NCLEX-PN® Review

made Incredibly Easy!®

3rd edition

thePoint

Wolters Kluwer Health | Lippincott Williams & Wilkins

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Not another boring foreword

If you're like most nursing students I know, you're too busy attending classes, going to clinicals, and preparing for NCLEX to have the time to wade through a foreword that uses pretentious terms and umpteen dull paragraphs to get to the point. So let's cut right to the chase! Here's why this book is so terrific:

1. It will teach you all the important things you need to know about preparing for and passing the NCLEX. (And it will leave out all the fluff that wastes your time.)
2. It will help you remember what you've learned.
3. It will make you smile as it enhances your knowledge and skills.

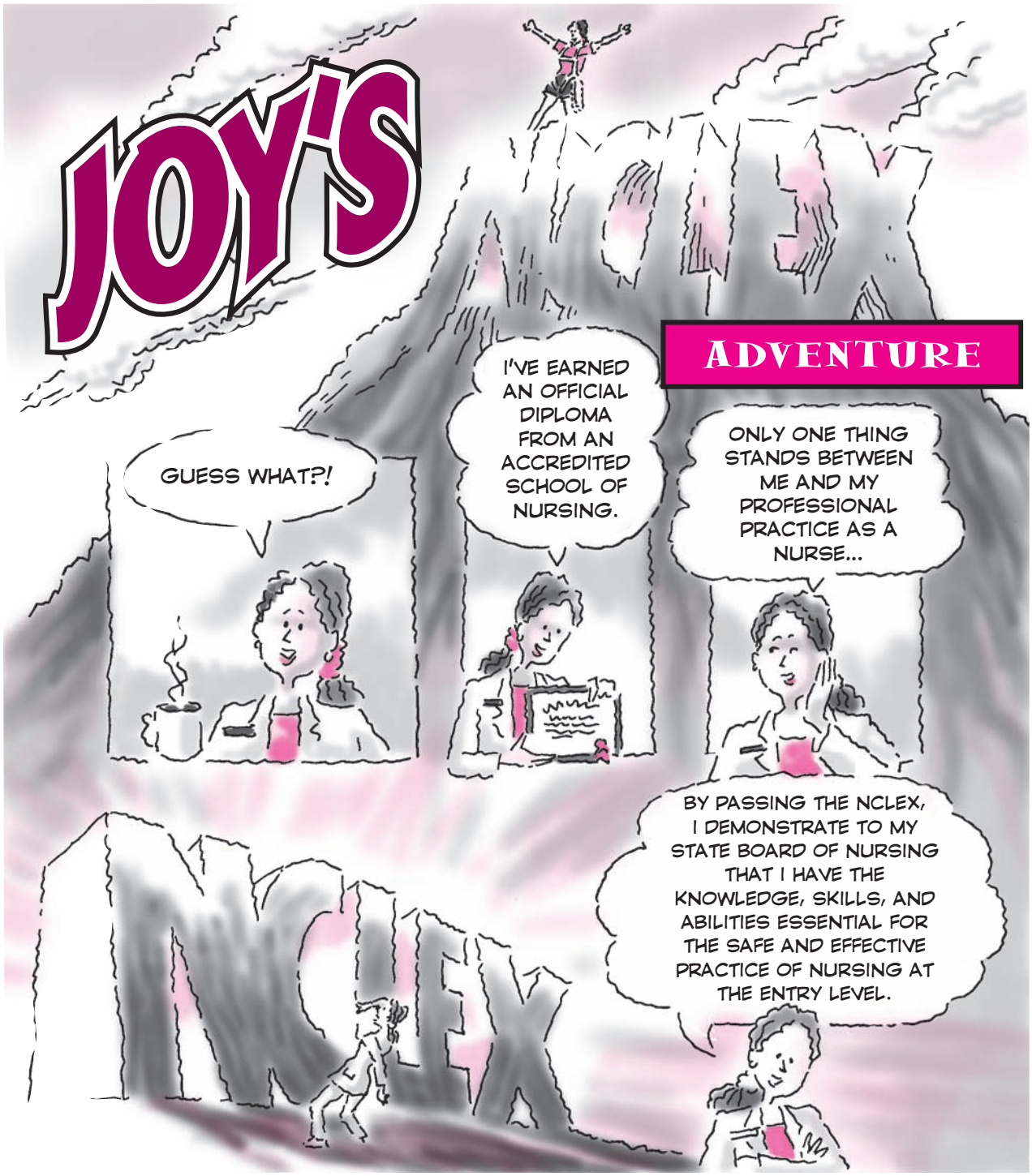
Don't believe me? Try these features on for size:

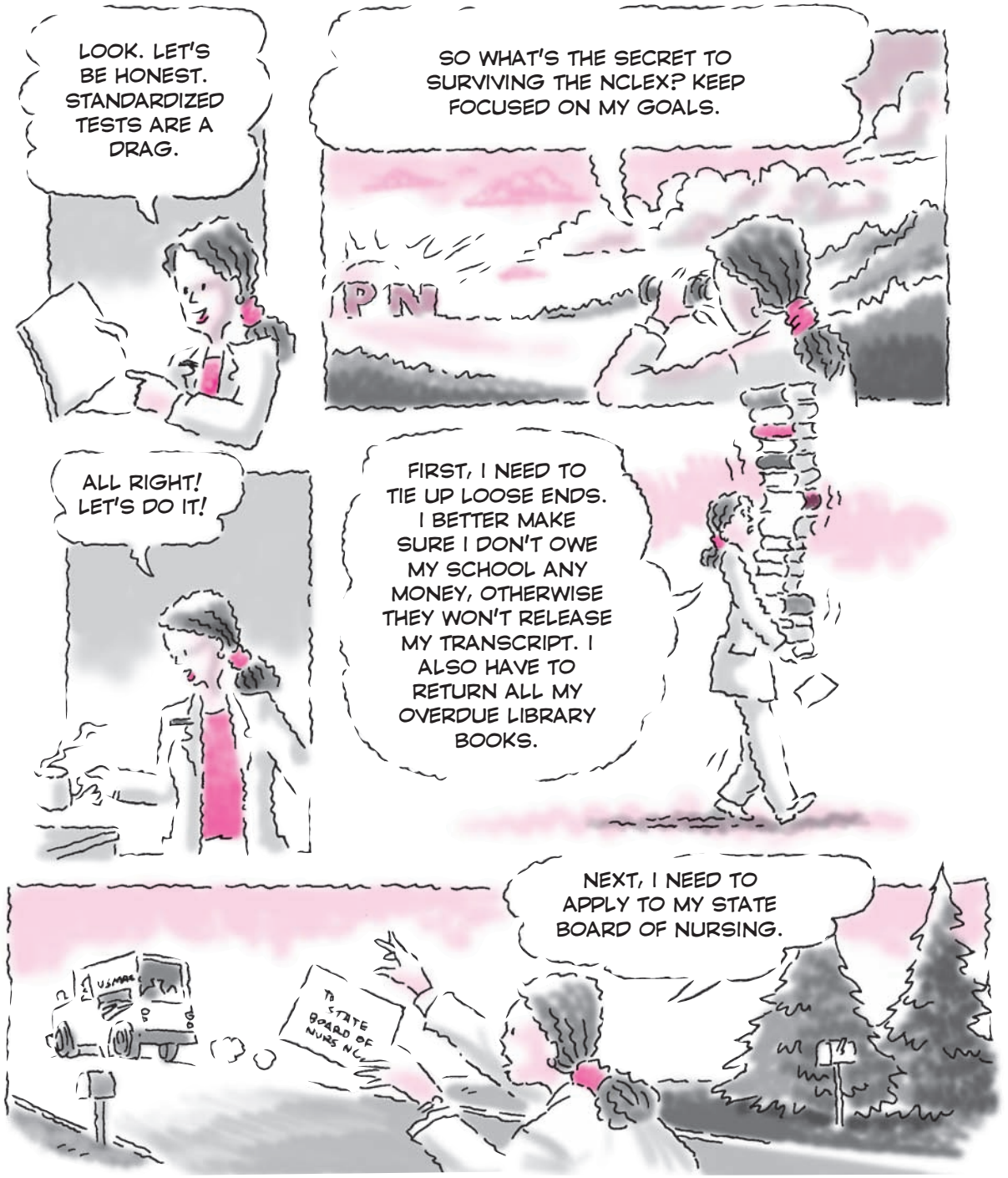
- Reliable NCLEX preparation guidelines and hundreds of test-taking hints and strategies
- Easy-to-follow outline review format covering all major topics tested on the exam
- Dozens of cheat sheets and memory joggers to help you remember key information
- Hundreds of NCLEX-style questions in the book and more than 1,000 others available online
- All information based on the latest test blueprint.

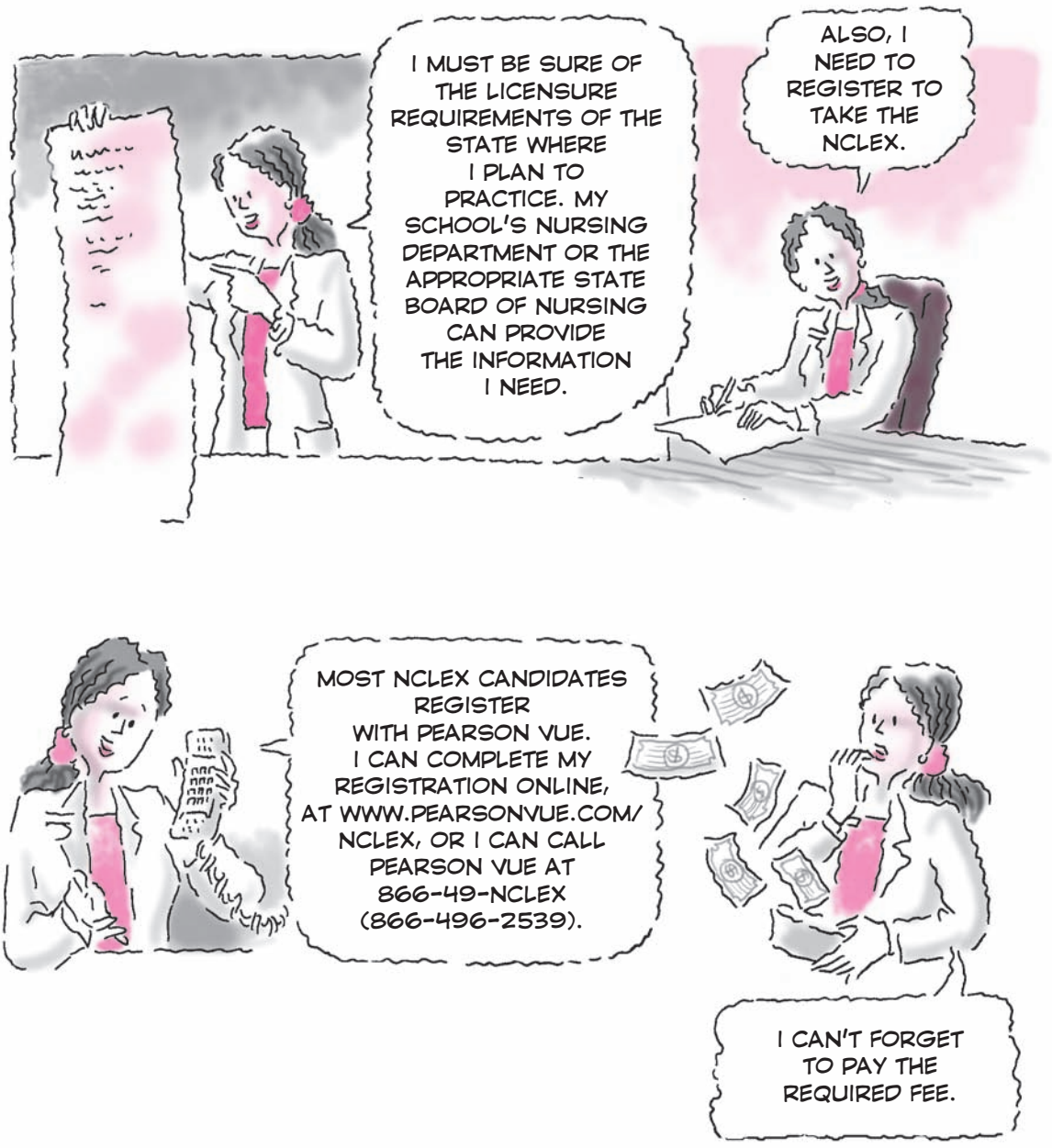
See? I told you! And that's not all. Look for me and my friends in the margins throughout this book. We'll be there to explain key concepts, provide important hints, and offer reassurance. Oh, and if you don't mind, we'll be spicing up the pages with a bit of humor along the way, to teach and entertain in a way that no other resource can.

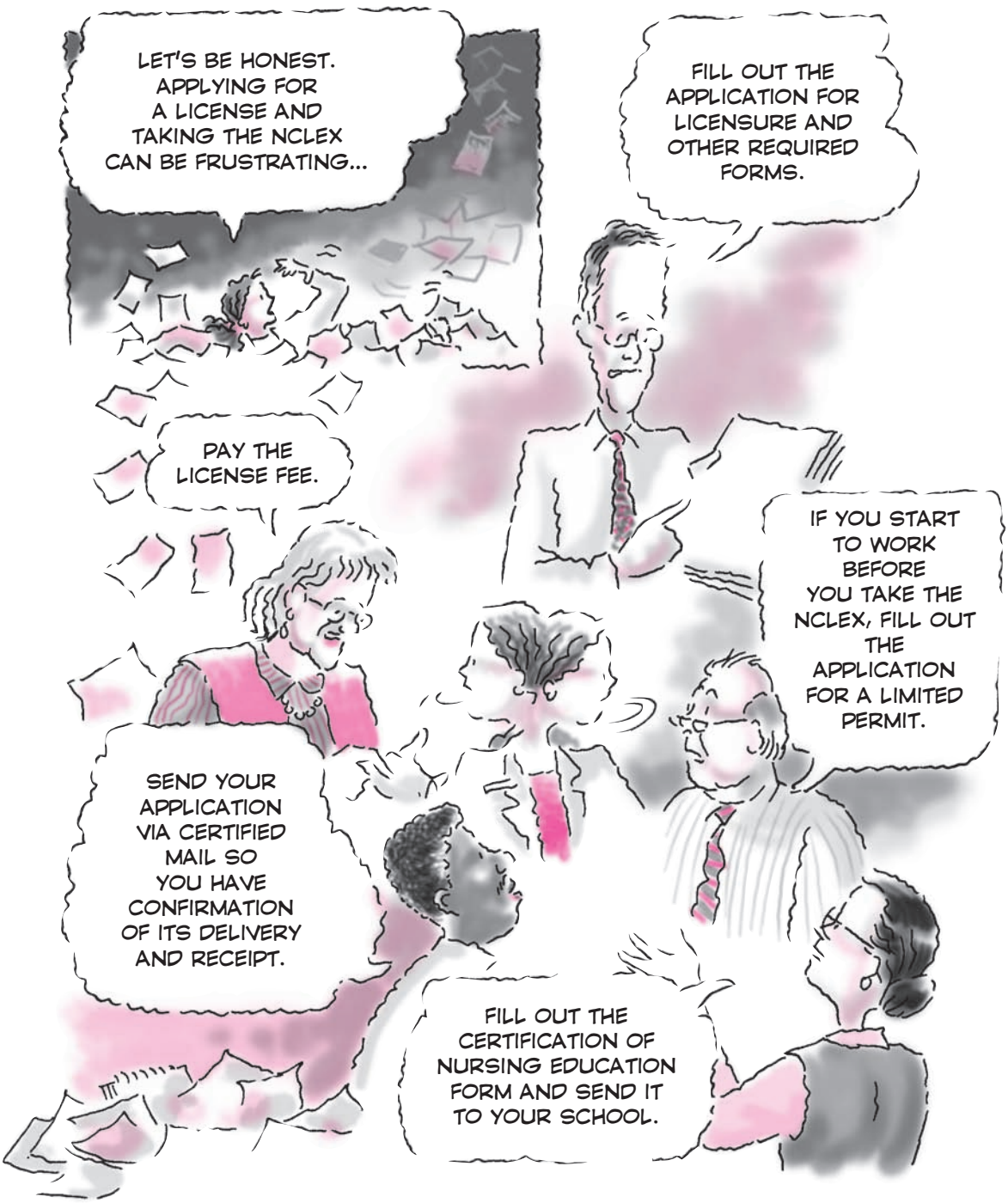
I hope you find this book helpful. Best of luck on the exam and throughout your career!

Joy

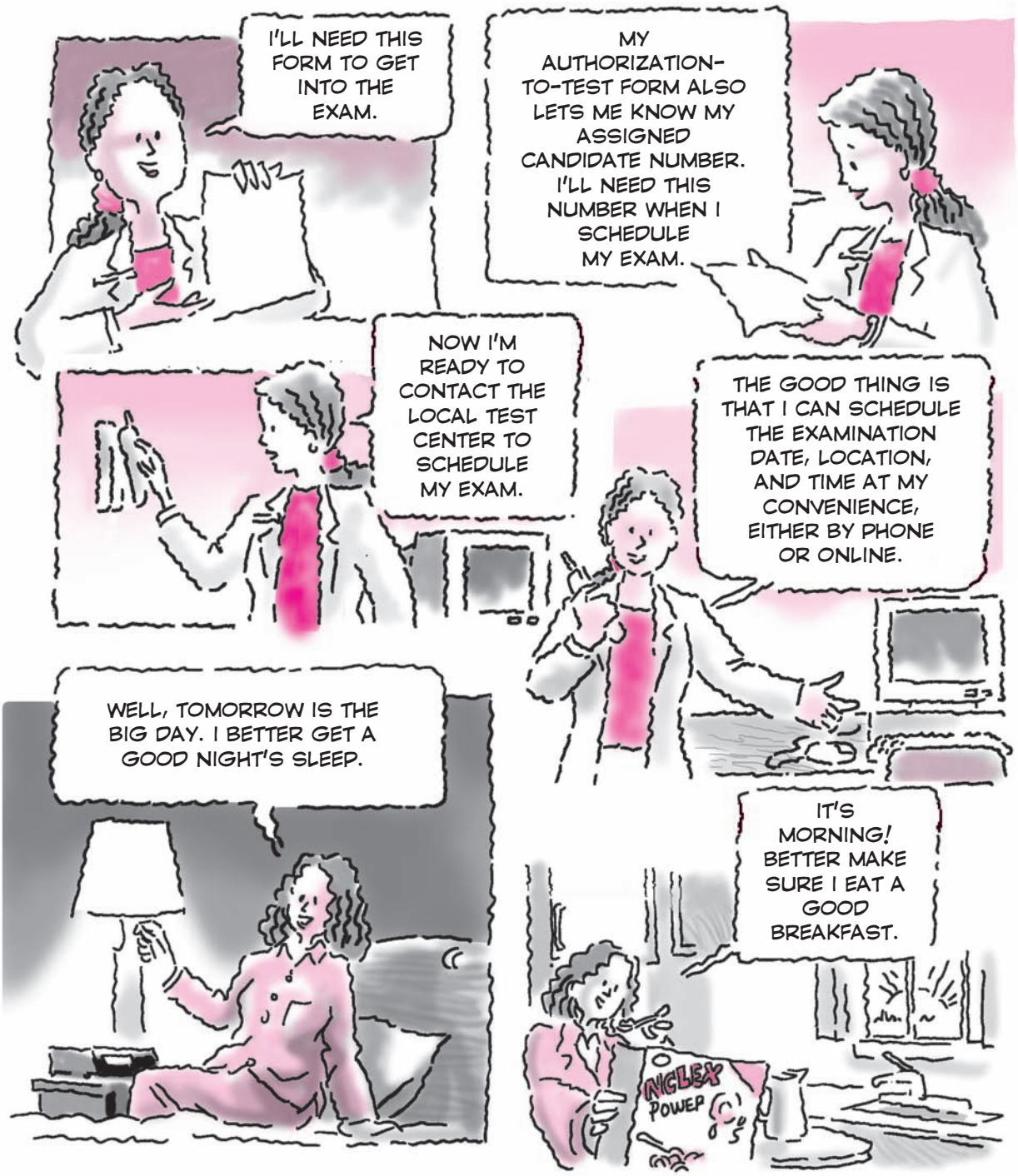

JOY'S
ADVENTURE
GUESS WHAT?!
I'VE EARNED AN OFFICIAL DIPLOMA FROM AN ACCREDITED SCHOOL OF NURSING.
ONLY ONE THING STANDS BETWEEN ME AND MY PROFESSIONAL PRACTICE AS A NURSE...
NCLEX
BY PASSING THE NCLEX, I DEMONSTRATE TO MY STATE BOARD OF NURSING THAT I HAVE THE KNOWLEDGE, SKILLS, AND ABILITIES ESSENTIAL FOR THE SAFE AND EFFECTIVE PRACTICE OF NURSING AT THE ENTRY LEVEL.

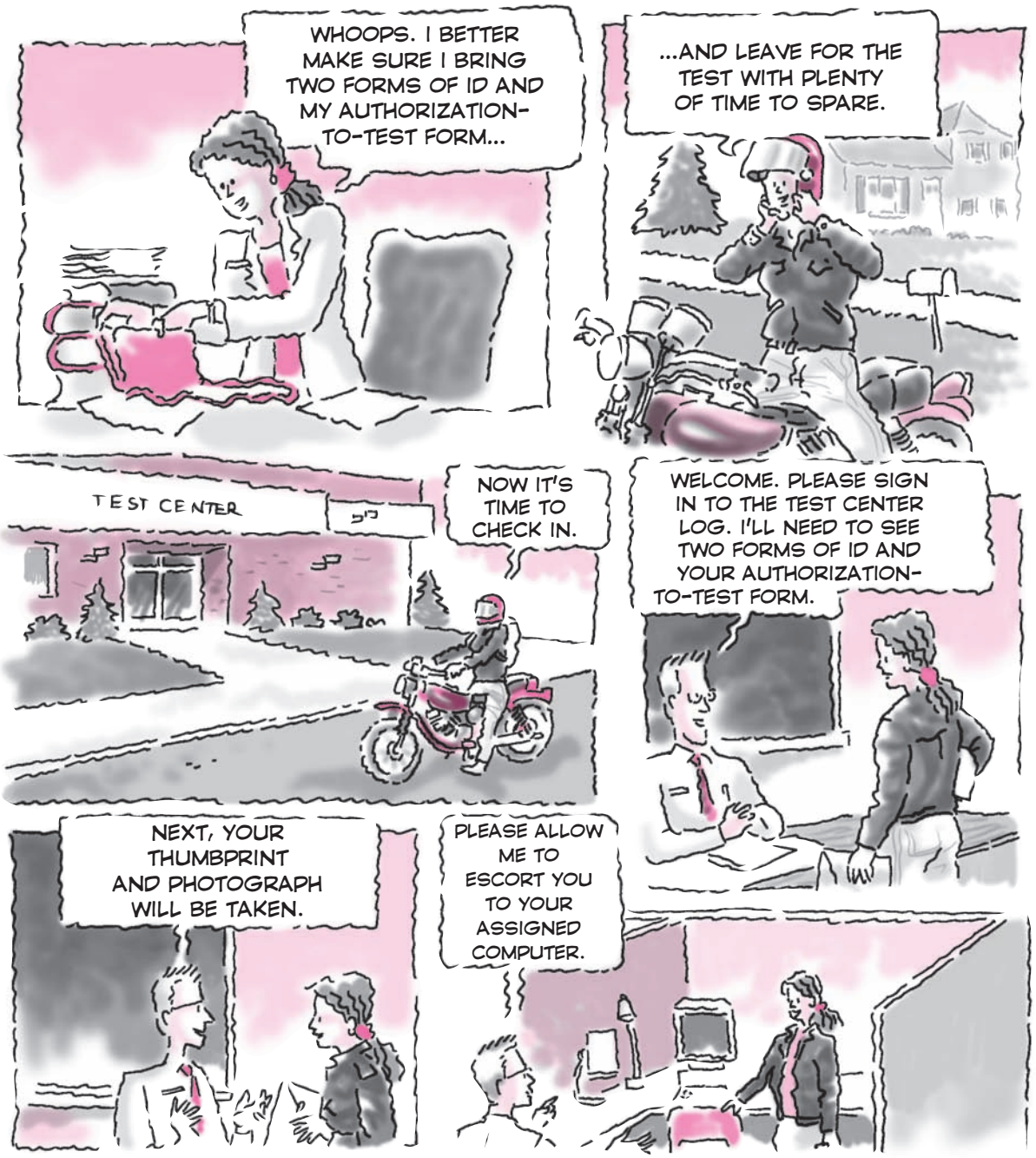

LOOK. LET'S BE HONEST. STANDARDIZED TESTS ARE A DRAG.
SO WHAT'S THE SECRET TO SURVIVING THE NCLEX? KEEP FOCUSED ON MY GOALS.
PN
ALL RIGHT! LET'S DO IT!
FIRST, I NEED TO TIE UP LOOSE ENDS. I BETTER MAKE SURE I DON'T OWE MY SCHOOL ANY MONEY, OTHERWISE THEY WON'T RELEASE MY TRANSCRIPT. I ALSO HAVE TO RETURN ALL MY OVERDUE LIBRARY BOOKS.
NEXT, I NEED TO APPLY TO MY STATE BOARD OF NURSING.
STATE BOARD OF NURS NC

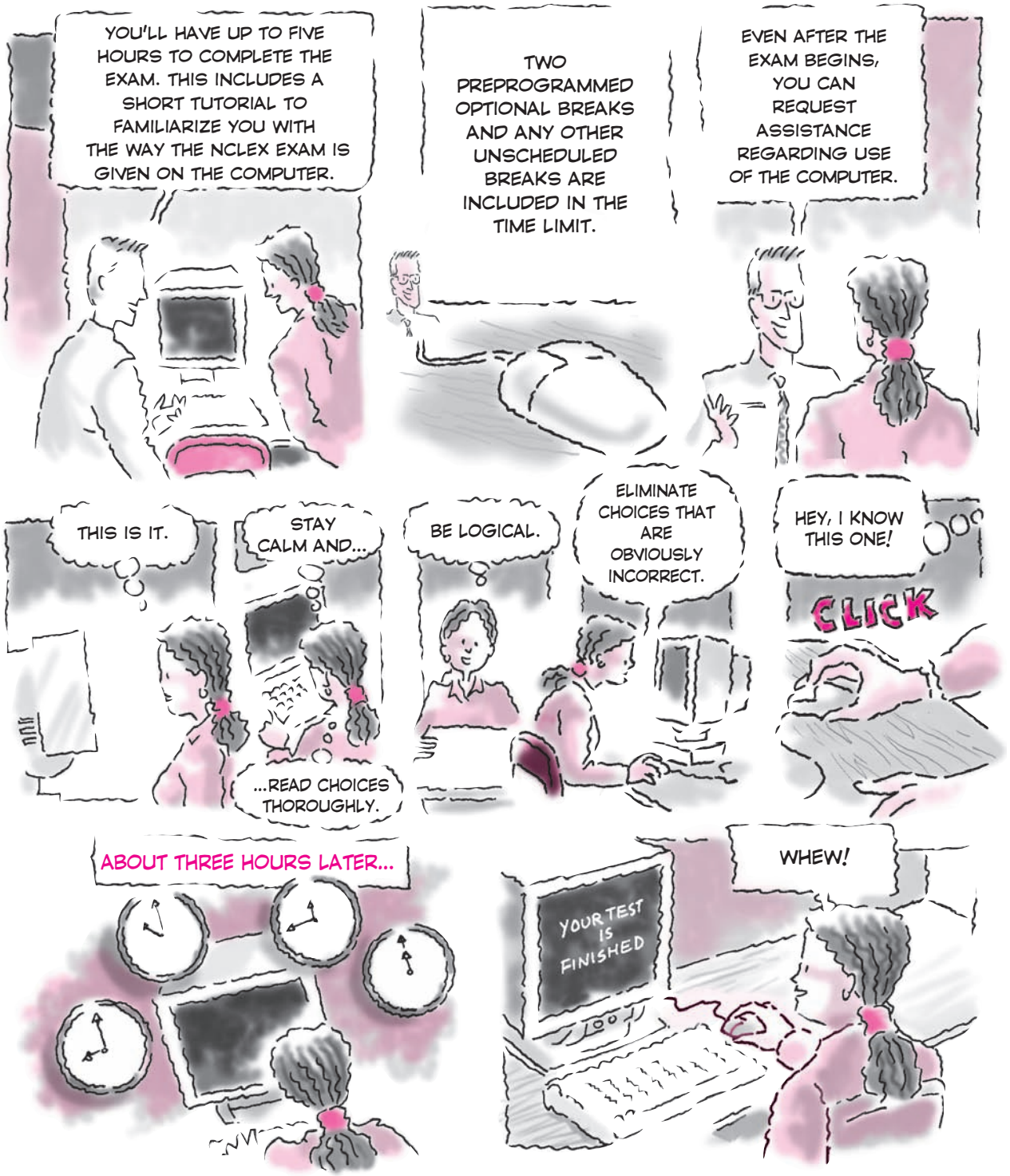

I MUST BE SURE OF THE LICENSURE REQUIREMENTS OF THE STATE WHERE I PLAN TO PRACTICE. MY SCHOOL'S NURSING DEPARTMENT OR THE APPROPRIATE STATE BOARD OF NURSING CAN PROVIDE THE INFORMATION I NEED.
ALSO, I NEED TO REGISTER TO TAKE THE NCLEX.
MOST NCLEX CANDIDATES REGISTER WITH PEARSON VUE. I CAN COMPLETE MY REGISTRATION ONLINE, AT WWW.PEARSONVUE.COM/NCLEX, OR I CAN CALL PEARSON VUE AT 866-49-NCLEX (866-496-2539).
I CAN'T FORGET TO PAY THE REQUIRED FEE.


