an elevated temperature. Mr. Warren has the fan on because he feels warm. Convection, the use of the fan, increases the amount of heat loss by air currents.
3. Do not measure the blood pressure in Mrs. Gray's right arm.
4. Reduced hemoglobin content in the blood causes a bluish discoloration (cyanosis) of the lips and nail beds.
5. Resonant sound is normally heard over the posterior apices on percussion.
6. Auscultation of bronchial breath sounds is normal over the trachea. Vesicular sounds are normally heard in the lung periphery. The auscultation of bronchial sounds in the lung periphery usually indicates emphysema.
7. A bimanual technique is used when palpating large breasts.
8. Fine crackle: Dry, high-pitched crackling, popping sound of short duration
Coarse crackle: Moist, low-pitched crackling, gurgling sound of long duration
Sonorous wheeze: Low-pitched snoring sound
Sibilant wheeze: High-pitched musical sound
Pleural friction rub: Creaking, grating sound
Stridor: Crowing sound

Chapter 28

1. The nurse practitioner identified during the history that for the past 2 months, Mr. Simon has had repeated colds with fever, fatigue, weakness, and a 20-pound weight loss; during the physical examination, the nurse found multiple bruises on his extremities and trunk and bone and joint pain on movement. These symptoms prompted the nurse practitioner to order a white blood cell differential. Although the repeated colds, fever, and weakness may indicate an infection, the cause of the weight loss, bruising, and pain has to be determined. Changes occur in the white blood cells (leukocytes) in inflammatory and immune responses. The WBC count provides an overview of the client's immune status, and the differential identifies the proportions of each WBC type. Table 28-5 identifies the common disorders associated

with changes in the WBC type. Based on Mr. Simon's symptoms, the nurse was trying to identify changes in the WBC types that would indicate a malignancy, such as an increase in segmented neutrophils and lymphocytes or a decrease in lymphocytes. The WBC count and differential only partially reflect the client's condition; however, when put into the context of the client's clinical manifestations, they provide a key to assessing the client's defenses and allow for appropriate interventions.

2. Whenever the skin is broken, as occurs with a puncture, the body's first line of defense against infection is compromised. Within 48 to 72 hours clinical manifestations of an infection may be present and the WBC count and segmented neutrophils and bands will be greater than normal. With an acute infection, this increase can occur within 4 to 24 hours post-puncture as the body speeds neutrophil production to destroy bacteria.
3. Correct client positioning and selection and preparation of equipment and vein provide for a safe and efficient venipuncture to prevent hemoconcentration, which can be caused by prolonged standing or a prolonged time of application of a tourniquet during venipuncture; hemolysis, which results from the rapid flow of blood through small-bore needles and exposure to large negative pressures; and the variability that occurs when a blood specimen is drawn from a site above an intravenous infusion.
4. The normal prothrombin time for adults is 12 to 14 seconds. This time interval represents the time it takes the body to convert prothrombin, an inactive precursor in the coagulation process, to thrombin to form a clot. If the control time is 12 seconds, the therapeutic range will be 24 to 30 seconds (2 to 2.5 times the control time).
5. When an offspring has a blood type of AB positive, the possible parental blood types are AB + A or AB + AB. Blood type O is the universal donor because the red blood cells have no agglutinogens and therefore do not react with either anti-A or anti-B serum. Blood type AB has both A and B agglutinogens and agglutinates with both types of serum.
6. Acetylcholine is a chemical substance that functions as a synaptic transmitter. The enzyme cholinesterase causes the rapid split of acetylcholine to acetate and choline, which allows for the transmission of nerve impulses. When the cholinesterase level is low and the client is scheduled to receive succinylcholine, the practitioner should be notified because succinylcholine further depresses the action of cholinesterase, which can cause prolonged periods of dyspnea and general muscle relaxation, resulting in respiratory distress.
7. Mrs. Smith is considered at high risk for coronary heart disease because her HDL is less than 35 mg/dl.

8. The nurse should review the radiological reports and the practitioner's progress notes to determine the potential risk factors for Maria Rodriguez.
9. Before the arteriography is performed, the nurse ensures that the client is not allergic to the dye and that the client knows what to expect during the procedure: The client will be placed on his back and connected to a cardiac monitor; the practitioner will insert a catheter through a peripheral artery such as in the groin; the catheter's tip will be threaded into the area being studied; and then a radiopaque dye will be injected into the catheter. Postprocedure teaching should include informing the client that the involved extremity will have to be maintained in a straight and immobile position. The client will be instructed to notify the nurse if he or she experiences any warm, trickling sensations at the puncture site that would indicate bleeding.
10. After a cardiac catheterization, the nurse should:
 - Place the client on telemetry.
 - Apply manual pressure (for 30 minutes or longer) when the catheter sheath is removed, then apply a pressure dressing.
 - Keep the client on bedrest, with the involved extremity straight and immobile.
 - Monitor and record vital signs, including the presence, quality, and character of peripheral pulses and the color, temperature, and tactile sensation of the involved extremity.
 - Encourage oral fluids and record intake and output.
 - Instruct the client to report any warm, trickling sensations at the puncture site that would indicate bleeding.
 - Monitor for procedural complications such as bleeding or hematoma formation at the site; allergic reactions; and cardiovascular, pulmonary, and neurological changes.

Chapter 29

1. Consult with the physician to consider prescribing another form of oral sulfamethoxazole because Mrs. Adams' arthritis may prevent her from vigorously shaking the bottle. If a suspension is not mixed properly, it may prevent the prescribed dosage of the medication from being poured from the bottle.

Mrs. Adams' teaching should include the drug's action, adverse effects, scheduling, and specific considerations for each drug prescribed.

Sulfamethoxazole: She should continue taking the drug until the full prescription has been taken. She should drink a large glass of water with each dose, plus four to six additional glasses of water to prevent crystalluria. Mrs. Adams should be cautioned to avoid sunlight and notify the physician

at the first signs of a sore throat or fever. The nurse should stress the importance of Mrs. Adams' returning to the physician's office for a urine culture, urinalysis, and CBC as directed by the physician 5 days after discharge. *Granisetron:* Instruct Mrs. Adams to notify the physician immediately of any adverse reactions such as headache, somnolence, diarrhea, constipation, nausea, vomiting, or decreased appetite. Stress the importance of taking the medication every 12 hours to achieve maximum effectiveness from the drug's actions even though she is not experiencing nausea. Inform Mrs. Adams that, although morphine is a narcotic, she will not become addicted to the drug when taken as prescribed for pain. Caution her to be careful when ambulating and to avoid driving and other potentially hazardous activities that require mental alertness until the drug's adverse effects are known.

2. Group B.
3. Use the household system, one tumblerful (glass) equals 240 ml. There are 1000 milliliters in a liter; 2 liters are equivalent to 2000 milliliters. By dividing 2000 ml by 240 ml, you get 8.3 glasses. Instruct the client that the physician has written the order for 8 glasses of liquid over a 24-hour period. Refer to Chapter 37 for how to schedule liquids over a 24-hour time period.
4. 2 tablets.
5. 57 mg.

Chapter 30

1. Emergency surgery requires immediate intervention in order to sustain life. The nurse should collaborate with the physician and the anesthetist in planning the client's essential care to ensure that the hospital stay is as short as possible after surgery. The nurse should meet with Mrs. G.'s family to discuss and plan the discharge teaching, assessing what resources are available in the home. The nurse should begin discharge teaching in the immediate postoperative phase in collaboration with the surgeon and a home health nurse. The accounting office should be notified that all efforts are being made to provide for a safe and speedy recovery. The family should be assured that Mrs. G. will receive safe, effective care and that arrangements will be made for the family to pay for the hospitalization.
2. As the client's age and developmental stage can influence the ability to cope with surgery, the nurse should listen to the child's concerns and explain the surgical experience using terms the child can understand. An 11-year-old boy may be hesitant to express his fears. The nurse, in the presence of the parent, should encourage the child to talk about what he is feeling. Before

discharge, the nurse should ensure that the parent demonstrates competency in changing a sterile dressing and proper disposal of soiled dressings and equipment.

The nurse should consider the specific age-related factors when doing discharge teaching. The client will have limitations in his activity, and the nurse should help the parent plan how these can be handled in the home environment with two younger siblings. For example, the 5-year-old could help his brother to the bathroom and the 3-year-old could bring pillows and other safely carried items to help with the care. Meals should be eaten at the table, and regular bedtimes should be maintained. The nurse should help the parent see how establishing routines in the 11-year-old's care will foster a sense of participation for the whole family unit.

3. The nurse should honor Mr. S.'s request and have a priest minister the sacrament of Anointing of the Sick. This sacrament is often used for its power of healing. The nurse should allow the client to prepare for surgery in accordance with his personal and religious beliefs. As with all interventions, after the Anointing, the nurse should document it in the nurse's notes.
4. The nurse has many actions to perform when preparing the client for surgery. These actions promote client safety and facilitate a smooth transition from one perioperative phase to another. Timing is a critical factor in planning perioperative care. All tests and their results should be on the chart before surgery. Preoperatively, the client should be prepared for discharge. Client teaching is a major factor in preventing complications such as infection that may place the client at risk and increase hospital costs.
5. The nurse's first action should be to assess for hypoxemia. The nurse should remain with the client and use the call light to have another staff member bring a portable pulse oximeter to the bedside to measure the client's blood oxygen saturation level. If the reading is below the normal range (95% to 100%), initiate oxygen via nasal cannula at 4 L/min and notify the physician. Oxygen is a drug and requires an order from a practitioner except in emergency situations. Clients with chronic obstructive lung disease should receive only low doses of oxygen 2 L/min, so that the hypoxic respiratory drive remains intact.

The physician may order arterial blood gases (ABGs) and a chest x-ray to rule out atelectasis and pulmonary infection. Postoperative clients may develop respiratory complications caused by general anesthesia such as atelectasis, which may lead to hypoxemia. Pain can also reduce ventilatory effort and function, and result in hypoxemia. The client's symptoms may be caused by the morphine, an opi-

ate analgesia that can cause respiratory depression, especially after the initial dose and after an increase in dosage. Although respiratory depression rarely occurs when the client receives the same continuous dose, the nurse should frequently monitor clients on a PCA pump for changes in respiratory status and signs of hypoxemia.

Early signs of hypoxemia are changes in mental status such as restlessness, confusion, agitation, and altered levels of consciousness. Pulse oximetry changes alert the nurse to changes in the blood oxygen level within seconds; whereas cyanosis is a late sign of hypoxemia. The nurse should monitor the client's blood pressure, urine output, pulses, and capillary refill for signs of diminished cardiac output and the client's respiratory status for signs of respiratory distress such as retractions, nasal flaring, unequal chest expansion on inspiration, and use of accessory muscles.

6. Mrs. Broussard's discharge plan of care:
 - Nursing diagnosis: *Impaired Physical Mobility* related to musculoskeletal impairment
 - Expected outcomes: Client will self-medicate to control pain; client will remain free from infection; client will perform exercises to keep the joint mobile; client will avoid activities that increase the risk of dislocating the prosthesis.
 - Interventions: Teach client about patient-controlled analgesia. Home health nurse to change dressing daily using aseptic technique, and monitor for signs of infection, such as redness, drainage from incision, and fever. Ensure that the client is taking prophylactic antibiotics. Observe the client performing range of motion (ROM) and continuous passive motion (CPM). Instruct client to keep hips abducted and avoid crossing legs when sitting; avoid bending hips more than 90° when getting up out of bed or chair, and avoid hip flexion greater than 60° at all other times; sit in high-back chairs with firm seats; notify the physician immediately if a sudden increase in pain is felt.
 - Evaluation: Pain controlled with analgesia. Incision site free from infection. Hip healed in 6 weeks. Client instructed to start frequent walks, swim, and use a high rocking chair to exercise hip.

Chapter 31

1. The typical hospital room has one or two beds in a well-lighted room. If two beds are present, a curtain is present between the beds. The beds can be lowered or raised mechanically, and the head and foot of the bed can also be raised or lowered mechanically. The beds have side rails on both sides for patient safety. A small dressing table with several drawers is present near the side of the bed. A bedside table is present to assist with eating and

grooming activities. Near the head of the bed is wall-mounted equipment such as oxygen outlet, vacuum outlet, blood pressure cuff, intercom system, outlet for call button, and an emergency button. Near the side of the bed, usually stored under the bed, is a stepping stool used to enter the bed. The room usually has a closet for storage space. A television is mounted on the wall. A bathroom is in the hospital room. It is equipped with a toilet, sink, shower and/or tub, grab rails near toilet and in the shower or tub, and an emergency call light.

Safety nursing interventions include: keeping the room well lighted; keeping the floors free of equipment; assessing the functioning of the bed and all equipment; keeping the foot stool stored under bed; keeping the bed in the lowest position; and keeping the bathroom clean.

2. A safety protocol for a client who is 65 years of age, is confused, and has severe arthritic contractures of the hand would minimally include:

- *Assessment:* Assess client's functional ability, especially use of hands. Assess visual acuity and hearing ability. Assess for previous falls. Assess medications.
- *Report to Physician:* Client's physical limitations and assistive devices needed. Client's history of falling.
- *Client Teaching:* Orient client to environmental surroundings as often as necessary. Instruct client on safety measures. Instruct client to call for assistance. Post reminders in obvious places.
- *Environmental Interventions:* Keep bed in lowest position, brakes locked, and side rails raised. Keep room lighted. Keep frequently used objects near bed or chair. Keep floor clean and clutter-free. Provide with assistive devices such as spoons and forks with large handles that facilitate grip. Place client in room nearest the nurse's station. Frequently check on client. Encourage family members to remain with client during the client's most active period of the day. Side rails and hand rails should have special grip handles to accommodate client's limited grip.
- *Direct Nursing Care:* Respond promptly to calls. Anticipate client's needs. Assist with ADLs. Provide proper assistive equipment for ambulation and other needs. Provide protective devices as necessary.
- *Evaluation:* Evaluate client's functional ability with the use of assistive equipment, client's orientation and knowledge of safety measures, and the effectiveness of client teaching and direct nursing care.
- *Documentation:* Document client's risk appraisal, safety plan of care, all safety nursing interventions implemented and client's response, and client education.

3. The patient should be placed on Standard Precautions for infection control. To break the

transmission of methicillin-resistant *Staphylococcus aureus* (MRSA), the most critical isolation precaution is handwashing before and after each patient contact. Some hospital infection control policies for MRSA may add Contact Precautions.

4. Factors known to affect a client's personal hygiene practices are body image; social and cultural habits and practices; personal preferences in regard to time, type of soap, and manner of bath; socioeconomic status; and knowledge. People who take pride in their appearance will usually engage in daily hygienic practices during their illness. Clients will request hygienic practices to be performed in accordance with their cultural beliefs and values. For example, some women may not be permitted to bathe during menstruation. Some cultures forbid a male nurse to bathe a female client. A client's personal preferences will determine the type of soap and shampoo used; the type of bath—full, partial, tub, shower, or bed bath; and the time of day that hygienic practices are desired. Some clients perform hygienic practices before going to bed; others upon wakening. Some clients may not be accustomed to a daily bath because of socioeconomic circumstances. Some clients may use only soap and water for hygienic practices and not use perfumes and deodorants because of their expense. A client's knowledge about his or her illness and ability to practice normal hygiene during this illness will influence his or her hygiene practices in the hospital. In addition, do not assume that clients are knowledgeable about the relationship between normal hygiene and health. Bathing is an excellent time to educate a client on the relationship between hygiene and health.

Chapter 32

1. Hemoglobin saturation (SaO_2) accounts for the vast majority of the total oxygen content of arterial blood.
2. Elevation of the head of the bed or assuming a sitting position may improve breathing efficiency by increasing diaphragmatic excursion and elevating the clavicles. In extreme examples (such as severe COPD), the client may lean forward with the arms resting on a table or ledge.
3. Anaerobic metabolism produces less energy (in the form of adenosine triphosphate, or ATP) than does aerobic metabolism; anaerobic metabolism produces lactic acid, which is cytotoxic, as a by-product.
4. IPPB forces air into the lungs under positive pressure; incentive spirometry relies on spontaneous (negative pressure) deep breathing.
5. Oxygen toxicity, resulting in alveolar collapse (atelectasis) and alveolar damage, results when

high concentrations of oxygen are administered for extended time periods. Clients with COPD may lose their drive to breathe when given excessive supplemental oxygen. Finally, oxygen increases the risk of fire in the immediate area.