LET'S BE HONEST. APPLYING FOR A LICENSE AND TAKING THE NCLEX CAN BE FRUSTRATING...
FILL OUT THE APPLICATION FOR LICENSURE AND OTHER REQUIRED FORMS.
PAY THE LICENSE FEE.
IF YOU START TO WORK BEFORE YOU TAKE THE NCLEX, FILL OUT THE APPLICATION FOR A LIMITED PERMIT.
SEND YOUR APPLICATION VIA CERTIFIED MAIL SO YOU HAVE CONFIRMATION OF ITS DELIVERY AND RECEIPT.
FILL OUT THE CERTIFICATION OF NURSING EDUCATION FORM AND SEND IT TO YOUR SCHOOL.


...BUT I WON'T LET THE SYSTEM GET ME DOWN.
OF COURSE, THE MOST IMPORTANT PART OF PREPARING FOR THE NCLEX IS STUDYING.
REVIEW BASIC NURSING INFORMATION.
BECOME FAMILIAR WITH NCLEX-TYPE QUESTIONS.
LEARN HOW TO APPLY WHAT I KNOW TO CLINICAL SITUATIONS.
DO PRACTICE QUESTIONS.
AND CONTROL PRETEST ANXIETY.
I NEED TO TAKE A SHORT BREAK FROM STUDYING TO CHECK THE MAIL.
A FEW WEEKS LATER...
OH, LOOK. MY AUTHORIZATION-TO-TEST FORM ARRIVED.


I'LL NEED THIS FORM TO GET INTO THE EXAM.
MY AUTHORIZATION-TO-TEST FORM ALSO LETS ME KNOW MY ASSIGNED CANDIDATE NUMBER. I'LL NEED THIS NUMBER WHEN I SCHEDULE MY EXAM.
NOW I'M READY TO CONTACT THE LOCAL TEST CENTER TO SCHEDULE MY EXAM.
THE GOOD THING IS THAT I CAN SCHEDULE THE EXAMINATION DATE, LOCATION, AND TIME AT MY CONVENIENCE, EITHER BY PHONE OR ONLINE.
WELL, TOMORROW IS THE BIG DAY. I BETTER GET A GOOD NIGHT'S SLEEP.
IT'S MORNING! BETTER MAKE SURE I EAT A GOOD BREAKFAST.
NCLEX POWER


WHOOPS. I BETTER MAKE SURE I BRING TWO FORMS OF ID AND MY AUTHORIZATION-TO-TEST FORM...
...AND LEAVE FOR THE TEST WITH PLENTY OF TIME TO SPARE.
TEST CENTER
NOW IT'S TIME TO CHECK IN.
WELCOME. PLEASE SIGN IN TO THE TEST CENTER LOG. I'LL NEED TO SEE TWO FORMS OF ID AND YOUR AUTHORIZATION-TO-TEST FORM.
NEXT, YOUR THUMBPRINT AND PHOTOGRAPH WILL BE TAKEN.
PLEASE ALLOW ME TO ESCORT YOU TO YOUR ASSIGNED COMPUTER.


YOU'LL HAVE UP TO FIVE HOURS TO COMPLETE THE EXAM. THIS INCLUDES A SHORT TUTORIAL TO FAMILIARIZE YOU WITH THE WAY THE NCLEX EXAM IS GIVEN ON THE COMPUTER.
TWO PREPROGRAMMED OPTIONAL BREAKS AND ANY OTHER UNSCHEDULED BREAKS ARE INCLUDED IN THE TIME LIMIT.
EVEN AFTER THE EXAM BEGINS, YOU CAN REQUEST ASSISTANCE REGARDING USE OF THE COMPUTER.
THIS IS IT.
STAY CALM AND...
...READ CHOICES THOROUGHLY.
BE LOGICAL.
ELIMINATE CHOICES THAT ARE OBVIOUSLY INCORRECT.
HEY, I KNOW THIS ONE!
CLICK
ABOUT THREE HOURS LATER...
YOUR TEST IS FINISHED
WHEW!


RESULTS ARE MAILED TO THE APPROPRIATE BOARD OF NURSING WITHIN 48 HOURS AFTER THE CANDIDATE HAS COMPLETED THE EXAMINATION. EACH BOARD OF NURSING FOLLOWS ITS OWN POLICY FOR DISTRIBUTING RESULTS. USUALLY, RESULTS ARE RECEIVED IN 2 TO 4 WEEKS.
YOU PASSED
WHAT'S THE BEST WAY TO PREPARE FOR THE NCLEX?
THE INCREDIBLY EASY WAY... GOOD LUCK!

Part I Getting ready

1 Preparing for the examination

In this chapter, you'll learn:

- why you must take the NCLEX
- what you need to know about taking the NCLEX by computer
- strategies to use when answering NCLEX questions
- how to recognize and answer new NCLEX alternate-format questions
- how to avoid common mistakes when taking the NCLEX.

NCLEX basics

Passing the National Council Licensure Examination (NCLEX®) is an important landmark in your career as a nurse. The first step on your way to passing the NCLEX is to understand what it is and how it's administered.

Exam structure

The NCLEX is a test written by registered nurses with a master's degree and clinical expertise in a particular area of nursing. Only one small difference distinguishes nurses who write NCLEX questions from those who are similarly qualified: They're trained to write questions in a style particular to this examination.

If you've completed an accredited nursing program, you've already taken numerous tests written by nurses with backgrounds and experiences similar to those of the nurses who write for the NCLEX. Therefore, the test-taking experience you've already gained will help you pass the NCLEX and your NCLEX review should be just that—a review of what you've already learned and should know.

What's the point?

The NCLEX is designed for one purpose: to determine whether it's appropriate for you to receive a license to practice as a nurse. By passing this exam, you demonstrate that you possess the minimum level of knowledge, understanding, and skills necessary to practice nursing safely.

Mix 'em up

In nursing school, you probably took courses organized according to the medical model. Courses were separated into such subjects as medical-surgical, pediatric, maternal-neonatal, and psychiatric nursing. In contrast, the NCLEX is integrated, which means that different subjects are mixed together.

As you answer NCLEX questions, you may encounter patients in any stage of life, from neonatal to geriatric. These patients—clients, in NCLEX lingo—may be of any background, may be completely well or extremely ill, and may have any of a variety of disorders.

Client needs, front and center

The NCLEX draws questions from four categories of client needs that were developed by the National Council of State Boards of Nursing (NCSBN), the organization that sponsors and manages the NCLEX. *Client needs categories* ensure that a wide variety of topics appear on every NCLEX.

The NCSBN developed client needs categories after conducting a work-study analysis of new nurses. All aspects of nursing care observed in the study were broken down into four main categories, some of which were broken down further into subcategories. (See *Client needs categories,* page 4.)

The whole kit and caboodle

The categories and subcategories are used to develop the *NCLEX test plan,* the content guidelines for the distribution of test questions. Question-writers and the people who put the NCLEX together use the test plan and client needs categories to make sure that a full spectrum of nursing activities is covered in the examination. Client needs categories appear in most NCLEX review and question-and-answer books, including this one. As a

Client needs categories

Each question on the NCLEX is assigned a category based on client needs. This chart lists client needs categories and subcategories and the percentages of each type of question that appear on the NCLEX.

Category	Subcategories	Percentage of questions
Safe, effective care environment	Coordinated care	12% to 18%
	Safety and infection control	8% to 14%
Health promotion and maintenance	—	7% to 13%
Psychosocial integrity	—	8% to 14%
Physiological integrity	Basic care and comfort	11% to 17%
	Pharmacological therapies	9% to 15%
	Reduction of risk potential	10% to 16%
	Physiological adaptation	11% to 17%

test-taker you don't have to concern yourself with client needs categories. You'll see those categories for each question and answer in this book, but they'll be invisible on the actual NCLEX.

Testing by computer

Like many standardized tests today, the NCLEX is administered by computer. That means you won't be filling in empty circles, sharpening pencils, or erasing frantically. It also means that you must become familiar with computer tests, if you aren't already. Fortunately, the skills required to take the NCLEX on a computer are simple enough to allow you to focus on the questions, not the keyboard.

Q&A formats—mixing them up

When you take the test, depending on the question format, you'll be presented with a question and four or more possible answers, a blank space in which to enter your answer, a figure on which you'll identify the correct area by clicking the mouse on it, a series of charts or exhibits you'll use to select the correct response, or items you must rearrange in priority order by dragging and dropping them in place.

Feeling smart? Think hard!

The NCLEX is a *computer-adaptive test*. When you respond to a question on the test, the computer supplies more difficult questions if you answer correctly and slightly easier questions if you answer incorrectly. This means each test is uniquely adapted to the individual test-taker.

A matter of time

You have a maximum of 5 hours to complete the test. That gives you the flexibility to spend extra time on more challenging questions. Just the same, it's important to keep an appro-

priate pace. Most students have plenty of time to finish the test. However, if you fail to correctly answer a set number of questions within 5 hours, the computer will determine that you lack minimum competency.

Difficult items = Good news

As you progress through the test, you may notice that the questions seem to be increasingly difficult. That's a good sign. The more questions you answer correctly, the more difficult the questions become.

Some students, knowing that questions get progressively harder, focus on the degree of difficulty of subsequent questions to figure out if they're answering questions correctly. Avoid this temptation and stay focused on selecting the best answer for each question.

Free at last!

The computer test ends when one of the following events occurs:

- You demonstrate minimum competency, according to the computer program.
- You demonstrate a lack of minimum competency, according to the computer program.
- You answer the maximum number of questions (205).
- You use the maximum time allowed (5 hours).

NCLEX questions

Most of the questions on the NCLEX are standard four-option, multiple-choice questions with only one correct answer. However, some questions are presented in other formats. Being able to identify the different types of questions you might find on the NCLEX can help you understand them and answer them correctly.

Alternate formats

The types of alternate-format questions are multiple-response, fill-in-the-blank; hot spot; chart/exhibit, and drag-and-drop.

Multiple, multiple: It's all or nothing

The first type of alternate-format question is the *multiple-response question*. Unlike a traditional multiple-choice question, each multiple-response question has one or more correct answers. It may also contain more than four possible answer options. You'll recognize this type of question because it will ask you to select *all* of the correct answers that apply—not just the best answer.

Keep in mind that for each multiple-response question, you must select all of the correct answers for the item to be counted as correct. On the NCLEX, you don't receive partial credit in the scoring of these items.

Don't go blank!

The second type of alternate-format question is the *fill-in-the-blank*. In this type of question, you perform a calculation and type your answer (a number, without any words, commas, or spaces) in the blank space provided after the question. No answer options are presented.

Feeling hot, hot, hot

The third type of alternate-format question is one that asks you to identify an area on an illustration or graphic. For these so-called *"hot-spot" questions*, the computerized exam will ask you to place your cursor and click over the correct area on an illustration. Try to be as precise as possible when marking the location. As with the fill-in-the-blanks, these questions require extremely precise answers.

Take a look at that!

The fourth alternate-format type is the *chart/exhibit format.* For this question type, you'll be given a problem and then a series of small screens with additional information you'll need to answer the question. By clicking on the tabs on screen, you can access each chart or exhibit item. After viewing the chart or exhibit, you select your answer from four multiple-choice options.

Sample NCLEX questions

Sometimes, getting used to the format is as important as knowing the material. Try your hand at these sample questions, and you'll have a leg up when you take the real test!

Four-option, multiple-choice question

The nurse turns a client 4 days after his abdominal surgery. When she observes the incision, she notes that part of the intestine is protruding. How should she intervene?

1. Cover the incision and protruding intestine with a sterile dressing.
2. Irrigate the incision with normal saline solution.
3. Cover the incision and protruding intestine with gauze soaked in normal saline solution.
4. Attempt to reinsert the protruding intestine and cover it with an abdominal binder.

Correct answer: 3

Multiple-response question

A client is admitted with chronic obstructive pulmonary disease (COPD). Which findings are characteristic of COPD? Select all that apply.

1. Decreased respiratory rate
2. Dyspnea on exertion
3. Barrel chest
4. Shortened expiratory phase
5. Clubbed fingers
6. Fever

Correct answers: 2, 3, 5

Fill-in-the-blank calculation question

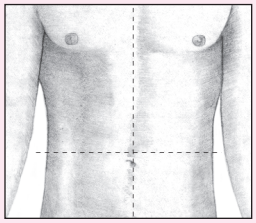
The physician prescribes 600 mg of ceftriaxone oral suspension to be given once daily to a client with pneumonia. The nurse obtains the suspension from the pharmacy and reads the label, which indicates that the dosage strength is 125 mg/5 ml. How many milliliters of the medication should the nurse administer? Record your answer using a whole number.

_____ milliliters

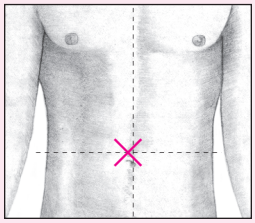
Correct answer: 24

Hot-spot question

Orders for a client with cirrhosis request a daily measurement of his abdominal girth. Identify the anatomical landmark where the tape measure should be placed to obtain this measurement.



Correct answer:



Sample NCLEX questions *(continued)*

Chart/exhibit question

A preschooler is being admitted to the hospital and isolation precautions need to be implemented. Based on the progress note below, which isolation precautions would be used for this client?

Progress notes

11/8/08 1100	5-year-old with varicella admitted with high fever, dehydration, and pruritic rash on face and trunk with lesions in all stages. See graphic record for vital signs. I.V. started in L arm. Isolation precautions instituted. J. Trump, RN

1. Standard precautions
2. Airborne precautions
3. Droplet precautions
4. Contact precautions

Correct answer: 2

Drag-and-drop question

The nurse thinks that her client may be in cardiac arrest. Based on American Heart Association guidelines, the nurse should perform the actions listed below in what order?

Unordered options:	Correct answer:
1. Activate the emergency response system.	2. Assess responsiveness.
2. Assess responsiveness.	1. Activate the emergency response system.
3. Call for a defibrillator.	3. Call for a defibrillator.
4. Provide two slow breaths.	6. Assess breathing.
5. Assess pulse.	4. Provide two slow breaths.
6. Assess breathing.	5. Assess pulse.

Focusing on what the question is really asking can help you choose the correct answer.

Drop it!

Drag-and-drop, the final type of alternate-format question, involves prioritizing actions or placing a series of statements in correct order using a drag-and-drop technique. To move an answer option from a list of unordered options into the correct sequence, click on it using the mouse. While still holding down the mouse button, drag the option to the ordered response part of the screen. Release the mouse button to "drop" the option into place.

Repeat this process until you've moved all the available options into the correct order.

The standard's still the standard

The number of alternate-format questions will vary for each candidate. In fact, your exam may contain only one. Keep in mind that standard four-option, multiple-choice questions constitute the bulk of the test. (See *Sample NCLEX questions.*)

Understanding the question

NCLEX questions are commonly long. As a result, it's easy to become overloaded with information. To focus on the question and avoid becoming overwhelmed, apply these proven strategies for answering NCLEX questions:

- Determine what the question is asking.
- Determine relevant facts about the client.
- Rephrase the question in your mind.
- Choose the best option(s) before entering your answer.

DETERMINE WHAT THE QUESTION IS ASKING

Read the question twice. If the answer isn't apparent, rephrase the question in simpler, more personal terms. This strategy may help you to focus more effectively to determine the correct answer.

Give it a try

For example, a question might be, "A 74-year-old client with a history of a myocardial infarction (MI) is admitted to the telemetry unit with heart failure. He's placed on 6 L of oxygen per minute and given furosemide (Lasix). Which parameters should the nurse watch closely to monitor the client's response to furosemide?"

The answer options for this question might include:

1. Daily weight
2. 24-hour intake and output
3. Serum sodium levels
4. Hourly urine output

Hocus, focus on the question

Read the question again, ignoring all details except what's being asked. Focus on the last line of the question. It asks you to select the appropriate parameter for monitoring a client who received furosemide.

DETERMINE WHAT FACTS ABOUT THE CLIENT ARE RELEVANT

Next, sort out the relevant client information. Identify any irrelevant information provided about the client. For instance, do you need to know that the client has been admitted to the telemetry unit? Probably not; his reaction to furosemide won't be affected by his location in the hospital.

Determine what you do know about the client. In the example, you know that:

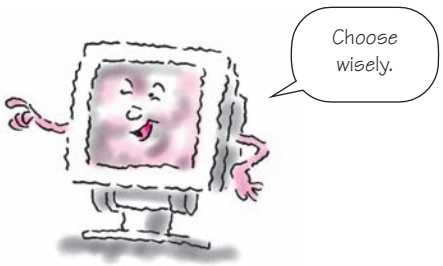
- he just received a dose of the diuretic furosemide, a crucial fact
- he has heart failure, the most fundamental aspect of the client's underlying condition
- he's receiving oxygen at 6 L/minute, which suggests that his heart failure is moderately severe
- he's 74 years old and has had an MI, a fact that may or may not be relevant.

REPHRASE THE QUESTION

After you've determined relevant information about the client and the question being asked, consider rephrasing the question to make it more clear. Eliminate jargon and put the question in simpler, more personal terms. Here's how you might rephrase the question in the example: "My client has heart failure. He requires 6 L/minute of oxygen. He's 74 years old and has had an MI. He received a dose of furosemide. What parameter should I monitor?"

CHOOSE THE BEST OPTION

Armed with all the information, it's time for you to select an option. You know that the client received a dose of furosemide. You know that monitoring fluid intake and output is a key nursing intervention for a client taking a diuretic, a fact that eliminates options 1 and 3 (daily weight and serum sodium levels) and narrows the answer down to option 2 or 4 (24-hour intake and output or hourly urine output).



Can I use a lifeline?

Monitoring the client's 24-hour intake and output would be appropriate for monitoring the effects of repeated doses of furosemide. Hourly urine output, however, is most appropriate in this situation because it monitors the more immediate effect of this drug.

Key strategies

Regardless of the type of question, four key strategies will help you determine the correct answer for each question. (See *Strategies for success.*) These strategies include:

- considering the nursing process
- referring to Maslow's hierarchy of needs
- reviewing client safety
- reflecting on principles of therapeutic communication.

Nursing process

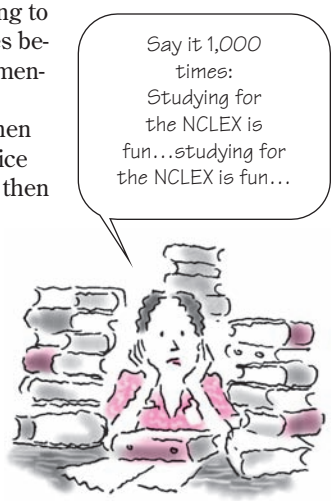
One of the ways to answer a question is to apply the nursing process. Steps in the nursing process are implemented in this order:

- data collection
- planning
- implementation
- evaluation.

First things first

The nursing process may provide insights that help you analyze a question. According to the nursing process, data collection comes before planning, which comes before implementation, which comes before evaluation.

You're halfway to the correct answer when you encounter a four-option, multiple-choice question that asks you to collect data and then provides two data collection options and two implementation options. You can immediately eliminate the implementation options. This gives you, at worst, a 50-50 chance of selecting the correct answer. Use the following sample question to apply the nursing process:



A client returns from an endoscopic procedure during which he was sedated. Before offering the client food, which action should the nurse take?

1. Monitor the client's respiratory status.
2. Check the client's gag reflex.
3. Place the client in a side-lying position.
4. Have the client drink a few sips of water.

Collect data before intervening

According to the nursing process, the nurse must collect client data before performing an

Advice from the experts

Strategies for success

Keeping a few main strategies in mind as you answer each NCLEX question can help ensure greater success. These four strategies are critical for answering NCLEX questions correctly:

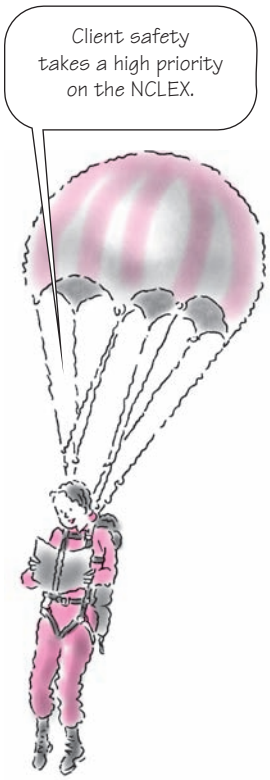
- If the question asks what you should do in a situation, use the nursing process to determine which step in the process would be next.
- If the question asks what the client needs, use Maslow's hierarchy to determine which need to address first.
- If the question indicates that the client doesn't have an urgent physiologic need, focus on the client's safety.
- If the question involves communicating with a client, use the principles of therapeutic communication.

intervention. Does the question indicate that data has been properly collected? No, it doesn't. Therefore, you can eliminate options 3 and 4 because they're both interventions.

That leaves options 1 and 2, both of which demonstrate data collection. Your nursing knowledge should tell you the correct answer—in this case, option 2. The sedation required for an endoscopic procedure may impair the client's gag reflex, so you would check the gag reflex before giving food to the client to reduce the risk of aspiration and airway obstruction.

Final elimination

Why not select option 1, monitoring the client's respiratory status? The question is specifically asking about offering the client food, an action that wouldn't be taken if the client's respiratory status was at all compromised. In this case, you're making a judgment based on the phrase, "before offering the client food." If the question was designed to test your knowledge of respiratory depression following an endoscopic procedure, it probably wouldn't mention a function such as feeding a client. This option clearly occurs only after the client's respiratory status has been stabilized.



Maslow's hierarchy

Knowledge of Maslow's hierarchy of needs can be a vital tool for answering questions on the NCLEX that require you to establish priorities. Maslow's theory states that physiologic needs are the most basic human needs of all. Only after physiologic needs have been met can safety concerns be addressed. Only after safety concerns are met can concerns involving love and belonging be addressed. Once concerns of love and belonging are met, an individual may explore the needs of self-esteem, then, ultimately, the needs of self-actualization. Apply the principles of Maslow's hierarchy of needs to the following sample question:

A client complains of severe pain 2 days after surgery. Which action should the nurse perform first?

1. Offer reassurance to the client that he will feel less pain tomorrow.
2. Allow the client time to verbalize his feelings.
3. Check the client's vital signs.
4. Administer an analgesic.

Phys before psych

In this example, options 3 and 4 address physiologic needs. Options 1 and 2 address psychosocial concerns. According to Maslow, physiologic needs must be met before psychosocial needs, so you can eliminate options 1 and 2.

Final elimination

Now, use your nursing knowledge to choose the best answer from the two remaining options. In this case, option 3 is correct because the client's vital signs should be checked before administering an analgesic (data collection before intervention). When prioritizing according to Maslow's hierarchy, remember your ABCs—airway, breathing, circulation—to help you further prioritize. Check for a patent airway before addressing breathing. Check breathing before checking the health of the cardiovascular system.

One caveat...

Always examine your choice in light of your knowledge and experience. Ask yourself, "Does this choice make sense for this client?" Allow yourself to eliminate choices—even ones that might normally take priority—if they don't make sense for a particular client's situation.

Client safety

As you might expect, client safety takes high priority on the NCLEX. You'll encounter many questions that can be answered by asking yourself, "Which answer will best ensure the safety of this client?" Use client safety criteria for situations involving laboratory values,

drug administration, or nursing care procedures.

Client first, equipment second

You may encounter a question in which some options address the client and others address the equipment. When in doubt, select an option relating to the client; never place equipment before a client.

For instance, suppose a question asks what the nurse should do first when entering a client's room where an infusion pump alarm is sounding. If two options deal with the infusion pump, one with the infusion tubing, and another with the client's catheter insertion site, select the one relating to the client's catheter insertion site. Always check the client first; the equipment can wait.

Therapeutic communication

Some NCLEX questions focus on the nurse's ability to communicate effectively with the client. Therapeutic communication incorporates verbal or nonverbal responses and involves:

- listening to the client
- understanding the client's needs
- promoting clarification
- gaining insight into the client's condition.

Room for improvement

Like other NCLEX questions, those dealing with therapeutic communication commonly require choosing the best response. First, eliminate options that indicate the use of poor therapeutic communication techniques, such as those in which the nurse:

- tells the client what to do without regard to his feelings or desires (the "do this" response)
- asks a question that can be answered with a one-word response, such as "yes" or "no"
- seeks reasons for the client's behavior
- implies disapproval of the client's behavior
- offers false reassurances
- attempts to interpret the client's behavior rather than allow the client to verbalize his own feelings
- offers a response that focuses on the nurse, not the client.

Ah, that's better!

When answering NCLEX questions, look for responses that:

- allow the client time to think and reflect
- encourage the client to talk
- encourage the client to describe a particular experience
- reflect that the nurse has listened to the client through paraphrasing the client's response or another communication technique.

Avoiding pitfalls

Even the most knowledgeable students can be tripped up by certain NCLEX questions. Students commonly cite three areas that can be difficult for unwary test-takers:

- knowing the difference between the NCLEX and the "real world"
- delegating care
- knowing laboratory values.

NCLEX examination versus the real world

Some students who take the NCLEX have extensive practical experience in health care. For example, many test-takers have worked as nursing assistants. In that capacity, test-takers might have been exposed to less than optimum clinical practice and may carry those experiences over to the NCLEX.

However, the NCLEX is a textbook examination—not a test of clinical skills. Take the NCLEX with the understanding that what happens in the real world may differ from what the NCLEX and your nursing school recommend.

Normal laboratory values

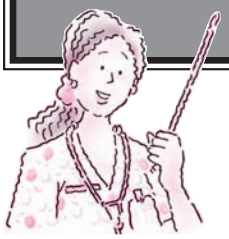
- Blood urea nitrogen: 8 to 25 mg/dl
- Creatinine: 0.6 to 1.5 mg/dl
- Sodium: 135 to 145 mmol/L
- Potassium: 3.5 to 5 mEq/L
- Chloride: 97 to 110 mmol/L
- Glucose (fasting plasma): 70 to 100 mg/dl
- Hemoglobin

  Male: 13.8 to 17.2 g/dl

  Female: 12.1 to 15.1 g/dl
- Hematocrit

  Male: 40.7% to 50.3%

  Female: 36.1% to 44.3%



Don't take shortcuts

If you've had practical experience in health care, you may know a quicker way to perform a procedure or tricks to help you get by when you don't have the right equipment. Situations such as staff shortages may force you to improvise. On the NCLEX, such scenarios can lead to trouble. Always check your practical experiences against textbook nursing care, and take care to select the response that follows the textbook.

Delegating care

On the NCLEX, you may encounter questions that assess your ability to delegate care. Delegating care involves coordinating the efforts of other health care workers to provide effective care for your client. On the NCLEX, you may be asked to assign duties to nursing assistants and other support staff.

In addition, you'll be asked to decide when to notify a registered nurse, a physician or practitioner, a social worker, or another hospital staff member. In each case, you'll have to decide when, where, and how to delegate.

Shoulds and shouldn'ts

As a general rule, it's okay to delegate actions that involve stable clients or standard procedures. Bathing, feeding, dressing, and transferring clients are examples of procedures that can be delegated.

Be careful not to delegate complicated or complex activities. In addition, don't delegate activities that involve data collection, evaluation, or your own nursing judgment. On the NCLEX and in the real world, these duties fall squarely on your shoulders. Make sure that you take primary responsibility for collecting client data, evaluating the client, and making decisions about the client's care. Never hand off those responsibilities to someone with less training.

Calling in reinforcements

Notifying a registered nurse, a physician or practitioner, a social worker, or another hospital staff member is an important element of nursing care. On the NCLEX, however, choices that involve notifying the physician are usually incorrect. Remember that the NCLEX tests you, the nurse, at work.

When you're sure the correct answer is to notify the physician, first make sure the client's safety has been addressed. On the NCLEX, the client's safety has a higher priority than notifying other health care providers.

Knowing laboratory values

Some NCLEX questions supply laboratory results without indicating normal levels. As a result, answering questions involving laboratory values requires you to have the normal range of the most common laboratory values memorized to make an informed decision (See *Normal laboratory values.*)

2 Strategies for success

In this chapter, you'll review:

- how to properly prepare for the NCLEX
- how to concentrate during difficult study times
- how to make more effective use of your time
- how creative strategies can enhance study.

Study preparations

If you're like most people preparing to take the NCLEX, you're probably feeling nervous, anxious, or concerned. Keep in mind that most test-takers pass the first time.

Passing the test won't happen by accident, though; you'll need to prepare carefully and efficiently. You should start studying sooner rather than later. To help jump-start your preparations:

- determine your strengths and weaknesses
- create a study schedule
- set realistic goals
- find an effective study space
- think positively.

Determine strengths and weaknesses

Most students recognize that, even at the end of their nursing studies, they know more about some topics than others. Because the NCLEX covers a broad range of material, you should make some decisions about how intensively you'll review each subject.