6. The upper airway structures (nasal cavities, mucosal surfaces, cilia) serve to warm, humidify, and filter inspired air. When these structures are bypassed, air must be artificially warmed and humidified, and places the client is at increased risk for infection.
7. Heart failure produces increased pressure in the venous circuits—systemic veins and pulmonary veins. This increased pressure is transmitted backward to the venules and capillary beds, where increased hydrostatic (fluid) pressure forces water from the vascular space into the interstitial space.
8. Placing the extremity below heart level utilizes gravity to improve arterial blood flow; placing the extremity above heart level would force blood to flow against gravity, decreasing perfusion and thus increasing pain.

Chapter 33

1. *Somatic pain*: Nonlocalized; originates in support structures such as tendons, ligaments, and nerves. *Cutaneous pain*: Caused by stimulation of the cutaneous nerve endings in the skin; is described as well-localized “burning” or “pricking” sensations. *Visceral pain*: Pain felt in the internal organs; transmission is slower than cutaneous pain messages; poorly localized dull aching or throbbing sensation. *Referred pain*: Pain that originates in one area and is felt in another. For example, the pain associated with a myocardial infarction may be experienced as pain in the jaw. *Ischemic pain*: Occurs when the blood supply of an area is restricted or cut off completely, leading to inadequate oxygenation and inadequate removal of waste products. *Acute pain*: Characterized by a sudden onset and relatively short duration, mild to severe intensity, and a steady decrease in intensity over a period of days to weeks. *Chronic pain*: Pain that is long-term (lasting 6 months or longer), persistent, nearly constant, or recurrent.
2. Nonpharmacologic interventions appropriate for a 50-year-old woman with arthritis: Establishment of rapport, touch, imagery, progressive muscle relaxation, heat application, massage, exercise (unless symptoms are exacerbated), client teaching. For a 9-year-old oncology client: Establishment of rapport; touch; imagery; distraction (e.g., play, video games, music, reading); massage; teaching child and family. For a couple experiencing childbirth: Establishment of rapport; touch; imagery; distraction (e.g., use of a focal point, deep breathing techniques); massage; reframing; client teaching.
3. Perform a complete assessment to determine: (1) type, duration, intensity, and location of pain; (2) any allergies to medications; (3) previous success with medications in pain relief; (4) all medications currently used. Use adjuvant medications to: (1) enhance the analgesic efficacy of opioids; (2) treat concurrent symptoms that exacerbate pain; (3) provide independent analgesia for specific types of pain. Do not abandon the client experiencing severe pain if the present interventions are not effective. Combining analgesics, titrating dosages, using adjuvant medications for neuropathic pain or clients with severe anxiety, and optimal use of nonpharmacologic interventions may be required.
4. *NREM stage 1*: Usually lasts only 10 minutes or so; characterized by a high degree of muscle tension, rapid eye movements, and fast EEG patterns. *NREM stage 2*: Fifty percent of normal adult sleep may be spent in stage 2; characterized by fairly light sleep, with a further slowing of brain wave (EEG) patterns and loss of slow rolling eye movements. *NREM stages 3 and 4*: Most stage 3 to 4 sleep occurs early in the sleep period, with the initial amount in adults being 60 minutes or so. All cortical brain cells appear to be firing at the same time, resulting in large slow waves on the EEG. It is believed that stages 3 and 4 sleep have restorative value, necessary for physical recovery. *REM sleep*: After the initial 90 minutes or so of NREM sleep, adults experience rapid eye movement (REM) sleep. An adult typically has 4 to 6 REM sleep periods through the night, accounting for 20% to 25% of sleep. REM sleep makes up 50% of sleep in the newborn, then gradually declines to 20% to 25% of sleep by early childhood and remains fairly constant throughout the remainder of the life span.
5. *Neonates*: Generally sleep in 3- to 4-hour intervals for a total of about 16 to 20 hours per day; are usually very passive, with little activity during sleep. *Infants*: Average about 12 to 16 hours of sleep per day. As infants age, the amount of sleep decreases. At approximately 2 months of age, many infants begin to sleep throughout the night. *Toddlers*: Daily average amount of sleep is 12 to 14 hours. Bedtime rituals often develop and assume great importance in providing nighttime security. *Elderly*: Sleep requirements usually decrease to 5 to 7 hours per day. Many elderly people misinterpret this decreased need as insomnia.
6. Outcomes of sleep deprivation: “REM rebound,” or increased REM sleep the next night; mild to moderate REM sleep deprivation can cause irritability; if sleep deprivation lasts for an extended period, the person may exhibit psychosis.
7. Nursing interventions that promote comfort, rest, and sleep: therapeutic nurse-client relationship; touch; distraction; reframing; relaxation techniques (e.g., imagery and progressive muscle relaxation); biofeed-

back; cold applications; heat applications; massage; transcutaneous electrical nerve stimulation (TENS); acupuncture/acupressure; exercise; client education; psychotherapy; medication administration.

Chapter 34

1. *Factors that facilitate:* Client's degree of motivation, readiness; instruction on proper use of walker; education about the importance of ambulation. *Factors that hinder:* Pain; anxiety; fear; being connected to tubing and machinery; presence of a splint or cast.
2. *Newborns:* Usually very little activity when sleeping. *Infants:* Rapid increase in motor ability, from raising head and neck, to rolling over, to pushing up, to crawling, to standing, to learning to walk. *Toddlers:* Usually very active, especially as their motor skill abilities increase. *Preschoolers:* Remain physically very active. *School-aged children:* Usually very active in school and play activities (sports). *Adolescents:* Have alternating periods of intense activity and sleep. *Adults:* Many tend to develop sedentary lifestyles with limited physical activity or exercise. *Elderly:* Prone to falls; females at risk for osteoporosis.
3. See answers for number 2.
4. Answers will vary.
5. Answers will vary. Some examples include: back support belts; Hoyer lifts; dress and safety codes that require proper shoes (low heel, rubber treads).

Chapter 35

1. Wounds may occur as a result of trauma or surgery, whereas pressure ulcers can occur whenever the skin is exposed to such factors as prolonged pressure, constant irritation, and immobility. Wound management requires that the nurse understands the physiology of the healing process and provides care that promotes healing and prevents complications such as infection.

Pressure ulcers are caused by compression of underlying blood vessels, which decreases blood flow, oxygen, and nutrients to the compressed area. Prevention is the primary goal of nursing care. The nurse should provide hygiene and skin care, positioning, and the use of support surface therapy.

Clients who have a wound or are at risk for a pressure ulcer require individualized outcomes that reflect the client's health status. Client teaching is an integral part of care.

2. The defensive (inflammatory) phase occurs immediately in response to injury and lasts 3 to 4 days postinjury. It is characterized by vasoconstriction of damaged large blood vessels, aggregation of platelets that forms a plug, and the formation of a fibrin mesh that initially closes the wound, preventing excessive loss of blood and body fluids and

wound contamination. The inflammatory reaction is characterized by vascular and cellular responses: vasoactive substances such as histamine, serotonin, complement, and kinins cause vasodilation that results in an increased blood supply to the injured tissue. During this process, leukocytes are transported to the area for phagocytosis, causing a red, edematous, warm-to-touch exudate area, beginning the cellular response. Phagocytosis is initiated by the neutrophils that die and are replaced by macrophages. Macrophages secrete substances such as FAF and AGF that promote wound healing by stimulating formation of new blood vessels, which ends the first phase of healing.

The second phase, reconstructive (proliferative), starts with the fibroblasts, which synthesize and secrete collagen needed for tissue repair, and angiogenesis, which supplies nutrients and oxygen for healing. Granulation (epithelialization) begins around the wound's edges and serves as a net to catch migrating cells, which differentiate into various cells that form the various layers of the epidermis. The edges of the wound are drawn together by the action of the myofibroblasts that cause contraction of the new tissue and wound closure. This phase takes approximately 2 to 3 weeks. The wounds takes on a red, translucent, granular appearance as scar tissue develops.

Maturation, the last stage of healing, begins around day 21 and can continue up to 2 or more years depending on the depth and size of the wound. The scar tissue is remodeled and continues to gain strength as the capillaries gradually disappear, producing a whitish (avascular) scar.

3. Depending on the extent of tissue loss, healing can occur in three ways: Primary intention healing occurs in noncomplicated wounds with minimal tissue loss, well-approximated edges, and minimal granulation and tissue scarring. Secondary intention healing occurs in wounds with extensive tissue loss, poorly approximated edges that heal through granulation and scarring, placing the client at risk for complications that can further delay healing. Tertiary intention healing results from poor circulation or infection of the wound, which causes a delayed closure. The wound cannot be sutured until the circulation is increased and the infection is resolved.
4. The various types of exudate are characterized by the primary substance contained therein: Serous exudate (composed mainly of serum) results from a mild inflammatory response (minimal capillary permeability and protein loss), which gives a watery appearance such as a blister from a burn. Purulent exudate (composed of leukocytes, liquefied dead tissue debris, and dead and living bacteria) results from a severe inflammatory response that produces pus that varies in color (yellow, green, or brown) as determined by the causative

organism. Hemorrhagic exudate (composed primarily of RBCs) occurs with a severe inflammatory response resulting from the degree of bleeding into the wound that is bright red (fresh blood) or dark red (old blood). Mixed types of exudates, such as serosanguineous, which is clear and tinged with RBCs, contain one or more substances.

5. Wound healing is promoted by providing adequate blood circulation to transport oxygen and nutrients needed by the body. The nurse should recognize those factors that can have a negative outcome on healing, such as the client's age, nutritional status, lifestyle, chronic conditions such as diabetes mellitus, and medications. Client teaching is a critical element of nursing care. Exercise promotes circulation and increases oxygen to tissue, which aids in healing, whereas smoking and obesity decrease oxygenation to tissues. The client should be taught the value of a balanced diet with adequate amounts of protein, carbohydrates, fats, vitamins (A, C, K, pyridoxine, riboflavin, and thiamine), and minerals, especially copper, iron, and zinc.

Healing is also promoted by preventing complications such as hemorrhage, infection, and evisceration. The nurse should monitor the dressing for drainage, inspect the wound for signs of infection, and use sterile technique when caring for the wound and changing the dressing. The client should be taught how to prevent disruption of healing or splitting of the area around the wound by avoiding pressure on the wound's edges or incision line when coughing and the avoidance of straining that may occur when lifting heavy objects.

6. Heat causes vasodilation and increases blood flow to the affected area; cold causes vasoconstriction, which reduces blood flow to the affected area. Heat and cold can be applied in dry or moist forms depending on the type and location of the wound or injury and the presence of drainage or inflammation. Moist heat is used for an open wound to improve circulation, relieve edema, and hasten the suppurative process and healing. Dry heat (e.g., a heating pad) is used in treating muscle sprains to decrease inflammation or edema. Cold packs or compresses are used initially to treat an injury such as a sprained ankle to decrease or prevent bleeding and to reduce swelling.
7. The comatose client is at high risk for developing pressure ulcers. The nurse should assess the skin daily, cleanse the skin with warm water and mild cleansing agents whenever soiling occurs, apply moisturizing lotions to dry skin, turn and reposition the client at least every 2 hours (avoid shearing and friction when repositioning), and use pressure-reducing devices.

Chapter 36

1. Nursing interventions should focus on ensuring client's safety and alleviating risks associated with impaired judgment, which leads to impulsive behavior and inappropriate decisions, and decreased problem-solving ability.
2. Morphine decreases respiratory rate; a client with impaired LOC is already at high risk for respiratory depression.
3. Safety.
4. Safety, self-care.
5. To increase sensory stimulation, use taped voices of family or friends, music (familiar to client), television, touch (applying lotions, different textures to skin), frequent position changes, and familiar visual stimuli (pictures, personal items), and allow rest periods with no stimulation.
6. Goal: To modify the environment to reduce excessive multisensory stimulation, reduce distractions, loud noise, and excessive light; use a calm, unhurried manner; provide a private room; plan the delivery of care to allow for rest periods; address the client by name; provide explanations of all procedures; use soft background music; keep the environment free of strong odors; and limit the number and frequency of visitors.

Chapter 37

1. The three sources of body water replacement are liquids; food products such as meats and vegetables, which contain 65% to 97% water; and the metabolism of foods, which yields water of oxidation.
2. Sodium is the primary determinant of extracellular fluid concentration because of its high concentration and inability to cross the cell membrane easily.
3. Calcium.
4. The serum albumin level.
5. Thirst.
6. It changes the rate of cellular chemical reactions.
7. Sodium imbalance, hypokalemia, hypernatremia, hypomagnesemia, and metabolic alkalosis.
8. c.
9. Laxatives, corticosteroids, and antibiotics.
10. It enhances the action of the drug, causing toxicity.
11. 10 mEq per hour.
12. Tenderness.
13. To establish a venous route as a precautionary measure for clients whose condition may change rapidly or who may require intermittent infusion therapy.
14. a.
15. b.
16. Stop the blood transfusion, infuse the normal saline, and notify the physician.

Chapter 38

1. d.
2. Dietary fiber promotes the formation of a soft, bulky stool that moves quickly through the large intestine; some fiber is believed to bind cholesterol, thus reducing the risk of heart attack.
3. Dietary cholesterol. The blood cholesterol level is related most directly to the risk of developing atherosclerosis.
4. b.
5. b.
6. c.
7. Clients who are receiving continuous gastric feeding should be assessed every 4 hours for tube placement and residual gastric contents.
8. c.
9. Place the client in a high Fowler's position, suction client immediately to prevent aspiration, and assess the amount and rate at which the formula was given.
10. Allows for the infusion of hypertonic solutions without damaging the vein, such as sclerosis, phlebitis, or swelling.

Chapter 39

1. The primary areas in the brain that modulate the detrusor muscle reflex are located in the frontal lobes, the thalamus, hypothalamus, basal ganglia, and cerebellum. The limbic system also influences continence. A micturition center, located near the base of the brain, has two groups of neurons that mark the origin of urination (micturition). In the adult, the micturition center is controlled by multiple centers of the brain. Reticulospinal tracts in the spinal cord transmit messages from the brain and brain stem to the peripheral nerves of the bladder. Bladder filling and urinary storage are accomplished through excitation of the sympathetic nervous system via efferent, sympathetic spinal nuclei at spinal segments T-10 to L-2. Excitation of these neurons relaxes the detrusor muscle and contracts muscular elements of the sphincter mechanism. Urinary evacuation is accomplished through the parasympathetic nervous system. Excitation of neurons located at segments S-2 to S-4 causes voiding by contraction of the detrusor muscle and relaxation of muscular elements of the sphincter mechanism. Two peripheral nerves transmit messages from the central nervous system to the detrusor muscle. The pelvic plexus transmits parasympathetic impulses to smooth muscle of the detrusor. Nervous excitation of the parasympathetic nerves causes release of a neurotransmitter, acetylcholine, which produces contraction of detrusor muscle cells. Other substances influence the detrusor reflex, but all act under the influence of the central nervous system.
2. The pelvic muscles connect the anterior and posterior aspects of the bony pelvis, support the organs of the true pelvis, and contribute to the urethral sphincter mechanism in both women and men. The pelvic muscles contain primarily slow-twitch fibers that are physiologically suited for prolonged periods of tone. Fibers from the pelvic muscles surround the membranous urethra of the male and the proximal two-thirds of the female urethra, and the urethra pierces the muscular diaphragm in both genders.
3. Stress urinary incontinence is associated with urethral hypermobility, with intrinsic sphincter deficiency (damage to the muscular components of the sphincter mechanism), or a combination of these factors.
4. With urge incontinence, the person experiences normal sensations of the lower urinary tract, whereas reflex incontinence is commonly associated with detrusor sphincter dyssynergia. Clients with reflex incontinence are at a greater risk for urinary retention than are those with urge incontinence because reflex incontinence causes a functional obstruction of the bladder outlet and urinary retention.
5. The primary causes of functional incontinence are altered mobility, dexterity, access to the toilet, or changes in mentation such as acute confusion or dementia.
6. The general principle of bladder health is the relationship between fluid intake and urinary output. The Recommended Daily Allowance (RDA) for fluids is 30 ml/kg of body weight, or roughly 1/2 ounce per pound of body weight for the average sized adult; this translates to 1500 to 2000 ml/day.
7. The primary behavioral intervention for the management of stress urinary incontinence is to teach the client pelvic muscle exercises. A strength training program is begun using principles of exercise physiology. Clients are taught to identify, isolate, and contract the pelvic muscles, and to avoid contraction of distant muscle groups such as the thigh or abdominal muscles. Because they frequently have difficulty isolating the pelvic muscles, biofeedback is recommended. The client is taught to perform a single exercise that combines maximal strength and endurance. The client is asked to perform a maximal strength contraction of the muscles surrounding the urethra and vagina or rectum for a count of 10 or approximately 6 seconds, followed by a rest period of equal length. The program begins with a few contractions (typically 10 or fewer), and the number of repetitions is increased to a maximum of 35 to 50. The exercise regimen must be integrated into activities of daily living for maximal effectiveness.
8. The primary behavioral intervention for urge incontinence uses biofeedback to teach the client

to perform either a quick flick maneuver or a sustained contraction in response to an episode of precipitous urgency. The quick flick is a rapid, maximal contraction of the pelvic muscles held for 3 to 4 seconds; a sustained contraction is held for 6 to 10 seconds. The client is instructed to stop, rather than rush to the bathroom, thus decreasing the risk of falling. Several quick flicks or sustained contractions are then performed until the precipitous urge is controlled. At this point, the client is instructed to proceed to the bathroom at a normal pace but without further delays.

9. The following strategies can be used to reduce environmental barriers to toileting: Modify clothing to facilitate ease of removal (e.g., stretch-band pants, one or two buttons or Velcro versus a zipper, or non-skid soles on shoes to increase mobility); the use of a hand-held urinal or bedside commode.
10. The anal sphincter has two basic mechanisms: (1) An internal anal sphincter that is primarily composed of smooth muscle bundles that are connected to the smooth muscle of the rectum. It is primarily innervated by sympathetic nerves that promote smooth muscle contraction and parasympathetic nerves that cause sphincter relaxation. (2) An external sphincter that is composed of striated muscle fibers that are divided into deep and superficial components. The deep portion comprises muscle fibers that encircle the proximal aspect of the anal canal and attach to the symphysis pubis, forming a U shape. The superficial portion of the anal sphincter also encircles the anal canal forming a U shape; however, it attaches to the coccyx and postanal plate rather than to the anterior aspect of the pelvis. The striated component of the external anal sphincter contains both fast- and slow-twitch fibers, allowing sustained tone over a period of time before voluntary defecation.
11. The primary causes of diarrhea are malabsorption disorders, infectious agents, inflammatory bowel disease, short bowel syndrome, side effects of drugs, and laxative or enema misuse. The treatment of diarrhea is to remove the predisposing factors and maintain adequate fluid and electrolyte balance. Foods and beverages that contain malabsorbed substances are removed from the diet. Infectious diarrhea is treated with antimicrobials; anti-inflammatory drugs are used to treat irritative disorders of the bowel. Antidiarrheal agents may be used to reduce intestinal motility and increase absorption of water from the stool; these drugs are contraindicated in clients with infectious diarrhea.
12. The enterostomal nurse should be consulted for clients with denuded skin in the perianal area that requires a rectal pouch.
13. The purpose of regulating dietary fiber and fluid intake is to promote the passage of soft, hydrated stools.
14. Constipation and diarrhea are common alterations in stool consistency that cause changes in fecal elimination patterns and predispose clients to bowel incontinence.
15. Clients with bowel elimination alterations are given referrals when additional care or teaching is deemed necessary.

Glossary

A

Abduction To move a body part away from the midline.

Absorption Process by which the end products of digestion pass through the epithelial membranes in the small and large intestines into the blood or lymph system; passage of a drug from the site of administration into the bloodstream.

Abstract Summary statement of a research article that identifies the purpose, methodology, findings, and conclusions.

Accommodation Component of cognitive development that allows for readjustment of the cognitive structure (mindset) in order to take in new information.

Accountability Process that mandates that individuals are answerable for their actions and have an obligation (or duty) to act.

Accreditation Process by which a voluntary, nongovernmental agency or organization appraises and grants accredited status to institutions and/or programs or services that meet predetermined structure, process, and outcome criteria.

Acculturation Process that consists of learning norms, beliefs, and behavioral expectations of a group through which people of a subculture assume the characteristics of the dominant culture.

Acid A molecule or an ion that can function as a hydrogen ion donor.

Acid-Base Balance Regulation of hydrogen ion concentration.

Acid-Base Buffer System A solution containing two or more chemical compounds that prevents marked changes in the hydrogen ion concentration when either an acid or a base is added to a solution.

Acidosis A condition that occurs when there is an excessive number of hydrogen ions in a solution.

Acquired Immunity Formation of antibodies (memory B cells) to protect against future invasions of an already experienced antigen.

Active Euthanasia Process of taking deliberate action that will hasten the client's death.

Active Listening Listening that focuses on the feelings of the individual who is speaking.

Active-Assistive Range-of-Motion Range-of-motion exercises performed by the client with the assistance of the nurse.

Active Range-of-Motion Range-of-motion exercises performed independently by the client.

Actual Nursing Diagnosis Nursing diagnosis that indicates that a problem exists; composed of the diagnostic label, related factors, and signs and symptoms.

Acupressure The use of finger pressure applied to specific points (energy pathways) on the body to promote healing.

Acupuncture The use of needles inserted at specific points on the body (energy pathways) to promote healing.

Acute Illness Disruption (usually reversible) in functional ability characterized by a rapid onset, intense manifestations, and a relatively short duration.

Acute Pain Discomfort identified by sudden onset and relatively short duration, mild to severe intensity, and a steady decrease in intensity over several days or weeks.

Adaptation Component of cognitive development that refers to the changes that occur as a result of assimilation and accommodation; ongoing process by which an individual adjusts to stressors in order to achieve homeostasis.

Addiction Physiological and/or psychological dependence upon a substance.

Adduction To move a body part toward the midline.

Adjuvant Medication Drugs used to enhance the analgesic efficacy of opioids, treat concurrent symptoms that exacerbate pain, and provide independent analgesia for specific types of pain.

Administrative Law Laws developed by groups who are appointed to governmental administrative agencies and who are entrusted with enforcing the statutory laws passed by the legislature.

Adolescence Developmental stage from the ages of 12 to 20 years that begins with the appearance of the secondary sex characteristics (puberty).

Advance Care Medical Directive Document in which an individual, in consultation with the physician, relatives, or other personal advisers, provides precise instructions for the type of health care the client wants or does not want in a number of scenarios (e.g., end-of-life decisions).

Advance Directive Written instruction for health care that is recognized under state law and is related to the provision of such care when the individual is incapacitated.

Advanced Practice Nursing Practice of nursing at a level requiring an expanded knowledge base and clinical expertise in a specialty area.

Adventitious Breath Sounds Super-imposed sounds on the normal vesicular, bronchovesicular, and bronchial breath sounds.

Adverse Reaction Any drug effect other than what is therapeutically intended.

Aerobic Metabolism Metabolism of nutrients in the presence of oxygen; a metabolic pathway that uses oxygen to convert glucose into cellular energy.

Affect Mood or feeling.

Affective Domain Area of learning that involves attitudes, beliefs, and emotions.

Afferent Nerve Pathway Ascending pathways that transmit sensory impulses to the brain.

Afferent Pain Pathway Ascending spinal cord.

Ageism Imposition of age stereotypes and discrimination.

Agent Entity capable of causing disease.

Agglutination Clumping together of red blood cells.

Agglutinin A specific kind of antibody whose interaction with antigens is manifested as agglutination.

Agglutinogen Any antigenic substance that causes agglutination by the production of agglutinin.

Airborne Transmission Mode of transfer of disease through contact with droplet, nuclei, or dust particles suspended in the air.

Algor Mortis Lack of skin elasticity as a result of death.

Alkalosis Excessive removal of hydrogen ions from a solution.

Allen Test Assessment procedure that measures the collateral circulation to the radial artery.

Allodynia Pain caused by a stimulus that does not normally evoke pain.

Allopathic That which is recognized by a specific culture as being traditional, conventional, or mainstream (e.g. Western medicine).

Alternative Therapies Treatment approaches that are not accepted by mainstream medical practice.

Ambulation Assisted or unassisted walking.

Amniocentesis Withdrawal of amniotic fluid to obtain a sample for specimen examination.

Anabolism Constructive phase of metabolism.

Anaerobic Metabolism Metabolism of nutrients in the absence of oxygen; a metabolic pathway that converts glucose into energy in the absence of oxygen.

Analysis Breaking the whole down into parts that can be examined.

Analyte A substance dissolved in a solution; also called solute.

Anemia Reduction in the amount of hemoglobin in the blood, thus decreasing the oxygen-carrying capacity of the blood.

Anesthesia Absence of pain.

Aneurysm Localized (aortic) abnormal dilation or weakness of a wall of a blood vessel.

Angina Pain in the chest, neck, and/or arm resulting from myocardial ischemia.

Angina Pectoris Pain caused by tissue ischemia in the heart.

Angiocatheter An intracatheter with a metal stylet.

Angiogenesis Formation of new blood vessels.

Angiography Visualization of the vascular structures through the use of fluoroscopy with contrast medium.

Anions Ions with a negative charge.

Anorexia Nervosa Self-imposed starvation that results in a 15 percent or more loss of body weight.

Anthropogenic Descriptor for transmission of microorganisms resulting from changes in the relationship between humans and the environment.

Anthropometric Measurements Measurement of the size, weight, and proportions of the body.

Antibody An immunoglobulin produced by the body in response to bacteria, viruses, or other antigenic substances; counteracts and neutralizes the effects of antigens, and destroys bacteria and other cells. Agglutinin is one type of antibody.

Anticipatory Grief Occurrence of grief work before an expected loss.

Antigens A substance, usually a protein, that causes the formation of an antibody and reacts specifically with that antibody (e.g., agglutininogen).

Anxiety Subjective response that occurs when a person experiences a threat to well-being; it is a diverse feeling of dread or apprehension.

Aphasia Impairment or absence of language function that can result from an injury to the cortex.

Apnea Monitor Machine with chest leads that monitors the movement of the chest.

Appetite Desire for specific foods instead of food in general (hunger); involves a psychological desire or craving.

Aromatherapy Therapeutic use of concentrated essences or essential oils that have been extracted from plants and flowers.

Arousal A component linked closely to the appearance of wakefulness and alertness.

Arterial Blood Gases (ABGs) Measurement of levels of oxygen and carbon dioxide, as well as pH and bicarbonate ion in arterial blood.

Arteriography Radiographic study of the vascular system following the injection of a radiopaque dye through a catheter.

Arthritis An inflammation of the joints that causes pain and swelling.

Arthroplasty Total hip replacement.

Artifact Specific type of nonverbal message that includes items in the client's environment, grooming, or use of clothing and jewelry.

Ascites Accumulation of fluid in the abdomen.

Asepsis Absence of microorganisms.

Aseptic Technique Infection control practice used to prevent the transmission of pathogens.

Aspiration Procedure performed to withdraw fluid that has abnormally collected or to obtain a specimen.

Assault Intentional and unlawful offer to touch a person in an offensive, insulting, or physically intimidating manner.

Assessment First step in the nursing process; includes collection, verification, organization, interpretation, and documentation of data.

Assessment Model Framework that provides a systematic method for organizing data.

Assimilation Component of cognitive development that involves taking in new experiences or information.

Assisted Suicide Situation in which a health care professional provides a client with the means to end his or her own life.

Atelectasis Collapsed alveoli.

Atherosclerosis Disease characterized by narrowing and eventual occlusion of the lumen (opening of the arteries) by deposits of lipids, fibrin, and calcium on the interior walls of the arteries.

Atherosclerotic plaque A thick, hard deposit on the walls of the inner arteries that can clog the arteries in the heart and the brain.

Atrophy Reduction in muscle size and shape, resulting in thin, flabby muscles.

Attending Behaviors A set of nonverbal listening skills that conveys interest in what the other person is saying.

Auditory Channel Transmission of messages through spoken words and by cues.

Auditory Learner Style of learning in which an individual learns by hearing.

Auscultation Physical examination technique that involves listening to sounds in the body that are created by movement of air or fluid.

Auscultatory Gap The temporary disappearance of sounds at the end of Korotkoff phase I and beginning of phase II.

Autocratic Leadership Style Style of leadership in which the leader maintains strong control, makes the decisions, and solves all the problems.

Autoimmune Disorder Condition in which the specific immune defense inappropriately reacts to the host's own tissue.

Autonomy Being self-directed, taking initiative instead of waiting for direction from others; ethical principle that refers to the individual's right to choose for oneself and the ability to act on that choice.

Autopsy Postmortem examination to determine the cause of death.

Autoregulation Redistribution of blood flow to areas of greatest need.

Awareness The capacity to perceive sensory impressions and react appropriately through thoughts and actions.

Ayurveda A healing system based on Hindu philosophy and Indian philosophy, that embraces the concept of an energy force in the body that seeks to maintain balance or harmony.

B

Bacteremia Bacteria in the blood.

Bacteriuria Bacteria in the urine.

Barium Chalky-white contrast medium.

Barium Enema Rectal infusion of barium sulfate used to visualize the colon.

Barium Swallow Fluoroscopic visualization of the esophagus following the ingestion of barium sulfate.

Basal Metabolic Rate (BMR) Energy needed to maintain essential physiological functions when a person is at complete rest both physically and mentally.

Base A molecule or an ion that will combine with hydrogen ions.

Base of Support Foundation on which a person or object rests.

Baseline Values Establish the norm against which subsequent vital sign measurements can be compared.

Basic Human Need Need that must be met for survival.

Battery Touching another person without consent.

Behavior Observable response of an individual to external stimuli.

Benchmarking Process that evaluates products, services, and priorities against the performance of others.

Beneficence Ethical principle regarding the duty to promote good and prevent harm.

Bereavement Period of grieving following the death of a loved one.

Bioavailability Readiness to produce a drug effect.

Bioethics Application of general ethical principles to health care.

Biofeedback Measurement of physiological responses that yields information about the relationship between the mind and body and helps clients learn how to manipulate these responses through mental activity.

Biological Agent Living organism that invades a host, causing disease.

Biological Clock Endogenous mechanism capable of measuring time in a living organism.

Biopsy Excision of a small amount of tissue.

Bisexuality Having an equal or almost equal preference for sexual partners of either gender.

Black Wound Wound containing necrotic tissue.

Blanching White color of the skin when pressure is applied.

Blood Pressure Measurement of pressure pulsations exerted against the blood vessel walls during systole and diastole.

Body Alignment Position of body parts in relation to each other.

Body Image Individual's perception of physical self, including appearance, function, and ability.

Body Mass Index (BMI) Determines whether a person's weight is appropriate for height by dividing the weight in kilograms by the height in meters squared.

Body Mechanics Purposeful and coordinated use of body parts and positions during activity.

Bodymind Inseparable connection and operation of thoughts, feelings, and physiological functions.

Bonding Formation of attachment between parent and child.

Bradycardia A heart rate less than 60 beats per minute in an adult.

Bradypnea Respiratory rate of 10 or fewer breaths per minute.

Bronchial Sounds Loud and high-pitched sounds with a hollow quality heard longer on expiration than inspiration from air moving through the trachea.

Bronchography Radiographic study of the trachea and bronchi following the injection of a contrast agent through a catheter.

Bronchovesicular Sounds Medium-pitched and blowing sounds heard equally on inspiration and expiration from air moving through the large airways, posteriorly between the scapula and anteriorly over bronchioles lateral to the sternum and second intercostal spaces.

Bruits Blowing sounds that are heard when the blood flow becomes turbulent as it rushes past an obstruction.

Bruxism Teeth grinding during sleep.

Buccal Pertaining to the inside cheek.

Bulimia Insatiable appetite.

Bulimia Nervosa An eating disorder characterized by episodic binge eating followed by purging.

Burnout State of physical and emotional exhaustion that occurs when caregivers deplete their adaptive energy; characterized by fatigue, depersonalization, and decreased feelings of personal accomplishment.