Make a review list

Base those decisions on a comprehensive list of topics you need to study. Start with the contents page in the front of this book, which summarizes the information you covered in school. Divide a sheet of paper in half vertically. Label one side "know well" and label the other side "needs review." List each topic from the contents page in the appropriate column. Don't worry if one list is longer than the other. After you've studied, you'll feel strong in every area. Separating content areas this way helps you allocate your study time.

Schedule study time

Study when you're most alert. If you feel most alert and energized in the morning, for example, set aside sections of time early in the day for topics that need a lot of review. Then you can use the evening, a time of lesser alertness, to refresh your memory about more familiar topics. The opposite is true as well; if you're more alert in the evening, study difficult topics at that time.

What you'll do when

Set up a basic schedule for studying. Using a calendar or an organizer, determine how much time remains before you'll take the NCLEX. (See *2 to 3 months before the NCLEX,* page 14.) Fill in the remaining days with specific times and topics to study. For example, you might schedule the respiratory system on a Tuesday morning and the GI system that afternoon. Remember to schedule difficult topics during your most alert times.

Keep in mind that you shouldn't fill each day with studying. Be realistic and set aside time for normal activities. Try to create ample study time before the NCLEX and then stick to the schedule.

Set realistic goals

Part of creating a schedule means setting goals you can accomplish. You no doubt studied a great deal in nursing school, and by now you have a sense of your own capabilities. Ask yourself, "How much can I cover in a day?" Set aside that amount of time and then stay on

To-do list

2 to 3 months before the NCLEX

Take these steps 2 to 3 months before you plan to take the examination:
- Establish a study schedule. Set aside ample time to study but leave time for social activities, exercise, family and personal responsibilities, and other matters.
- Become knowledgeable about the NCLEX: its content, the types of questions it asks, and the testing format.
- Begin studying your notes, texts, and other appropriate materials.
- Take some NCLEX practice questions to help you diagnose your strengths and weaknesses as well as to become familiar with NCLEX questions.

task. You'll feel better about yourself—and your chances of passing the NCLEX—when you meet your goals regularly.

Find an effective study space

Find a space to study that is conducive to effective learning. Whatever you do, don't study with a television on in the room. Instead, find an inviting, quiet, convenient place, away from normal traffic patterns. Sit in a solid chair that encourages good posture. (Avoid studying in bed; you'll be more likely to fall asleep and not accomplish your goals.) The room should have comfortable, soft lighting with which you can see clearly without straining, a temperature between 65° and 70°F, flowers or green plants, familiar photos or paintings, and easy access to soft, instrumental background music.

Accentuate the positive

Consider taping positive messages around your study space. Make signs with words of encouragement, such as "You can do it!" and "Remember the goal!" These upbeat messages can help keep you going when your attention begins to waver.

Maintaining concentration

When you're faced with reviewing the amount of information covered by the NCLEX, it's easy to become distracted and lose your concentration. When you lose concentration, you make less effective use of valuable study time. To stay focused, keep these tips in mind:
- Alternate the order of the subjects you study to add variety to your day. Try alternating between topics you find more interesting and those you find less interesting.
- Approach your study with enthusiasm, sincerity, and determination.
- Begin studying on a schedule and don't let anything interfere with your thought processes after you've begun.
- Concentrate on accomplishing one task at a time, to the exclusion of everything else, such as watching television and conversing with friends.
- Work continuously without interruption for a while, but don't study for such a long period that the whole experience becomes grueling or boring.
- Take breaks to give yourself a change of pace. These breaks can ease your transition into studying a new topic.

• When studying in the evening, wind down from your studies slowly. Don't go directly from studying to sleeping.

Taking care of yourself

Never neglect your physical and mental well-being in favor of longer study hours. Maintaining physical and mental health is critical for success in taking the NCLEX. (See *4 to 6 weeks before the NCLEX.*)

A few simple rules

You can increase your likelihood of passing the test by following these simple health rules:

• Get plenty of rest. You can't think deeply or concentrate for long periods when you're tired.

• Eat nutritious meals. Maintaining your energy level is impossible when you're undernourished.

• Exercise regularly. Regular exercise helps you work harder and think more clearly. As a result, you'll study more efficiently and increase the likelihood of success on the all-important NCLEX.

Memory powers, activate!

If you're having trouble concentrating but would rather push through than take a break, try making your studying more active by reading out loud. Active studying can renew your powers of concentration. By reading review material out loud, you're engaging your ears as well as your eyes—and making your study a more active process. Hearing the material out loud fosters memory and subsequent recall.

You can also rewrite in your own words a few of the more difficult concepts you're reviewing. Explaining these concepts in writing forces you to think through the material and can jump-start your memory.

Study schedule

When you were creating your schedule, you might have asked yourself, "How long should I study? One hour at a stretch? Two hours? Three?" To make the best use of your study time, you'll need to answer those questions.

Optimum study time

Experts are divided about the optimum duration of study time. Some say you should study no more than 1 hour at a time several times per day. Their reasoning: You remember the material you study at the beginning and end of a session best and are less likely to remember material studied in the middle of the session.

Other experts say you should hold longer study sessions because you lose time in the beginning, when you're just warming up, and again at the end, when you're cooling down.

To-do list

4 to 6 weeks before the NCLEX

Take these steps 4 to 6 weeks before you plan to take the examination:

• Focus on your areas of weakness. Keep in mind that you'll have time to review these areas again before the test date.

• Find a study partner or form a study group.

• Take a practice test to gauge your skill level early.

• Take time to eat, sleep, exercise, and socialize to avoid burnout.

Studying getting dull? Get creative and liven it up.

To-do list

1 week before the NCLEX

One week before the NCLEX, take these steps:
- Take a review test to measure your progress.
- Record key ideas and principles on note cards or audiotapes.
- Rest, eat well, and avoid thinking about the examination during nonstudy times.
- Treat yourself to one special event. You've been working hard, and you deserve it!

That means a long, concentrated study period will allow you to cover more material.

To thine own self be true

So what's the best plan? It doesn't matter as long as you determine what's best for you. At the beginning of your NCLEX study schedule, try study periods of varying lengths. Pay close attention to those that seem more successful.

Remember that you're a trained nurse who competently collects data. Think of yourself as a client, and collect data about your own progress. Then implement the strategy that works best for you.

Finding time to study

Regardless of the study plan you've chosen, remember that we all have periods in our day that might otherwise be dead time. These are perfect times to review for the NCLEX. However, you shouldn't cover new material because, by the time you get deep into new material, your time will be over. Always keep flash cards or a small notebook handy for situations when you have a few extra minutes. (See *1 week before the NCLEX*.)

You'll be amazed by how many short sessions you can find in a day and how much review you can do in 5 minutes. For example, the following occasions offer short stretches of time you can use for studying:
- eating breakfast
- waiting for a train or bus
- standing in line at the bank, post office, or bookstore.

Creative studying

Even when you study in a perfect place and concentrate better than ever, preparing for the NCLEX can get a little, well, dull. Even people with great study habits occasionally feel bored or sluggish. That's why it's important to have some creative tricks in your study bag to liven up those down times.

Creative studying doesn't have to be hard work. It involves making efforts to alter your study habits a bit. Some techniques that might help include studying with a partner or group and creating flash cards or other audiovisual study tools.

Study partners

Studying with a partner or group of students can be an excellent way to energize your studying. It allows you to test each other on the material you've reviewed and share ways of studying. You can also encourage and help each other to stay motivated. Perhaps most important, working with a partner can provide a welcome break from solitary studying.

What to look for in a partner

Exercise care when choosing a study partner or assembling a study group. A partner who doesn't fit your needs won't help you make the most of your study time. Look for a partner who:

- possesses goals similar to yours—for example, someone taking the NCLEX at approximately the same date as you will likely feel the same sense of urgency as you and might make an excellent partner.
- possesses about the same level of knowledge as you—tutoring someone can help you learn, but each partner should add to the other's knowledge.
- studies without excess chatting or interruptions—socializing is an important part of creative study but you have to pass the NCLEX, so stay serious!

Audiovisual tools

Using flash cards and other audiovisual tools fosters retention and makes learning and reviewing fun.

Flash Gordon? No, it's Flash Card!

Flash cards can be an excellent study tool. The process of writing material on a flash card will help you remember it. In addition, flash cards are small and portable, perfect for those 5-minute slivers of time during the day.

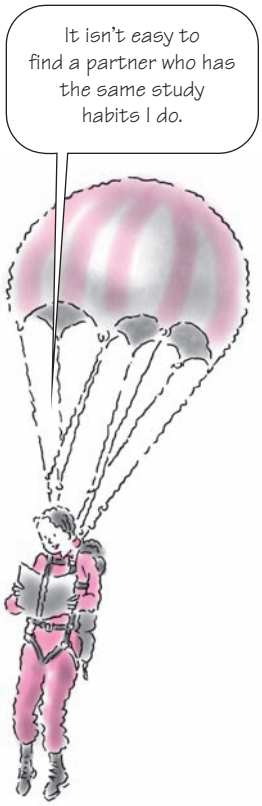
Creating flash cards should be fun. Use magic markers, highlighters, and other colorful tools to make them visually stimulating. The more effort you put into creating your flash cards, the better you'll remember the material contained on them.

Other visual tools

Flowcharts, drawings, diagrams, and other image-oriented study aids can also help you learn material more effectively. Substituting images for text can be a great way to give your eyes a break and recharge your brain. Use vivid colors to make your creations visually engaging.

Hear's the thing

If you learn more effectively when you hear information rather than see it, consider recording key ideas using a handheld tape recorder. Recording information helps promote memory because you say the information aloud and then listen to it as it plays back. Like flash cards, tapes are portable and perfect for those short study periods during the day. Don't forget to stock up on batteries. (See *The day before the NCLEX.*)



To-do list

The day before the NCLEX

One day before the NCLEX, take these steps:

- Drive to the test site to check traffic patterns and find out where to park. If your drive occurs during heavy traffic or if you're expecting bad weather, set aside extra time to ensure your prompt arrival.
- Do something relaxing during the day.
- Avoid thinking too much about the test.
- Rest and eat well.
- Call a supportive friend or relative for some last-minute words of encouragement.

To-do list

The day of the NCLEX

On the day of the NCLEX:
- Get up early.
- Wear comfortable clothes, preferably with layers you can add and remove to adjust to the room temperature.
- Leave your house early so you can arrive at the test site early.
- Avoid looking at your notes as you wait for your test computer.
- Listen carefully to the instructions given before entering the test room.

Practice questions

You can take practice tests on your computer using the CD-ROM in the back of this book.

Practice questions should be an important part of your NCLEX study strategy. Practice questions can improve your studying by helping you review material and familiarizing yourself with the exact style of questions you'll encounter on the test.

Practice at the beginning

Consider working through some practice questions as soon as you begin studying for the NCLEX. For example, you might try a few of the questions that appear at the end of each chapter in this book.

If you do well, you probably know that particular topic and can spend less time reviewing it. If you have trouble with the questions, spend extra study time on that topic.

I'm getting there

Practice questions can also provide an excellent means of marking your progress. Don't worry if you have trouble answering the first few practice questions; you'll need time to learn how the questions are asked. Eventually, you'll become accustomed to the question format and begin to focus more on the questions themselves.

If you make practice questions a regular part of your study regimen, you'll be able to recognize areas in which you're improving. You can then adjust your study time accordingly.

Practice makes perfect

As you near the examination date, you should increase the number of NCLEX practice questions you answer at one sitting. This will enable you to approximate the experience of taking the actual NCLEX. Using the CD-ROM found at the back of this book, you can take practice tests with varying numbers of questions. Note that 85 questions is the minimum number of questions you'll be asked on the actual NCLEX. By gradually tackling larger practice tests, you'll increase your confidence, build test-taking endurance, and strengthen the concentration skills that will enable you to succeed. (See *The day of the NCLEX*.)

Part II Care of the adult

3 Cardiovascular system

In this chapter, you'll review:

- the function of the heart, arteries, and veins
- tests used to diagnose cardiovascular disorders
- common cardiovascular disorders.

Brush up on key concepts

The heart, arteries, and veins make up the cardiovascular system. These structures:
- transport life-supporting oxygen and nutrients to cells
- help remove metabolic waste products
- carry hormones from one part of the body to another.

At the center of the system, the heart propels blood through the body by continuous rhythmic contractions.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 22 to 30.

2 atria & 2 ventricles

The heart is a muscular organ composed of two atria and two ventricles.

A sac

The heart is surrounded by a **pericardial sac** that consists of two layers: the **visceral** (inner) layer and the **parietal** (outer) layer.

3 layers

The heart wall has three layers:
- **epicardium** (visceral pericardium), the outer layer
- **myocardium,** the thick, muscular middle layer
- **endocardium,** the inner layer.

4 valves

There are four heart valves. The **tricuspid valve** (in the right side of the heart) and **mitral valve** (in the left side of the heart) lie between the atria and ventricles; because of their location, they're also called atrioventricular (AV) valves. These valves prevent backflow of blood into the atria when the ventricles contract. The **pulmonic semilunar valve** lies between the right ventricle and the pulmonary artery. The **aortic semilunar valve** lies between the left ventricle and the aorta. These valves prevent backflow of blood into the ventricles during diastole.

Pumping it in

The heart itself is nourished by blood from two main arteries, the **left coronary artery** and the **right coronary artery.** As it branches off the aorta, the left coronary artery branches into the left anterior descending (LAD) artery and the circumflex artery. The LAD artery then supplies blood to the anterior wall of the left ventricle, the anterior ventricular septum, and the apex of the left ventricle. The circumflex artery supplies blood to the left atrium and the lateral and posterior portions of the left ventricle.

The right coronary artery (RCA) fills the groove between the atria and ventricles. It gives rise to the acute marginal artery, which becomes the posterior descending artery. The RCA supplies blood to the sinoatrial (SA) and AV nodes, the septum, the right atrium, and the right ventricle. The posterior descending artery supplies blood to the posterior and inferior wall of the left ventricle and the posterior portion of the right ventricle.

Pumping it through (and out)

Blood circulates through the heart following this pathway:
- from the inferior and superior venae cavae to the right atrium
- through the tricuspid valve to the right ventricle
- through the pulmonic valve to the pulmonary artery, to the lungs where blood is oxygenated

(Text continues on page 30.)

Cheat sheet

Cardiovascular refresher

ABDOMINAL AORTIC ANEURYSM

Key signs and symptoms

- Commonly produces no symptoms

Key test results

- Chest X-ray shows an aneurysm.

Key treatments

- Abdominal aortic aneurysm resection or repair
- Blood administration, as needed

Key interventions

- Monitor and record vital signs.
- Monitor intake, output, and laboratory studies.
- Observe the patient for signs of hypovolemic shock from aneurysm rupture, such as:
  - anxiety and restlessness
  - severe back pain
  - decreased pulse pressure
  - increased thready pulse
  - pale, cool, moist, clammy skin.

ANGINA

Key signs and symptoms

- Pain may be substernal, crushing, or compressing; may radiate to the arms, jaw, or back; usually lasts 3 to 5 minutes; usually occurs after exertion, emotional excitement, or exposure to cold but can also develop when the patient is at rest

Key test results

- Electrocardiogram (ECG) shows ST-segment depression and T-wave inversion during anginal pain.

Key treatments

- Percutaneous transluminal coronary angioplasty or coronary artery stent placement

Key interventions

- Administer medications as prescribed. Withhold nitrates and notify doctor if systolic blood pressure is less than 90 mm Hg. Withhold beta-adrenergic blockers and notify doctor if heart rate is less than 60 beats/minute.
- Monitor for chest pain; if present, evaluate its characteristics.
- Obtain 12-lead ECG during an acute attack.

ARRHYTHMIAS

Key signs and symptoms

Atrial fibrillation

- Commonly produces no symptoms
- Irregular pulse with no pattern to the irregularity

Asystole

- Apnea
- Cyanosis
- No palpable blood pressure
- Pulselessness

Ventricular fibrillation

- Apnea
- No palpable blood pressure
- Pulselessness or pulselessness

Ventricular tachycardia

- Diaphoresis
- Hypotension
- Weak pulse or pulselessness
- Dizziness

Key test results

Atrial fibrillation

- ECG shows:
  - irregular atrial rhythm
  - atrial rate greater than 400 beats/minute
  - irregular ventricular rhythm
  - QRS complexes of uniform configuration and duration
  - no discernible PR interval
  - no P waves or P waves that appear as erratic, irregular baseline fibrillation waves.

Asystole

- ECG shows no atrial or ventricular rate or rhythm and no discernible P waves, QRS complexes, or T waves.

Ventricular fibrillation

- ECG shows ventricular activity that appears as fibrillatory waves with no recognizable pattern. Atrial rate and rhythm and ventricular rhythm can't be determined because no pattern or regularity occurs. The P wave, PR interval, QRS complex, T wave, and QT interval can't be determined.

Want a quick overview of this chapter? Check out the Cheat sheet.

Cardiovascular refresher *(continued)*

ARRHYTHMIAS *(continued)*

Ventricular tachycardia

• ECG shows ventricular rate of 100 to 250 beats/minute, wide and bizarre QRS complexes, and no discernible P waves. Ventricular tachycardia may start or stop suddenly.

Key treatments

Atrial fibrillation

• Antiarrhythmics: amiodarone (Cordarone), digoxin (Lanoxin), diltiazem (Cardizem), procainamide (Pronestyl), verapamil (Calan)

• Synchronized cardioversion (if patient is unstable)

Asystole

• Cardiopulmonary resuscitation (CPR)

• Advanced cardiac life support (ACLS) protocol for endotracheal (ET) intubation and possible transcutaneous pacing

• Atropine, epinephrine (Adrenalin) per ACLS protocol

Ventricular fibrillation

• CPR

• Defibrillation

• ACLS protocol for endotracheal intubation

• Amiodarone (Cordarone), epinephrine (Adrenalin), lidocaine (Xylocaine), magnesium sulfate, procainamide (Pronestyl), vasopressin per ACLS protocol

Ventricular tachycardia

• CPR, if pulseless

• Defibrillation

• ACLS protocol for ET intubation

• Amiodarone (Cordarone), epinephrine (Adrenalin), lidocaine (Xylocaine), magnesium sulfate, procainamide (Pronestyl)

Key interventions

• Monitor ECG to detect arrhythmias and ischemia.

• If the patient's pulse is abnormally rapid, slow, or irregular, watch for signs of hypoperfusion, such as hypotension and altered mental status.

• When life-threatening arrhythmias develop, rapidly assess the level of consciousness (LOC), respirations, and pulse.

• Initiate CPR, if indicated.

• Administer medications as needed, and prepare for medical procedures (for example, cardioversion) if indicated.

• Monitor pulse oximetry. Provide adequate oxygen to reduce the heart's workload while carefully maintaining metabolic, neurologic, respiratory, and hemodynamic status.

ARTERIAL OCCLUSIVE DISEASE

Key signs and symptoms

Femoral, popliteal, or innominate arteries

• Mottling of the affected extremity

• Pallor

• Paralysis and paresthesia in the affected arm or leg

• Pulselessness distal to the occlusion

• Sudden and localized pain in the affected arm or leg (most common symptom)

• Temperature change distal to the occlusion

Internal and external carotid arteries

• Transient ischemic attacks (TIAs) that produce transient monocular blindness, dysarthria, hemiparesis, possible aphasia, confusion, decreased mentation, headache

Subclavian artery

• Subclavian steel syndrome (characterized by the backflow of blood from the brain through the vertebral artery on the same side as the occlusion into the subclavian artery distal to the occlusion; clinical effects of vertebrobasilar occlusion and exercise-induced arm claudication)

Vertebral and basilar arteries

• TIAs that produce binocular vision disturbances, vertigo, dysarthria, and falling down without loss of consciousness

Key test results

• Arteriography demonstrates the type (thrombus or embolus), location, and degree of obstruction, and the status of collateral circulation.

• Doppler ultrasonography shows decreased blood flow distal to the occlusion.

Key treatments

• Surgery (for acute arterial occlusive disease): atherectomy, balloon angioplasty, bypass graft, embolectomy, laser angioplasty, patch grafting, stent placement, thromboendarterectomy, amputation

• Thrombolytic agents: alteplase (Activase), streptokinase (Streptase)

Key interventions

Preoperatively (during an acute episode)

• Check the patient's most distal pulses and inspect his skin color and temperature.

• Provide pain relief as needed.

• Maintain heparin infusion per protocol.

• Watch for signs of fluid and electrolyte imbalance, and monitor intake and output for signs of renal failure (urine output less than 30 ml/hour).

(continued)

Cardiovascular refresher *(continued)*

ARTERIAL OCCLUSIVE DISEASE *(continued)*

Postoperatively

• Monitor the patient's vital signs. Continuously monitor his circulatory function by inspecting skin color, taking temperature, and checking for distal pulses. While charting, compare earlier findings and observations. Watch closely for signs of hemorrhage (tachycardia, hypotension), and check dressings for excessive bleeding.
• Check neurologic status frequently for changes in LOC, muscle strength, or pupil size.
• With mesenteric artery occlusion, connect a nasogastric tube to low intermittent suction. Monitor intake and output. Check abdominal status.
• With saddle block occlusion, check distal pulses for adequate circulation. Watch for signs of renal failure and mesenteric artery occlusion (severe abdominal pain).
• With iliac artery occlusion, monitor urine output for signs of renal failure from decreased perfusion to the kidneys as a result of surgery. Provide meticulous catheter care.
• With femoral and popliteal artery occlusion, assist with early ambulation and discourage prolonged sitting.

CARDIAC TAMPONADE

Key signs and symptoms

• Muffled heart sounds on auscultation
• Narrow pulse pressure
• Jugular vein distention
• Pulsus paradoxus (an abnormal inspiratory drop in systemic blood pressure greater than 15 mm Hg)
• Restlessness
• Upright, leaning forward posture

Key test results

• Chest X-ray shows slightly widened mediastinum and cardiomegaly.
• Echocardiography identifies pericardial effusion with signs of right ventricular and atrial compression.
• ECG may reveal:
  – a low-amplitude QRS complex and electrical alternans
  – an alternating beat-to-beat change in the amplitude of the P wave, QRS complex, and T wave
  – a generalized ST-segment elevation is noted in all leads.

Key treatments

• Supplemental oxygen
• Surgery: pericardiocentesis (needle aspiration of the pericardial cavity) or surgical creation of an opening to drain fluid, thoracotomy
• Inotropic agent: dopamine (Intropin)

Key interventions

For pericardiocentesis

• Keep a pericardial aspiration needle attached to a 50-ml syringe by a three-way stopcock, an ECG machine, and an emergency cart with a defibrillator at the bedside. Keep the equipment turned on to be prepared for immediate use.
• Position the patient at a 45- to 60-degree angle.
• Monitor blood pressure during and after pericardiocentesis to watch for complications such as hypotension, which may indicate cardiac chamber puncture.
• Be alert for complications of pericardiocentesis, such as ventricular fibrillation, vasovagal response, or coronary artery or cardiac chamber puncture.

For thoracotomy

• Explain the procedure to the patient. Tell him what to expect after the operation (chest tubes, drainage bottles, administration of oxygen). Teach him how to turn, deep-breathe, and cough.
• Maintain the chest drainage system, and observe the patient for complications, such as hemorrhage and arrhythmias.

CARDIOGENIC SHOCK

Key signs and symptoms

• Cold, clammy skin
• Hypotension (systolic pressure below 90 mm Hg)
• Narrow pulse pressure
• Tachycardia or other arrhythmias

Key test results

• ECG shows myocardial infarction (MI), as indicated by an enlarged Q wave and elevated ST segment.

Key treatments

• Intra-aortic balloon pump
• Adrenergic agent: epinephrine (Adrenalin)
• Cardiac glycoside: digoxin (Lanoxin)
• Cardiac inotropic agents: dopamine (Intropin), dobutamine (Dobutrex), inamrinone (Inocor), milrinone (Primacor)
• Diuretics: furosemide (Lasix), bumetanide (Bumex), metolazone (Zaroxolyn)
• Vasodilators: nitroprusside (Nitropress), nitroglycerin (Tridil)
• Vasopressor: norepinephrine (Levophed)

Cardiovascular refresher *(continued)*

CARDIOGENIC SHOCK *(continued)*

Key interventions

- Monitor vital signs, heart sounds, capillary refill, skin temperature, and peripheral pulses.
- Monitor ECG.
- Monitor respiratory status, including breath sounds and arterial blood gas (ABG) levels.
- Administer oxygen and medications as prescribed.
- Maintain I.V. fluids.

CARDIOMYOPATHY

Key signs and symptoms

- Murmur
- S_3 and S_4

Key test results

- ECG shows left ventricular hypertrophy and nonspecific changes.

Key treatments

- Dual chamber pacing (for hypertrophic cardiomyopathy)
- Beta-adrenergic blockers: propranolol (Inderal), nadolol (Corgard), metoprolol (Lopressor) for hypertrophic cardiomyopathy
- Calcium channel blockers: verapamil (Calan), diltiazem (Cardizem) for hypertrophic cardiomyopathy
- Diuretics: furosemide (Lasix), bumetanide (Bumex), metolazone (Zaroxolyn) for dilated cardiomyopathy
- Inotropic agents: dobutamine (Dobutrex), milrinone (Primacor), digoxin (Lanoxin) for dilated cardiomyopathy
- Oral anticoagulant: warfarin (Coumadin) for dilated or hypertrophic cardiomyopathy

Key interventions

- Monitor ECG.
- Monitor vital signs.
- Administer oxygen and medications, as prescribed.

CORONARY ARTERY DISEASE

Key signs and symptoms

- Chest pain that may be substernal, crushing, or compressing; may radiate to the arms, jaw, or back; usually lasts 3 to 5 minutes; usually occurs after exertion, emotional excitement, or exposure to cold but can also develop when the patient is at rest

Key test results

- Blood chemistry tests show increased cholesterol (decreased high-density lipoproteins and increased low-density lipoproteins).
- ECG or Holter monitor shows ST-segment depression and T-wave inversion during an anginal episode.

Key treatments

- Activity changes, including weight loss, if necessary
- Dietary changes, including establishing a low-sodium, low-cholesterol, low-fat diet with increased dietary fiber (low-calorie only if appropriate)
- Oxygen therapy
- Antilipemic agents: cholestyramine (Questran), lovastatin (Mevacor), simvastatin (Zocor), nicotinic acid (Niacor), gemfibrozil (Lopid), colestipol (Colestid)

Key interventions

- Obtain ECG during anginal episodes.
- Monitor vital signs.
- Monitor ECG.
- Monitor intake and output.
- Administer nitroglycerin for anginal episodes.

ENDOCARDITIS

Key signs and symptoms

- Chills
- Fatigue
- Loud, regurgitant murmur

Key test results

- Echocardiography may identify valvular damage.
- ECG may show atrial fibrillation and other arrhythmias that accompany valvular disease.
- Three or more blood cultures in a 24- to 48-hour period identify the causative organism in up to 90% of patients.

Key treatments

- Maintaining sufficient fluid intake
- Antibiotics: based on causative organism
- Antiplatelet agent: Aspirin

Key interventions

- Monitor ECG.
- Monitor cardiovascular status.
- Watch for signs of embolization (hematuria, pleuritic chest pain, left-upper-quadrant pain, and paresis), a common occurrence during the first 3 months of treatment.
- Monitor the patient's renal status (blood urea nitrogen [BUN] level, creatinine clearance, and urine output).
- Observe for signs of heart failure, such as dyspnea, tachypnea, tachycardia, crackles, jugular vein distention, edema, and weight gain.

(continued)

Cardiovascular refresher *(continued)*

HEART FAILURE

Key signs and symptoms

Left-sided failure
- Crackles
- Dyspnea
- Gallop rhythm: S_3, S_4

Right-sided failure
- Dependent edema
- Jugular vein distention
- Weight gain

Key test results

Left-sided failure
- B-type natriuretic peptide (BNP) levels elevated
- Chest X-ray shows increased pulmonary congestion and left ventricular hypertrophy.

Right-sided failure
- BNP levels elevated
- Chest X-ray reveals pulmonary congestion, cardiomegaly, and pleural effusion.

Key treatments
- Diuretics: furosemide (Lasix), bumetanide (Bumex), metolazone (Zaroxolyn)
- Human B-type natriuretic peptide: nesiritide (Natrecor)
- Angiotensin-converting enzyme (ACE) inhibitors: captopril (Capoten), enalapril (Vasotec), lisinopril (Prinivil)
- Cardiac glycoside: digoxin (Lanoxin)
- Inotropic agents: dopamine (Intropin), dobutamine (Dobutrex), inamrinone (Inocor)
- Nitrates: isosorbide dinitrate (Isordil), nitroglycerin (Nitro-Bid)
- Vasodilator: nitroprusside (Nitropress)

Key interventions
- Administer oxygen.
- Monitor ECG.
- Monitor vital signs.
- Monitor respiratory status.
- Keep the patient in semi-Fowler's position.
- Weigh the patient daily.

HYPERTENSION

Key signs and symptoms
- Produces no symptoms.

Key test results
- Blood pressure measurements result in sustained readings greater than 140/90 mm Hg.