Butterfly Needles Winged-tipped needle.

C

Cachexia Weight loss marked by weakness and emaciation that usually occurs with a chronic illness such as tuberculosis or cancer.

Calorie Quantity of heat required to raise the temperature of 1 gram of water 1°C.

Capitated Rate Preset fees based on membership, not services provided; payment system used in managed care.

Carbohydrate Organic compound composed of carbon, hydrogen, and oxygen.

Cardiac Catheterization Radiographic study with the use of a contrast medium injected into a vascular catheter that is threaded into the heart, coronary, and/or pulmonary vessels.

Cardiac Conduction System Specialized cells in the heart that generate and conduct electrical impulses; consists of the sinoatrial node, internodal pathways, atrioventricular node, bundle of His, right and left bundle branches, and Purkinje fibers.

Cardiac Cycle Series of electrical and mechanical events resulting in a cycle of atrial and ventricular contraction and relaxation.

Cardiac Output Measurement of blood pumped by the heart in one minute; measured by multiplying the heart rate by the ventricle's stroke volume.

Cardiopulmonary Resuscitation (CPR) Technique of applying respiration and chest compressions to support oxygenation in the event of cardiac and respiratory arrest.

Case Management Methodology for organizing client care through an episode of illnesses so that specific clinical and financial outcomes are achieved within an allotted time frame.

Catabolism Destructive phase of metabolism.

Categorical Imperative Concept that states that one should act only if the action is based on a principle that is universal.

Catharsis Process of talking out one's feelings; "getting things off the chest" through verbalization.

Cations Ions with a positive charge.

Causation Breach of duty that must be legally proved to have caused an injury.

Cavities Dental caries.

Ceiling Effect Phenomenon in which increasing doses of a medication above a certain level does not result in increased analgesic effect.

Centering Process of bringing oneself to an inward focus of serenity that is done before beginning an energetic touch therapy treatment.

Central Line Venous catheter inserted into the superior vena cava through the subclavian, internal, or external jugular vein.

Certification Process by which a nongovernmental agency or association certifies that an individual licensed to practice a profession has met predetermined standards specified by that profession for specialty practice.

Certified Nurse Midwife Advanced practice nurse who is prepared in nursing and midwifery.

Certified Registered Nurse Anesthetist Advanced practice nurse who is prepared in the science of anesthesiology.

Chakra A concentrated area of energy that influences the physical body, emotions, mental patterns, and spiritual awareness.

Chain of Infection Phenomena of developing an infectious process.

Change Dynamic process in which an individual's response to a stressor leads to an alteration in behavior.

Change Agent Individual who intentionally creates and implements change.

Channel Medium through which a message is transmitted.

Charting by Exception (CBE) Charting method that requires the nurse to document only deviations from preestablished norms.

Chemical Agent Substance that interacts with a host, causing disease.

Chemical Restraints Medications used to control the client's behavior.

Chest Physiotherapy Technique of percussing or vibrating the chest wall in an effort to mobilize pulmonary secretions; usually accompanies postural drainage.

Chiropractic Promotion of healing through manipulation of the spinal column.

Cholangiography Roentgenographic visualization of the integrity of the biliary system by a radiopaque contrast medium.

Cholesterol Lipid that is produced by the body and used in the synthesis of steroid hormones. Cholesterol is excreted in bile.

Cholinesterase Enzyme manufactured in the liver that is responsible for the breakdown of acetylcholine and other choline esters.

Chronemics Study of the effects of time on the communication process.

Chronic Acute Pain Discomfort that occurs almost daily over a long period (months or years) and that has a high probability of ending; also known as progressive pain.

Chronic Illness Disruption in functional ability usually characterized by a gradual, insidious onset with lifelong changes that are usually irreversible.

Chronic Nonmalignant Pain Discomfort that occurs almost daily, has been present for at least 6 months, and ranges in intensity from mild to severe; also known as chronic benign pain.

Chronic Obstructive Pulmonary Disease (COPD) Category of alterations in ventilation including emphysema, asthma, and chronic bronchitis.

Chronic Pain Discomfort that is persistent, nearly constant, and long-lasting (6 months or longer); or recurrent pain that produces significant negative changes in a person's life.

- Chronobiology** Science of studying biorhythms.
- Chronological Age** Exact age of a person from birth.
- Chylomicrons** Lipoproteins synthesized in the intestines that transport triglycerides to the liver.
- Circadian Rhythm** Biorhythm that cycles on a daily basis.
- Civil Law** Law that deals with relations between individuals.
- Clean-Contaminated Wound** Intentional wound created by entry into the alimentary, respiratory, or genitourinary tract under controlled conditions.
- Clean Object** Object on which there are microorganisms that are not usually pathogenic.
- Cleansing** Removal of soil or organic material from instruments and equipment used in providing client care.
- Clean Wound** Intentional wound in which no inflammation was encountered and the respiratory, alimentary, and oropharyngeal tracts were not entered.
- Client Advocate** Person who speaks up or acts on behalf of the client.
- Client Behavior Accidents** Mishaps that occur when the client's behavior or actions precipitate the incident.
- Clinical Nurse Specialist** Advanced practice nurse educated in a recognized nursing specialty area who is authorized to provide direct nursing care to a select population.
- Closed Question** Interviewing technique that consists of questions that can be answered briefly with one-word responses.
- Closed Suction Drainage System** Drain with a reservoir that, when compressed, creates negative pressure, or a vacuum, which draws exudate away from a wound.
- Cluster** Set of data cues in which relationships between and among cues are established to identify a specific health state or condition.
- Cognition** The intellectual ability to think.
- Cognitive Domain** Area of learning that involves intellectual understanding.
- Cognitive Reframing** Stress management technique in which the individual changes his or her own negative perception of a situation or event to a more positive, less threatening perspective.
- Colic** Acute abdominal pain.
- Collaboration** A partnership in which all parties are valued for their contribution.
- Collaborative Problems** Certain physiological complications that nurses monitor to detect onset of changes in status.
- Collagen** Protein responsible for tissue repair.
- Colloid** Nondiffusible substances.
- Colonization** Multiplication of microorganisms on or within a host that does not result in cellular injury.
- Communicable Agent** Infectious agent transmitted to a client by direct or indirect contact, vehicle or vector, or airborne route.
- Communicable Disease** Disease caused by a communicable agent.
- Communication** Dynamic, continuous, and multidimensional process for sharing information as determined by standards or policies.
- Co-morbidity** Existence of simultaneous disease processes within an individual.
- Competency** Ability, qualities, and capacity to function in a particular way.
- Complementary Therapies** Treatment approaches that can be used in conjunction with conventional medical therapies.
- Complicated Grief** Associated with traumatic death such as death by homicide, suicide, or an accident.
- Comprehensive Assessment** Type of assessment that provides baseline client data, including a complete health history and current needs assessment.
- Compromised Host** Person whose normal defense mechanisms are impaired.
- Computed Tomography** Radiological scanning of the body with x-ray beams and radiation detectors that transmit data to a computer that transcribes the data into quantitative measurement and multidimensional images of the internal structures.
- Concept** Vehicle of thought.
- Conceptual Framework** Structure that links global concepts together to form a unified whole.
- Conceptualization** Process of developing and refining abstract ideas.
- Conduction** Loss of heat to an object in contact with the body.
- Conscious Sedation** Minimally depressed level of consciousness during which the client retains the ability to maintain a continuously patent airway and to respond appropriately to physical stimulation or verbal commands.
- Consciousness** State of awareness of self, others, and the surrounding environment.
- Consent** Voluntary act by which a person agrees to allow someone else to do something.
- Constipation** Infrequent and difficult passage of hard stool.
- Constitution** Set of basic laws that defines and limits the powers of government.
- Construct** Abstraction or mental representation inferred from situations, events, or behaviors.

Consultation Method of soliciting help from a specialist in order to resolve diagnoses.

Contact Transmission Mode of transfer of disease through direct contact.

Contaminated Wound Open, traumatic wound or intentional wound with acute nonpurulent inflammation.

Continuous Passive Motion Device (CPM) Device that increases range of motion and stimulates healing of the articular cartilage by decreasing swelling and the formation of adhesions.

Continuous Quality Improvement Approach to quality management in which scientific, data-driven approaches are used to study work processes that lead to long-term system improvements.

Contract Law Enforcement of agreements among private individuals.

Contrast Medium Radiopaque substance that facilitates roentgen imaging of the body's internal structures.

Convalescent Stage Period of time in which acute symptoms of an infection begin to disappear until the client returns to the previous state of health.

Convection Movement of heat away from the body's surface.

Costal (Thoracic) Breathing Occurs when the external intercostal muscles are used to move the chest upward and outward.

Counterstimulation Technique used to achieve relaxation by activating the endogenous opioid and monoamine analgesia systems.

Crackle An audible breath sound heard on inspiration over the base of the lungs. May be either a dry, high-pitched popping of short duration or a moist, low-pitched gurgling of long duration.

Creative Problem Solving Goal-directed thinking that leads to achievement by using a new idea or method.

Crepitus Grating or crackling sensation caused by two rough surfaces rubbing together, as in subcutaneous emphysema.

Criminal Law Acts or offenses against the welfare or safety of the public.

Crisis Acute state of disorganization that occurs when the individual's usual coping mechanisms are no longer effective.

Crisis Intervention Specific technique used to assist clients in regaining equilibrium.

Criteria Standards that are used to evaluate whether the behavior demonstrated indicates accomplishment of the goal

Critical Pathway Abbreviated summary of key elements from the case management plan.

Critical Period Time of the most rapid growth or development in a particular stage of the life cycle in which an individual is most vulnerable to stressors of any type.

Critical Thinking Disciplined, deliberate method of thinking used to search for meaning; employs strategies such as asking questions, evaluating evidence, identifying assumptions, examining alternatives, and seeking to understand various points of view.

Cross-Functional Team Interdepartmental, multidisciplinary group that is assigned to study an organization-wide process.

Crystallized Intelligence The application of life experiences and learned skills to solve problems.

Crystalloid Electrolyte solution with the potential to form crystals.

Cues Small amounts of data that are applied to the decision-making process.

Cullen's Sign Bluish discoloration around the umbilicus in postoperative clients; can indicate intra-abdominal or perineal bleeding.

Cultural Assimilation Process by which individuals from a minority group are absorbed by the dominant culture and take on the characteristics of the dominant culture.

Cultural Competence Process through which the nurse provides care that is appropriate to the client's cultural context.

Cultural Diversity Individual differences among people that result from racial, ethnic, and cultural variables.

Culture Dynamic and integrated structures of knowledge, beliefs, behaviors, ideas, attitudes, values, habits, customs, languages, symbols, rituals, ceremonies, and practices that are unique to a particular group of people; growing microorganisms to identify a pathogen.

Customer Anyone who uses the products, services, or processes provided by an organization.

Cutaneous Pain Discomfort caused by stimulation of the cutaneous nerve endings in the skin.

Cyanosis Blue or gray discoloration of the skin, resulting from reduced oxygen levels in the arterial blood.

Cystocele Bladder hernia that protrudes through the vagina.

Cystography Radiographic study used to visualize the excretory function by instilling an aqueous iodine contrast agent into the bladder through a urinary catheter.

Cytology Study of cells.

Cytomegalovirus (CMV) DNA virus that causes intranuclear and intracytoplasmic changes in infected cells.

D

Data Clustering Process of grouping significant cues together according to a specific assessment model to establish a nursing diagnosis.

Data Interpretation Recognition of patterns in data to determine nursing diagnoses.

Data Verification Process through which data are validated as being complete and accurate.

Deadspace Condition in which lung tissue is well ventilated but poorly perfused.

Deamination Removal of the amino groups from the amino acids.

Decision making The consideration and selection of interventions that facilitate the achievement of a desired outcome.

Declarative Knowledge Specific facts or information and an understanding of the nature of that knowledge.

Defamation Act that occurs when information that damages an individual's reputation is communicated to a third party either in writing (libel) or verbally (slander).

Defecation Evacuation of feces from the rectum.

Defendant Person being sued in a lawsuit.

Defense Mechanisms Unconscious operations that protect the mind from anxiety.

Defining Characteristics Collected data that are also known as signs and symptoms, subjective and objective data, or clinical manifestations.

Deglutition Swallowing of food.

Degrees Units which measure the heat of the body.

Dehiscence Partial or complete separation of the wound edges and the layers below the skin.

Delegation Process of transferring a selected nursing task in a situation to an individual who is competent to perform that task.

Democratic Leadership Style Style of leadership (also called participative leadership) that is based on the belief that every group member should have input into the development of goals and problem solving.

Deontology Ethical theory that considers the intrinsic moral significance of an act itself as the criterion for determination of good.

Dependence Reliance on or need to take a drug.

Dependent Nursing Intervention Nursing action that requires an order from a physician or other health care professional.

Dependent Variable Outcome variable of interest.

Depersonalization Treating an individual as an object rather than as a person.

Dermatome Map Cutaneous area whose sensory receptors and axons feed into a single dorsal root of the spinal cord.

Detrusor Muscle Smooth muscle of the bladder wall.

Development Behavioral changes in functional abilities and skills.

Developmental Tasks Certain goals that must be achieved during each developmental stage of the life cycle.

Diabetes Mellitus A disease in which the pancreas fails to secrete adequate levels of insulin to accommodate blood glucose levels.

Diagnosis Science and art of identifying problems or conditions.

Diaphoresis Profuse perspiration.

Diaphragmatic (Abdominal) Breathing Occurs when the diaphragm contracts and relaxes as observed by the movement of the abdomen.

Diarrhea Passage of liquified stool (increased frequency and consistency of stool sufficient to represent a change in bowel habits).

Diastole Process of cardiac chamber filling.

Dietary Fiber The part of food that body enzymes cannot digest and absorb.

Diffusion Movement of molecules in a solution or a gas from an area of high concentration to one of low concentration.

Diffusion Defect Decrease in efficiency of gas diffusion from the alveolar space into the pulmonary capillary blood.

Digestion Mechanical and chemical processes that convert nutrients into a physically absorbable state.

Digital Subtraction Angiography Computerized imaging of the vasculature with visualization on a monitor screen following the intravenous injection of iodine through a catheter.

Dirty and Infected Wound Traumatic wound with retained dead tissue, or intentional wound created when purulent drainage was present.

Dirty Object Object on which there is a high number of microorganisms, including some that are potentially pathogenic.

Disaccharide Double sugar.

Disseminated Intravascular Coagulation (DIC) An acquired hemorrhagic syndrome characterized by uncontrollable formation and deposition of thrombi.

Dissolution Rate at which a drug becomes a solution.

Discharge Planning Planning that involves critical anticipation and planning for the client's needs after discharge; the client begins to resume self-care activities before leaving the health care environment.

Discipline Field of study.

Disinfectant Chemical solution used to clean inanimate objects.

Disinfection Elimination of pathogens, with the exception of spores, from inanimate objects.

Disorientation A mentally confused state in which the person's awareness of time, place, self, and/or situation is impaired.

Distraction Technique of focusing attention on stimuli other than pain.

Distress Experienced when stressors evoke an ineffective response.

Distribution Movement of drugs from the blood into various body fluids and tissues.

Documentation Written evidence of the interactions between and among health care professionals, clients and their families, and health care organizations; the administration of tests, procedures, treatments, and client education; the result or client's response to these diagnostic tests and interventions.

Dominant Culture Group whose values prevail within a society.

Doppler Hand-held transducer.

Drug Allergy Hypersensitivity to a drug.

Drug Incompatibility Undesired chemical or physical reaction between a drug and a solution, between two drugs, or between a drug and the container or tubing.

Drug Tolerance Reaction that occurs when the body becomes accustomed to a specific drug and requires larger doses of the drug to produce the desired therapeutic effect.

Dullness A high-pitched sound of short duration.

Durable Power of Attorney Document or legal status that enables any competent individual to name someone to exercise health-related decision-making authority, under specific circumstances, on the individual's behalf when the client is incapable of making decisions for self.

Duty Obligation created either by law or contract, or by any voluntary action.

Dysfunctional Grief Failure to progress through the stages of overwhelming emotions associated with grief; or failure to demonstrate any behaviors commonly associated with grief.

Dyspnea Difficulty in breathing as observed by labored or forced respirations through the use of accessory muscles in the chest and neck to breathe.

Dysrhythmia Irregular heartbeat.

Dysuria Painful urination.

E

Echocardiogram Ultrasonic procedure used to reveal abnormal structure or motion of the heart wall and thrombi.

Edema Detectable accumulation of increased interstitial fluid.

Efferent Nerve Pathway Descending pathways that send sensory impulses from the brain.

Efferent Pain Pathway Descending spinal cord.

Effleurage Massage technique consisting of long, smooth strokes used at the beginning and end of treatment and between other movements.

Electrocardiogram Graphic recording of the heart's electrical activity.

Electrochemical Gradient Sum of all the diffusion forces acting on the membrane.

Electroencephalogram Graphic recording of the brain's electrical activity.

Electrolyte Element or compound that, when dissolved in water or another solvent, dissociates (separates) into ions (electrically charged particles) and provides for cellular reactions.

Embryonic Stage Developmental stage that occurs during the first 2–8 weeks after fertilization of a human egg.

Empathy Understanding another person's perception of a situation.

Empowerment Process of enabling others to do for themselves.

Encoding Use of language and other specific signs and symbols for sending messages.

Endorphins Group of opiate-like substances produced naturally by the brain; these substances raise the pain threshold, produce sedation and euphoria, and promote a sense of well-being.

Endoscopy Visualization of a body organ or cavity through a scope.

Energetic Touch Therapies Techniques in which the hands are used to direct or redirect the flow of the body's energy fields to enhance balance within the fields.

Enteral Instillation Administration of drugs through a gastrointestinal tube.

Enteral Nutrition The nonvolitional delivery of nutrients through a gastrointestinal tube.

Enzyme Protein produced in the body that catalyzes chemical reactions in organic matter.

Epithelialization Growth of epithelial tissue.

Equipment Accidents Accidents resulting from the malfunction or improper use of medical equipment.

Equity Process that acts in accordance with the spirit, not the letter, of the law.

Erythema Increased blood flow to an inflamed area.

Erythrocytes Red blood cells.

Essential Amino Acids Amino acids that are required for growth and development and must be obtained from food.

Ethical Dilemma Situation that occurs when there is a conflict between two or more ethical principles.

Ethical Principles Tenets that direct or govern actions.

Ethical Reasoning Process of thinking through what one ought to do in an orderly, systematic manner in order to provide justification of actions based on principles.

Ethics Branch of philosophy concerned with determining right from wrong on the basis of a body of knowledge.

Ethnicity Cultural group's perception of themselves (group identity) and others' perception of them.

Ethnocentrism Assumption of cultural superiority and an inability to accept other cultures' ways of organizing reality.

Etiology Related cause of or contributor to a problem.

Eupnea Easy respirations with a normal breath rate of breaths per minute that are age specific.

Eustress Type of stress that results in positive outcomes.

Euthanasia Intentional action or lack of action causing the merciful death of someone suffering from a terminal illness or incurable condition; derived from the Greek word *euthanatos*, which literally means "good or gentle death."

Evaluation Fifth step in the nursing process; involves determining whether client goals have been met, partially met, or not met.

Evaporation Continuous insensible heat loss from the skin and lungs when water is converted from a liquid to a gas.

Evidenced-Based Practice The application of the best available empirical evidence, including recent research findings to clinical practice in order to aid clinical decision-making.

Evisceration Protrusion of the internal viscera through a disrupted wound.

Exclusive Provider Organization Organization in which care must be delivered by the plan in order for clients to receive reimbursement for health care services.

Excretion Elimination of drugs from the body.

Existentialism Movement that is centered on individual existence in an incomprehensible world and the role that free will plays in it.

Expected Outcome Detailed, specific statement that describes the methods through which a goal will be achieved and includes aspects such as direct nursing care, client teaching, and continuity of care.

Expert Witness Person called by parties in a malpractice suit who is a member of the same profession as the party being sued and who is qualified to testify to the expected behaviors usually employed by members of the profession when in a similar situation.

Expiration (Exhalation) Movement of gases from the lungs to the atmosphere.

Expressed Contract Conditions and terms of a contract given in writing by the concerned parties.

Extension To straighten a joint.

External Respiration See Oxygen Uptake.

Extinction Ability to discriminate the points of distance when two body parts are simultaneously touched.

Extraurethral Incontinence Uncontrolled loss of urine caused when the sphincter mechanism has been bypassed.

Extubation Removal of an endotracheal tube.

Exudate Material and cells discharged from blood vessels.

F

False Imprisonment Situation that occurs when clients are made to wrongfully believe they cannot leave a place.

Fat-Soluble Vitamins Vitamins that require the presence of fats for their absorption from the gastrointestinal tract and for cellular metabolism.

Fatty Acids Basic structural units of most lipids that contain carbon chains and hydrogen.

Fecal Incontinence Involuntary loss of stool of sufficient duration and volume to create a social or hygienic problem.

Feedback Information the sender receives about the receiver's reaction to a message.

Fee-for-Service Health care recipient directly pays the provider for services as they are provided.

Felony Crime of a serious nature usually punishable by imprisonment in a state penitentiary or by death.

Fetal Alcohol Syndrome Condition in which fetal development is impaired by maternal consumption of alcohol.

Fetal Stage Intrauterine developmental period from 8 weeks to birth.

Fidelity Ethical concept that means faithfulness and keeping promises.

Fight-or-Flight Response State in which the body becomes physiologically ready to respond to a stressor by either fighting or running away from the danger (which may be actual or perceived).

Fixation Inadequate mastery or failure to achieve a developmental task that inhibits healthy progression through subsequent stages.

FlashBack Rush of blood back into intravenous tubing when a negative pressure is created on the tubing.

Flatulence Discharge of gas from the rectum.

Flexion To bend a joint.

Flora Vegetation of microorganisms on the human body.

Flow Rate Volume of fluid to infuse over a set period of time.

Fluency Ability to talk in a steady manner.

Fluid Intelligence Ability to acquire new concepts and adapt to unfamiliar situations; mental activities based on organizing information.

Fluoroscopy Immediate, serial images of the body's structure or function.

Focused Assessment Type of assessment that is limited in scope in order to focus on a particular need or health care problem or potential health care risks.

Focus Charting Documentation method using a columnar format to chart data, action, and response.

Formal Contract Written contract that cannot be changed legally by an oral agreement.

Fraud Wrong that results from a deliberate deception intended to produce unlawful gain.

Friction Force of two surfaces moving against one another; massage technique whereby the heels of the hands or the thumb pads are used to apply deep penetrating pressure on knotted muscles.

Full Disclosure Communication of complete information to potential research subjects regarding the nature of the study, the subject's right to refuse participation, and the likely risks and benefits that will be incurred.

Full-Thickness Wound Wound involving the entire epidermis and dermis.

Functional Assessment Assessment of the client's ability to perform activities of daily living.

Functional Incontinence Loss of urine caused by altered mobility or dexterity, access to the toilet, or changes in mentation.

Functional Team Departmental or unit-specific group whose scope is limited to departmental or work area processes.

G

Gait or Transfer Belt Two-inch wide webbed belt worn by the client for the purpose of stabilization during transfers and ambulation.

Gallop Extra heart sounds.

Gate Control Pain Theory Theory that proposes that the cognitive, sensory, emotional, and physiological components of the body can act together to block an individual's perception of pain.

Gender Identity View of one's self as male or female in relationship to others.

General Adaptation Syndrome Physiological response that occurs when a person experiences a stressor.

General Anesthesia Anesthesia that causes the client to lose all sensation and consciousness; used for major surgical procedures.

Germicide Chemical that can be applied to both animate and inanimate objects to kill pathogens.

Germinal Stage Developmental stage that begins with conception and lasts approximately 10 to 14 days.

Gingivitis Inflammation of the gums.

Glasgow Coma Scale (GCS) An international scale used in grading neurologic responses to determine the client's level of consciousness.

Gluconeogenesis Conversion of amino acids into glucose or glycogen.

Glycolysis Breakdown of glucose by enzymes located inside the cell's cytoplasm.

Goal Aim, intent, or end.

Goniometer A protractor with two movable arms used to measure the angles of skeletal joint during range of motion.

Good Samaritan Acts Laws that provide protection to health care providers by assuring immunity from civil liability when the caregiver provides assistance at the scene of an emergency and does not intentionally or recklessly cause the client injury.

Grand Theory Theory composed of concepts representing global and complex phenomena.

Graphesthesia Ability to identify numbers, letters, or shapes when drawn on the skin.

Grief Series of intense physical and psychological responses that occur following a loss.

Grief Work Phrase coined from Lindemann, it describes the process experienced by the bereaved. It consists of: freedom from attachment to the deceased, becoming reoriented to the environment in which the deceased is no longer present, and establishing new relationships.

Group Communication A complex level of communication that occurs when three or more people meet in face-to-face encounters or through another communication medium, such as a conference call.

Group Dynamics Study of the events that take place during small-group interaction and the development of subgroups.

Groupthink Going along with the majority opinion while personally having another viewpoint.

Growth Quantitative (measurable) changes in the physical size of the body and its parts.

Guided Imagery A process in which the person uses all the senses to experience the sensation of relaxation.

H

Half-Life Time it takes the body to eliminate half of the blood concentration level of the original drug dose.

Halitosis Bad breath.

Hallucination A sensory perception that occurs in the absence of external stimuli and is not based on reality.

Handwashing Rubbing together of all surfaces and crevices of the hands using a soap or chemical and water.

Healing Process of recovery from illness, accident, or disability.

Healing Touch Energy-based therapeutic modality that alters the energy fields through the use of touch, thereby affecting physical, mental, emotional, and spiritual health.

Health Process through which the person seeks to maintain an equilibrium that promotes stability and comfort; includes physiological, psychological, sociocultural, intellectual, and spiritual well-being.

Health Care Delivery System Mechanism for providing services that meet the health-related needs of individuals.

Health History Review of the client's functional health patterns prior to the current contact with a health care agency.

Health Maintenance Organization Prepaid health plan that provides primary health care services for a preset fee and focuses on cost-effective treatment methods.

Health-Promoting Behaviors Actions that increase well-being or quality of life.

Health Promotion Process undertaken to increase levels of wellness in individuals, families, and communities.

Health-Seeking Behaviors Activities that are directed toward attaining and maintaining a state of well-being.

Heart Failure Inability of the heart to pump enough blood to meet the metabolic needs of the body; often accompanied by a backup of blood in the venous circuits (congestive heart failure).

Heaves Lifting of the cardiac area secondary to an increased workload and force of left ventricular contraction.

Heimlich Maneuver Application of sharp, upward thrusts to the abdomen in order to remove an airway obstruction.

Hematoma Localized collection of blood underneath the tissue.

Hematuria Blood in the urine; *microscopic hematuria* is the presence of blood noted on microscopic examination of the urine; *gross hematuria* is the presence of blood visible to the naked eye.

Hemoconcentration Reduced volume of plasma water and the increased concentration of blood cells, plasma proteins, and protein-bound constituents; occurs with increased capillary hydrostatic pressure, which causes water to shift from the intravascular into the interstitial space.

Hemodynamic Regulation Physiological function of blood circulating to maintain an appropriate environment in tissue fluids.

Hemoglobin Electrophoresis A laboratory test that uses an electromagnetic field to identify various types of hemolytic anemia.

Hemolysis A breakdown of red cells and the release of hemoglobin.

Hemorrhage Persistent bleeding.

Hemorrhagic Exudate Discharge with a large component of red blood cells; present with severe inflammation.

Hemorrhoids Perianal varicosity of the hemorrhoidal veins.

Hemostasis Cessation of bleeding.

Heterosexuality Sexual activity between a man and a woman.

High-Biological-Value Proteins (Complete Proteins) Proteins that contain all of the essential amino acids.

High-Level Wellness State in which individuals function at their maximum health potential while remaining in balance with the environment.

History Study of the past, including events, situations, and individuals.

Homeostasis Equilibrium (balance) between physiological, psychological, sociocultural, intellectual, and spiritual needs.

Homosexuality Sexual activity between two members of the same sex.

Hospice Type of care for the terminally ill founded on the concept of allowing individuals to die with dignity and surrounded by those who love them.

Host Simple or complex organism that can be affected by an agent.

Humoral Immunity Stimulation of B cells and antibody production.

Hydrostatic Pressure Pressure that a liquid exerts on the sides of the container that holds it; also called filtration force.

Hygiene Science of health.

Hyperalgesia Extreme sensitivity to pain.

Hypercalcemia Excess in the extracellular level of calcium.

Hypercapnia Elevation of carbon dioxide levels in the blood indicating inadequate alveolar ventilation.

Hyperchloremia Excess in the extracellular level of chloride.

Hyperglycemia Condition characterized by a blood glucose level greater than 110 mg/dl.

Hyperkalemia Excess in the extracellular level of potassium.

Hypermagnesemia Excess in the extracellular level of magnesium.

Hypernatremia Excess in the extracellular level of sodium.

Hyperphosphatemia Excess in the extracellular level of phosphorus.

Hypersomnia Alteration in sleep pattern characterized by excessive sleep, especially in the daytime.

Hypertension Refers to a persistent systolic pressure greater than 135 to 140 mm Hg and a diastolic pressure greater than 90 mm Hg.

Hyperthyroidism Increased secretion of thyroid hormones, which increases the rate of metabolism.

Hypertonic Solution with more solutes in proportion to the volume of body water; also called a hyperosmolar solution.

Hypertonicity Increased muscle tone.

Hypertrophy Refers to an increase in muscle size and shape due to an increase in muscle fiber.

Hyperventilation Characterized by deep, rapid ventilations.

Hypervolemia Increased circulating fluid volume.

Hypnosis State of heightened awareness and focused concentration.

Hypocalcemia Deficit in the extracellular level of calcium.

Hypochloremia Deficit in the extracellular level of chloride.

Hypoglycemia Condition characterized by a blood glucose level less than 80 mg/dl.

Hypokalemia Deficit in the extracellular level of potassium.

Hypomagnesemia Deficit in the extracellular level of magnesium.

Hypонатremia Deficit in the extracellular level of sodium.

Hypophosphatemia Deficit in the extracellular level of phosphorus.

Hypotension A systolic blood pressure less than 90 mm Hg or 20 to 30 mm Hg below the client's normal blood pressure.

Hypothesis Statement of an asserted relationship between dependent variables.

Hypothyroidism Decreased secretion of thyroid hormones, which decreases the metabolic rate.

Hypotonic Solution with less solute in proportion to the volume of water; also called a hypo-osmolar solution.

Hypotonicity A flabby muscle with poor tone.

Hypoventilation Characterized by shallow respirations.

Hypoxemia Decreased oxygen level in the blood.

Hypoxia Oxygen deprivation of the body's cells.

I

Identity What sets one person apart as a unique individual. It may include a person's name, gender, ethnic identity, family status, occupation, and various roles.

Idiosyncratic Reaction Reaction of overresponse, underresponse, or an atypical response.

Illness Inability of an individual's adaptive responses to maintain physical and emotional balance that subsequently results in an impairment in functional abilities.

Illness Stage Time interval when client is presenting or manifesting specific signs and symptoms of an infectious agent.

Illusion An inaccurate perception or misinterpretation of sensory stimuli.

Imagery Relaxation technique in which the individual uses the imagination to visualize a pleasant, soothing image.

Immediate Memory The retention of information for a specified and usually short period of time.

Impaction Hard bolus of stool that obstructs the fecal stream.

Impaired Nurse Nurse who is habitually intemperate or is addicted to the use of alcohol or habit-forming drugs.

Implantable Port Device with a radiopaque silicone catheter and a plastic or stainless steel injection port with a self-sealing silicone-rubber septum.

Implementation Fourth step in the nursing process; involves the execution of the nursing plan of care formulated during the planning phase of the nursing process.

Implied Contract Contract that recognizes a relationship between parties for services.

Incentive Spirometers Breathing devices that measure the client's ventilatory volumes.

Incidence Refers to the prevalence of a disease in a population or community. The predictive value of the same test can be different when applied to people of differing ages, genders and geographic locations.

Incident Report Documentation of an unusual occurrence or an accident in delivery of client care.

Incontinence Loss of the ability to initiate, control, or inhibit elimination.