Key treatments
- Weight reduction
- Increased physical activity
- Dietary changes
- Reducing sodium intake
- Limiting alcohol intake
- ACE inhibitors: captopril (Capoten), enalapril (Vasotec), lisinopril (Prinivil)

Key interventions
- Monitor vital signs. Take two or more blood pressure readings rather than relying on a single, possibly abnormal reading.

HYPOVOLEMIC SHOCK

Key signs and symptoms
- Cold, pale, clammy skin
- Decreased sensorium
- Hypotension with narrow pulse pressure
- Reduced urine output (less than 25 ml/hour)
- Tachycardia

Key test results
- Blood tests show:
  - elevated serum potassium, serum lactate, and BUN levels
  - increased urine specific gravity (greater than 1.020) and urine osmolality
  - decreased hemoglobin and hematocrit
  - decreased blood pH
- ABG analysis reveals metabolic acidosis.

Key treatments
- Supplemental oxygen
- Blood and fluid replacement
- Control of bleeding

Key interventions
- Record blood pressure, pulse rate, peripheral pulses, respiratory rate, and pulse oximetry readings every 15 minutes, and monitor the ECG continuously. A systolic blood pressure lower than 80 mm Hg usually results in inadequate coronary artery blood flow, cardiac ischemia, arrhythmias, and further complications of low cardiac output. When blood pressure drops below 80 mm Hg, increase the oxygen flow rate and notify the charge nurse or doctor immediately.
- Maintain I.V. lines with normal saline or lactated Ringer's.
- An indwelling urinary catheter may be inserted to measure urine output. If less than 30 ml/hour in adults, increase the fluid infusion rate but watch for signs of fluid overload. Notify the charge nurse or doctor if urine output doesn't improve. An osmotic diuretic such as mannitol (Osmitrol) may be ordered.

Cardiovascular refresher *(continued)*

HYPOVOLEMIC SHOCK *(continued)*

• During therapy, assess skin color and temperature and note any changes.

MYOCARDIAL INFARCTION

Key signs and symptoms

• Crushing substernal chest pain that may:
  – radiate to the jaw, back, and arms
  – last longer than anginal pain
  – not be relieved by rest or nitroglycerin
  – not be present (in silent MI—present atypically in women)

Key test results

• ECG shows an enlarged Q wave, an elevated or a depressed ST segment, and T-wave inversion.

Key treatments

• Antiplatelet aggregation: aspirin, abciximab (ReoPro), clopidogrel (Plavix), eptifibatide (Integrilin)
• Thrombolytic agents: tissue plasminogen activator (Activase), streptokinase (Steptase), anistreplase (Eminase), reteplase (Retavase); given within 6 hours of onset of symptoms but most effective when started within 3 hours

Key interventions

• Monitor respiratory status.
• Obtain an ECG reading during acute pain.

MYOCARDITIS

Key signs and symptoms

• Arrhythmias (S_3 and S_4 gallops, faint S_1)
• Dyspnea
• Fatigue
• Fever

Key test results

• ECG typically shows diffuse ST-segment and T-wave abnormalities (as in pericarditis), conduction defects (prolonged PR interval), and other supraventricular arrhythmias.
• Endomyocardial biopsy confirms the diagnosis, but a negative biopsy doesn't exclude the diagnosis. A repeat biopsy may be needed.

Key treatments

• Bed rest
• Antiarrhythmics: amiodarone (Cordarone), procainamide (Pronestyl)
• Antibiotics according to sensitivity of causative organism
• Cardiac glycoside: digoxin (Lanoxin) to increase myocardial contractility
• Diuretic: furosemide (Lasix)

Key interventions

• Observe breathing pattern and check lung status.
• Stress the importance of bed rest. Assist the patient with bathing as needed; provide a bedside commode. Reassure the patient that activity limitations are temporary.

PERICARDITIS

Key signs and symptoms

Acute pericarditis

• Pericardial friction rub (grating sound heard as the heart moves)
• Sharp and commonly sudden pain that usually starts over the sternum and radiates to the neck, shoulders, back, and arms (Unlike the pain of MI, pericardial pain is commonly pleuritic, increasing with deep inspiration and decreasing when the patient sits up and leans forward, pulling the heart away from the diaphragmatic pleurae of the lungs.)

Chronic pericarditis

• Pericardial friction rub
• Symptoms similar to those of chronic right-sided heart failure (fluid retention, ascites, hepatomegaly)

Key test results

• Echocardiography confirms the diagnosis when it shows an echo-free space between the ventricular wall and the pericardium (in cases of pleural effusion).
• ECG shows the following changes in acute pericarditis: elevation of ST segments in the standard limb leads and most precordial leads without significant changes in QRS morphology that occur with MI, atrial ectopic rhythms such as atrial fibrillation, and diminished QRS voltage in pericardial effusion.

Key treatments

• Bed rest
• Surgery: pericardiocentesis (for cardiac tamponade), partial pericardectomy (for recurrent pericarditis), and total pericardectomy (for constrictive pericarditis)
• Antibiotics according to sensitivity of causative organism

Key interventions

• Provide complete bed rest.
• Monitor pain related to respiration and body position.
• Place the patient in an upright position.

(continued)

Cardiovascular refresher *(continued)*

PERICARDITIS *(continued)*

• Provide analgesics and oxygen, and reassure the patient with acute pericarditis that his condition is temporary and treatable.

PULMONARY EDEMA

Key signs and symptoms

• Dyspnea, orthopnea, tachypnea

Key test results

• Chest X-ray shows pulmonary congestion.

Key treatments

• Diuretics: furosemide (Lasix), bumetanide (Bumex), metolazone (Zaroxolyn)
• Cardiac glycoside: digoxin (Lanoxin)
• Inotropic agents: dobutamine (Dobutrex), inamrinone (Inocor), milrinone (Primacor), nesiritide (Natrecor)
• Nitrates: isosorbide dinitrate (Isordil), nitroglycerin (Nitro-Bid)
• Vasodilator: nitroprusside (Nitropress)

Key interventions

• Administer oxygen.
• Monitor vital signs and breathing pattern.
• Place the patient in high Fowler's position if blood pressure remains stable; if hypotensive, maintain in semi-Fowler's position if tolerated.
• Monitor ECG.
• Monitor pulse oximetry readings.

RAYNAUD'S DISEASE

Key signs and symptoms

• Numbness and tingling that are relieved by warmth
• Typically, after exposure to cold or stress, blanching of the skin on the fingers, which then become cyanotic before changing to red

Key test results

• Arteriography reveals vasospasm.

Key treatments

• Activity changes: avoidance of cold
• Smoking cessation (if appropriate)
• Surgery (used in less than 25% of patients): sympathectomy
• Calcium channel blockers: diltiazem (Cardizem), nifedipine (Procardia)

Key interventions

• Advise the patient to avoid exposure to the cold. Tell him to wear mittens or gloves in cold weather and when handling cold items.

RHEUMATIC FEVER AND RHEUMATIC HEART DISEASE

Key signs and symptoms

• Temperature of 100.4° F (38° C) or higher
• Migratory joint pain or polyarthritis

Key test results

• Blood tests show elevated white blood cell count and erythrocyte sedimentation rate and slight anemia during periods of inflammation.
• Cardiac enzyme levels may increase in severe carditis.
• C-reactive protein test is positive (especially during the acute phase).

Key treatments

• Bed rest (in severe cases)
• Surgery: corrective valvular surgery (in cases of persistent heart failure)
• Antibiotics: erythromycin (Erythrocin), penicillin (Pfizerpen)
• Nonsteroidal anti-inflammatory drugs (NSAIDs): aspirin, indomethacin (Indocin)

Key interventions

• Before giving penicillin, ask the patient if he has ever had a hypersensitivity reaction to it. Even if the patient has never had a reaction to penicillin, warn him that such a reaction is possible.
• Warn the patient to watch for and immediately report signs of recurrent streptococcal infection:
  – diffuse throat redness and oropharyngeal exudate
  – swollen and tender cervical lymph glands
  – pain on swallowing
  – temperature of 101° to 104° F (38.3° to 40° C).
• Urge the patient to avoid people with respiratory tract infections.

THORACIC AORTIC ANEURYSM

Key signs and symptoms

Ascending aneurysm

• Pain (described as severe, penetrating, and ripping and extending to the neck, shoulders, lower back, or abdomen)
• Unequal intensities of the right carotid and left radial pulses

Descending aneurysm

• Pain (described as sharp and tearing, usually starting suddenly between the shoulder blades and possibly radiating to the chest)

Cardiovascular refresher *(continued)*

THORACIC AORTIC ANEURYSM *(continued)*

Transverse aneurysm

- Dyspnea
- Pain (described as sharp and tearing and radiating to the shoulders)

Key test results

- Aortography, the definitive test, shows the lumen of the aneurysm, its size and location, and the false lumen in a dissecting aneurysm.
- Chest X-ray shows widening of the aorta.
- Computed tomography scan confirms and locates the aneurysm and may be used to monitor its progression.

Key treatments

- Surgery: resection of aneurysm with a Dacron or Teflon graft replacement, possible replacement of aortic valve
- Blood product administration
- Oxygen therapy and possibly ET intubation and mechanical ventilation
- Analgesic: morphine
- Antihypertensives: nitroprusside (Nitropress), labetalol (Normodyne)
- Negative inotropic agent: propranolol (Inderal)

Key interventions

- Monitor the patient's blood pressure. Also evaluate pain, breathing, and carotid, radial, and femoral pulses.
- Insert an indwelling urinary catheter. Maintain I.V. infusion of normal saline or lactated Ringer's solution and antibiotics as needed.
- When the doctor suspects that an aneurysm is leaking, give any ordered whole-blood transfusion.

After repair of thoracic aneurysm

- Evaluate the patient's LOC. Monitor vital signs, pulse rate, urine output, and pain.
- Check respiratory function. Carefully observe and record the type and amount of chest tube drainage, and frequently assess heart and breath sounds.
- Monitor I.V. therapy to prevent fluid excess, which may occur with rapid fluid replacement.
- Give medications as appropriate.

THROMBOPHLEBITIS

Key signs and symptoms

Deep vein thrombophlebitis

- Cramping calves
- Edema
- Tenderness to touch

Superficial vein thrombophlebitis

- Redness along vein
- Warmth and tenderness along vein

Key test results

- Photoplethysmography shows venous-filling defects.
- Ultrasound reveals decreased blood flow.

Key treatments

- Activity changes: maintaining bed rest and elevating the affected extremity
- Anticoagulants: warfarin (Coumadin), heparin, dalteparin (Fragmin), enoxaparin (Lovenox)
- Antiplatelet aggregation agent: aspirin
- Fibrinolytic agent: streptokinase (Streptase)

Key interventions

- Monitor breathing pattern and breath sounds.
- Maintain bed rest, and elevate the affected extremity.
- Apply warm, moist compresses to improve circulation.
- Perform neurovascular checks.
- Monitor laboratory values.

VALVULAR HEART DISEASE

Key signs and symptoms

Aortic insufficiency

- Angina
- Cough
- Dyspnea
- Fatigue
- Palpitations

Mitral insufficiency

- Angina
- Dyspnea
- Fatigue
- Orthopnea
- Peripheral edema

Mitral stenosis

- Dyspnea on exertion
- Fatigue
- Orthopnea
- Palpitations
- Peripheral edema
- Weakness

Mitral valve prolapse

- May produce no symptoms
- Palpitations

(continued)

Cardiovascular refresher *(continued)*

VALVULAR HEART DISEASE *(continued)*

Tricuspid insufficiency

- Dyspnea
- Fatigue

Key test results

Aortic insufficiency

- Echocardiography shows left ventricular enlargement.
- Chest X-ray shows left ventricular enlargement and pulmonary vein congestion.

Mitral insufficiency

- Cardiac catheterization shows mitral regurgitation and elevated atrial and pulmonary artery wedge pressures.

Mitral stenosis

- Cardiac catheterization shows diastolic pressure gradient across valve and elevated left atrial and pulmonary artery wedge pressures.
- Echocardiography shows thickened mitral valve leaflets.
- ECG shows left atrial hypertrophy.
- Chest X-ray shows left atrial and ventricular enlargement.

Mitral valve prolapse

- ECG shows prolapse of the mitral valve into the left atrium.

Tricuspid insufficiency

- Echocardiography shows systolic prolapse of the tricuspid valve.
- ECG shows right atrial or right ventricular hypertrophy.
- Chest X-ray shows right atrial dilation and right ventricular enlargement.

Key treatments

- Surgery: open-heart surgery using cardiopulmonary bypass for valve replacement (in severe cases)
- Anticoagulant: warfarin (Coumadin) to prevent thrombus formation around diseased or replaced valves

Key interventions

- Watch closely for signs of heart failure or pulmonary edema and for adverse effects of drug therapy.
- Place the patient in an upright position.
- Maintain bed rest, and provide assistance with bathing, if necessary.
- If the patient undergoes surgery, watch for hypotension, arrhythmias, and thrombus formation. Monitor vital signs, intake, output, daily weight, and blood chemistry values.

Cardiac output is the total amount of blood ejected from a ventricle per minute.

- through the pulmonary veins to the left atrium
- through the mitral valve to the left ventricle
- through the aortic valve to the aorta and throughout the body.

The body electric

The system that conducts electrical impulses and coordinates the heart's contractions consists of the SA node, internodal tracts, AV node, bundle of His, right and left bundle branches, and Purkinje fibers.

A normal electrical impulse is initiated at the **SA node,** the heart's intrinsic pacemaker, which results in the following chain of events:

- atrial depolarization
- atrial contraction
- impulse transmission to the AV node
- impulse transmission to the bundle of His, bundle branches, and Purkinje fibers
- ventricular depolarization
- ventricular contraction
- ventricular repolarization.

How's it working?

Cardiac function can be assessed by measuring three parameters:

- **Cardiac output** is the total amount of blood ejected from a ventricle per minute. Cardiac output equals stroke volume multiplied by heart rate (CO = SV × HR).
- **Stroke volume** is the amount of blood ejected from a ventricle with each beat (normally, 70 ml).
- **Ejection fraction** is the percentage of left ventricular end-diastolic volume ejected during systole (normally, 60% to 70%).

A system of canals

Blood flows throughout the body via arteries and veins as well as smaller vessels, such as arterioles, capillaries, and venules:

- **Arteries** are three-layered vessels (intima, media, adventitia). The pulmonary artery carries deoxygenated blood to the lungs. The other arteries carry oxygenated blood from the heart to the tissues.

• **Arterioles** are small-resistance vessels that feed into capillaries.
• **Capillaries** join arterioles to venules, which are larger vessels that have lower pressure than arterioles. Nutrients and wastes are exchanged in the capillaries.
• **Venules** join capillaries to veins.
• **Veins** are large-capacity, low-pressure vessels. The pulmonary veins carry oxygenated blood to the left atrium. The other veins return unoxygenated blood to the heart.

Think of these vessels as a series of large and small canals forming an interlocking system of blood flow.

Keep abreast of diagnostic tests

Here are some important tests used to diagnose cardiovascular disorders, along with common nursing interventions associated with each test.

Graphing the heart's electrical activity

Electrocardiography is a noninvasive test that gives a graphic representation—known as an electrocardiogram (ECG—of the heart's electrical activity. (See *Obtaining an ECG,* page 32.)

Nursing actions

• Determine the patient's ability to lie still for several minutes.
• Reassure the patient that he won't experience an electric shock.

24-hour record of the heart

An ambulatory ECG, also known as **Holter monitoring,** is a noninvasive test that records the heart's electrical activity and cardiac events over an extended period of time. It's usually conducted during the patient's normal daily activities.

Nursing actions

• Explain the purpose of Holter monitoring to the patient.
• Ask him to keep an activity diary.
• Advise him not to bathe, shower, operate machinery, use a microwave oven, or use an electric shaver while wearing the monitor.

View through a catheter

Cardiac catheterization and **arteriography** (also called **angiography**) involve injection of radiopaque dye through a catheter. A fluoroscope is then used to examine the coronary arteries and intracardiac structures. The procedure is also used to monitor major intracardiac pressures, oxygenation, and cardiac output.

Nursing actions

Before the procedure
• Withhold food and fluids from the patient after midnight.
• Discuss any anxiety the patient may have about the procedure.
• Assess and record baseline vital signs and peripheral pulses.
• Make sure that written, informed consent has been obtained.
• Inform the patient about possible nausea, chest pain, flushing of the face, or a sudden urge to urinate after the injection of radiopaque dye.
• Note any patient allergies to seafood, iodine, or radiopaque dyes.

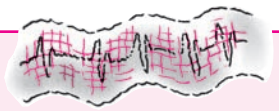
After the procedure
• Monitor vital signs. Also monitor peripheral pulses distal to the catheter insertion site. Compare them to those on the opposite extremity.
• Maintain a pressure dressing or hemostatic device at the injection site and monitor for bleeding. Enforce bed rest for 8 hours after the procedure.
• Keep the patient's left leg straight for 6 to 8 hours if the femoral approach was used; keep the arm extended for 3 hours if the antecubital fossa was used.
• Encourage fluids unless contraindicated.
• Report any complaints of chest pain immediately.
• If bleeding occurs at the site, apply manual pressure until the bleeding stops.

Memory jogger

To remember how blood flows from the heart, think **Arteries away.** **Arteries** carry oxygenated blood **away** from the heart to the tissues.

Veins, by contrast, carry blood to the heart. To remember the flow of blood in the veins, think **veto**, for **ve**ins **to**.

Obtaining an ECG



WHY YOU DO IT

One of the most valuable and frequently used diagnostic tools, electrocardiography measures the heart's electrical activity as waveforms. How? Impulses moving through the heart's conduction system create electric currents that can be monitored on the body's surface. Electrodes attached to the skin detect these electric currents and transmit them to an instrument that produces a record (electrocardiogram) of cardiac activity.

Electrocardiography can be used to identify myocardial ischemia and infarction, rhythm and conduction disturbances, chamber enlargement, electrolyte imbalances, and drug toxicity.

HOW YOU DO IT

- Place the electrocardiogram (ECG) machine close to the patient's bed, and plug the power cord into the wall outlet.
- Explain the procedure to the patient.
- Place the patient in the supine position in the center of the bed with his arms at his sides. You may raise the head of the bed to make the patient more comfortable.
- Place the electrodes on flat, fleshy areas; avoid muscular and bony areas. If an area is excessively hairy, clip it before applying the electrode. Also, clean excess oil and other substances from the patient's skin.
- Apply the disposable electrodes to the patient's wrists and the medial aspects of his ankles. Position electrodes as follows:
  - V_1: fourth intercostal space at the right sternal border
  - V_2: fourth intercostal space at the left sternal border
  - V_3: halfway between V_2 and V_4
  - V_4: fifth intercostal space at midclavicular line
  - V_5: fifth intercostal space at anterior axillary line, halfway between V_4 and V_6
  - V_6: fifth intercostal space at midaxillary line, level with V_4.
- Connect the leadwires to the electrodes as indicated by the coding on the tip of each leadwire.
- Enter the appropriate information as prompted by the ECG machine.
- Set the paper speed selector to the standard 25 mm/second and select full voltage.
- Ask the patient to breathe normally, lie still, and avoid talking. Press the AUTO button. Observe the tracing quality of all 12 leads.
- When the machine has recorded the 12-lead ECG, remove the electrodes and clean the patient's skin. After disconnecting the leadwires from the electrodes, dispose of the electrodes or leave them in place for subsequent ECGs, according to facility policy.
- If the machine doesn't label the ECG recording for you, label the recording with the patient's name and identification number as well as the date and time. Note the test date and time as well as significant responses by the patient in the patient's record, and write any appropriate clinical information on the ECG.

Echoing heart structures

Echocardiography is a noninvasive examination of the heart in which echoes from sound waves are used to visualize intracardiac structures and monitor the direction of blood flow.

Nursing actions

- Determine the patient's ability to lie still for 30 to 60 minutes.
- Explain the procedure to the patient.

Jog and monitor

An **exercise ECG,** also known as a *stress test,* is a noninvasive test that records the heart's electrical activity by monitoring it for ischemic events during levels of increasing exercise.

Nursing actions

- Explain the procedure to the patient.
- Withhold food and fluids for 2 to 4 hours before the test.
- Instruct the patient to wear loose-fitting clothing and supportive shoes.
- Perform a cardiopulmonary assessment.
- Tell the patient to report chest discomfort, shortness of breath, fatigue, leg cramps, and dizziness immediately if they occur during the test.

No fallout here

Nuclear cardiology examines the heart using radioisotopes. After I.V. injection of the isotopes, a monitor displays images of myocardial perfusion and contractility.

Nursing actions

Before the procedure

- Explain the procedure to the patient.
- Determine the patient's ability to lie still during the procedure.

After the procedure
• Examine the injection site for bleeding.

A complete picture of arterial blood supply

Digital subtraction angiography is an invasive procedure involving fluoroscopy with an image intensifier. This test allows complete visualization of the arterial blood supply to a specific area.

Nursing actions

Before the procedure
• Determine the patient's ability to lie still during the test.
• Make sure that written, informed consent has been obtained.
After the procedure
• Monitor the patient's vital signs.
• Check the insertion site for bleeding.
• Instruct the patient to drink at least 1 L of fluid after the procedure.

Balloon and blood flow

For **hemodynamic monitoring,** a balloon-tipped, flow-directed pulmonary artery catheter is used to measure intracardiac pressures and cardiac output.

Nursing actions

• Make sure that written, informed consent has been obtained.
• Monitor the patient for such complications as arrhythmias, hemorrhage, clot formation, and air embolus.
• Check the insertion site for signs of infection.

One for the photo album

A **chest X-ray** supplies a radiographic picture that can be used to determine the size and position of the heart. It can also detect the presence of fluid in the lungs and other abnormalities such as pneumothorax.

Nursing actions

• Determine the patient's ability to hold his breath during the test.
• Make sure that the patient removes all jewelry before the X-ray is taken.

Blood to the lab, part 1

Blood chemistry tests use blood samples to measure:
• electrolytes (calcium, magnesium, phosphorus, potassium, sodium)
• protein and protein metabolites (blood urea nitrogen [BUN], creatinine)
• lipids and lipoproteins (cholesterol, triglycerides)
• cardiac enzymes and proteins (B-type natriuretic peptide assay, creatine kinase [CK], CK isoenzymes, lactate dehydrogenase [LD], LD isoenzymes, myoglobin, troponin)
• bicarbonate
• glucose
• aspartate aminotransferase (AST).

Nursing actions

Before the procedure
• Note any drugs the patient is taking that might alter test results.
• Restrict the patient's exercise before the blood sample is drawn.
• Withhold I.M. injections, or note the time of the injection on the laboratory slip (with CK levels).
• Withhold food and fluids as ordered.
After the procedure
• Check the venipuncture site for bleeding.

Blood to the lab, part 2

Hematologic and coagulation studies use blood samples to analyze and measure red blood cells (RBCs), white blood cells (WBCs), erythrocyte sedimentation rate (ESR), prothrombin time (PT), international normalized ratio (INR), partial thromboplastin time (PTT), platelets, hemoglobin, and hematocrit.

Nursing actions

• Before the procedure, note any drugs the patient is taking that might alter test results.
• After the procedure, check the venipuncture site for bleeding.

ABCs of ABGs

An **arterial blood gas (ABG) analysis** assesses arterial blood for tissue oxygenation, ventilation, and acid-base status.

Nursing actions

Before the procedure

- Document the patient's temperature.
- Note the amount of oxygen the patient is receiving. If the patient is receiving mechanical ventilation, note the ventilator settings.

After the procedure

- Apply continuous pressure to the puncture site for at least 5 minutes; then apply a pressure dressing for at least 30 minutes.
- Afterward, periodically check the site for bleeding.

Hear that sound? It's blood flow

A **Doppler ultrasound** transforms echoes from sound waves into audible sounds, allowing examination of blood flow in peripheral circulation.

Nursing actions

- Determine the patient's ability to lie still.
- Explain the procedure.

Visualize the veins

For a **venogram,** a dye is injected to allow visualization of the veins. This picture is then used to diagnose deep vein thrombosis or incompetent valves.

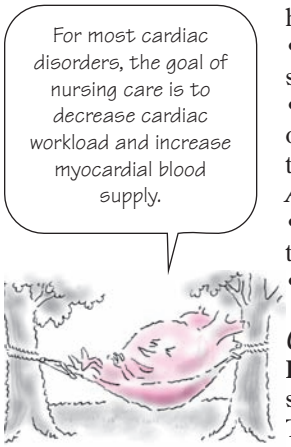
Nursing actions

Before the procedure

- Withhold food and fluids after midnight.
- Obtain and record the patient's baseline vital signs and peripheral pulses.
- Make sure that written, informed consent has been obtained.
- Note any allergies the patient has to seafood, iodine, or radiopaque dyes.
- Inform the patient about possible flushing of the face or throat irritation from the injection of the dye.

After the procedure

- Check the injection site for bleeding, infection, and hematoma.
- Encourage fluids unless contraindicated.



Oxygen in arterial blood

Pulse oximetry uses infrared light to measure arterial oxygen saturation in the blood. This test helps assess a patient's pulmonary status.

To distinguish oxygen saturation obtained by pulse oximetry from that obtained by ABG analysis (abbreviated as Sao_2), the pulse oximetry value is abbreviated as Spo_2.

Nursing actions

- Protect the sensor from bright light.
- Don't place the sensor on an extremity with impeded blood flow.
- Attach the monitoring sensor to a fingertip, an earlobe, the bridge of the nose, or a toe.
- If a fingertip is used, remove artificial nails, nail tips, and nail polish because they may interfere with light transmission.

Polish up on patient care

Major cardiovascular disorders include abdominal aortic aneurysm, angina, arrhythmias, arterial occlusive disease, cardiac tamponade, cardiogenic shock, cardiomyopathy, coronary artery disease, endocarditis, heart failure, hypertension, hypovolemic shock, myocardial infarction (MI), myocarditis, pericarditis, pulmonary edema, Raynaud's disease, rheumatic fever and rheumatic heart disease, thoracic aortic aneurysm, thrombophlebitis, and valvular heart disease.

For most of these disorders, the goal of nursing management is to decrease cardiac workload and increase myocardial blood supply. These steps increase oxygenation to the tissues and reduce overall damage to the heart.

Abdominal aortic aneurysm

An abdominal aortic aneurysm results from damage to the medial layer of the abdominal portion of the aorta. The underlying cause is commonly atherosclerosis, which over time causes a weakening in the medial layer of the artery. Continued weakening from the force of blood flow may cause a bulge in the artery known as an aneurysm. The aneurysm may then cause a rupture, leading to hemorrhage, hypovolemic shock, and possibly death.

There are four types of abdominal aneurysms:

- **dissecting** (vessel wall layers become separated by a column of blood, which pouches out tissue)
- **false** (bilateral outpouching in which layers of the vessel wall separate, creating a cavity)
- **fusiform** (bilateral outpouching)
- **saccular** (unilateral outpouching).

CAUSES

- Atherosclerosis
- Congenital defect
- Hypertension
- Infection
- Marfan syndrome
- Syphilis
- Trauma

DATA COLLECTION FINDINGS

- Abdominal mass to the left of the midline
- Abdominal pulsations
- Bruits over the aneurysm
- Commonly produces no symptoms
- Diminished femoral pulses
- Lower abdominal pain
- Lower back pain
- Systolic blood pressure that's lower in the legs than in the arms

DIAGNOSTIC FINDINGS

- Abdominal computed tomography (CT) scan shows an aneurysm.
- Abdominal ultrasound shows an aneurysm.
- Arteriography shows an aneurysm.
- Chest X-ray shows an aneurysm.
- ECG differentiates an aneurysm from MI.
- Magnetic resonance imaging of the abdomen shows an aneurysm.

NURSING DIAGNOSES

- Acute pain
- Ineffective tissue perfusion: Peripheral
- Deficient fluid volume

TREATMENT

- Endovascular stenting for some patients
- Abdominal aortic aneurysm resection or repair
- Bed rest
- Blood administration, as indicated.

Drug therapy

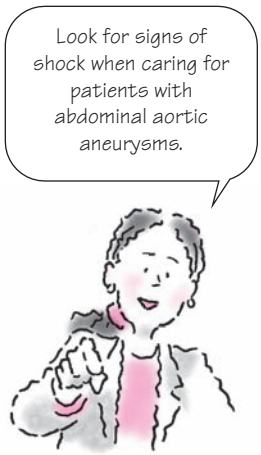
- Analgesics: oxycodone (OxyContin), morphine
- Antihypertensives: hydralazine (Apresoline), nitroprusside (Nitropress), enalaprilat (Vasotec)
- Beta-adrenergic blockers: propranolol (Inderal), metoprolol (Lopressor)

INTERVENTIONS AND RATIONALES

- Monitor and record vital signs. *Tachycardia, dyspnea, or hypotension may indicate fluid volume deficit caused by rupture of the aneurysm.*
- Monitor ECG *to detect arrhythmias.*
- Monitor intake and output and laboratory studies. *Low urine output and high specific gravity indicate hypovolemia.*
- Observe the patient for signs of hypovolemic shock from aneurysm rupture, such as anxiety, restlessness, severe back pain, decreased pulse pressure, increased thready pulse, and pale, cool, moist, clammy skin, *to detect early signs of compromise.*
- Gently palpate the abdomen for distention. *Increasing distention may signify impending rupture.*
- Check peripheral circulation—pulses, temperature, color, and complaints of abnormal sensations—*to detect poor arterial blood flow.*
- Monitor pain *to detect an enlarging aneurysm or rupture.*
- Administer medications, as prescribed, *to reduce hypertension and control pain.*
- Encourage the patient to express feelings, such as a fear of dying, *to reduce anxiety.*
- Maintain a quiet environment *to control blood pressure and reduce risk of rupture.*

Teaching topics

- Recognizing signs and symptoms of decreased peripheral circulation, such as change in skin color or temperature, complaints of numbness or tingling, and absent pulses
- Maintaining activity limitations, including alternating rest periods with activity, and ad-



hering to prescribed exercise and diet regimen

Angina

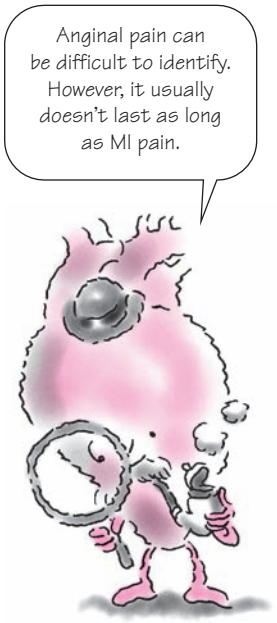
Angina is chest pain caused by inadequate myocardial oxygen supply. It's usually caused by narrowing of the coronary arteries, which results from plaque accumulation in the intimal lining.

Angina is generally categorized into three main forms:

- **stable angina**—symptoms are consistent and pain is relieved by rest
- **unstable angina (acute coronary syndrome)**—pain is marked by increasing severity, duration, and frequency and responds slowly to nitroglycerin.
- **Prinzmetal's angina**—pain is unpredictable and may occur at rest.

CAUSES

- Activity or disease that increases metabolic demands
- Aortic stenosis
- Atherosclerosis
- Pulmonary stenosis
- Small-vessel disease (associated with rheumatoid arthritis, radiation injury, or lupus erythematosus)
- Thromboembolism
- Vasospasm



DATA COLLECTION FINDINGS

- Anxiety
- Diaphoresis
- Dyspnea
- Epigastric distress
- Palpitations
- Pain that may be substernal, crushing, or compressing; may radiate to the arms, jaw, or back; usually lasts 3 to 5 minutes; usually occurs after exertion, emotional excitement, or exposure to cold but can also develop when the patient is at rest
- Tachycardia

DIAGNOSTIC FINDINGS

- Blood chemistry tests show increased cholesterol levels.
- Cardiac enzymes are within normal limits.
- Coronary arteriography shows plaque accumulation.
- ECG shows ST-segment depression and T-wave inversion during anginal pain.
- Holter monitoring reveals ST-segment depression and T-wave inversion.
- Stress test results show abnormal heart activity on the ECG and chest pain.

NURSING DIAGNOSES

- Acute pain
- Anxiety
- Decreased cardiac output

TREATMENT

- Diet: low-fat, low-sodium, and low-cholesterol (low-calorie, if necessary)
- Coronary artery bypass grafting
- Oxygen therapy (typically 2 to 4 L)
- Percutaneous transluminal coronary angioplasty (PTCA), stent placement

Drug therapy

- Anticoagulants: heparin, dalteparin (Fragmin), enoxaparin (Lovenox)
- Beta-adrenergic blockers: propranolol (Inderal), nadolol (Corgard), atenolol (Tenormin), metoprolol (Lopressor)
- Calcium channel blockers: verapamil (Calan), diltiazem (Cardizem), nifedipine (Procardia), nicardipine (Cardene), amlodipine (Norvase), bepridil (Vascor)
- Nitrates: nitroglycerin (Nitrostat), isosorbide dinitrate (Isordil), topical nitroglycerin (Nitrol), transdermal nitroglycerin (Transderm-Nitro)
- Platelet aggregation inhibitors: ticlopidine (Ticlid), clopidogrel (Plavix), aspirin
- Thrombin inhibitor: bivalirudin (Angiomax)

INTERVENTIONS AND RATIONALES

- Monitor vital signs *to detect evidence of cardiac compromise and patient's response to treatment.*
- Monitor ECG *to detect arrhythmias and ischemia.*
- Observe pulse oximetry values *to detect hypoxemia.*
- Track and record intake and output *to monitor fluid status.*

• Administer medications, as prescribed, *to increase oxygenation and to reduce cardiac workload.* Withhold nitrates and notify the charge nurse or doctor if the systolic blood pressure is less than 90 mm Hg. Withhold beta-adrenergic blockers and notify doctor if the heart rate is less than 60 beats/minute. *These steps may prevent complications that can occur as a result of therapy.*
• Monitor for chest pain and evaluate its characteristics. *Chest pain may indicate the need to modify the care plan.*
• Tell the patient to call you immediately if he experiences chest pain or discomfort *to prevent treatment delay.*
• Advise patient in pain to rest *to reduce cardiac workload.*
• Obtain a 12-lead ECG during an acute attack *to assess for ischemic changes.*
• Place the patient in semi-Fowler's position *to promote chest expansion and ventilation.*
• Maintain the patient's prescribed diet (low-fat, low-sodium, and low-cholesterol; low-calorie, if necessary) *to reduce risk of coronary artery disease.*
• Encourage weight reduction, if necessary, *to reduce risk of coronary artery disease.*
• Encourage the patient to express anxiety, fears, and concerns *because anxiety can increase oxygen demands.*
• Administer oxygen *to improve oxygenation.*

Teaching topics

• Taking sublingual nitroglycerin for acute attacks and for prevention of anginal episodes
• Keeping nitroglycerin in its original container because exposure to light decreases the drug's effectiveness
• Reducing risk factors through diet, exercise, weight loss, smoking cessation, and stress reduction
• Avoiding activities or situations that cause angina, such as exertion, heavy meals, emotional upsets, and exposure to cold
• Seeking medical attention if pain lasts longer than 20 minutes
• Differentiating between symptoms of angina and symptoms of MI
• Contacting the American Heart Association

Arrhythmias

In cardiac arrhythmias, abnormal electrical conduction or automaticity changes heart rate and rhythm. Arrhythmias vary in severity. Mild and asymptomatic ones (such as sinus arrhythmia, in which heart rate increases and decreases with respirations) require no treatment. Catastrophic ventricular fibrillation (VF) necessitates immediate resuscitation.

Arrhythmias are generally classified according to their origin (atrial or ventricular). Their effect on cardiac output and blood pressure, partially influenced by the site of origin, determines their clinical significance. The most common arrhythmias include atrial fibrillation (AF), asystole, VF, and ventricular tachycardia (VT).

CAUSES

• Congenital factors
• Degeneration of conductive tissue
• Drug toxicity
• Electrolyte imbalance
• Excess caffeine intake
• Fluid imbalance
• Heart disease
• MI
• Myocardial ischemia

DATA COLLECTION FINDINGS

Atrial fibrillation

• Commonly produces no symptoms
• Palpitations
• Complaints of feeling faint
• Irregular pulse with no pattern to the irregularity

Asystole

• Apnea
• Cyanosis
• No palpable blood pressure
• Pulselessness

Ventricular fibrillation

• Apnea
• No palpable blood pressure
• Pulselessness

Ventricular tachycardia

• Chest pain

- Diaphoresis
- Hypotension
- Weak pulse or pulselessness
- Dizziness
- Loss of consciousness

DIAGNOSTIC FINDINGS

Atrial fibrillation

- ECG shows irregular atrial rhythm, atrial rate greater than 400 beats/minute, irregular ventricular rhythm, QRS complexes of uniform configuration and duration, no discernible PR interval, and no P waves (fibrillatory waves).

Asystole

- ECG shows no atrial or ventricular rate or rhythm and no discernible P waves, QRS complexes, or T waves.

Ventricular fibrillation

- ECG shows ventricular activity that appears as fibrillatory waves with no recognizable pattern. Atrial rate and rhythm and ventricular rhythm can't be determined because no pattern or regularity occurs.
- The P wave, PR interval, QRS complex, T wave, and QT interval can't be determined.

Ventricular tachycardia

- ECG shows ventricular rate of 100 to 250 beats/minute, wide and bizarre QRS complexes, and no P waves. VT may start or stop suddenly.

NURSING DIAGNOSES

- Ineffective tissue perfusion: Cardiopulmonary
- Decreased cardiac output
- Impaired gas exchange

TREATMENT

Atrial fibrillation

- Antiarrhythmics: amiodarone (Cordarone), digoxin (Lanoxin), diltiazem (Cardizem), procainamide (Pronestyl), verapamil (Calan)
- Anticoagulants: heparin, warfarin (Coumadin)
- Permanent pacemaker
- Radiofrequency catheter ablation
- Synchronized cardioversion (if patient is unstable)

Asystole

- Cardiopulmonary resuscitation (CPR)
- Advanced cardiac life support (ACLS) protocol for endotracheal (ET) intubation and possible transcutaneous pacing
- Atropine, epinephrine (Adrenalin) per ACLS protocol
- Buffering agent: sodium bicarbonate

Ventricular fibrillation

- CPR
- Defibrillation
- ACLS protocol for ET intubation
- Amiodarone (Cordarone), epinephrine (Adrenalin), lidocaine (Xylocaine), magnesium sulfate, procainamide (Pronestyl), vasopressin per ACLS protocol
- Implantable cardiac defibrillator
- Buffering agent: sodium bicarbonate

Ventricular tachycardia

- CPR (if patient is pulseless)
- Defibrillation
- ACLS protocol for ET intubation
- Amiodarone (Cordarone), epinephrine (Adrenalin), lidocaine (Xylocaine), magnesium sulfate, procainamide (Pronestyl)
- Implantable cardiac defibrillator

INTERVENTIONS AND RATIONALES

- Check pulse for rate and rhythm.
- Monitor ECG *to detect arrhythmias and ischemia.*
- If the patient's pulse is abnormally rapid, slow, or irregular, watch for signs of hypoperfusion, such as hypotension and altered mental status, *to prevent such complications as renal failure and cerebral anoxia.*
- Document any arrhythmias in a monitored patient *to create a record of their occurrence.*
- When life-threatening arrhythmias develop, rapidly assess level of consciousness (LOC), respirations, and pulse *to avoid crisis.*
- Initiate CPR, if indicated, *to maintain cerebral perfusion until other ACLS measures are successful.*
- Evaluate the patient for altered cardiac output resulting from arrhythmias. *Decreased cardiac output may cause inadequate perfusion of major organs, leading to irreversible damage.*

• Administer medications, as needed, and prepare for medical procedures (for example, cardioversion), if indicated, *to ensure prompt treatment of life-threatening arrhythmias.*
• Monitor for predisposing factors—such as fluid and electrolyte imbalance—and signs of drug toxicity, especially with digoxin. Drug toxicity may require withholding the next dose. *Alleviating predisposing factors decreases the risk of arrhythmias.*
• Monitor pulse oximetry results and provide adequate oxygen *to reduce the heart's workload* while carefully maintaining metabolic, neurologic, respiratory, and hemodynamic status, *to prevent arrhythmias in a cardiac patient.*
• Restrict the patient's activity after permanent pacemaker insertion. Monitor his cardiac rhythm, and watch for signs of decreased cardiac output *to detect pacemaker malfunction.*
• If the patient has a permanent pacemaker, warn him about environmental hazards as indicated by the pacemaker manufacturer *to avoid pacemaker malfunction.*

Teaching topics

• Reporting light-headedness or syncope
• Coming in for regular checkups
• Recognizing environmental hazards for patients with permanent pacemakers
• Returning for follow-up permanent pacemaker function tests

Arterial occlusive disease

With arterial occlusive disease, obstruction or narrowing of the lumen of the aorta and its major branches causes an interruption of blood flow, usually to the legs and feet. Arterial occlusive disease may affect the carotid, basilar, vertebral, femoral, popliteal, innominate, subclavian, mesenteric, and iliac arteries. Occlusions may be acute or chronic and commonly cause severe ischemia, skin ulceration, and gangrene.

Arterial occlusive disease is more common in males than in females. The prognosis depends on the location of the occlusion, the development of collateral circulation to counteract reduced blood flow and, in acute disease, the time elapsed between the occlusion and its removal.

CAUSES

• Atherosclerosis
• Embolus formation
• Thrombosis
• Trauma or fracture

Risk factors

• Age
• Diabetes
• Family history of vascular disorders, MI, or stroke
• Hyperlipidemia
• Hypertension
• Smoking

DATA COLLECTION FINDINGS

Assessment findings depend on the site of the occlusion.

Femoral, popliteal, and innominate arteries

• Mottling of the affected extremity
• Pallor
• Paralysis and paresthesia in the affected arm or leg
• Pulselessness distal to the occlusion
• Sudden and localized pain in the affected arm or leg (most common symptom)
• Temperature change distal to the occlusion

Internal and external carotid arteries

• Absent or decreased pulsation with an auscultatory bruit over affected vessels
• Stroke
• Transient ischemic attacks (TIAs), which can produce transient monocular blindness, dysarthria, hemiparesis, possible aphasia, confusion, decreased mentation, and headache

Subclavian artery

• Subclavian steel syndrome (characterized by the backflow of blood from the brain through the vertebral artery on the same side as the occlusion into the subclavian artery distal to the occlusion; clinical effects of vertebrobasilar occlusion and exercise-induced arm claudication)

Vertebral and basilar arteries

• TIAs, which produce binocular vision disturbances, vertigo, dysarthria, and falling down without LOC

DIAGNOSTIC FINDINGS

• Arteriography demonstrates the type (thrombus or embolus), location, and degree of obstruction and collateral circulation.
• Doppler ultrasonography shows decreased blood flow distal to the occlusion.
• EEG and a CT scan may be necessary to rule out brain lesions.
• Ophthalmodynamometry helps determine the degree of obstruction in the internal carotid artery by comparing ophthalmic artery pressure to brachial artery pressure on the affected side. A pressure more than 20% lower in the ophthalmic artery suggests insufficiency.

NURSING DIAGNOSES

• Ineffective tissue perfusion (type depends on the location of the occlusion)
• Acute pain
• Risk for injury

TREATMENT

• Light exercise such as walking
• Surgery (for acute arterial occlusive disease): atherectomy, balloon angioplasty, bypass graft, embolectomy, laser angioplasty, patch grafting, stent placement, thromboendarterectomy, or amputation

Drug therapy

• Anticoagulants: heparin, dalteparin (Fragmin), enoxaparin (Lovenox), warfarin (Coumadin)
• Antiplatelet agents: aspirin, pentoxifylline (Trental)
• Thrombolytic agents: alteplase (Activase), streptokinase (Streptase)

INTERVENTIONS AND RATIONALES

• Advise the patient to stop smoking and to follow the prescribed medical regimen *to modify risk factors and promote compliance.*

Preoperatively (during an acute episode)

• Check the most distal pulses by inspecting skin color and temperature. *Decreased tissue perfusion causes mottling; skin also becomes cooler and skin texture changes.*
• Provide pain relief, as needed, *to help decrease ischemic pain.*
• Maintain heparin infusion per protocol *to prevent thrombi.*
• Move the affected foot frequently *to prevent pressure on any one area.* Strictly avoid elevating or applying heat to the affected leg. *Directly heating extremities causes increased tissue metabolism; if arteries don't dilate normally, tissue perfusion decreases and ischemia may occur.*
• Watch for signs of fluid and electrolyte imbalance, and monitor intake and output for signs of renal failure (urine output less than 30 ml/hour). *Electrolyte imbalances and renal failure may occur as a result of arterial occlusion and tissue damage.*
• Monitor for signs of stroke, such as numbness in an arm or leg and intermittent blindness, *to detect early signs of decreased cerebral perfusion.*

Postoperatively

• Monitor the patient's vital signs. Continuously monitor his circulatory function by inspecting skin color, noting temperature, and checking for distal pulses. While charting, compare earlier findings and observations. Watch closely for signs of hemorrhage (tachycardia, hypotension) and check dressings for excessive bleeding *to prevent or detect postoperative complications.*
• Check neurologic status frequently for changes in LOC, muscle strength, or pupil size *to ensure prompt treatment of deteriorating neurologic condition.*
• With mesenteric artery occlusion, connect a nasogastric tube to low intermittent suction. Monitor intake and output. (*Low urine output may indicate damage to renal arteries during surgery.*) Check abdominal status. *Increasing abdominal distention and tenderness may indicate extension of bowel ischemia. Extended bowel ischemia may cause peritonitis or gangrene, which could require further surgery.*
• With saddle block occlusion, check distal pulses for adequate circulation. Watch for signs of renal failure and mesenteric artery occlusion (severe abdominal pain) and cardiac arrhythmias, which may precipitate em-

bolus formation. *These steps ensure prompt recognition and treatment of complications.*
• With iliac artery occlusion, monitor urine output for signs of renal failure from decreased perfusion to the kidneys as a result of surgery. Provide meticulous catheter care *to prevent complications.*
• With femoral or popliteal artery occlusion, assist with early ambulation but tell the patient to avoid prolonged sitting *to encourage circulation in the extremities.*
• After amputation, check the patient's stump carefully for drainage and record its color, the amount, and the time *to detect hemorrhage*. Elevate the stump and administer adequate analgesics *to treat edema and pain*. Because phantom limb pain is common, explain this phenomenon to the patient *to reduce his anxiety.*
• When preparing the patient for discharge, instruct him to watch for signs of recurrence (pain, pallor, numbness, paralysis, absence of pulse) that can result from graft occlusion or occlusion at another site. Warn him against wearing constrictive clothing. *These measures enable the patient to actively participate in his care and make informed decisions about his health status.*

Teaching topics
• Performing proper foot care
• Recognizing signs of arterial occlusion
• Modifying risk factors

Cardiac tamponade

With cardiac tamponade, a rapid rise in intrapericardial pressure impairs diastolic filling of the heart. The rise in pressure usually results from blood or fluid accumulation in the pericardial sac.

Rapid fluid accumulation, a commonly fatal condition, requires emergency lifesaving measures. Slow accumulation and rise in pressure, as in pericardial effusion associated with cancer, may not produce immediate symptoms because the fibrous wall of the pericardial sac can gradually stretch to accommodate as much as 1 to 2 L of fluid.

CAUSES
• Dressler's syndrome
• Effusion (in cancer, bacterial infections, tuberculosis and, rarely, acute rheumatic fever)
• Hemorrhage from nontraumatic causes (such as rupture of the heart or great vessels or anticoagulant therapy in a patient with pericarditis)
• Hemorrhage from trauma (gunshot or stab wounds of the chest, perforation by a catheter during cardiac or central venous catheterization, or cardiac surgery)
• MI
• Uremia

DATA COLLECTION FINDINGS
• Anxiety
• Diaphoresis
• Dyspnea
• Hepatomegaly
• Increased central venous pressure (CVP)
• Muffled heart sounds on auscultation
• Narrow pulse pressure
• Jugular vein distention
• Pallor or cyanosis
• Pulsus paradoxus (an abnormal inspiratory drop in systemic blood pressure greater than 15 mm Hg)
• Reduced arterial blood pressure
• Restlessness
• Tachycardia
• Upright, leaning forward posture

DIAGNOSTIC FINDINGS
• Chest X-ray shows slightly widened mediastinum and cardiomegaly.
• Echocardiography identifies pericardial effusion with signs of right ventricular and atrial compression.
• ECG may reveal a low-amplitude QRS complex and electrical alternans, an alternating beat-to-beat change in the amplitude of the P wave, QRS complex, and T wave. Generalized ST-segment elevation is noted in all leads.
• Pulmonary artery catheterization detects increased right atrial pressure, right ventricular diastolic pressure, and CVP.

NURSING DIAGNOSES
• Ineffective tissue perfusion: Cardiopulmonary

• Anxiety
• Decreased cardiac output

TREATMENT

• Supplemental oxygen.
• Surgery: pericardiocentesis (needle aspiration of the pericardial cavity), surgical creation of an opening to drain fluid, or thoracotomy

Drug therapy

• Heparin antagonist: protamine sulfate in heparin-induced cardiac tamponade
• Inotropic agent: dopamine (Intropin)
• Vitamin: vitamin K (AquaMEPHYTON) in warfarin-induced cardiac tamponade

INTERVENTIONS AND RATIONALES

• Monitor ECG *to detect arrhythmias and ischemia.*

For pericardiocentesis

• Explain the procedure to the patient *to alleviate anxiety.*
• Make sure that informed consent has been obtained.
• Keep a pericardial aspiration needle attached to a 50-ml syringe by a three-way stopcock, an ECG machine, and an emergency cart with a defibrillator at the bedside. Make sure the equipment is turned on and ready for immediate use *to avoid treatment delay.*
• Position the patient at a 45- to 60-degree angle.
• Monitor pulse oximetry values *to detect hypoxia.*
• Monitor blood pressure during and after pericardiocentesis *to monitor for complications such as hypotension, which may indicate cardiac chamber puncture.*
• Maintain I.V. solutions *to support blood pressure*. Watch for a rise in blood pressure, *which indicates relief of cardiac compression.*
• Watch for complications of pericardiocentesis (VF, vasovagal response, and coronary artery or cardiac chamber puncture) *to prevent crisis.*
• Closely monitor pulse rate, LOC, and urinary output *to detect signs of decreased cardiac output.*

For thoracotomy

• Make sure that informed consent has been obtained.
• Explain the procedure to the patient. Tell him what to expect after the surgery (chest tubes attached to a chest drainage system, administration of oxygen). Teach him how to turn, deep-breathe, and cough *to prevent postoperative complications and relieve his anxiety.*
• Give antibiotics *to prevent or treat infection* and protamine sulfate or vitamin K (AquaMEPHYTON) as needed *to prevent hemorrhage.*
• Postoperatively, monitor critical parameters, such as vital signs and pulse oximetry levels, and assess heart and breath sounds *to detect early signs of complications such as reaccumulation of fluid.*
• Give pain medication as needed *to alleviate pain and promote comfort.*
• Maintain the chest drainage system and be alert for complications, such as hemorrhage and arrhythmias, *to prevent further decompensation.*

Teaching topics

• Alerting the nurse if condition worsens

Cardiogenic shock

Cardiogenic shock occurs when the heart fails to pump adequately, thereby reducing cardiac output and compromising tissue perfusion.

Here's how cardiogenic shock progresses:
• Decreased stroke volume results in increased left ventricular volume.
• Blood pooling in the left ventricle backs up into the lungs, causing pulmonary edema.
• To compensate for a falling cardiac output, heart rate and contractility increase.
• These compensating mechanisms increase the demand for myocardial oxygen.
• An imbalance between oxygen supply and demand develops, which increases myocardial ischemia and further compromises the heart's pumping action.

CAUSES

• Advanced heart block
• Cardiomyopathy

- Heart failure
- MI
- Myocarditis
- Papillary muscle rupture

DATA COLLECTION FINDINGS

- Anxiety, restlessness, disorientation, and confusion
- Cold, clammy skin
- Crackles
- Hypotension (systolic pressure below 90 mm Hg) and narrow pulse pressure
- Jugular vein distention
- Oliguria (urine output of less than 30 ml/hour)
- S_3 and S_4
- Tachycardia or other arrhythmias
- Tachypnea
- Hypoxia
- Weak, thready pulse

DIAGNOSTIC FINDINGS

- ABG levels show respiratory alkalosis initially. As shock progresses, metabolic acidosis develops.
- Blood chemistry test results show increased BUN, creatinine, and cardiac enzymes and troponin levels.
- ECG shows evidence of an MI (enlarged Q wave, elevated ST segment).

NURSING DIAGNOSES

- Decreased cardiac output
- Ineffective tissue perfusion: Cardiopulmonary, cerebral, peripheral, GI, and renal
- Excess fluid volume

TREATMENT

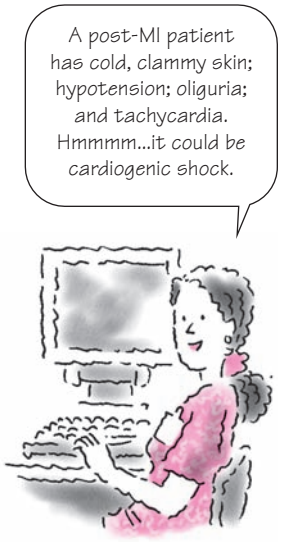
- Intra-aortic balloon pump (IABP)
- Left ventricular assist device
- Surgery to repair papillary muscle rupture or ventricular septal defect
- Activity changes, including maintaining bed rest and implementing passive range-of-motion and isometric exercises
- Oxygen therapy: intubation and mechanical ventilation, if necessary
- Continuous renal replacement therapy (a type of slow dialysis that can be done during injury or trauma)
- Dietary changes, including withholding food and oral fluids
- Heart transplantation if other measures fail.

Drug therapy

- Adrenergic agent: epinephrine (Adrenalin)
- Cardiac glycoside: digoxin (Lanoxin)
- Inotropic agents: dopamine (Intropin), dobutamine (Dobutrex), inamrinone (Inocor), milrinone (Primacor)
- Diuretics: furosemide (Lasix), bumetanide (Bumex), metolazone (Zaroxolyn)
- Vasodilators: nitroprusside (Nitropress), nitroglycerin (Tridil)
- Vasopressor: norepinephrine (Levophed)

INTERVENTIONS AND RATIONALES

- Monitor vital signs, heart sounds, capillary refill, skin temperature, and peripheral pulses *to monitor the effects of drug therapy and detect cardiac decompensation.*
- Monitor the ECG *to detect arrhythmias and ischemia.*
- Monitor respiratory status, including breath sounds and ABG values. *Tachypnea, crackles, and hypoxemia may indicate pulmonary edema.*
- Monitor fluid balance, including intake and output, *to keep track of renal function and detect fluid overload leading to pulmonary edema.*
- Monitor LOC *to detect cerebral hypoxia caused by reduced cardiac output.*
- Review the results of laboratory studies *to detect evidence of MI, evaluate renal function, and assess the oxygen-carrying capacity of the blood.*
- Withhold food and fluids, as directed, *to reduce the risk of aspiration that accompanies a lower LOC.*
- Maintain I.V. fluids and administer oxygen and medications, as prescribed, *to maximize cardiac, pulmonary, and renal function.*
- Provide suctioning *to aid in the removal of secretions and reduce the risk of aspiration.*
- Encourage the patient to express his feelings, such as a fear of dying, *to reduce his anxiety.*



Teaching topics

- Recognizing early signs and symptoms of fluid overload
- Maintaining activity limitations, including alternating rest periods with activity
- Maintaining a low-fat, low-sodium diet
- Monitoring daily weight and notifying the doctor of a weight gain greater than 3 lb (1.4 kg)

Cardiomyopathy

With cardiomyopathy, the myocardium (middle muscular layer) around the left ventricle becomes flabby, altering cardiac function and resulting in decreased cardiac output. Increased heart rate and increased muscle mass compensate in early stages. In later stages, heart failure develops.

The three types of cardiomyopathy are:

- **dilated** (congestive), the most common form, in which dilated heart chambers contract poorly, causing blood to pool and reducing cardiac output
- **hypertrophic** (obstructive), in which a hypertrophied left ventricle is unable to relax and fill properly
- **restrictive** (obliterative), a rare form characterized by stiff ventricles that are resistant to ventricular filling.

CAUSES

Dilated cardiomyopathy

- Chronic alcoholism
- Infection
- Metabolic and immunologic disorders
- Pregnancy and postpartum disorders

Hypertrophic cardiomyopathy

- Congenital factors
- Hypertension

Restrictive cardiomyopathy

- Amyloidosis
- Cancer and other infiltrative diseases

DATA COLLECTION FINDINGS

- Cough
- Crackles on lung auscultation
- Dependent pitting edema
- Dyspnea, paroxysmal nocturnal dyspnea
- Enlarged liver
- Fatigue
- Jugular vein distention
- Murmur, S_3 and S_4

DIAGNOSTIC FINDINGS

- Cardiac catheterization excludes the diagnosis of coronary artery disease.
- Chest X-ray shows cardiomegaly and pulmonary congestion.
- ECG findings indicate left ventricular hypertrophy and nonspecific changes.
- Echocardiogram shows decreased myocardial function.