Incubation Period Time interval between the entry of an infectious agent in the host and the onset of symptoms.

Independent Nursing Intervention Nursing action initiated by the nurse that does not require direction or an order from another health care professional.

Independent Variable Variable that is believed to cause or influence the dependent variable.

Infancy Developmental stage from the first month to the first year of life.

Infarction Death (necrosis) of an area of tissue caused by oxygen deprivation.

Infection Actual invasion and multiplication of microorganisms in body tissue with cellular injury.

Infectious Agent Microorganism that causes infections.

Infiltration Seepage of foreign substances into the interstitial tissue.

Inflammation Nonspecific cellular response to tissue injury or infection; involves increased blood flow in the affected area.

Informed Consent Client understands the reason for the proposed intervention, its benefits and risks, and agrees to the treatment by signing a consent form.

Initial Planning Planning that involves development of an initial plan of care by the nurse who performs the admission assessment and gathers the comprehensive admission assessment data.

Injury Physical, financial, or emotional harm.

Insensible Heat Loss Heat that is lost through the continuous, unnoticed water loss that occurs with vaporation.

Insomnia Chronic inability to sleep, or inadequate quality of sleep.

Inspection Physical examination technique that involves careful visual observation.

Inspiration (Inhalation) Intake of air into the lungs.

Instability Incontinence Loss of urine caused by a premature or hyperactive contraction of the detrusor.

Insulin Pancreatic hormone that aids in the diffusion of glucose into the liver and muscle cells and the synthesis of glycogen.

Integrative therapy A clinical approach that combines Western technological medicine with techniques from Eastern medicine.

Integumentary System (Skin, hair, scalp, and nails) provides the body with external protection, regulates temperature, and is a sensory organ for pain, temperature, and touch.

Intentional Wound Wound acquired during treatment (such as surgery) or therapy (such as venipuncture).

Interdependent Nursing Intervention Nursing action that is implemented in a collaborative manner with other health care professionals.

Intermittent Claudication Ischemia to the extremities usually brought on by activity and relieved by rest.

Internal Respiration Process of gas exchange between capillary blood and the body's cells, in which the cells receive oxygen and carbon dioxide is removed.

Interpersonal Communication Process that occurs between two people in face-to-face encounters, over the telephone, or through other communication media.

Interview Therapeutic interaction that has a specific purpose.

Intracath Plastic tube for insertion into a vein.

Intradermal (ID) Injection into the dermis.

Intramuscular (IM) Injection into the muscle.

Intraoperative (during surgery) Phase that begins when the client is transferred to the operating room and ends when the client is transferred to a postanesthesia care unit.

Intrapersonal Communication Messages one sends to oneself, including "self-talk," or communication with oneself.

Intrapsychic Theory Theory that focuses on an individual's unconscious processes. Feelings, needs, conflicts, and drives are considered to be motivators of behavior.

Intravenous Pyelogram A series of x-rays of the kidneys, ureters, and bladder following the administration of an intravenous iodine preparation.

Intravenous (IV) Injection into a vein.

Intravenous (IV) Therapy Administration of nutrients, fluids, electrolytes, or medications by the venous route.

Intubation Insertion of an endotracheal tube into the bronchus through the nose or mouth to ensure an airway.

Invasive Accessing the body tissues, organs, or cavities through some type of instrumentation procedure.

Ischemia Oxygen deprivation, usually caused by poor perfusion, that is usually temporary and localized.

Ischemic Pain Discomfort resulting when the blood supply of an area is restricted or obstructed.

Isotonic Solution with body water and solutes (sodium) in equal amounts; also called an isosmolar solution.

J

Judgment The ability to compare or evaluate alternatives to life situations and arrive at an appropriate course of action.

Jurisprudence Body of judge-made law.

Justice Ethical principle based on the concept of fairness that is extended to each individual.

K

Kardex Summary worksheet reference of basic client care information.

Ketogenesis Conversion of amino acids into keto acids or fatty acids.

Ketones Products of incomplete fat metabolism.

Ketonuria Abnormally high concentration of ketones in the urine.

Kilocalorie Equivalent to 1,000 calories.

Kinesthetic Channel Transmission of messages through sensation of touch.

Kinesthetic Learner Learning style in which a person processes information by experiencing the information or by touching and feeling.

L

Laissez-Faire Leadership Style Style of leadership in which the leader assumes a passive, nondirective, and inactive style.

Lancinating Type of pain that is typically described as piercing or stabbing.

Late Potentials Electrical activity that occurs after normal depolarization of the ventricles.

Law That which is laid down or fixed.

Leadership Interpersonal process that involves motivating and guiding others to achieve goals.

Learning Process of assimilating information with a resultant change in behavior.

Learning Plateau Peak in effectiveness of teaching and depth of learning.

Learning Style Way in which an individual incorporates new information.

Legal Regulation Process by which the state attests to the public that the individual licensed to practice is competent to do so.

Lentigo Senilis Benign brown pigmented areas on the face, hands, and arms of older people.

Leukocytes White blood cells.

Liability Obligation one has incurred or might incur through any act or failure to act.

Licensure Method by which a state holds the nurse accountable for safe practice to citizens of that state.

Licensure by Endorsement Process by which an individual who is duly licensed as a registered nurse under the laws of one state or country has his or her credentials accepted and approved by another state or country.

Licensure by Examination Process by which an individual who has completed an approved program of studies leading to registered nurse licensure seeks initial licensure by successfully passing a standardized competency examination.

Line of Gravity Vertical line passing through the center of gravity.

Lipids Organic compounds that are insoluble in water but soluble in organic solvents such as ether and alcohol; also known as fats.

Lipoproteins Blood lipids bound to protein.

Liver Mortis Bluish purple discoloration that is a by-product of red blood cell destruction.

Living Will Document prepared by a competent adult that provides direction regarding medical care should the person become incapacitated or otherwise unable to make decisions personally.

Local Adaptation Syndrome Physiological response to a stressor (e.g., trauma, illness) affecting a specific part of the body.

Local Anesthesia Anesthesia that causes the client to lose sensation to a localized body part (e.g., spraying the back of the throat with lidocaine decreases the gag reflex).

Localized Infection Infection limited to a defined area or single organ.

Lock-Out Interval Minimum time allowed between doses for the client to self-medicate; feature found in infusion pumps used for patient-controlled analgesia.

Locus of Control A person's perception of the source of control over events and situations affecting the person's life.

Logrolling A technique for moving a client whose body must remain in straight alignment.

Long-Term Goal Statement written in objective format demonstrating an expectation to be achieved in resolution of the nursing diagnosis over a long period of time, usually over weeks or months.

Loss Any situation in which a valued object is changed or is no longer accessible to an individual.

Low-Biological-Value Proteins (Incomplete Proteins) Proteins lacking in one or more of the essential amino acids.

Lumbar Puncture Aspiration of cerebrospinal fluid from the subarachnoid space.

Lymphangiography Radiographic study of the lymphatic system following a catheter injection of an oil-based dye.

Lymphokine Mediator substance released by lymphocytes.

M

Magnetic Resonance Imaging An imaging technique that uses radiowaves and a strong magnetic field to make continuous cross-sectional images of the body.

Maladaptation Process of ineffective coping with stressors.

Malignant Hyperthermia (MH) A potentially lethal syndrome caused by a hypermetabolic state that is precipitated by the administration of certain anesthetic agents.

Malnutrition Nutritional alterations related to inadequate intake, disorders of digestion or absorption, or overeating.

Malpractice Professional person's wrongful conduct, improper discharge of professional duties, or failure to meet the standards of acceptable care that results in harm to another person.

Mammography A low-dose radiographic study of the breast tissue.

Managed Care System of providing and monitoring care in which access, cost, and quality are controlled before or during delivery of services. These networks "manage" or control costs in many ways (for example, by limiting referrals to costly specialists). HMOs are a common form of managed care.

Management Accomplishment of tasks either by oneself or by directing others.

Mandatory Licensure Laws Legislation that prohibits any individual from practicing as a registered nurse without a current license.

Mastication Chewing into fine particles and then mixing the food with enzymes in saliva.

Material Principles of Justice Rationale for determining when there can be unequal allocation of scarce resources.

Maturation Process of becoming fully grown and developed; involves physiological and behavioral aspects.

Maturation Loss Adolescent that loses the younger child's freedom from responsibility.

Medical Asepsis Practices that reduce the number, growth, and spread of microorganisms.

Medical Diagnosis Clinical judgment by the physician that identifies or determines a specific disease, condition, or pathological state.

Medical Model Traditional approach to health care in which the focus is on treatment and cure of disease.

Meditation Quieting the mind by focusing one's attention.

Menarche Onset of the first menstrual period.

Message Stimulus produced by a sender and responded to by a receiver.

Metabolic Rate Rate of heat liberated during chemical reactions.

Metabolism Aggregate of all chemical reactions in every body cell.

Metacommunication Relationship aspect of communication, which refers to the message about the message.

Metaparadigm Unifying force in a discipline that names the phenomena of concern to that discipline.

Micro-Range Theory Theory that explains a specific phenomenon of concern to a discipline.

Middle Adulthood Developmental stage from the ages of 40 to 65 years.

Middle-Range Theory Theory that addresses more concrete and more narrowly defined phenomena than a grand theory but does not cover the full range of phenomena of concern to a discipline.

Mid-Upper-Arm Circumference Measures skeletal muscle mass and serves as an indicator of protein reserve.

Minerals Inorganic elements.

Minority Group Group of people who constitute less than a numerical majority of the population and who, because of their cultural or physical characteristics, are labeled and treated differently from others in the society.

Misdemeanor Offense less serious than a felony that may be punished by a fine or sentence to a local prison for less than one year.

Mixed Agonist-Antagonist Compound that blocks opioid effects on one receptor type while producing opioid effects on a second receptor type.

Mobility Ability to engage in activity and free movement.

Mode of Transmission Process that bridges the gap between the portal of exit of the biological agent from the reservoir and the portal of entry of the susceptible “new” host.

Monosaccharides Simple sugars.

Monounsaturated Fatty Acids Fatty acids with one double or triple bond.

Morality Behavior in accordance with custom or tradition that usually reflects personal or religious beliefs.

Moral Maturity Ability to decide for oneself what is “right.”

Mourning Period of time during which the grief is expressed and resolution and integration of the loss occur.

Moxibustion Type of acupuncture that involves the application of heat from certain burning substances, such as herbs, at acupuncture points on the body.

Murmur Swishing or blowing sounds of long duration heard during the systolic and diastolic phases, created by turbulent blood flow through a valve.

Muscle Tone Normal state of balanced tension present in the body that allows muscles to respond quickly to stimuli.

Music-Thanatology Holistic and palliative method for use of music with dying clients; solely concerned with dissipating any obstacle to a peaceful passage.

Myelography Study of the spinal cord and its surrounding subarachnoid spaces through the use of radiography and pantopaque, a contrast agent.

Myocardial Infarction Necrosis of the heart muscle.

Myoneuronal Junction Point at which nerve endings come in contact with muscle cells.

Myofascial Pain Syndromes Group of muscle disorders characterized by pain, muscle spasm, tenderness, stiffness, and limited motion.

N

Narcolepsy Sleep alteration characterized by sudden uncontrollable urges to fall asleep.

Narrative Charting A story format of documentation that describes the client’s status, interventions and treatments, and the response to treatments.

Necrosis Tissue death as the result of disease or injury.

Need Anything that is absolutely essential for existence.

Negative Nitrogen Balance Condition that exists when nitrogen output exceeds intake, protein catabolism exceeds anabolism.

Negligence Failure of an individual to provide the care in a situation that a reasonable person would ordinarily provide in a similar circumstance.

Neonatal Period First 28 days of life following birth.

Networking Process of building connections with others.

Neuralgia Paroxysmal pain that extends along the course of one or more nerves.

Neuropathic Pain Discomfort from damage to portions of the peripheral or central nervous system.

Neuropeptides Amino acids produced in the brain and other sites in the body that act as chemical communicators.

Neurotransmitters Chemical substances produced by the body that facilitate nerve impulse transmission.

Nitrogen Balance Net result of intake and loss of nitrogen that measures protein anabolism and catabolism.

Nociception Process by which an individual becomes aware of pain.

Nociceptor Receptive neuron for painful sensations.

Nocturia Awakening from sleep to urinate.

Nonessential Amino Acids Amino acids that can be synthesized in the adult body.

Noninvasive Body is *not* entered with any type of instrument.

Nonmaleficence Ethical principle that means the duty to cause no harm to others.

Nonverbal Message Message communicated without words.

Nosocomial Infection Infection acquired in the hospital that was not present or incubating at the time of the client’s admission.

Nurse-Client Relationship One-to-one interactive process between client and nurse that is directed at improving the client’s health status or assisting in problem solving.

Nurse Practice Act Law determined by each state governing the practice of nursing.

Nurse Practitioner Advanced practice nurse educated in a specified area of care who is authorized to provide primary care to individuals, families, and other groups in a variety of settings.

Nursing An art and a science that assists individuals to learn to care for themselves whenever possible; it also involves caring for others when they are unable to meet their own needs.

Nursing Audit Process of collecting and analyzing data to evaluate the effectiveness of nursing interventions.

Nursing Diagnosis Second step in the nursing process; a clinical judgment about individual, family, or community (aggregate) responses to actual, possible, or risk (potential) health problems, wellness states, or syndromes.

Nursing Intervention Action performed by a nurse that helps the client achieve the results specified by the goals and expected outcomes.

Nursing Intervention Classification (NIC) Standardized language for nursing interventions.

Nursing Minimum Data Set (NMDS) Elements contained in clinical records and abstracted for studies on the effectiveness and costs of nursing care.

Nursing Order Statement written by the nurse that is within the scope of nursing practice to plan and initiate.

Nursing Process Systematic method of providing care to clients; consists of five steps: assessment, diagnosis, outcome identification and planning, implementation, and evaluation.

Nursing Research Systematic application of formalized methods for generating valid and dependable information about the phenomena of concern to the discipline of nursing.

Nutraceuticals Natural substances found in plant or animal foods that act as protective or healing agents.

Nutrition Process by which the body metabolizes and utilizes nutrients.

Nystagmus Involuntary, rhythmical oscillation of the eyes.

O

Obesity Weight that is 20 percent or more above the ideal body weight.

Objective Data Observable and measurable data that are obtained through both standard assessment techniques performed during the physical examination and laboratory and diagnostic tests.

Obligatory Loss of Proteins Degradation of the body's own proteins into amino acids in response to inadequate protein intake.

Observation Skill of watching carefully and attentively.

Obstructive Pulmonary Disease Category of lung diseases characterized by obstruction of the airways and trapping of air distal to the obstruction.

Occult Blood in the stool that can be detected only through a microscope or by chemical means.

Older Adulthood Developmental stage occurring from the age of 65 and beyond.

Oliguria Diminished production of urine (typically less than 400 ml/24 hours).

Ongoing Assessment Type of assessment that includes systematic monitoring and observation related to specific problems.

Ongoing Planning Planning that entails continuous updating of the client's plan of care.

Onset of Action Time it takes the body to respond to a drug after administration.

Open-Ended Questions Interview technique that encourages the client to elaborate about a particular concern or problem.

Operative Knowledge An understanding of the nature of knowledge (knowing the "how" or "why").

Opposition One body part being across from another part at nearly 180°.

Oppression Condition in which the rules, modes, and ideals of one group are imposed on another group.

Oral Cholecystography Visualization of the gallbladder and presence of stones through the administration of radiopaque iodine tablets.

Organization Means by which members of a profession join together to promote and protect the profession as a valuable service to society.

Organizational Culture Commonly held beliefs, values, norms, and expectations that drive the work force.

Orientation Perception of self in relation to the surrounding environment.

Orientation Phase First stage of the therapeutic relationship in which the nurse and client become acquainted, establish trust, and determine the expectations of each other.

Orthostatic Hypotension (Postural Hypotension) Refers to a sudden drop in 25 mm Hg in systolic pressure and 10 mm Hg in diastolic pressure when the client moves from a lying to a sitting or a sitting to a standing position.

Osmolality Measurement of the total concentration of dissolved particles (solutes) per kilogram of water.

Osmolarity Concentration of solutes per liter of cellular fluid.