NURSING DIAGNOSES

- Decreased cardiac output
- Impaired gas exchange
- Activity intolerance

TREATMENT

- Dietary changes: establishing a low-sodium diet with vitamin supplements
- Dual-chamber pacing (for hypertrophic cardiomyopathy)
- Surgery (when medication fails): heart transplantation or cardiomyoplasty (for dilated cardiomyopathy); ventricular myotomy (for hypertrophic cardiomyopathy)

Drug therapy

- Beta-adrenergic blockers: propranolol (Inderal), nadolol (Corgard), metoprolol (Lopressor) for hypertrophic cardiomyopathy
- Calcium channel blockers: particularly verapamil (Calan) and diltiazem (Cardizem) for hypertrophic cardiomyopathy
- Diuretics: furosemide (Lasix), bumetanide (Bumex), metolazone (Zaroxolyn) for dilated cardiomyopathy
- Inotropic agents: dobutamine (Dobutrex), milrinone (Primacor), digoxin (Lanoxin) for dilated cardiomyopathy
- Oral anticoagulant: warfarin (Coumadin) for dilated and hypertrophic cardiomyopathy

INTERVENTIONS AND RATIONALES

- Monitor ECG *to detect arrhythmias and ischemia.*
- Monitor laboratory results *to detect abnormalities, such as hypokalemia, from the use of diuretics.*
- Monitor respiratory status, including pulse oximetry values, *to detect evidence of heart failure, such as dyspnea and crackles.*
- Monitor vital signs *to detect complications.*
- Monitor and record intake and output *to detect fluid volume overload.*
- Keep the patient in semi-Fowler's position *to enhance gas exchange.*
- Maintain bed rest *to reduce oxygen demands on the heart.*
- Administer oxygen and medications, as prescribed, *to improve oxygenation and cardiac output.*
- Maintain the patient's prescribed diet. *A low-sodium diet reduces fluid retention.*

Teaching topics

- Recognizing early signs and symptoms of heart failure
- Measuring weight daily and reporting increases over 3 lb (1.4 kg)
- Doing exercises such as raising the arms to increase cardiac output
- Easing bowel movements to avoid straining
- Avoiding the use of alcohol and tobacco
- Contacting the American Heart Association

Coronary artery disease

Coronary artery disease (CAD) results from the buildup of atherosclerotic plaque in the arteries of the heart. This causes a narrowing of the arterial lumen, reducing blood flow to the myocardium. The degree of occlusion that results determines the type of acute coronary syndrome the patient may experience, such as unstable angina or an MI.

CAUSES

- Aging
- Arteriosclerosis
- Atherosclerosis
- Depletion of estrogen after menopause
- Diabetes
- Excessive alcohol intake
- Genetics
- High-fat, high-cholesterol diet
- Hyperlipidemia
- Hypertension
- Obesity
- Sedentary lifestyle
- Smoking
- Stress

DATA COLLECTION FINDINGS

- Chest pain that may be substernal, crushing, or compressing; may radiate to the arms, jaw, or back; usually lasts 3 to 5 minutes if anginal pain (longer-lasting pain may signal an MI); usually occurs after exertion, emotional excitement, or exposure to cold but can also develop when the patient is at rest

DIAGNOSTIC FINDINGS

- Blood chemistry tests show increased cholesterol levels (decreased high-density lipoprotein [HDL] level, increased low-density lipoprotein [LDL] level).
- Coronary arteriography shows plaque formation.
- ECG or Holter monitoring shows ST-segment depression and T-wave inversion during anginal episode.
- Stress test reveals ST-segment changes, multiple premature ventricular contractions, and chest pain.

NURSING DIAGNOSES

- Activity intolerance
- Impaired gas exchange
- Acute pain

TREATMENT

- Activity changes, including weight loss, if necessary
- Atherectomy
- Coronary artery bypass surgery
- Coronary artery stent placement
- Dietary changes, including establishing a low-sodium, low-cholesterol, low-fat diet involving increased dietary fiber (low-calorie only if appropriate)
- PTCA
- Oxygen therapy during an anginal episode

Drug therapy

- Analgesic: morphine (I.V.)
- Anticoagulants: heparin, dalteparin (Fragmin), enoxaparin (Lovenox)
- Antilipemic agents: cholestyramine (Questran), lovastatin (Mevacor), simvastatin (Zocor), nicotinic acid (Niacor), gemfibrozil (Lopid), colestipol (Colestid)
- Beta-adrenergic blockers: metoprolol (Lopressor), propranolol (Inderal), nadolol (Corgard)
- Calcium channel blockers: amlodipine (Norvase), bepridil (Vascor), nifedipine (Procardia), verapamil (Calan), diltiazem (Cardizem)
- Nitrates: nitroglycerin (Nitro-Bid), isosorbide dinitrate (Isordil)
- Platelet aggregation inhibitors: ticlopidine (Ticlid), clopidogrel (Plavix), abciximab (ReoPro), aspirin
- Thrombin inhibitor: bivalirudin (Angiomax)

INTERVENTIONS AND RATIONALES

- Obtain an ECG during anginal episodes *to detect evidence of ischemia.*
- Monitor vital signs *to detect evidence of compromise.*
- Monitor the ECG *to detect arrhythmias and ischemia.*
- Monitor the patient's intake and output *to detect changes in fluid status.*
- Encourage the patient to express anxiety, fears, or concerns *to help him cope with his illness.*
- Administer nitroglycerin sublingually for anginal episodes *to relieve the pain.*
- Maintain bed rest during an anginal episode *to decrease oxygen demand.*
- Monitor pulse oximetry values *to detect hypoxia.*

Teaching topics

- Limiting alcohol intake and dietary fat
- Beginning a smoking-cessation program, if appropriate
- Properly storing and using nitroglycerin for chest pain
- Contacting the American Heart Association

Endocarditis

Endocarditis is an infection of the endocardium, heart valves, or a cardiac prosthesis caused by a bacterial or fungal invasion. This invasion produces vegetative growths on the heart valves, the endocardial lining of a heart chamber, or the endothelium of a blood vessel that may embolize to the spleen, kidneys, central nervous system, and lungs. This disorder may also be called infective endocarditis or bacterial endocarditis.

With endocarditis, fibrin and platelets aggregate on the valve tissue and engulf circulating bacteria or fungi that flourish and produce friable verrucous vegetations. Such vegetations may cover the valve surfaces, causing ulceration and necrosis; they may also extend to the chordae tendineae, leading to their rupture and subsequent valvular insufficiency.

Untreated endocarditis is usually fatal, but with proper treatment, about 70% of patients recover. The prognosis is worst when endocarditis causes severe valvular damage that leads to insufficiency and heart failure or when it involves a prosthetic valve.

CAUSES

- Enterococci
- I.V. drug abuse
- Mitral valve prolapse
- Prosthetic heart valve
- Rheumatic heart disease
- Streptococci (especially *Streptococcus viridans*)
- Staphylococci (especially *Staphylococcus aureus*)

Risk factors

- Coarctation of the aorta
- Degenerative heart disease
- Marfan syndrome
- Pulmonary stenosis
- Subaortic and valvular aortic stenosis
- Tetralogy of Fallot
- Ventricular septal defects

DATA COLLECTION FINDINGS

- Anorexia
- Arthralgia
- Chills
- Fatigue

• Intermittent, recurring fever
• Loud, regurgitant murmur
• Malaise
• Night sweats
• Signs of cerebral, pulmonary, renal, or splenic infarction
• Valvular insufficiency
• Weakness
• Weight loss

DIAGNOSTIC FINDINGS

• Blood test results may include normal or elevated WBC count, abnormal histiocytes (macrophages), elevated ESR, normocytic normochromic anemia (in 70% to 90% of endocarditis cases), and positive serum rheumatoid factor (in about one-half of all patients with endocarditis after the disease is present for 3 to 6 weeks).
• Echocardiography may identify valvular damage.
• ECG may show AF and other arrhythmias that accompany valvular disease.
• Three or more blood cultures in a 24- to 48-hour period identify the causative organism in up to 90% of patients.

NURSING DIAGNOSES

• Activity intolerance
• Decreased cardiac output
• Risk for injury

TREATMENT

• Bed rest
• Maintaining sufficient fluid intake
• Surgery (in cases of severe valvular damage) to replace defective valve

Drug therapy

• Antibiotics: most effective in treating causative organism
• Antiplatelet agent: aspirin

INTERVENTIONS AND RATIONALES

• Monitor ECG *to detect arrhythmias.*
• Monitor cardiovascular status *to detect complications.*
• Monitor pulse oximetry values *to detect hypoxia.*
• Before giving antibiotics, obtain a patient history of allergies *to prevent anaphylaxis.*
• Observe for signs of infiltration and inflammation—possible complications of long-term I.V. drug administration—at the venipuncture site.
• Watch for signs of embolization (hematuria, pleuritic chest pain, left-upper-quadrant pain, and paresis), a common occurrence during the first 3 months of treatment. *These signs may indicate impending peripheral vascular occlusion or splenic, renal, cerebral, or pulmonary infarction.*
• Monitor the patient's renal status (BUN levels, creatinine clearance, and urine output) *to check for signs of renal emboli or drug toxicity.*
• Observe for signs of heart failure, such as dyspnea, tachypnea, tachycardia, crackles, jugular vein distention, edema, and weight gain. *Detecting heart failure early ensures prompt intervention and treatment. It also decreases the risk that heart failure will progress to pulmonary edema.*

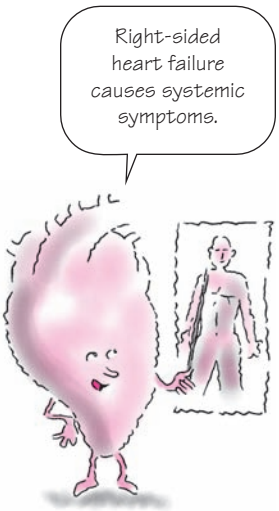
Teaching topics

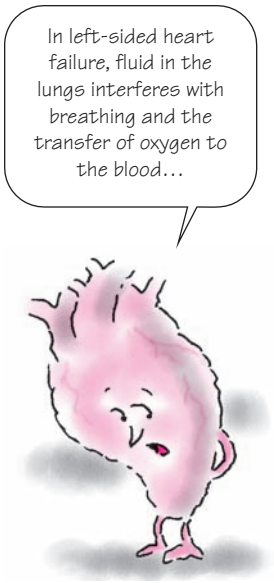
• Importance of continuing antibiotic therapy for as long as prescribed even if he's feeling better.
• Recognizing symptoms of endocarditis; notifying the doctor immediately if symptoms occur
• Understanding the need for prophylactic antibiotics before, during, and after dental work, childbirth, and GU, GI, or gynecologic procedures

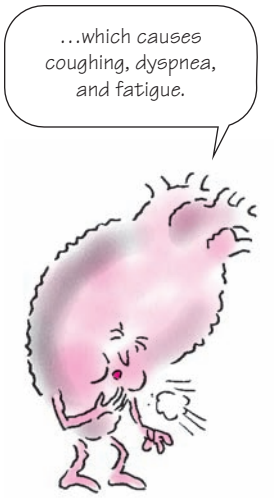
Heart failure

Heart failure occurs when the heart can't pump enough blood to meet the body's metabolic needs.

Heart failure can occur as left-sided failure or right-sided failure. Left-sided heart failure causes mostly pulmonary symptoms, such as dyspnea, dyspnea on exertion, and a moist cough. Right-sided heart failure causes systemic symptoms, such as peripheral edema and swelling, jugular vein distention, and hepatomegaly.







CAUSES

- Atherosclerosis
- Cardiac conduction defects (left-sided failure)
- Chronic obstructive pulmonary disease (COPD; right-sided failure)
- Fluid overload
- Hypertension (left-sided failure)
- Left-sided heart failure (right-sided failure)
- MI
- Pulmonary hypertension (right-sided failure)
- Valvular insufficiency
- Valvular stenosis

DATA COLLECTION FINDINGS

Left-sided failure

- Anxiety
- Arrhythmias
- Cough
- Crackles
- Diaphoresis
- Dyspnea
- Fatigue
- Gallop rhythm: S_3 and S_4
- Orthopnea
- Paroxysmal nocturnal dyspnea
- Tachycardia
- Tachypnea

Right-sided failure

- Anorexia
- Ascites
- Dependent edema
- Fatigue
- Gallop rhythm: S_3 and S_4
- Hepatomegaly
- Jugular vein distention
- Nausea
- Signs of left-sided heart failure
- Tachycardia
- Weight gain

DIAGNOSTIC FINDINGS

Left-sided failure

- BNP levels are elevated.
- Chest X-ray shows increased pulmonary congestion and left ventricular hypertrophy.
- ABG levels indicate hypoxemia and hypercapnia.
- Blood chemistry tests reveal decreased potassium and sodium levels and increased BUN and creatinine levels.
- ECG shows left ventricular hypertrophy.
- Echocardiography shows enlarged cardiac chambers and decreased wall motion.

Right-sided failure

- BNP levels are elevated.
- Chest X-ray reveals pulmonary congestion, cardiomegaly, and pleural effusion.
- ABG levels indicate hypoxemia.
- Blood chemistry tests show decreased sodium and potassium levels and increased BUN and creatinine levels.
- ECG shows left and right ventricular hypertrophy.
- Echocardiogram shows enlarged cardiac chambers and decreased wall motion.

NURSING DIAGNOSES

- Decreased cardiac output
- Excess fluid volume
- Impaired gas exchange

TREATMENT

- Establishing a low-sodium diet and limiting fluids
- IABP
- Oxygen therapy, possibly requiring intubation and mechanical ventilation
- Left ventricular assist device (for left-sided failure)
- Paracentesis (for right-sided failure)
- Thoracentesis (for right-sided failure)

Drug therapy

- Diuretics: furosemide (Lasix), bumetanide (Bumex), metolazone (Zaroxolyn)
- Human B-type natriuretic peptide: nesiritide (Natrecor)
- Angiotensin-converting enzyme (ACE) inhibitors: captopril (Capoten), enalapril (Vasotec), lisinopril (Prinivil)
- Analgesic: morphine (I.V.)
- Cardiac glycoside: digoxin (Lanoxin)
- Inotropic agents: dopamine (Intropin), dobutamine (Dobutrex), inamrinone (Inocor), milrinone (Primacor), nesiritide (Natrecor)
- Nitrates: isosorbide dinitrate (Isordil), nitroglycerin (Nitro-Bid)
- Vasodilator: nitroprusside (Nitropress)

INTERVENTIONS AND RATIONALES

- Administer oxygen *to enhance arterial oxygenation.*
- Monitor pulse oximetry values *to detect hypoxia.*
- Monitor ECG *to detect arrhythmias and ischemia.*
- Monitor vital signs *to detect signs of reduced cardiac output.*
- Monitor respiratory status *to detect increasing fluid in the lungs and respiratory failure.*
- Keep the patient in semi-Fowler's position *to increase chest expansion and improve ventilation.*
- Administer medications, as prescribed, *to enhance cardiac performance and reduce excess fluids.*
- Measure and record intake and output. *Intake greater than output may indicate fluid retention.*
- Provide suctioning, if necessary, and assist with turning, coughing, and deep breathing *to prevent pulmonary complications.*
- Restrict oral fluids *because excess fluids can worsen heart failure.*
- Weigh the patient daily. *A weight gain of 1.1 to 2.2 lb (0.5 to 1 kg) per day indicates fluid gain.*
- Measure and record the patient's abdominal girth. *An increase in abdominal girth suggests worsening fluid retention and right-sided heart failure.*
- Maintain the patient's prescribed diet (low sodium) *to reduce fluid accumulation.*
- Encourage the patient to express feelings, such as a fear of dying, *to reduce anxiety.*

Teaching topics

- Limiting sodium intake and supplementing diet with foods high in potassium
- Recognizing signs and symptoms of fluid overload
- Elevating legs when seated
- Contacting the American Heart Association

Hypertension

Persistent elevation of systolic or diastolic blood pressure indicates hypertension. Hypertension results from a narrowing of the arterioles, which increases peripheral resistance, necessitating increased force to circulate blood through the body.

There are two major types of hypertension:

- **Essential hypertension,** the most common, has no known cause, though many factors play a role in its development.
- **Secondary hypertension** is caused by renal disease or other systemic diseases.

The National Institutes of Health classifies blood pressure as follows:

Normal	Systolic blood pressure (SBP) <120 mm Hg and diastolic blood pressure (DBP) <80 mm Hg
Prehypertension	SBP 120 to 139 mm Hg or DBP 80 to 89 mm Hg
Stage 1 hypertension	SBP 140 to 159 mm Hg or DBP 90 to 99 mm Hg
Stage 2 hypertension	SBP 160 mm Hg or DBP 100 mm Hg

A blood pressure of 130/80 mm Hg or higher is considered high blood pressure for patients with diabetes or chronic kidney disease.

CAUSES

- Coarctation of the aorta
- Cushing's disease
- Neurologic disorders
- No known cause (essential hypertension)
- Hormonal contraceptive use
- Pheochromocytoma
- Pregnancy
- Primary hyperaldosteronism
- Renovascular disease
- Thyroid, pituitary, or parathyroid disease
- Use of drugs, such as cocaine, epoetin alfa, and cyclosporine

Risk factors for essential hypertension

- Aging (males over age 45, females over age 55)
- Atherosclerosis
- Diet (high sodium and caffeine intake)
- Family history
- Overweight
- Race (more common in blacks)
- Sex (more common in males over age 40)
- Smoking

- Stress
- Lack of physical activity
- Excessive alcohol use
- Diabetes mellitus

DATA COLLECTION FINDINGS

- Ankle edema
- Asymptomatic
- Chest pain
- Dizziness
- Dyspnea
- Elevated blood pressure
- Headache
- Papilledema
- Vision disturbances, including blindness

DIAGNOSTIC FINDINGS

- Blood chemistry test results show elevated sodium, BUN, creatinine, and cholesterol levels.
- Blood pressure measurements show sustained readings higher than 140/90 mm Hg.
- Chest X-ray reveals cardiomegaly.
- ECG shows left ventricular hypertrophy.
- Ophthalmoscopic examination shows retinal changes, such as severe arteriolar narrowing, papilledema, and hemorrhage.
- Urinalysis shows proteinuria, RBCs, and WBCs.

NURSING DIAGNOSES

- Excess fluid volume
- Deficient knowledge (hypertension)
- Imbalanced nutrition: More than body requirements

TREATMENT

- Weight reduction
- Increasing physical activity to 30 minutes at least 5 days per week
- Dietary changes:
  - Consuming foods low in saturated fat, total fat, and cholesterol

Dash into dietary changes

Studies indicate that using the National Institutes of Health DASH (Dietary Approaches to Stop Hypertension) combination diet lowers blood pressure and may also help prevent hypertension. The diet is low in cholesterol; high in dietary fiber, potassium, calcium, and magnesium; and moderately high in protein. If you educate your patient about this diet, he may be able to control his blood pressure without the use of medication.

Here is a sample DASH plan based on a 2,000-calorie diet. Depending on caloric needs, the number of servings in a food group may vary.

Food group	Daily servings	Serving sizes
Grains	7 to 8	• 1 slice bread • ½ cup celery • ½ cup cooked rice, pasta, or cereal
Vegetables	4 to 5	• 1 cup raw leafy vegetable • ½ cup cooked vegetable • 6 oz vegetable juice
Fruits	4 to 5	• 6 oz fruit juice • 1 medium fruit • ¼ cup dried fruit • ¼ cup fresh, frozen, or canned fruit
Low-fat or nonfat dairy products	2 to 3	• 8 oz milk • 1 cup yogurt • ½ oz cheese
Meat, poultry, and fish	2 or less	• 3 oz cooked meat, poultry, or fish
Nuts, seeds, and legumes	4 to 5 per week	• ½ oz or ⅓ cup nuts • ½ oz or 2 tablespoons seeds • ½ cup cooked legumes

– Eating fruits, vegetables, and low-fat dairy foods, through programs such as the DASH eating plan (see *Dash into dietary changes*)
– Reducing sodium intake
– Limiting alcohol intake

Drug therapy

• ACE inhibitors: captopril (Capoten), enalapril (Vasotec), lisinopril (Prinivil)
• Aldosterone receptor blockers: spironolactone (Aldactone), eplerenone (Inspra)
• Antihypertensives: methyldopa (Aldomet), prazosin (Minipress), doxazosin (Cardura), clonidine (Catapres)
• Beta-adrenergic blockers: propranolol (Inderal), metoprolol (Lopressor), carteolol (Cartrol), penbutolol (Levatol), labetalol (Normodyne), atenolol (Tenormin)
• Angiotensin II antagonists: losartan (Cozaar), valsartan (Diovan)
• Calcium channel blockers: nifedipine (Procardia), verapamil (Calan), diltiazem (Cardizem), nicardipine (Cardene)
• Diuretics: furosemide (Lasix), spironolactone (Aldactone), hydrochlorothiazide (HydroDIURIL), bumetanide (Bumex), metolazone (Zaroxolyn)
• Vasodilators: nitroprusside (Nitropress), hydralazine (Apresoline)

INTERVENTIONS AND RATIONALES

• Monitor vital signs. Take an average of two or more blood pressure readings rather than relying on a single abnormal one *to establish hypertension.*
• Obtain blood pressure readings in the lying, sitting, and standing positions *to monitor for orthostatic hypotension* (observe for pallor, diaphoresis, or vertigo).
• Note neurologic status and observe *for changes that may indicate an alteration in cerebral perfusion* (stroke or hemorrhage).
• Monitor and record intake and output and weigh the patient daily *to detect fluid volume overload.*
• Administer medications, as prescribed, *to lower blood pressure.*
• Maintain the patient's prescribed diet *because a high-sodium, high-cholesterol, high-fat diet may contribute to hypertension.*
• Encourage the patient to express feelings about daily stress *to reduce anxiety.*
• Maintain a quiet environment *to reduce stress.*

Teaching topics

• Taking blood pressure daily and recognizing when to notify the doctor
• Beginning a smoking-cessation program, if appropriate
• Reducing alcohol intake to moderate levels
• Following the DASH diet
• Following a program of regular exercise
• Losing weight, if appropriate
• Contacting the American Heart Association

Hypovolemic shock

In hypovolemic shock, reduced intravascular blood volume causes circulatory dysfunction and inadequate tissue perfusion. Without sufficient blood or fluid replacement, hypovolemic shock syndrome may lead to irreversible cerebral and renal damage, cardiac arrest and, ultimately, death.

Hypovolemic shock requires early recognition of signs and symptoms and prompt, aggressive treatment to improve the prognosis.

CAUSES

• Acute blood loss (approximately one-fifth of total volume)
• Acute pancreatitis
• Dehydration from excessive perspiration
• Diabetes insipidus
• Diuresis
• Inadequate fluid intake
• Intestinal obstruction
• Peritonitis
• Severe diarrhea or protracted vomiting

DATA COLLECTION FINDINGS

• Cold, pale, clammy skin
• Decreased sensorium
• Hypotension with narrowing pulse pressure
• Rapid, shallow respirations
• Reduced urine output (less than 25 ml/hour)
• Tachycardia

DIAGNOSTIC FINDINGS

- Blood test results show elevated serum potassium, serum lactate, and BUN levels, increased urine specific gravity (greater than 1.020) and urine osmolality; and decreased hemoglobin and hematocrit (if blood loss occurs).
- Gastroscopy, aspiration of gastric contents through a nasogastric tube, and X-rays identify internal bleeding sites.
- ABG analysis reveals metabolic acidosis (decreased blood pH, decreased bicarbonate level).

NURSING DIAGNOSES

- Ineffective tissue perfusion: Cardiopulmonary, cerebral, peripheral, renal
- Decreased cardiac output
- Deficient fluid volume

TREATMENT

- Supplemental oxygen administration
- Complete bed rest
- Blood and fluid replacement
- Control of bleeding (may require surgery)
- Pneumatic antishock garment (sometimes used)

Drug therapy

- Vitamin K if patient was receiving warfarin (Coumadin)

INTERVENTIONS AND RATIONALES

Management of hypovolemic shock necessitates prompt, aggressive support measures, careful assessment, and monitoring of vital signs. Follow these priorities:

- Check for a patent airway and adequate circulation. If blood pressure and heart rate are absent, start CPR *to prevent irreversible organ damage and death.*
- Record blood pressure, pulse rate, peripheral pulses, respiratory rate, and other vital signs every 15 minutes. Monitor the ECG continuously. A systolic blood pressure lower than 80 mm Hg usually results in inadequate coronary artery blood flow, cardiac ischemia, arrhythmias, and further complications of low cardiac output. When blood pressure drops below 80 mm Hg, increase the oxygen flow rate and notify the doctor immediately. *A progressive drop in blood pressure accompanied by a thready pulse generally signals inadequate cardiac output from reduced intravascular volume.*
- Maintain I.V. lines with normal saline or lactated Ringer's solution *to correct fluid volume deficit.*
- Monitor pulse oximetry values *to detect hypoxia.*
- An indwelling urinary catheter may be inserted to measure hourly urine output. If output is less than 30 ml/hour in adults, increase the fluid infusion rate as indicated in the doctor's order, but watch for signs of fluid overload. Notify the doctor if urine output doesn't improve. An osmotic diuretic such as mannitol (Osmitrol) may be ordered *to increase renal blood flow and urine output.*
- Administer oxygen *to ensure adequate oxygenation of tissues.* ET intubation and mechanical ventilation may be necessary.
- Draw venous blood for complete blood count, electrolyte levels, type and crossmatch, and coagulation studies *to guide the treatment regimen.*
- During therapy, assess skin color and temperature and note any changes. *Cold, clammy skin may be a sign of continuing peripheral vascular constriction, indicating progressive shock.*
- Provide emotional support to the patient and his family *to help them cope with this typically overwhelming situation.*

Teaching topics

- All procedures and their purpose
- Understanding the cause of hypovolemia and treatment options

Myocardial infarction

With MI, an acute coronary syndrome, reduced blood flow in one of the coronary arteries leads to myocardial ischemia, injury, and necrosis.

In Q-wave MI, tissue damage extends through all myocardial layers. In non–Q-wave MI, usually only the innermost layer is damaged.

CAUSES

- Aging
- Decreased serum HDL levels

- Diabetes mellitus
- Elevated serum triglyceride, LDL, and cholesterol levels
- Excessive intake of saturated fats, carbohydrates, or salt
- Hypertension
- Obesity
- Family history of CAD
- Sedentary lifestyle
- Smoking
- Stress
- Use of amphetamines or cocaine
- Postmenopause

DATA COLLECTION FINDINGS

- Anxiety
- Arrhythmias
- Crushing substernal chest pain that may radiate to the jaw, back, and arms; lasts longer than anginal pain; isn't relieved by rest or nitroglycerin (may not be present in asymptomatic or silent MI); in women, possibly atypical symptoms such as pain and fatigue
- Diaphoresis
- Dyspnea
- Elevated temperature
- Nausea and vomiting
- Pallor

DIAGNOSTIC FINDINGS

- ECG shows an enlarged Q wave, elevated or depressed ST segment, and T-wave inversion.
- Blood chemistry studies show increased CK, LD, AST, and lipid levels; positive CK-MB fraction; flipped LD_1 (LD_1 levels exceed LD_2 levels, the reverse of their normal patterns); and increased troponin (T and I).
- Blood studies show increased WBC count.
- Echocardiography may show ventricular wall motion abnormalities and may reveal septal or papillary muscle rupture.
- The chest X-ray may show left-sided heart failure or cardiomegaly caused by ventricular dilation.
- Nuclear imaging scanning may show areas of infarction and viable muscle cells.
- Cardiac catheterization may be used to identify the involved coronary artery as well as provide information on ventricular function and pressures and volumes within the heart.

NURSING DIAGNOSES

- Decreased cardiac output
- Ineffective denial
- Ineffective tissue perfusion: Cardiopulmonary

TREATMENT

- Bed rest with bedside commode for the first 12 hours
- Coronary artery bypass graft surgery
- IABP
- Left ventricular assist device
- Low-calorie, low-cholesterol, low-fat diet
- Monitoring vital signs, urine output, ECG, and hemodynamic status
- Ongoing laboratory studies: ABG, CK with isoenzyme, electrolyte, and cardiac troponin levels
- Oxygen therapy
- PTCA or coronary artery stent placement
- Pulmonary artery catheterization (to detect left- or right-sided heart failure)
- Pacemaker for symptomatic bradycardia

Drug therapy

- Analgesic: morphine (I.V.)
- ACE inhibitors: captopril (Capoten), enalapril (Vasotec)
- Antiarrhythmics: amiodarone (Cordarone), lidocaine (Xylocaine), procainamide (Pronestyl)
- Anticoagulants: dalteparin (Fragmin), enoxaparin (Lovenox), heparin I.V. after thrombolytic therapy
- Antiplatelet aggregation agents: aspirin, abciximab (ReoPro), clopidogrel (Plavix), eptifibatide (Integrilin)
- Beta-adrenergic blockers: propranolol (Inderal), nadolol (Corgard), metoprolol (Lopressor); beta-adrenergic blockers contraindicated if patient also has hypotension, asthma, or COPD
- Calcium channel blockers: nifedipine (Procardia), verapamil (Calan), diltiazem (Cardizem)
- I.V. atropine for symptomatic bradycardia or heart block
- Nitrate: nitroglycerin I.V. (Nitro-Bid)
- Thrombolytic agents: tissue plasminogen activator (Activase), streptokinase (Streptase), anistreplase (Eminase), reteplase (Retavase); should be given within 6 hours of on-

Memory jogger

To remember the signs and symptoms of MI, think **DANCE PAD:**

Dyspnea

Anxiety

Nausea and vomiting

Crushing substernal chest pain

Elevated temperature

Pallor

Arrhythmias

Diaphoresis

set of symptoms but are most effective when started within 3 hours
• Vasodilator: hydralazine (Apresoline)

INTERVENTIONS AND RATIONALES

• Monitor the ECG *to detect ischemia, injury, new or extended infarction, arrhythmias, and conduction defects.* (See *Close monitoring for complications*.)
• Monitor and record vital signs *to track response to therapy and detect complications.*
• Monitor and record intake and output *to assess renal perfusion and possible fluid retention.*
• Monitor breathing status *to watch for signs of heart failure, such as an S_3 or S_4 gallop, crackles, cough, tachypnea, and edema.*
• Maintain bed rest for the first 12 hours *to reduce oxygen demands on the heart.*
• Administer oxygen, as prescribed, *to improve oxygen supply to heart muscle.*
• Monitor pulse oximetry values *to detect hypoxia.*
• Obtain an ECG reading during acute pain *to detect myocardial ischemia, injury, or infarction.*
• Maintain the patient's prescribed diet *to reduce fluid retention and cholesterol levels.*

Close monitoring for complications

After a myocardial infarction (MI), closely monitor the patient for complications. Early recognition and treatment of these complications can improve his outcome.