Osmole Unit of measure of osmotic pressure.

Osmosis Process caused by a concentration difference of water.

Osmotic Pressure Force that develops when two solutions of different strengths are separated by a selectively permeable membrane.

Osteoarthritis The most common type of degenerative arthritis in which the joints become stiff and tender to touch.

Osteoporosis Process in which reabsorption exceeds accretion of bone.

Outcome Evaluation Process of comparing the client's current status with the expected outcomes.

Oximeter Machine that measures the oxygen saturation of the blood through a probe clipped to the fingernail or earlobe.

Oxygen Uptake Process of oxygen diffusing from the alveolar space into the pulmonary capillary blood; also called external respiration.

Oxyhemoglobin Dissociation Curve Graphic representation of the relationship between partial pressure of oxygen and oxygen saturation.

P

Pain State in which an individual experiences and reports the presence of physical discomfort; may range in intensity from uncomfortable sensation to severe discomfort.

Pain Threshold Level of intensity at which pain becomes appreciable or perceptible.

Pain Tolerance Level of intensity or duration of pain that a person is willing to endure.

Palliative Care Control of the symptoms rather than cure.

Palpation Physical examination technique that uses the sense of touch to assess texture, temperature, moisture, organ location and size, vibrations and pulsations, swelling, masses, and tenderness.

Papanicolaou Test Smear method of examining stained exfoliative cells.

Paracentesis Aspiration of fluid from the abdominal cavity.

Paradigm Pattern, model, or mindset that strongly influences one's decisions and behaviors.

Paradigm Revolution Turmoil experienced by a discipline when a competing paradigm gains acceptance over the dominant, prevailing paradigm.

Paradigm Shift Acceptance of a competing paradigm over the prevailing paradigm.

Parasomnia Sleep alteration resulting from activation of physiological systems at inappropriate times during the sleep-wake cycle.

Paraverbal communication The way in which a person speaks, including voice tone, pitch, and inflection.

Paraverbal cues Verbal messages accompanied by cues, such as tone and pitch of voice, speed, inflection, volume, and other non-language vocalizations.

Parenteral Nutrition Nutrients bypass the small intestine and enter the blood directly.

Paresthesia Abnormal sensation such as burning, prickling, or tingling.

Paroxysmal Nocturnal Dyspnea Episode of sudden shortness of breath occurring during sleep.

Partial Thickness Wound Wound involving the epidermis and part of the dermis.

Passive Euthanasia Process of cooperating with the client's dying process.

Passive Range-of-Motion Range of motion exercises performed by the nurse for the dependent client.

Patency Openness of tube lock or bodily passageway.

Paternalism Practice by which health care providers decide what is "best" for clients and then attempt to coerce clients to act against their own choices.

Pathogen Microorganism that causes disease.

Pathogenicity Ability of a microorganism to cause disease.

Patient-Controlled Analgesia Device that allows the client to control the delivery of intravenous or subcutaneous pain medication in a safe, effective manner through a programmable pump.

Patient-Focused Care Specific approach to care delivery that involves the decentralization of services, physical redesign of units, and cross-training of employees to bring client care and services to the client in order to minimize contacts with large numbers of staff and to increase overall client satisfaction.

Peak Plasma Level Achievement of the highest blood concentration of a single drug dose until the elimination rate equals the rate of absorption.

Peer Evaluation Process by which professionals provide critical performance appraisal and feedback that is geared toward corrective action.

Penrose Drain Flexible drain that functions by gravity.

Perception Person's sense and understanding of the world.

Percussion Physical examination technique that uses short, tapping strokes on the surface of the skin to create vibrations of underlying organs.

Performance Improvement Activities and behaviors that each individual does to meet customers' expectations.

Perineal Care Cleansing of the external genitalia, perineum, and surrounding area.

Perioperative Refers to the management and treatment of the surgical client during the three phases of surgery: preoperative, intraoperative, and postoperative.

Peristalsis Coordinated, rhythmic, serial contraction of the smooth muscles of the gastrointestinal tract.

Permeability Capability of a substance, molecule, or ion to diffuse through a membrane.

Petrissage Massage technique using squeezing, kneading, and rolling movements to release muscle tension and stimulate circulation.

Phagocytosis Process by which certain cells engulf and dispose of foreign bodies.

Phantom Limb Pain Neuropathic pain in which pain sensations are referred to an area from which an extremity has been amputated.

Pharmacokinetics Study of the absorption, distribution, metabolism, and excretion of drugs.

Phenomenon Observable fact or event that can be perceived through the senses and is susceptible to description and explanation.

Phenylketonuria Genetic disorder that can lead to impaired intellectual functioning if untreated.

Philosophy Statement of beliefs that is the foundation for one's thoughts and actions.

Phlebitis Inflammation of a vein.

Phlebotomist Individual who performs venipuncture.

Phospholipids Composed of one or more fatty acid molecules and one phosphoric acid radical, and usually contain a nitrogenous base.

Physical Agent Factor in the environment capable of causing disease in a host.

Physical Dependence Reaction of the body to abrupt discontinuation of a medication; also known as withdrawal syndrome.

Physical Restraints Manual methods or physical equipment attached to the client to reduce the client's movement.

Phytonutrients Chemical found in plants.

PIE Charting Documentation method using problem, intervention, evaluation (PIE) format.

Piggybacked Addition of an intravenous solution to infuse concurrently with another infusion.

Piloerection Hairs standing on end as a result of the body's decrease in body temperature.

Plaintiff Party who initiates a lawsuit that seeks damages or other relief.

Plan of Care Written guide that organizes data about a client's care into a formal statement of the strategies that will be implemented to help the client achieve optimal health.

Planning Third step of the nursing process; includes the formulation of guidelines that establish the proposed course of nursing action in the resolution of nursing diagnoses and the development of the client's plan of care.

Plateau Level at which a drug's blood concentration is maintained.

Pleura Lining of the chest cavity.

Pleural Friction Rub Heard on either inspiration or expiration over anterior lateral lungs as a continuous creaking, grating sound.

Pneumatic Compression Device Device that provides intermittent compression cycles to the veins of the extremities to promote circulation.

Pneumothorax Collection of air or gas in the pleural space causing the lungs to collapse.

Point-of-Care Charting Documentation system that allows health care providers to gain immediate access to client information at the bedside.

Poison Any substance that causes an alteration such as injury or death in the client's health when inhaled, injected, ingested, or absorbed by the body.

Politics Way in which people try to influence decision making, especially decisions about the use of resources.

Polyp A small, abnormal growth of tissue.

Polypharmacy Concurrent use of several different medications.

Polysaccharide Complex sugar.

Polyunsaturated Fatty Acids Fatty acids that have many carbons unbonded to hydrogen atoms.

Port-a-Cath A port that has been implanted under the skin with a catheter inserted into the superior vena cava or right atrium through the subclavian or internal jugular vein.

Positive Nitrogen Balance Condition that exists when nitrogen intake exceeds output, protein anabolism exceeds catabolism.

Possible Nursing Diagnosis Nursing diagnosis that indicates a situation exists in which a problem could arise unless preventive action is taken, or a "hunch" or intuition by the nurse that cannot be confirmed or eliminated until more data have been collected. It is composed of the diagnostic label and related factors.

Postoperative (after surgery) Begins when the client leaves the operating room and is taken to a postanesthesia care unit; this phase continues until the client is discharged from the care of the surgeon.

Postural Drainage A technique of positioning that promotes gravity drainage of specific lung lobes.

Power Ability to do or act, resulting in the achievement of desired results.

Preadolescence Developmental stage from the ages of approximately 10 to 12 years.

Pre-Albumin Precursor of albumin.

Precapillary Sphincters Smooth muscles surrounding the smallest arterioles that control blood flow through the capillary beds.

Predictive Value The ability of screening test results to correctly identify the disease state, such as a true-positive correctly identifies persons who actually have the disease, whereas a true-negative correctly identifies persons who do not actually have the disease (Fischbach, 2000).

Preferred Provider Organization Type of managed care model in which member choice is limited to providers within the system.

Prenatal Period Developmental stage beginning with conception and ending with birth.

Preoperative (before surgery) Refers to the time interval that begins when the decision is made for surgery until the client is transferred to the operating room.

Presbycusis Hearing loss associated with old age.

Preschool Stage Developmental stage from the ages of 3 to 6 years.

Presence The process of “just being” with another; a therapeutic nursing intervention

Prescriptive Authority Legal recognition of the ability to prescribe medications.

Pressure Ulcer Localized area of tissue necrosis that develops when soft tissue is compressed between a bony prominence and an external surface for a prolonged period of time; also known as bedsore or decubitus ulcer.

Primary Care Provider Health care provider who a client sees first for health care; typically, a family practitioner (physician/nurse), internist, or pediatrician.

Primary Health Care Client’s point of entry into the health care system; includes assessment, diagnosis, treatment, coordination of care, education, preventive services, and surveillance.

Primary Intention Healing Healing process of a wound with minimal tissue loss and well-approximated edges; occurs with minimal granulation tissue and scarring.

Primary Source Major provider of information about client; research article written by one or more researchers.

Proactive Initiating change rather than responding to change imposed by others.

Problem-Oriented Medical Record (POMR) Documentation focused on the client’s problem with a structured, logical format to narrative charting called SOAP (subjective and objective data, assessment, plan).

Process Series of steps or acts that lead to accomplishment of a goal or purpose.

Process Evaluation Measurement of nursing actions by examination of each phase of the nursing process.

Process Improvement Process that examines the flow of client care between departments in order to ensure that the processes work as they were designed and that acceptable levels of performance are achieved.

Prodromal Stage Time interval from the onset of nonspecific symptoms until specific symptoms of the infectious agent begin to manifest themselves.

Profession Group (vocational or occupational) that requires specialized education and intellectual knowledge.

Professional Regulation Process by which nursing ensures that its members act in the public interest by providing a unique service that society has entrusted to them.

Professional Standards Authoritative statements developed by the profession by which quality of practice, service, and/or education can be judged.

Progressive Muscle Relaxation Stress management technique involving tensing and relaxing muscles.

Proposition Statement that proposes a relationship between concepts.

Proprioception Awareness of posture, movement, and changes in equilibrium and the knowledge of position, weight, and resistance of objects in relation to the body.

Prosody Melody of speech that conveys meaning through changes in the tempo, rhythm, and intonation.

Proteins Organic compounds of amino acid polymers connected by peptide bonds that contain carbon, hydrogen, oxygen, and nitrogen.

Protocol Series of standing orders or procedures that should be followed under certain specific conditions.

Proxemics Study of the distance between people and objects.

Psychomotor Domain Area of learning that involves performance of motor skills.

Psychoneuroimmunology Study of the complex relationship between the cognitive, affective, and physical aspects of humans.

Puberty Appearance of secondary sex characteristics that signals the beginning of adolescence.

Public Law Law that deals with an individual’s relationship to the state.

Pulse Bounding of blood flow in an artery that is palpable at various points on the body.

Pulse Deficit Condition in which the apical pulse rate is greater than the radial pulse rate.

Pulse Oximeter Sensor device used to measure the oxygen saturation level of the blood.

Pulse Pressure Measurement of the ratio of stroke volume to compliance (total distensibility) of the arterial system.

Pulse Quality Refers to the “feel” of the pulse, its rhythm and forcefulness.

Pulse Rate Indirect measurement of cardiac output obtained by counting the number of apical or peripheral pulse waves over a pulse point.

Pulse Rhythm Regularity of the heartbeat.

Pulse Volume Measurement of the strength or amplitude of the force exerted by the ejected blood against the arterial wall with each contraction.

Purulent Exudate Thick discharge composed of leukocytes, liquefied dead tissue debris, and dead and living bacteria; also known as pus.

Pyogenic Bacteria Bacteria that produce pus.

Pyorrhea Periodontal disease.

Pyrexia When heat production exceeds heat loss and body temperature rises above the normal range.

Pyrogens Bacteria, viruses, fungi, and some antigens.

Pyuria Pus (white blood cells) in the urine.

Q

Qualitative Analysis Integration and synthesis of narrative, nonnumerical data.

Qualitative Research Systematic collection and analysis of subjective narrative materials, using procedures for which there tends to be a minimum of research-imposed control.

Quality Meeting or exceeding requirements of the client.

Quality Assurance Traditional approach to quality management in which monitoring and evaluation focus on individual performance, deviation from standards, and problem solving.

Quantitative Research Systematic collection of numerical information, often under conditions of considerable control.

R

Race Grouping of people based on biological similarities such as physical characteristics.

Racism Discrimination directed toward individuals who are misperceived to be inferior because of biological factors.

Radiation Loss of heat in the form of infrared rays.

Radiofrequency ablation The delivery of low-voltage, high-frequency alternating electrical current to cauterize the abnormal myocardial tissue.

Radiography Study of x-rays or gamma ray-exposed film through the action of ionizing radiation.

Range-of-Motion Extent to which a joint can move.

Rapport Bond or connection between two people that is based on mutual trust.

Rationale Explanation based on the theories and scientific principles of natural and behavioral sciences and the humanities.

Readiness for Learning Evidence of willingness to learn.

Receiver Person who intercepts the sender’s message.

Recent Memory The result of events that have occurred over the past 24 hours.

Recommended Dietary Allowances (RDA) Recommended allowances of essential nutrients established by the Food and Nutritional Academy of Sciences–National Research Council.

Recurrent Acute Pain Discomfort marked by cycles of repetitive pain episodes that alternate with pain-free intervals; this pain may recur over a prolonged period or throughout a person’s lifetime.

Red Cell Indices Laboratory measurement of the size and hemoglobin content of the red cells.

Red Wound Wound in the proliferative phase of repair.

Referred Pain Discomfort from the internal organs that is felt in another area of the body.

Reframing Technique of monitoring negative thoughts and replacing them with positive ones.

Regional Anesthesia Anesthesia that causes the client to lose sensation in a particular area of the body (e.g., laparoscope for a tubal sterilization).

Regurgitation Backward flow of blood through a diseased heart valve, also known as insufficiency.

Relaxation Response State of increased arousal of the parasympathetic nervous system which leads to a relaxed physiological state.

Relaxation Techniques Methods used to decrease anxiety and muscle tension.

Remote memory The retention of experiences that occurred during earlier periods of life.

Research Systematic method of exploring, describing, explaining, relating, or establishing the existence of a phenomenon, the factors that cause changes in the phenomenon, and how the phenomenon influences other phenomena.

Research Design Overall plan used to conduct research.

Resident Flora Microorganisms that are always present, usually without altering the client’s health.

Respiration The act of breathing.

Rest State of relaxation and calmness, both mental and physical.

Restorative Nursing Care Nursing care provided to clients who have residual impairment as a result of disease or injury; seeks to increase the client's independence and ability to perform self-care.

Restraints Protective devices used to limit the physical activity of a client or to immobilize a client or extremity.

Restrictive Pulmonary Disease A category of lung diseases characterized by impaired mobility or elasticity of the lungs or chest wall.

Review of Systems A brief account of any recent signs or symptoms related to any body system.

Rhonchi Heard predominantly on expiration over the trachea and bronchi as a continuous, low-pitched musical sound.

Rigor Mortis Stiffening of the body after death caused by contraction of the skeletal and smooth muscles.

Risk for Infection State in which an individual is at increased risk for being invaded by pathogenic organisms.

Risk Nursing Diagnosis Nursing diagnosis that indicates that a problem does not yet exist but specific risk factors are present; composed of the diagnostic label preceded by the phrase "Risk for" with the specific risk factors listed.

Role Set of expected behaviors associated with a person's status or position.

Role Conflict When the expectations of one role compete with the expectations of other roles.

Rounds Reporting method; care team members walk to clients' rooms and discuss care and progress with each other and with the clients.

S

Saccharides Sugar units.

Satiety Feeling of fulfillment from food.

Saturated Fatty Acids Glycerol esters of organic acids whose atoms are joined by a single-valence bond.

School-Age Period Developmental stage from the ages of 6 to 12 years.

Scope of Practice Legal boundaries of practice for health care providers as defined in state statutes.

Sebum Substance produced by the skin to kill bacteria.

Secondary Gain Outcomes of the sick role other than alleviation of anxiety (primary gain); examples include gaining attention and sympathy, avoiding responsibilities, and receiving financial compensation or reward.

Secondary Intention Healing Healing process of a wound that has extensive tissue loss and poorly approximated edges; occurs with gradual tissue replacement and scarring.

Secondary Source Source of data other than the client, family members, other health care providers, or medical records; article in which an author addresses the research of someone else.

Self-Care Learned behavior and a deliberate action in response to a need.

Self-Care Deficit State in which an individual is not able to perform one or more activities of daily living.

Self-Concept Individual's perception of self; includes self-esteem, body image, and ideal self.

Self-Efficacy Belief in one's ability to succeed; according to social cognitive theory of learning, serves as an internal motivator for change.

Self-Esteem Individual's perception of self-worth; includes judgments about one's self and one's capabilities.

Semipermeable Selective permeability of membranes.

Sender Person who generates a message.

Sensation The ability to receive and process stimuli received through the sensory organs.

Sensitivity Determines the susceptibility of a pathogen to an antibiotic; the ability of a test to correctly identify those individuals who have the disease.

Sensory Deficit A change in the perception of sensory stimuli.

Sensory Deprivation A state of reduced sensory input from the internal or external environment, manifested by alterations in sensory perceptions.

Sensory Overload Increased perception of the intensity of auditory and visual stimuli.

Sensory Perception The ability to receive sensory impressions and, through cortical association, relate the stimuli to past experiences to form an impression of the nature of the stimulus.

Serous Exudate Watery discharge composed primarily of serum, with a low protein count.

Sex Roles Culturally determined patterns associated with being male or female.

Sexuality Human characteristic that refers not just to gender but to all the aspects of being male or female, including feelings, attitudes, beliefs, and behavior.

Sexual Orientation Individual's preference for ways of expressing sexual feelings.

Shaman Folk healer-priest who uses natural and supernatural forces to help others.

Shamanism Practice of entering altered states of consciousness with the intent of helping others.

Shearing Force exerted against the skin by movement or repositioning.

Short-Term Goal Statement written in objective format demonstrating an expectation to be achieved in resolution of the nursing diagnosis in a short period of time, usually a few hours or days.

Shunting Condition in which alveolar regions are well-perfused but not adequately ventilated.

Side Effects Mild non-therapeutic drug effect.

Signal-Averaged ECG Surface ECG that amplifies late potentials.

Simultaneity Paradigm Nursing viewpoint that focuses on the quality of life from the client's perspective and conceptualizes the interaction between person and environment as mutual and simultaneous.

Single-Payer System Health care delivery model in which the government is the only entity to reimburse.

Single Point of Entry Entry into the health care system is required through a point designated by the plan.

Situational Leadership Style of leadership in which there is a blending of styles based on current circumstances and events.

Situational Loss Occurs in response to external events, usually beyond the individual's control (such as the death of a significant other).

Skinfold Measurement Measures the amount of body fat.

Skin Shear Result of dragging skin across a hard surface.

Skin Turgor Normal resiliency of the skin.

Sleep State of altered consciousness during which an individual experiences fluctuations in level of consciousness, minimal physical activity, and a general slowdown of the body's physiological processes.

Sleep Apnea A syndrome in which breathing periodically ceases during sleep, often associated with heavy snoring.

Sleep Cycle Sequence of sleep that begins with the four stages of no rapid eye movement (NREM) sleep, with a return to stages 3 then 2, then passage into the first rapid eye movement (REM) stage.

Sleep Deprivation Prolonged inadequate quality and quantity of sleep.

Small-Group Ecology Study of proxemics in small-group situations.

Snellen Chart A chart of graduating black letters which test visual acuity.

SOAP Charting Documentation method using subjective data, objective data, assessment, and plan.

Solute A substance dissolved in a solution; also called analyte.

Solvent A liquid with a substance in solution.

Somatic Pain Nonlocalized discomfort originating in tendons, ligaments, and nerves.

Somnambulism Sleepwalking.

Source-Oriented (SO) Charting Narrative recording by each member (source) of the health care team on a separate record.

Spasticity Increase in muscle tension

Specific Gravity Weight of urine compared with weight of distilled water; a specific gravity greater than 1.000 indicates solutes in the urine.

Specificity The ability of a test to correctly identify those individuals who do not have the disease.

Spherocytes Small, thick red cells.

Spiritual Distress The client's perception that their belief system, or their place within it, is threatened.

Spirituality Relationship with one's self, a sense of connection with others, and a relationship with a higher power or divine source.

Spores Single-celled microorganisms or microorganisms in the resting or inactive stage.

Standing Order Standardized intervention written, approved, and signed by a physician that is kept on file within health care agencies to be used in predictable situations or in circumstances requiring immediate attention.

Stat Orders An order for a single dose of medication to be given immediately.

Statutory Law Laws enacted by legislative bodies.

Stenosis Narrowing or constriction of a blood vessel or valve.

Stereognosis Ability to identify objects by manipulation and touch.

Stereotyping Belief that all people within the same racial, ethnic, or cultural group act alike and share the same beliefs and attitudes.

Sterilization Total elimination of all microorganisms including spores.

Stock Supply Medications dispensed and labeled in large quantities for storage in the medication room or nursing unit.

Stoma Surgically created opening.

Stomatitis Inflammation of the oral mucosa.

Stool Fecal material.

Stress Body's reaction to any stimulus.

Stressor Any stimulus encountered by an individual; leads to the need to adapt.

Stress Test Measures the client's cardiovascular response to exercise tolerance.

Stress Urinary Incontinence Uncontrolled loss of urine caused by physical exertion in the absence of a bladder contraction.

Striae Red or silver-white streaks over the breasts or axillae.

Stridor Heard predominantly on inspiration as a continuous crowing sound.

Stroke Volume Measurement of blood that enters the aorta with each ventricular contraction.

Structure Evaluation Determination of the health care agency's ability to provide the services offered to its client population.

Subacute care Short-term aggressive care that emphasizes restorative interventions before the client's reentry into the community

Subculture Group of people with characteristic patterns of behavior that distinguish it from the larger culture or society.

Subcutaneous (SC/SQ) Injection into the subcutaneous tissue.

Subjective Data Data from the client's point of view, including feelings, perceptions, and concerns.

Sublingual Under the tongue.

Superficial Wound Wound confined to the epidermis layer.

Supination Turning a body part upward.

Suppository A substance specifically designed to insert into a bodily orifice other than the mouth (anus, vagina, urethra). The suppository is typically composed of a vehicle containing a medication.

Suppression Conscious defense mechanism whereby a person decides to avoid dealing with a stressor at the present time.

Suppuration Formation of pus, or purulent exudate.

Surfactant Phospholipid secreted by Type II alveolar cells that reduces the alveolar surface tension and thus helps prevent alveolar collapse.

Surgical Asepsis Practices that eliminate all microorganisms from an object or area.

Susceptible Host Person who lacks resistance to an agent and is therefore vulnerable to disease.

Suture Surgical means of closing a wound by sewing, wiring, or stapling.

Synergy Combined power of many people.

Synthesis Putting data together in a new way.

Systemic Infection Infection that affects the entire body with involvement of multiple organs.

Systole Process of cardiac chamber emptying or ejecting blood.

T

Tachycardia A heart rate in excess of 100 beats per minute in an adult.

Tachypnea Respiratory rate greater than 24 breaths per minute.

Tactile Fremitus Vibrations created by sound waves.

Tapotement Massage technique using a light tapping of the fingers that stimulates movement in tired muscles.

Taxonomy of Nursing Diagnoses Type of classification under which the diagnostic label is grouped according to which human response the client is demonstrating to the actual or perceived stressor.

Teaching Active process in which one individual shares information with another as a means to facilitate behavioral changes.

Teaching-Learning Process Planned interaction that promotes a behavioral change that is not a result of maturation or coincidence.

Teaching Strategies Techniques employed by the teacher to promote learning.

Team Group of individuals who work together to achieve a common goal.

Teleology Ethical theory that states that the moral value of a situation is determined by its consequences.

Teratogenic Substance Substance that can cross the placental barrier and impair normal growth and development.

Termination Phase Third and final stage of the therapeutic relationship; focuses on evaluation of goal achievement and effectiveness of treatment.

Tertiary Intention Healing Healing process of a wound in which primary closure of a wound is undesirable; occurs when circulation is poor or when infection is present.

Testimony Written or verbal evidence given by a qualified expert in an area.

Thallium Radionuclide that is the physiological analogue of potassium.

Theory Set of concepts and propositions that provide an orderly way to view phenomena.

Therapeutic Describes actions that are beneficial to the client.

Therapeutic Communication Use of communication for the purpose of creating a beneficial outcome for the client.

Therapeutic Massage Application of pressure and motion by the hands with the intent of improving the recipient's well-being.

Therapeutic Procedure Accidents Accidents that occur during the delivery of medical or nursing interventions.

Therapeutic Range Achievement of a constant therapeutic blood level of a medication within a safe range.

Therapeutic Relationship Relationship that benefits the client's health status.

Therapeutic Touch Holistic technique that consists of assessing alterations in a person's energy fields and using the hands to direct energy to achieve a balanced state.

Therapeutic Use of Self Process in which nurses deliberately plan their actions and approach the relationship with a specific goal in mind before interacting with the client.

Thermoregulation Body's physiological function of heat regulation to maintain a constant internal body temperature.

Thoracentesis The aspiration of fluids from the pleural cavity.

Thrills Vibrations that feel similar to a purring cat.

Thrombus Blood clot.

Toddler Developmental stage beginning at approximately 12 to 18 months of age, when a child begins to walk, and ending at approximately age 3.

Tolerance Phenomenon of requiring larger and larger doses of an analgesic to achieve the same level of pain relief.

Tort Civil wrong committed upon a person or property stemming from a direct invasion of some legal right of the person, the infraction of some public duty, or the violation of some private obligation by which damages accrue to the person.

Tort Law Enforcement of duties and rights among individuals independent of contractual agreements.

Totality Paradigm Nursing viewpoint that conceptualizes the interaction between person and environment as constant in order to accomplish goals and maintain balance.

Total Parenteral Nutrition Intravenous infusion of a solution containing dextrose, amino acids, fats, essential fatty acids, vitamins, and minerals.

Total Quality Management Method of management and system operation that is used to achieve continuous quality improvement.

Touch Means of perceiving or experiencing through tactile sensation.

Toxic Effect Reaction that occurs when the body cannot metabolize a drug, causing the drug to accumulate in the blood.

Tracheotomy A surgical procedure in which an opening (stoma) is made through the anterior neck into the trachea; an artificial airway (tracheostomy tube) is placed into the stoma.

Transcultural Nursing Formal area of study and practice focused on comparative analysis of different cultures and subcultures with respect to cultural care, health and illness beliefs, values and practices, with the goal of providing health care within the context of the client's culture.

Transcutaneous Electrical Nerve Stimulation (TENS) Method of applying minute amounts of electrical stimulation to large-diameter nerve fibers via electrodes placed on the skin to block the passage of pain to the dorsal spinal root.

Transducer Instrument that converts electrical energy to sound waves.

Transferrin (nonheme iron) Combination of a blood protein and iron.

Transient Flora Microorganisms that attach to the skin for a brief period of time but do not continuously live on the skin.

Transsexuality Belief that one is psychologically of the sex opposite his or her anatomic gender.

Trigger Point Hypersensitive point in a muscle, ligament, fascia, or joint capsule that, when stimulated, causes a local twitch or jump response.

Triglycerides Lipid compounds consisting of three fatty acids and a glycerol molecule.

Trocar Large-bored abdominal paracentesis needle.

T-Tube Artificial drain placed in the common bile duct during surgery.

Tympany A low-pitched sound of long duration.

Type and Cross-Match Laboratory test that identifies the client's blood type (e.g., A or B) and determines the compatibility of the blood between potential donor and recipient.

U

Ultrasound Use of high-frequency sound waves instead of x-ray film to visualize deep body structures; also called an echogram.

Uncomplicated Grief A fairly predictable grief reaction following a significant loss, ending with the relinquishing of the lost object and resumption of the previous life.

Understaffing Failure of a facility to provide a sufficient number of professional staff to meet the needs of their clients.

Unintentional Wound Wound resulting from trauma or accident.

Unit Dose Form System of packaging and labeling each dose of medication, usually for a 24-hour period.

Unprofessional Conduct Conduct that could adversely affect the health and welfare of the public.

Unsaturated Fatty Acids Glycerol esters of organic acids whose atoms are joined by double or triple valence bonds.

Urgency Timely intervention of surgery.

Urge Urinary Incontinence Uncontrolled discharge of urine caused by hyperactive (unstable) contractions of the detrusor muscle.

Urinalysis Laboratory analysis of the urine.

Urinary Incontinence Uncontrolled loss of urine of sufficient duration and volume to create a social or hygienic problem.

Urinary Retention Inability to completely evacuate the bladder.

Urobilinogen Derived from the normal bacterial action of intestinal flora on bilirubin.

Utility Ethical principle that states that an act must result in the greatest amount of good for the greatest number of people involved in a situation.

V

Vaccination Inoculation with a vaccine to produce immunity against specific diseases.

Value Variation of the variable.

Values Principles that influence the development of beliefs and attitudes.

Values Clarification Process of analyzing one's own values to better understand what is truly important to oneself.

Variable Anything that may differ from the norm.

Variations Goals not met or interventions not performed according to the time frame; also called variance.

Vasoconstriction The narrowing of the vessels, usually leading to reduced blood flow.

Vasodilation The widening of the vessels, usually leads to increased blood flow.

Vector-Borne Transmission Mode of transmission of disease through animate objects.

Vehicle Transmission Mode of transmission of disease through inanimate objects.

Venipuncture Puncturing of a vein with a needle to aspirate blood.

Venography Radiographic study of the venous system of the lower extremities following the injection of an iodine contrast agent.

Ventilation Movement of air into and out of the lungs for the purpose of delivering fresh air to the alveoli.

Ventilation–Perfusion (V/Q) Mismatching Condition in which perfusion and ventilation of the lung areas are not adequately balanced.

Veracity Ethical principle that means that one should be truthful, neither lying nor deceiving others.

Verbal Message Message communicated through words or language, both spoken and written.

Vesicant Medication that causes blisters and tissue injury when it escapes into surrounding tissue.

Vesicular Sounds Soft, breezy, and low-pitched sounds heard longer on inspiration than expiration that result from air moving through the smaller airways over the lung's periphery, with the exception of the scapular area.

Vibration Massage technique using rapid movements that stimulate or relax muscles.

Virulence Degree of pathogenicity of an infectious microorganism (pathogen).

Visceral Pain Discomfort felt in the internal organs.

Visual Channel Transmission of messages through sight, observation, and perception.

Visual Learner Style of learning in which people learn by processing information by seeing.

Vital Capacity Amount of air exhaled from the lungs after a minimal full inspiration.

Vital Signs Measurement of the client's body temperature (T), pulse (P) and respiratory (R) rates, and blood pressure (BP).

Vitamins Organic compounds.

Voiding Process of urine evacuation.

W

Walking Rounds Reporting method used when the members of the care team walk to each client's room and discuss care and progress with each other and the client.

Water-Soluble Vitamins Vitamins that require daily ingestion in normal quantities because they are not stored in the body.

Wellness Condition in which an individual functions at optimal levels.

Wellness Nursing Diagnosis Nursing diagnosis that indicates the client's expression of a desire to obtain a higher level of wellness in some area of function. It is composed of the diagnostic label preceded by the phrase "potential for enhanced."

Wheezes Heard predominantly on expiration all over the lungs as a continuous sonorous wheeze or sibilant wheeze.

Whistle-blowing Calling attention to the unethical, illegal, or incompetent actions of others.

Withdrawal Syndrome State in which symptoms occur after abrupt discontinuation of a narcotic.

Work of Breathing Amount of muscular energy (work) required to accomplish ventilation.

Working Phase Second stage of the therapeutic relationship in which problems are identified, goals are established, and problem-solving methods are selected.

Wound Disruption in the integrity of a body tissue.

Y

Yellow Wound Wound with fibrinous slough or purulent exudate from bacteria.

Young Adulthood Developmental stage from the ages of 21 to approximately 40 years.

Z

Z-Track Injection Method of IM injection to seal the medication in the muscle, preventing the drug from irritating the subcutaneous tissue.

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