Complication	What to look for
Arrhythmias	• Ventricular tachycardia • Ventricular fibrillation • In inferior wall MI, bradycardia, junctional rhythms, or atrioventricular blocks • In anterior wall MI, tachycardia or atrioventricular blocks
Heart failure	• Dyspnea • Dyspnea on exertion • Crackles on auscultation of the lungs • Jugular vein distention
Cardiogenic shock	• Hypotension • Tachycardia • S_3 and S_4 • Decreased level of consciousness • Decreased urine output • Jugular vein distention • Cool, pale skin
Papillary muscle rupture	• Jugular vein distention • Dyspnea • Holosystolic murmur on auscultation
Pericarditis	• Chest pain that's relieved by sitting up • Friction rub on auscultation

• Provide postoperative care, if necessary, *to avoid postoperative complications and help the patient achieve a full recovery.*
• Allay the patient's anxiety *because anxiety increases oxygen demand.*
• Provide postprocedure care if PTCA is necessary.

Teaching topics
• Undergoing cardiac rehabilitation
• Maintaining activity limitations
• Maintaining a low-cholesterol, low-fat, low-sodium diet
• Differentiating between the pain of angina and MI
• Contacting the American Heart Association
• Importance of avoiding tobacco
• Reducing alcohol intake
• Losing weight
• Obtaining regular follow-up care

Myocarditis

Myocarditis is focal or diffuse inflammation of the cardiac muscle (myocardium). It may be acute or chronic and can occur at any age. In many cases, myocarditis fails to produce specific cardiovascular symptoms or ECG abnormalities, and recovery is usually spontaneous, without residual defects. Occasionally, myocarditis is complicated by heart failure; rarely, it may lead to cardiomyopathy.

CAUSES
• Bacterial infections: diphtheria, tuberculosis, typhoid fever, tetanus, and staphylococcal, pneumococcal, and gonococcal infections
• Chemical poisons such as chronic alcoholism
• Helminthic infections such as trichinosis
• Hypersensitive immune reactions, such as acute rheumatic fever and postcardiotomy syndrome
• Parasitic infections, especially South American trypanosomiasis (Chagas' disease) in neonates and immunosuppressed adults; also, toxoplasmosis
• Radiation therapy: large doses of radiation to the chest for treatment of lung or breast cancer
• Viral infections (most common cause in the United States and western Europe): coxsackievirus A and B strains and, possibly, poliomyelitis, influenza, rubeola, rubella, and adenoviruses and echoviruses

DATA COLLECTION FINDINGS
• Arrhythmias (S_3 and S_4 gallops, faint S_1)
• Dyspnea
• Fatigue
• Fever
• Mild, continuous pressure or soreness in the chest (unlike the recurring, stress-related pain of angina pectoris)
• Palpitations

DIAGNOSTIC FINDINGS
• Blood tests show elevated cardiac enzyme levels (CK, the CK-MB isoenzyme, AST, and LD), increased WBC count and ESR, and elevated antibody titers (such as antistreptolysin O titer in rheumatic fever).
• ECG typically shows diffuse ST-segment and T-wave abnormalities (as in pericarditis), conduction defects (prolonged PR interval), and other supraventricular arrhythmias.
• Endomyocardial biopsy confirms the diagnosis. A negative biopsy doesn't exclude the diagnosis and a repeat biopsy may be needed to rule out the diagnosis.
• Stool and throat cultures may identify the causative bacteria.

NURSING DIAGNOSES
• Activity intolerance
• Decreased cardiac output
• Hyperthermia

TREATMENT
• Bed rest
• Diet: sodium restriction

Drug therapy
• Antiarrhythmics: amiodarone (Cordarone), procainamide (Pronestyl)
• Antibiotics: based on sensitivity of infecting organism
• Anticoagulants: warfarin (Coumadin), heparin, dalteparin (Fragmin), enoxaparin (Lovenox)

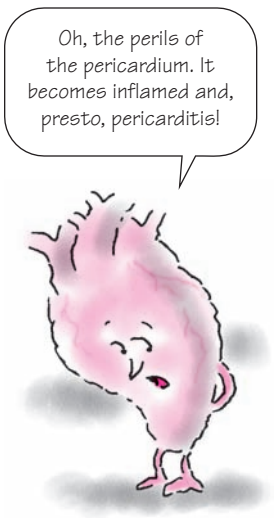
• Cardiac glycoside: digoxin (Lanoxin) to increase myocardial contractility
• Diuretic: furosemide (Lasix)

INTERVENTIONS AND RATIONALES

• Observe breathing pattern and check lung status *to detect signs of heart failure.*
• Monitor the ECG *to detect arrhythmias.*
• Watch for signs of digoxin toxicity (anorexia, nausea, vomiting, blurred vision, cardiac arrhythmias) and for complicating factors that may increase the potential for toxicity, such as electrolyte imbalances or hypoxia. *Early identification of these signs may help prevent further complications.*
• Stress the importance of bed rest *to decrease oxygen demands on the heart.* Assist with bathing as necessary; have the patient use a bedside commode, *which is less stressful on the heart than using a bedpan.* Reassure the patient that activity limitations are temporary.
• Offer diversional activities that aren't physically demanding *to decrease his anxiety.*

Teaching topics

• Restricting activities for as long as the doctor prescribes
• If taking digoxin at home, checking pulse for 1 full minute before taking the dose and withholding the dose and notifying the doctor if pulse rate falls below the predetermined rate (usually 60 beats/minute)
• Resuming normal activities slowly, when appropriate, and avoiding competitive sports



Pericarditis

Pericarditis is an inflammation of the pericardium, the fibroserous sac that envelops, supports, and protects the heart. It occurs in both acute and chronic forms. **Acute pericarditis** can be fibrinous or effusive, with purulent, serous, or hemorrhagic exudate; **chronic constrictive pericarditis** is characterized by dense, fibrous pericardial thickening. The prognosis depends on the underlying cause but is generally good in acute pericarditis, unless constriction occurs.

CAUSES

• Bacterial, fungal, or viral infection (infectious pericarditis)
• High-dose radiation to the chest
• Hypersensitivity or autoimmune disease, such as acute rheumatic fever (most common cause of pericarditis in children), systemic lupus erythematosus, and rheumatoid arthritis
• Idiopathic factors (most common in acute pericarditis)
• Neoplasms (primary or metastases from lungs, breasts, or other organs)
• Postcardiac injury, such as MI (which later causes an autoimmune reaction [Dressler's syndrome] in the pericardium), trauma, or surgery that leaves the pericardium intact but causes blood to leak into the pericardial cavity
• Uremia

DATA COLLECTION FINDINGS

Acute pericarditis

• Pericardial friction rub (grating sound heard as the heart moves)
• Sharp and commonly sudden pain that usually starts over the sternum and radiates to the neck, shoulders, back, and arms; unlike the pain of MI, pericardial pain is commonly pleuritic, increasing with deep inspiration and decreasing when the patient sits up and leans forward, pulling the heart away from the diaphragmatic pleurae of the lungs
• Symptoms of cardiac tamponade (pallor, clammy skin, hypotension, pulsus paradoxus, jugular vein distention)
• Symptoms of heart failure (dyspnea, orthopnea, tachycardia, ill-defined substernal chest pain, feeling of fullness in the chest)

Chronic pericarditis

• Gradual increase in systemic venous pressure
• Pericardial friction rub
• Symptoms similar to those of chronic right-sided heart failure (fluid retention, ascites, hepatomegaly)

DIAGNOSTIC FINDINGS

• Blood tests reflect inflammation and may show normal or elevated WBC count, especially in infectious pericarditis; elevated ESR; and slightly elevated cardiac enzyme levels if associated with myocarditis.

• Culture of pericardial fluid obtained by open surgical drainage or cardiocentesis sometimes identifies a causative organism in bacterial or fungal pericarditis.
• Echocardiography confirms the diagnosis when it shows an echo-free space between the ventricular wall and the pericardium (in cases of pleural effusion).
• ECG shows the following changes in acute pericarditis: elevation of ST segments in the standard limb leads and most precordial leads without significant changes in QRS morphology that occur with MI, atrial ectopic rhythms such as AF, and diminished QRS voltage in pericardial effusion.

NURSING DIAGNOSES
• Decreased cardiac output
• Deficient diversional activity
• Acute pain

TREATMENT
• Bed rest
• Surgery: pericardiocentesis (for cases of cardiac tamponade), partial pericardectomy (for recurrent pericarditis), total pericardectomy (for constrictive pericarditis)
• Supplemental oxygen

Drug therapy
• Antibiotics: according to sensitivity of causative organism
• Corticosteroid: methylprednisolone (Solu-Medrol)
• Nonsteroidal anti-inflammatory drugs (NSAIDs): aspirin, indomethacin (Indocin)

INTERVENTIONS AND RATIONALES
• Monitor vital signs *to detect deterioration in condition.*
• Monitor ECG *to detect arrhythmias.*
• Provide complete bed rest *to decrease oxygen demands on the heart.*
• Monitor pain in relation to respiration and body position *to distinguish pericardial pain from myocardial ischemic pain.*
• Place the patient in an upright position *to relieve dyspnea and chest pain.*
• Provide analgesics and oxygen, and reassure the patient with acute pericarditis that his condition is temporary and treatable *to promote patient comfort and allay anxiety.*
• Explain tests and treatments to the patient. If surgery is necessary, teach him deep-breathing and coughing exercises *to alleviate fear and anxiety and to promote compliance with the postoperative treatment regimen.* Postoperative care is similar to that given after cardiothoracic surgery.

Teaching topics
• Understanding all tests and treatments
• Performing coughing and deep-breathing exercises
• Slowly resuming daily activities and scheduling rest periods in daily routine

Pulmonary edema

Pulmonary edema is a complication of left-sided heart failure. It occurs when pulmonary capillary pressure exceeds intravascular osmotic pressure and results in increased pressure in the capillaries of the lungs and acute transudation of fluid. This leads to impaired oxygenation and hypoxia.

CAUSES
• Acute respiratory distress syndrome
• Atherosclerosis
• Drug overdose: heroin, barbiturates, morphine
• Heart failure
• Hypertension
• MI
• Myocarditis
• Overload of I.V. fluids
• Smoke inhalation
• Valvular disease

DATA COLLECTION FINDINGS
• Agitation, restlessness, and intense fear
• Blood-tinged, frothy sputum
• Paroxysmal cough
• Cold, clammy skin
• Crackles over lung fields
• Dyspnea, orthopnea, or tachypnea
• Jugular vein distention
• Syncope
• Tachycardia, S_3 and S_4, and chest pain

DIAGNOSTIC FINDINGS

- ABG levels show respiratory alkalosis or acidosis and hypoxemia.
- Chest X-ray shows pulmonary congestion.
- ECG reveals tachycardia and ventricular enlargement.
- Pulse oximetry reveals hypoxia.

NURSING DIAGNOSES

- Anxiety
- Excess fluid volume
- Impaired gas exchange

TREATMENT

- Oxygen therapy: possibly intubation and mechanical ventilation
- Activity changes: maintaining bed rest and implementing range-of-motion and isometric exercises
- Dietary changes: establishing a low-sodium diet and limiting oral fluids
- Hemodialysis and ultrafiltration, if available

Drug therapy

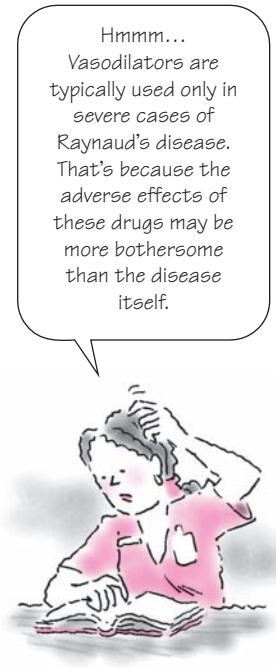
- Diuretics: furosemide (Lasix), bumetanide (Bumex), metolazone (Zaroxolyn)
- Analgesic: morphine I.V.
- Cardiac glycoside: digoxin (Lanoxin)
- Inotropic agents: dobutamine (Dobutrex), inamrinone (Inocor), milrinone (Primacor), nesiritide (Natrecor)
- Nitrates: isosorbide dinitrate (Isordil), nitroglycerin (Nitro-Bid)
- Vasodilator: nitroprusside (Nitropress)

INTERVENTIONS AND RATIONALES

- Administer oxygen, as prescribed, *to increase alveolar oxygen concentration and enhance arterial blood oxygenation.*
- Monitor vital signs and breathing pattern *to detect changes in fluid balance. Tachycardia, S_3, hypotension, increased respiratory rate, and crackles indicate increased fluid volume.*
- Monitor ECG *to detect arrhythmias and ischemia.*
- Monitor pulse oximetry values *to detect hypoxia.*
- Monitor and record intake and output. *Intake greater than output and elevated specific gravity suggest fluid retention.*
- Weigh the patient daily to detect fluid retention. *Weight gain of 1.1 to 2.2 lb (0.5 to 1 kg) per day suggests fluid retention.*
- Keep the patient in high Fowler's position if his blood pressure remains stable. If the patient is hypotensive, have him maintain the semi-Fowler's position. *Elevating the head of the bed reduces venous return to the heart and promotes chest expansion.*
- Administer medications *to improve gas exchange, improve myocardial function, and reduce anxiety.*
- Note the color, amount, and consistency of sputum. *The amount and consistency may indicate hydration status. A change in color or foul-smelling sputum may indicate a respiratory infection.*
- Withhold food and fluids, as directed, *to prevent aspiration.*
- Encourage the patient to express his feelings, such as a fear of suffocation, *to reduce anxiety and lessen oxygen demand.*

Teaching topics

- Elevating the head of the bed while sleeping
- Eating foods high in potassium and low in sodium
- Recognizing early signs of fluid overload
- Recognizing signs and symptoms of respiratory distress
- Taking medications exactly as prescribed
- Recording weight daily



Raynaud's disease

Raynaud's disease, characterized by episodic vasospasm in the small peripheral arteries and arterioles, is precipitated by exposure to cold or stress. This condition occurs bilaterally and usually affects the hands or, less often, the feet. It's most prevalent in women, particularly between puberty and age 40. A benign condition, it requires no specific treatment and has no serious residual effects.

Raynaud's phenomenon, however, a condition often associated with several connective tissue disorders—such as scleroderma, systemic lupus erythematosus, and polymyositis—has a progressive course, leading to ischemia, gangrene, and amputation.

Differentiating the two disorders is difficult because some patients who experience mild symptoms of Raynaud's disease for several years may later develop overt connective tissue disease—most commonly scleroderma.

CAUSES

• Unknown (most probable theory involves an antigen-antibody immune response)

DATA COLLECTION FINDINGS

• Numbness and tingling relieved by warmth
• Typically, blanching of skin on the fingers, which then becomes cyanotic before changing to red (after exposure to cold or stress)
• Sclerodactyly (thickening of the skin of the digits), ulcerations, or chronic paronychia (inflammation involving tissue folds around the nails) in longstanding disease

DIAGNOSTIC FINDINGS

• Arteriography reveals vasospasm.
• Plethysmography reveals intermittent vessel occlusion.

NURSING DIAGNOSES

• Ineffective tissue perfusion: Peripheral
• Risk for injury
• Risk for peripheral neurovascular dysfunction

TREATMENT

• Activity changes: avoidance of cold
• Smoking cessation (if appropriate)
• Surgery (used in less than 25% of patients): sympathectomy

Drug therapy

• Calcium channel blockers: diltiazem (Cardizem), nifedipine (Procardia)
• Vasodilators: phenoxybenzamine (Dibenzyline), reserpine (Diupres)

INTERVENTIONS AND RATIONALES

• Warn the patient against exposure to cold. Tell him to wear mittens or gloves during cold weather and when handling cold items or defrosting the freezer. *This prevents vasospasm, which triggers symptoms.*
• Advise the patient to avoid stressful situations and to stop smoking. *These lifestyle changes can prevent exacerbation of symptoms.*
• Instruct the patient to inspect his skin frequently and to seek immediate care for signs of skin breakdown or infection *to prevent complications.*
• Teach the patient about typically prescribed drugs, their uses, and their adverse effects *to prevent further complications.*
• Provide psychological support and reassurance *to allay the patient's fear of amputation and other disfigurement.*

Teaching topics

• Eliminating risk factors such as smoking
• Maintaining preventive measures such as avoiding cold and stress

Rheumatic fever and rheumatic heart disease

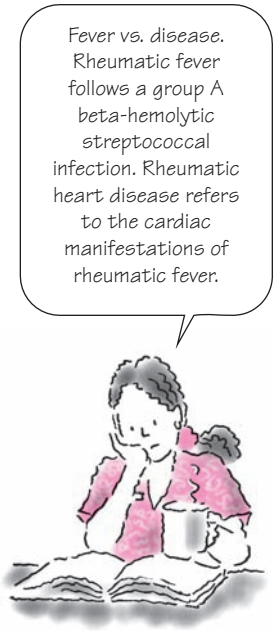
Commonly recurrent, acute rheumatic fever is a systemic inflammatory disease of childhood that follows a group A beta-hemolytic streptococcal infection. Rheumatic heart disease refers to the cardiac manifestations of rheumatic fever and includes pancarditis (myocarditis, pericarditis, and endocarditis) during the early acute phase and chronic valvular disease later.

Long-term antibiotic therapy can minimize recurrence of rheumatic fever, reducing the risk of permanent cardiac damage and eventual valvular deformity. However, severe pancarditis occasionally produces fatal heart failure during the acute phase. Of the patients who survive this complication, about 20% die within 10 years.

This disease strikes most often during cool, damp weather in the winter and early spring. In the United States, it's most common in the northern states.

CAUSES

• Hypersensitivity reaction to a group A beta-hemolytic streptococcal infection



DATA COLLECTION FINDINGS

- Temperature of at least 100.4° F (38° C)
- Migratory joint pain or polyarthritis
- Skin lesions such as erythema marginatum (in only 5% of patients)
- Transient chorea (can develop up to 6 months after the original streptococcal infection)

DIAGNOSTIC FINDINGS

- Blood test results show elevated WBC count and ESR as well as slight anemia during inflammation.
- Cardiac catheterization findings help evaluate valvular damage and left ventricular function in severe cardiac dysfunction.
- Cardiac enzyme levels may be increased in severe carditis.
- Chest X-rays show normal heart size (except in myocarditis, heart failure, or pericardial effusion).
- C-reactive protein test is positive (especially during the acute phase).
- Echocardiography helps evaluate valvular damage, chamber size, and ventricular function.
- ECG shows prolonged PR interval in 20% of patients.

NURSING DIAGNOSES

- Activity intolerance
- Decreased cardiac output
- Risk for infection

TREATMENT

- Bed rest (in severe cases)
- Surgery: corrective valvular surgery (in persistent heart failure)

Drug therapy

- Antibiotics: erythromycin (Erythrocin), penicillin (Pfizerpen)
- NSAIDs: aspirin, indomethacin (Indocin)

INTERVENTIONS AND RATIONALES

- Monitor vital signs *to detect changes.*
- Administer antibiotic as ordered. Be sure to check for drug hypersensitivity, especially before giving penicillin, *to prevent anaphylaxis and other complications*
- Stress the need for bed rest during the acute phase, and suggest appropriate diversions that aren't physically demanding. *These measures decrease oxygen demands on the heart.*
- After the acute phase, encourage family and friends to spend as much time as possible with the patient *to minimize boredom.*
- If the patient has severe carditis, help him prepare for permanent changes in his lifestyle *to promote positive coping strategies.*
- Warn the patient to watch for and immediately report signs of recurrent streptococcal infection (oropharyngeal redness and exudate, swollen and tender cervical lymph glands, pain on swallowing, a temperature of 101° to 104° F [38.3° to 40° C]). *Early awareness of these symptoms can help to prevent complications associated with delayed treatment such as heart valve damage.*
- Urge the patient to avoid people with respiratory tract infections *to prevent reinfection.*
- Remind him of the need for additional antibiotics when undergoing dental surgery *to prevent reinfection.*
- Arrange for a visiting nurse to oversee home care, if necessary, *to promote compliance.*

Teaching topics

- Watching for and reporting signs of heart failure
- Starting normal activities slowly
- Taking prophylactic antibiotics before undergoing dental surgery
- Understanding the importance of good dental hygiene to prevent gingival infection

Thoracic aortic aneurysm

Thoracic aortic aneurysm is characterized by an abnormal widening of the ascending, transverse, or descending part of the aorta. Aneurysm of the ascending aorta is the most common type and is commonly fatal.

The aneurysm may be:

- **dissecting,** a hemorrhagic separation in the aortic wall, usually within the medial layer
- **saccular,** an outpouching of the arterial wall, with a narrow neck

• **fusiform,** a spindle-shaped enlargement encompassing the entire aortic circumference.

Some aneurysms progress to life-threatening complications such as rupture into the pericardium, with resulting tamponade.

CAUSES

• Atherosclerosis
• Congenital disorders such as coarctation of the aorta
• Fungal infection of the aortic arch and descending segments (in an infected aneurysm)
• Hypertension
• Syphilis, usually of the ascending aorta (uncommon because of antibiotics)
• Trauma, usually of the descending thoracic aorta, from an accident that shears the aorta transversely (acceleration-deceleration injuries)

DATA COLLECTION FINDINGS

Ascending aneurysm

• Bradycardia
• Pain (described as severe, penetrating, and ripping; extends to the neck, shoulders, lower back, or abdomen)
• Pericardial friction rub caused by a hemopericardium
• Unequal intensities of the right carotid and left radial pulses
• Hypertension followed by hypotension (if rupture occurs)

Descending aneurysm

• Pain (described as sharp and tearing, usually starting suddenly between the shoulder blades and possibly radiating to the chest)
• Hypertension followed by hypotension (if rupture occurs)

Transverse aneurysm

• Dry cough
• Dyspnea
• Dysphagia
• Hoarseness
• Pain (described as sharp and tearing; radiates to the shoulders)
• Hypertension followed by hypotension (if rupture occurs)

DIAGNOSTIC FINDINGS

• Aortography, the definitive test, shows the lumen of the aneurysm, its size and location, and the false lumen in a dissecting aneurysm.
• Blood tests may show low hemoglobin levels caused by blood loss from a leaking aneurysm.
• Chest X-ray shows widening of the aorta.
• A CT scan confirms that the patient has an aneurysm and shows its location.
• ECG helps distinguish a thoracic aneurysm from MI.
• Echocardiography may help identify a dissecting aneurysm of the aortic root.
• Transesophageal echocardiography is used to measure an aneurysm in the ascending and descending aorta.

NURSING DIAGNOSES

• Decreased cardiac output
• Ineffective breathing pattern
• Acute pain

TREATMENT

• Surgery: resection of aneurysm with a Dacron or Teflon graft replacement, possible replacement of aortic valve
• Blood product administration if the aneurysm is leaking or ruptures
• I.V. fluid administration
• Oxygen therapy and possibly ET intubation and mechanical ventilation
• Sequential compression device after surgery

Drug therapy

• Analgesic: morphine
• Antihypertensives: nitroprusside (Nitropress), labetalol (Normodyne)
• Negative inotropic agent: propranolol (Inderal)

INTERVENTIONS AND RATIONALES

• Monitor the patient's blood pressure *to detect deficient fluid volume.*
• Evaluate pain, breathing, and carotid, radial, and femoral pulses *to detect early signs of aneurysm rupture.*
• Monitor cardiovascular status *to detect complications.*
• Monitor ECG *to detect arrhythmias and ischemia.*

• Insert an indwelling urinary catheter *to monitor fluid status.*
• Maintain I.V. lines with normal saline or lactated Ringer's solution *to help prevent hypotension and correct fluid volume deficit.*
• When bleeding from an aneurysm is suspected, give a whole-blood transfusion *to adequately replace lost fluid.*
• Explain diagnostic tests. If surgery is scheduled, explain the procedure and expected postoperative care (I.V. lines, ET and drainage tubes, cardiac monitoring, and ventilation) *to alleviate the patient's anxiety.*
• Monitor pulse oximetry values *to detect hypoxia.*

After repair of thoracic aneurysm
• Monitor cardiovascular status *to detect changes.*
• Monitor ECG *to detect arrhythmias.*
• Evaluate the patient's LOC. Monitor vital signs, pulse rate, urine output, and pain *to guide treatment regimen and evaluate its effectiveness.*
• Check respiratory function. Carefully observe and record the type and amount of chest tube drainage, and frequently assess heart and breath sounds *to detect early signs of compromise.*
• Monitor I.V. therapy to prevent fluid excess, which may occur with rapid fluid replacement.
• Give medications, as appropriate, *to help improve the patient's condition.*
• Watch for signs of infection, especially fever, and excessive wound drainage *to initiate treatment promptly and prevent complications such as sepsis.*
• Assist with range-of-motion exercises of the legs *to prevent thromboembolism caused by venostasis during prolonged bed rest.*
• Encourage the patient to turn, cough, and breathe deeply *to promote lung expansion.*
• Help the patient walk *to prevent pneumonia, thromboembolism, and other complications of immobility.*
• Before the patient is discharged, educate him on the importance of antihypertensive drugs and potential adverse reactions.
• Teach the patient how to monitor his blood pressure *to prevent stroke and other complications associated with ineffective blood pressure management.*
• Throughout hospitalization, offer the patient and his family psychological support *to relieve anxiety and feelings of helplessness.*

Teaching topics
• Monitoring blood pressure to prevent or control hypertension
• Modifying risk factors by beginning a smoking-cessation program, if appropriate

Thrombophlebitis

Thrombophlebitis is marked by inflammation of the venous wall and thrombus formation. It may affect deep veins or superficial veins. The thrombus may occlude a vein or detach and embolize to the lungs.

CAUSES
• Hypercoagulability (from cancer, blood dyscrasias, or hormonal contraceptives)
• Injury to the venous wall (from I.V. injections, fractures, or antibiotics)
• Venous stasis (from varicose veins, pregnancy, heart failure, or prolonged bed rest)

DATA COLLECTION FINDINGS
Deep vein thrombophlebitis
• Cramping calves
• Edema
• Tenderness to touch

Superficial vein thrombophlebitis
• Redness along the vein
• Warmth and tenderness along the vein

DIAGNOSTIC FINDINGS
• Hematology results reveal increased WBC count.
• Photoplethysmography shows venous-filling defects.
• Ultrasound reveals decreased blood flow.
• Venography shows venous-filling defects.

NURSING DIAGNOSES
• Acute pain
• Impaired skin integrity
• Ineffective tissue perfusion: Peripheral

TREATMENT

- Activity changes: maintaining bed rest and elevating the affected extremity
- Embolectomy and insertion of a vena cava umbrella or filter
- Antiembolism stockings
- Warm, moist compresses

Drug therapy

- Anticoagulants: warfarin (Coumadin), heparin, dalteparin (Fragmin), enoxaparin (Lovenox)
- Antiplatelet aggregation agent: aspirin
- Fibrinolytic agent: streptokinase (Streptase)

INTERVENTIONS AND RATIONALES

- Monitor breathing pattern and breath sounds. *Crackles, dyspnea, tachypnea, hemoptysis, and chest pain suggest pulmonary embolism.*
- Evaluate cardiovascular status. *Tachycardia and chest pain may indicate pulmonary embolism.*
- Observe for bleeding *due to anticoagulant therapy.*
- Monitor and record vital signs. Watch for such complications as hypotension, tachycardia, tachypnea, and restlessness. Observe for bruising, epistaxis, blood in stool, bleeding gums, and painful joints. *Tachypnea and tachycardia may suggest pulmonary embolism or hemorrhage.*
- Perform neurovascular checks *to detect nerve or vascular damage.*
- Monitor laboratory values. PTT in a patient taking heparin and PT in a patient receiving warfarin should be 1½ to 2 times the control. INR should be 2 to 3 for the patient receiving warfarin. *A falling hemoglobin level and hematocrit indicate blood loss.*
- Keep the patient in bed and elevate the affected extremity *to promote venous return and reduce swelling.*
- Administer medications, as prescribed, *to control or dissolve blood clots.*
- Apply warm, moist compresses *to improve circulation to the affected area and relieve pain and inflammation.*
- Measure and record the circumference of thighs and calves. Compare the measurements *to determine worsening inflammation in the affected leg.*

Teaching topics

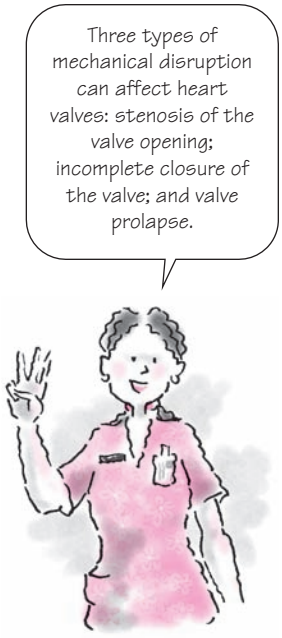
- Recognizing signs and symptoms of bleeding and clot formation
- Avoiding prolonged sitting or standing, constrictive clothing, and crossing the legs when seated
- Avoiding hormonal contraceptives

Valvular heart disease

In valvular heart disease, three types of mechanical disruption can occur: stenosis, or narrowing, of the valve opening; incomplete closure of the valve; or prolapse of the valve. These conditions can result from such disorders as endocarditis (most common), congenital defects, and inflammation. They can also lead to heart failure.

Valvular heart disease occurs in several forms. The most common include:

- **aortic insufficiency,** in which blood flows back into the left ventricle during diastole, causing fluid overload in the ventricle, which dilates and hypertrophies (the excess volume causes fluid overload in the left atrium and, finally, the pulmonary system; eventually, it causes left ventricular failure and pulmonary edema)
- **mitral insufficiency,** in which blood from the left ventricle flows back into the left atrium during systole, causing the atrium to enlarge to accommodate the backflow (as a result, the left ventricle also dilates to accommodate the increased volume of blood from the atrium and to compensate for diminishing cardiac output)
- **mitral stenosis,** in which narrowing of the valve caused by valvular abnormalities, fibrosis, or calcification obstructs blood flow from the left atrium to the left ventricle (consequently, left atrial volume and pressure rise and the chamber dilates)
- **mitral valve prolapse (MVP),** in which one or both valve leaflets protrude into the left atrium (*MVP syndrome* is the term used when the anatomic prolapse assessment findings aren't related to the valvular abnormality)
- **tricuspid insufficiency,** in which blood flows back into the right atrium during systole, decreasing blood flow to the lungs and



left side of the heart (cardiac output also lessens; fluid overload in the right side of the heart can eventually lead to right-sided heart failure)

CAUSES

Aortic insufficiency
- Endocarditis
- Hypertension
- Idiopathic origin
- Rheumatic fever
- Syphilis

Mitral insufficiency
- Hypertrophic cardiomyopathy
- Left ventricular failure
- MVP
- Rheumatic fever

Mitral stenosis
- Rheumatic fever

MVP
- Unknown
- MI involving papillary muscles

Tricuspid insufficiency
- Endocarditis
- Rheumatic fever
- Right-sided heart failure
- Trauma

DATA COLLECTION FINDINGS

Aortic insufficiency
- Angina
- Cough
- Dyspnea
- Fatigue
- Palpitations
- Rapidly rising and collapsing pulses

Mitral insufficiency
- Angina
- Dyspnea
- Fatigue
- Orthopnea
- Peripheral edema

Mitral stenosis
- Dyspnea on exertion
- Fatigue
- Orthopnea
- Palpitations
- Peripheral edema
- Weakness

MVP
- Chest pain
- Fatigue
- Headache
- May produce no symptoms
- Palpitations

Tricuspid insufficiency
- Dyspnea
- Fatigue
- Peripheral edema

DIAGNOSTIC FINDINGS

Aortic insufficiency
- Cardiac catheterization results show reduction in arterial diastolic pressures.
- Echocardiography shows left ventricular enlargement.
- ECG shows sinus tachycardia and left ventricular hypertrophy.
- Chest X-ray shows left ventricular enlargement and pulmonary vein congestion.

Mitral insufficiency
- Cardiac catheterization shows mitral regurgitation and elevated atrial and pulmonary artery wedge pressures.
- Echocardiography shows abnormal valve leaflet motion.
- ECG may show left atrial and ventricular hypertrophy.
- Chest X-ray shows left atrial and ventricular enlargement.

Mitral stenosis
- Cardiac catheterization shows diastolic pressure gradient across the valve and elevated left atrial and pulmonary artery wedge pressures.
- Echocardiography shows thickened mitral valve leaflets.
- ECG shows left atrial hypertrophy.
- Chest X-ray shows left atrial and ventricular enlargement.

MVP
- Color-flow Doppler studies show mitral insufficiency.

• ECG shows prolapse of the mitral valve into the left atrium.

Tricuspid insufficiency

• Echocardiography shows systolic prolapse of the tricuspid valve.
• ECG shows right atrial or right ventricular hypertrophy.
• Chest X-ray shows right atrial dilation and right ventricular enlargement.

NURSING DIAGNOSES

• Activity intolerance
• Anxiety
• Decreased cardiac output

TREATMENT

• Diet: sodium restriction (in heart failure)
• Surgery: open-heart surgery using cardiopulmonary bypass for valve replacement (in severe cases)

Drug therapy

• Anticoagulant: warfarin (Coumadin) to prevent thrombus formation around diseased or replaced valves

INTERVENTIONS AND RATIONALES

• Watch closely for signs of heart failure or pulmonary edema and for adverse effects of drug therapy *to prevent cardiac decompensation.*
• Observe breathing patterns *to detect respiratory distress or signs of heart failure.*
• Place the patient in an upright position *to relieve dyspnea.*
• Maintain bed rest and provide assistance with bathing, if necessary, *to decrease oxygen demands on the heart.*
• If the patient undergoes surgery, watch for hypotension, arrhythmias, and thrombus formation. Monitor vital signs, intake and output, daily weight, blood chemistry test results, and chest X-rays *to detect early signs of postoperative complications and ensure early intervention and treatment.*
• Allow the patient to verbalize his concerns about being unable to meet demands of daily life because of activity restrictions. *This helps to reduce anxiety.*

Teaching topics

• Following diet restrictions and medication schedule
• Understanding the need for consistent follow-up care
• Incorporating rest into the daily routine

Pump up on practice questions

1. After undergoing cardiac catheterization, a client has a 10-lb sandbag resting over the left femoral insertion site. When the nurse removes the sandbag, she observes a swelling at the site, about 2″ (5 cm) in diameter. The nurse should initially:

1. replace the 10-lb bag with a 15-lb sandbag for additional pressure.
2. place a pressure dressing over the site and elevate the left leg at least 45 degrees.
3. draw a stat partial thromboplastin time and stop any heparin infusions.
4. apply firm pressure to the site and instruct another staff member to notify the physician.

Answer: 4. The client has likely developed a hematoma from bleeding at the femoral puncture site. The bleeding must be stopped, so the nurse should apply pressure to the site and notify the physician. At some point, a heavier sandbag may be indicated but not in lieu of direct pressure. The leg should be neutral, not elevated. Monitoring coagulation is a concern to be considered later.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

2. A client is prescribed diltiazem (Cardizem) to manage his hypertension. The nurse should tell the client the diltiazem will:

1. lower his blood pressure only.
2. lower his heart rate and blood pressure.
3. lower his blood pressure and increase his urine output.
4. lower his heart rate and blood pressure and increase his urine output.

Answer: 2. Diltiazem (Cardizem), a calcium channel blocker, will reduce both the heart rate and blood pressure. It doesn't directly affect urine output.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Comprehension

3. A client reports substernal chest pain. Test results show electrocardiographic changes and an elevated cardiac troponin level. What should be the focus of nursing care?

1. Improving myocardial oxygenation and reducing cardiac workload
2. Confirming a suspected diagnosis and preventing complications
3. Reducing anxiety and relieving pain
4. Eliminating stressors and providing a nondemanding environment

Answer: 1. The client is exhibiting clinical signs and symptoms of an MI. Nursing care should focus on improving myocardial oxygenation and reducing cardiac workload. Confirming the diagnosis of MI, preventing complications, reducing anxiety, relieving pain, and providing a nondemanding environment are secondary interventions. Stressors can be reduced but not eliminated.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

4. A 42-year-old man with a history of two MI incidents is diagnosed with acute pulmonary edema. He has severe dyspnea with noisy, wet respirations. The nurse's initial action should be to:

1. place the client in high Fowler's position.
2. perform nasotracheal suctioning to relieve congestion.
3. determine the cause of the attack.
4. monitor cardiac rhythm.

Answer: 1. High Fowler's position reduces venous congestion and eases dyspnea. Suctioning isn't a priority. After the client is stabilized, further assessments can be made to determine the cause of the attack. Although appropriate, cardiac monitoring isn't the nurse's priority in this situation.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

5. A client with unstable angina receives routine applications of nitroglycerin ointment. The nurse should delay the next dose if the client has:

1. atrial fibrillation.
2. a systolic blood pressure below 90 mm Hg.
3. a headache.
4. skin redness at the current site.

Answer: 2. Nitroglycerin is a vasodilator and can lower arterial blood pressure. As a rule, when the client's systolic blood pressure is below 90 mm Hg, the nurse should delay the dose and notify the physician. Nitroglycerin isn't contraindicated in a client with atrial fib-

rillation. Headache, a common occurrence with nitroglycerin, can be treated with an analgesic and isn't a cause for withholding a dose. Sites should be changed with each dose, especially if skin irritation occurs.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

6. A male client has been admitted to the coronary care unit to rule out MI. Which symptoms during the health interview would indicate that he may be developing an MI?

1. Epigastric pain and heartburn
2. Fatigue and headache
3. Diaphoresis and substernal pain
4. Dizziness and nausea

Answer: 3. Diaphoresis and substernal or radiating chest pain are classic signs of an MI. Epigastric pain and heartburn are more indicative of indigestion or esophagitis. Fatigue and headache typically aren't reported in clients with MI. Although dizziness and nausea may accompany MI, they aren't common symptoms.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

7. A 65-year-old client is admitted for heart failure. The physician orders daily administration of furosemide (Lasix). Which intervention should the nurse perform every day before administering the medication?

1. Check the client's weight.
2. Check the client's apical heart rate.
3. Ask the client whether he's experiencing any numbness.
4. Provide the client with extra fluids.

Answer: 1. Heart failure develops because the heart can't move blood as quickly as it should. This decreases urine output and increases weight. Therefore, the client should be weighed daily. Checking the client's apical heart rate isn't indicated before administering furosemide. Clients may have numbness in the extremities because of increased peripheral edema, but numbness doesn't inhibit the administration of the medication. The nurse shouldn't provide the client with extra fluids because clients with heart failure are commonly on fluid restrictions.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

8. A client who is 70 lb (31.8 kg) overweight has started taking medication for essential hypertension. Desired goals for this client should include:

1. checking his blood pressure every 3 months.
2. maintaining a weight-reduction diet and losing 2 lb (0.9 kg) each week.
3. following a strict weight-reduction diet until he has lost at least 30 lb (13.6 kg).
4. maintaining a high-fiber diet.

Answer: 2. The most effective weight-loss campaign is one that is gradual and changes eating habits. A moderate weight-reduction diet that aims for a weight loss of 2 lb per week is best for an overweight client with essential hypertension. The client's blood pressure should be checked more than once every 3 months. A strict weight-reduction diet isn't as effective as a slow, gradual decrease in weight. Maintaining a high-fiber diet won't control blood pressure.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

9. A nurse administers warfarin (Coumadin) to a client with deep vein thrombophlebitis. Which of the following laboratory values indicates that the client has a therapeutic level of warfarin?

1. PTT 1½ to 2 times the control
2. PT 2 to 3 times the control
3. INR of 2 to 3
4. Hematocrit of 32%

Answer: 3. Warfarin is at a therapeutic level when the INR is 2 to 3. Values greater than this increase the risk of bleeding and hemorrhage; lower values increase the risk of blood clot formation. Heparin, not warfarin, prolongs PTT. PT may also be used to determine whether warfarin is at a therapeutic level; PT at 1½ to 2 times the control is considered therapeutic. Hematocrit doesn't provide information on the effectiveness of warfarin. On the other hand, a falling hematocrit in a client taking warfarin may be a sign of hemorrhage.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

10. A client comes into the emergency department with a dissecting aortic aneurysm. The client is at greatest risk for:

1. septic shock.
2. anaphylactic shock.
3. cardiogenic shock.
4. hypovolemic shock.

Answer: 4. A dissecting aortic aneurysm is a precursor to aortic rupture, which leads to hemorrhage and hypovolemic shock. Septic shock results from an uncontrolled infection. Anaphylactic shock results from exposure to an allergen. Cardiogenic shock results from cardiac damage.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

4 Respiratory system

In this chapter, you'll review:

- components of the respiratory system and their function
- tests used to diagnose respiratory disorders
- common respiratory disorders.

Brush up on key concepts

The major function of the respiratory system is gas exchange. During gas exchange, air is taken into the body through inhalation and travels through respiratory passages to the lungs. In the lungs, oxygen (O_2) takes the place of carbon dioxide (CO_2) in the blood. The carbon dioxide is then expelled from the body through exhalation.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 70 to 77.

Enter here

The **nose** and **mouth** allow air to flow in and out of the body. They also humidify inhaled air, which reduces irritation of the mucous membranes. The **nares** (nostrils) contain olfactory receptor sites and provide the body's sense of smell.

Because the major function of the respiratory system is gas exchange, focus on keeping airways clear and facilitating breathing.

Keep out!

The **paranasal sinuses** are air-filled, cilia-lined cavities within the nose. Their function is to trap particles of foreign matter that might interfere with the respiratory system or cause infection.

Going down

The **pharynx** serves as a passageway to the digestive and respiratory tracts. It maintains air pressure in the middle ear. It also contains a mucosal lining that continues the process of humidifying and warming inhaled air in addition to trapping foreign particles.

If you can read this aloud, thank your larynx

The **larynx,** also known as the voice box, connects the upper and lower airways. It contains vocal cords, which produce sounds. The larynx also initiates the cough reflex, which is one part of the respiratory system's defense mechanisms.

C-shaped connector

The **trachea** contains C-shaped cartilaginous rings composed of smooth muscle. It connects the larynx to the bronchi.

Branching into bronchi

The trachea branches into the right and left **bronchi,** which are the large air passages that lead to the right and left lungs. The right main bronchus is slightly larger and more vertical than the left.

As they pass into the lungs, the bronchi form smaller branches called **bronchioles,** which themselves branch into terminal bronchioles and alveoli.

Gas exchange center

Alveoli are clustered microscopic sacs enveloped by capillaries. Exchange and diffusion of gases in the lungs takes place over the approximately 3 million alveoli and the alveolar capillary membranes. The alveoli also contain a coating of surfactant, which reduces surface tension and keeps them from collapsing.

Lobes: 3 and 2

As a unit, the lungs are composed of three **lobes** on the right side and two lobes on the left side. The lungs regulate air exchange by a concentration gradient. In the alveoli, gases

(Text continues on page 77.)

Cheat sheet

Respiratory refresher

ACUTE RESPIRATORY DISTRESS SYNDROME

Key signs and symptoms

- Anxiety, restlessness
- Crackles, rhonchi, decreased breath sounds
- Dyspnea, tachypnea

Key test results

- Arterial blood gas (ABG) levels show respiratory acidosis, metabolic acidosis, and hypoxemia that doesn't respond to increased fraction of inspired oxygen.
- Chest X-ray shows bilateral infiltrates (in early stages), lung fields with a "ground-glass" appearance and, with irreversible hypoxemia, massive consolidation of both lung fields (in later stages).

Key treatments

- Intubation and mechanical ventilation using positive end-expiratory pressure (PEEP) or pressure-controlled inverse ratio ventilation
- Antibiotics most effective in treating causative organism
- Analgesic: morphine
- Neuromuscular blocking agents: pancuronium (Pavulon), vecuronium (Norcuron)
- Steroids: hydrocortisone (Solu-Cortef), methylprednisolone (Solu-Medrol)

Key interventions

- Monitor respiratory, cardiovascular, and neurologic status.
- Monitor electrocardiogram (ECG).
- Maintain bed rest, with alternating supine and prone positioning if possible.
- Perform turning, chest physiotherapy, and postural drainage.

ACUTE RESPIRATORY FAILURE

Key signs and symptoms

- Decreased respiratory excursion, accessory muscle use, retractions
- Difficulty breathing, dyspnea (shortness of breath), tachypnea, orthopnea
- Fatigue

Key test results

- ABG levels show hypoxemia, acidosis, alkalosis, and hypercapnia.

Key treatments

- Supplemental oxygen (O_2) therapy, intubation, and mechanical ventilation (possibly with PEEP)
- Analgesic: morphine
- Antianxiety agent: lorazepam (Ativan)
- Bronchodilators: terbutaline (Brethine), aminophylline (Phyllocontin); via nebulizer: albuterol (Proventil), ipratropium (Atrovent), metaproterenol (Alupent)
- Neuromuscular blocking agents: pancuronium (Pavulon), vecuronium (Norcuron), atracurium (Tracrium)
- Steroids: hydrocortisone (Solu-Cortef), methylprednisolone (Solu-Medrol)

Key interventions

- Monitor respiratory status.
- Administer O_2.
- Provide suctioning; assist with turning, coughing, and deep breathing; and perform chest physiotherapy and postural drainage.
- Maintain bed rest.

ASBESTOSIS

Key signs and symptoms

- Dry crackles at lung bases
- Dry cough
- Dyspnea on exertion (usually first symptom)
- Pleuritic chest pain

Key test results

- Chest X-rays show fine, irregular, and linear diffuse infiltrates; extensive fibrosis results in a "honeycomb" or "ground-glass" appearance. X-rays may also show pleural thickening and calcification, with bilateral obliteration of costophrenic angles and, in later stages, an enlarged heart with a classic "shaggy" heart border.

Key treatments

- Chest physiotherapy
- Fluid intake up to 3,000 ml/day

Respiratory refresher *(continued)*

ASBESTOSIS *(continued)*

- O_2 therapy or mechanical ventilation (with advanced cases)
- Antibiotics most effective in treating causative organism (for treatment of respiratory tract infections)
- Mucolytic inhalation therapy: acetylcysteine (Mucomyst)

Key interventions

- Perform chest physiotherapy techniques, such as controlled coughing and segmental bronchial drainage, with chest percussion and vibration.
- Administer O_2 by cannula or mask (1 to 2 L/minute). Use mechanical ventilation if arterial oxygen saturation can't be maintained above 40 mm Hg.

ASPHYXIA

Key signs and symptoms

- Agitation
- Altered respiratory rate (apnea, bradypnea, occasionally tachypnea)
- Anxiety
- Central and peripheral cyanosis (cherry-red mucous membranes in late-stage carbon monoxide poisoning)
- Altered mental status
- Decreased breath sounds
- Dyspnea

Key test results

- Pulse oximetry reveals decreased oxygen saturation.
- ABG measurement indicates decreased partial pressure of arterial oxygen (Pao_2) < 60 mm Hg and increased partial pressure of arterial carbon dioxide ($Paco_2$) > 50 mm Hg.

Key treatments

- O_2 therapy, which may include endotracheal (ET) intubation and mechanical ventilation
- Bronchoscopy (for extraction of a foreign body)
- Opioid antagonist: naloxone (Narcan) (for opioid overdose)

Key interventions

- Monitor cardiac and respiratory status.
- Position the patient upright, if he can tolerate it.
- Suction carefully, as needed, and encourage deep breathing.

ASTHMA

Key signs and symptoms

- Usually produces no symptoms between attacks
- Wheezing, primarily on expiration but sometimes on inspiration

Key test results

- Pulmonary function tests (PFTs) during attacks show decreased forced expiratory volumes that improve with therapy, increased residual volume, and increased total lung capacity.

Key treatments

- Fluid intake up to 3,000 ml/day as tolerated
- Beta-adrenergic drugs: epinephrine (Adrenalin), salmeterol (Serevent), formoterol (Foradil)
- Bronchodilators: terbutaline (Brethine), aminophylline (Phyllocontin), theophylline (Theo-Dur); via nebulizer: albuterol (Proventil), ipratropium (Atrovent), metaproterenol (Alupent)
- Mast cell stabilizer: cromolyn (Intal), nedocromil (Tilade)
- Anti-immunoglobulin E agent: omalizumab (Xolair)

Key interventions

- Administer low-flow humidified O_2.
- Monitor respiratory status and pulse oximetry values.
- Keep the patient in high Fowler's position.

ATELECTASIS

Key signs and symptoms

- Diminished or bronchial breath sounds
- Dyspnea
- Low-grade fever

In severe cases

- Anxiety
- Cyanosis
- Diaphoresis
- Severe dyspnea
- Substernal or intercostal retractions
- Tachycardia

Key test results

- Chest X-ray shows characteristic horizontal lines in the lower lung zones and, with segmental or lobar collapse, characteristic dense shadows often associated with hyperinflation of neighboring lung zones (in widespread atelectasis).

Key treatments

- Bronchoscopy
- Chest physiotherapy
- Bronchodilators: albuterol (Proventil)
- Mucolytic inhalation therapy: acetylcysteine (Mucomyst)
- Pain control

Key interventions

- Encourage postoperative and other high-risk patients to cough and deep breathe every hour during their waking hours.

(continued)

Respiratory refresher *(continued)*

ATELECTASIS *(continued)*

• Postoperatively, teach the patient to hold a pillow tightly over the incision while deep breathing or moving. Gently reposition these patients often, and help them walk as soon as possible.
• Administer adequate analgesics.
• Teach the patient how to use an incentive spirometer, and encourage him to use it hourly during his waking hours.
• Humidify inspired air, and encourage adequate fluid intake. Perform postural drainage and chest percussion.
• Monitor breath sounds and ventilatory status frequently, and be alert for any changes.

BRONCHIECTASIS

Key signs and symptoms

• Chronic cough that produces copious, foul-smelling, mucopurulent secretions, possibly totaling several cupfuls daily
• Coarse crackles during inspiration over involved lobes or segments
• Dyspnea
• Hemoptysis
• Weight loss

Key test results

• Chest X-rays show peribronchial thickening, areas of atelectasis, and scattered cystic changes.
• Sputum culture and Gram stain identify predominant organisms.

Key treatments

• Bronchoscopy (to mobilize secretions)
• Chest physiotherapy
• O_2 therapy
• Antibiotics most effective in treating the causative organism
• Bronchodilator: albuterol (Proventil)

Key interventions

• Monitor respiratory status and pulse oximetry values.
• Provide supportive care and help the patient adjust to the permanent changes in lifestyle that irreversible lung damage makes necessary.
• Perform chest physiotherapy, including postural drainage and chest percussion designed for involved lobes, several times a day. The best times to do this are early morning and just before bedtime. Instruct the patient to maintain each position for 10 minutes. Then perform percussion and tell him to cough.

CHRONIC BRONCHITIS

Key signs and symptoms

• Cyanosis
• Dyspnea
• Increased sputum production
• Productive cough

Key test results

• Chest X-ray shows hyperinflation and increased bronchovascular markings.
• PFTs may reveal increased residual volume, decreased vital capacity and forced expiratory volumes, and normal static compliance and diffusion capacity.

Key treatments

• Fluid intake up to 3,000 ml/day, if not contraindicated by other conditions
• Intubation and mechanical ventilation, if respiratory status deteriorates
• Antibiotics most effective in treating causative organism
• Bronchodilators: terbutaline (Brethine), aminophylline (Phyllocontin), theophylline (Theo-Dur); via nebulizer: albuterol (Proventil), ipratropium (Atrovent), metaproterenol (Alupent)
• Influenza and Pneumovax vaccines
• Steroids: hydrocortisone (Solu-Cortef), methylprednisolone (Solu-Medrol)
• Steroids (via nebulizer): beclomethasone (Vanceril), triamcinolone (Azmacort)

Key interventions

• Administer low-flow O_2.
• Monitor respiratory status and pulse oximetry values.
• Assist with diaphragmatic and pursed-lip breathing.
• Monitor and record the color, amount, and consistency of sputum.
• Provide chest physiotherapy, postural drainage, incentive spirometry, and suction.

COR PULMONALE

Key signs and symptoms

• Dyspnea on exertion
• Edema
• Fatigue
• Orthopnea
• Tachypnea
• Weakness

Key test results

• ABG analysis shows decreased Pao_2 (< 70 mm Hg).
• Chest X-ray shows large central pulmonary arteries and suggests right ventricular enlargement by rightward enlargement of cardiac silhouette on an anterior chest film.

Respiratory refresher *(continued)*

COR PULMONALE *(continued)*

• Pulmonary artery pressure measurements show increased right ventricular and pulmonary artery pressures because of increased pulmonary vascular resistance.

Key treatments

• O_2 therapy as necessary by mask or cannula in concentrations of 24% to 40%, depending on Pao_2 and, in acute cases, mechanical ventilation
• Cardiac glycoside: digoxin (Lanoxin)
• Diuretic (to reduce edema): furosemide (Lasix)
• Vasodilators: diazoxide (Proglycem), hydralazine (Apresoline), nitroprusside (Nipride), prostaglandins (in primary pulmonary hypertension)
• Calcium channel blocker: diltiazem (Cardizem)
• Angiotensin-converting enzyme inhibitor: captopril (Capoten)

Key interventions

• Monitor respiratory status and pulse oximetry values.
• Monitor cardiovascular status.
• Limit the patient's fluid intake to 1,000 to 2,000 ml/day, and provide a low-sodium diet.
• Reposition bedridden patients often.
• Provide meticulous respiratory care, including O_2 therapy and, for patients with chronic obstructive pulmonary disease, teach pursed-lip breathing exercises.
• Watch for signs of respiratory failure, such as a change in pulse rate, increased fatigue from exertion, and deep, labored respirations.

EMPHYSEMA

Key signs and symptoms

• Barrel chest
• Dyspnea
• Pursed-lip breathing

Key test results

• Chest X-ray of patients in an advanced disease stage reveals a flattened diaphragm, reduced vascular markings in the lung periphery, enlarged anteroposterior chest diameter, and a vertical heart.
• PFTs show increased residual volume, total lung capacity, and compliance as well as decreased vital capacity, diffusing capacity, and expiratory volumes.

Key treatments

• Chest physiotherapy, postural drainage, and incentive spirometry
• Fluid intake up to 3,000 ml/day, if not contraindicated by heart failure
• O_2 therapy at 2 to 3 L/minute, transtracheal therapy for home O_2 therapy
• Antibiotics most effective in treating causative organism
• Bronchodilators: terbutaline (Brethine), aminophylline (Phyllocontin), theophylline (Theo-Dur); via nebulizer: albuterol (Proventil), ipratropium (Atrovent), metaproterenol (Alupent)
• Influenza and Pneumovax vaccines
• Steroids: hydrocortisone (Solu-Cortef), methylprednisolone (Solu-Medrol)
• Steroids (via nebulizer): beclomethasone (Vanceril), triamcinolone (Azmacort)

Key interventions

• Monitor respiratory status and pulse oximetry values.
• Assist with diaphragmatic and pursed-lip breathing.
• Monitor and record the color, amount, and consistency of sputum.
• Perform chest physiotherapy, postural drainage, incentive spirometry, and suction.

LEGIONNAIRES' DISEASE

Key signs and symptoms

• Cough, initially nonproductive, that eventually produces grayish, nonpurulent, blood-streaked sputum
• Fever
• Generalized weakness
• Malaise
• Recurrent chills

Key test results

• Chest X-ray shows patchy, localized infiltration, which progresses to multilobar consolidation (usually involving the lower lobes), pleural effusion and, in fulminant disease, opacification of the entire lung.
• Direct immunofluorescence of *Legionella pneumophila* and indirect fluorescent serum antibody testing compare findings from initial blood studies with findings from those done at least 3 weeks later. A convalescent serum sample showing a fourfold or greater rise in antibody titer for *L. pneumophila* confirms the diagnosis.

Key treatments

• Antibiotics: erythromycin (Erythrocin), rifampin (Rifadin), tetracycline (Achromycin V)
• Antipyretics: acetaminophen (Tylenol), aspirin

Key interventions

• Closely monitor the patient's respiratory status. Evaluate chest wall expansion, depth and pattern of respirations, cough, and chest pain.

(continued)

Respiratory refresher *(continued)*

LEGIONNAIRES' DISEASE *(continued)*

- Monitor the patient's vital signs, pulse oximetry values, level of consciousness, and dryness and color of the lips and mucous membranes. Watch for signs of shock (decreased blood pressure, thready pulse, diaphoresis, clammy skin).
- Administer I.V. fluids.
- Provide respiratory therapy as needed.
- Give antibiotics as necessary, and observe carefully for adverse effects.

LUNG CANCER

Key signs and symptoms

- Cough, hemoptysis
- Weight loss, anorexia

Key test results

- Chest X-ray shows lesion or mass.

Key treatments

- Resection of the affected lobe (lobectomy) or lung (pneumonectomy)
- Antineoplastics: cyclophosphamide (Cytoxan), doxorubicin (Adriamycin), cisplatin (Platinol), vincristine (Oncovin), vinorelbine (Navelbine), gemcitabine (Gemzar), paclitaxel (Taxol), docetaxel (Taxotere), irinotecan (Camptosar)

Key interventions

- Monitor the patient's pain level, and administer analgesics as prescribed.
- Perform suctioning, and assist with turning, coughing, and deep breathing.
- Monitor for bleeding, infection, and electrolyte imbalance caused by effects of chemotherapy.

PLEURAL EFFUSION AND EMPYEMA

Key signs and symptoms

- Decreased breath sounds
- Dyspnea
- Fever
- Pleuritic chest pain

Key test results

- Chest X-ray shows radiopaque fluid in dependent regions.
- Thoracentesis results include:
  - lactate dehydrogenase (LD) levels less than 200 IU
  - protein levels less than 3 g/dl (in transudative effusions)
  - ratio of protein in pleural fluid to protein in serum greater than or equal to 0.5
  - LD in pleural fluid greater than or equal to 200 IU
  - ratio of LD in pleural fluid to LD in serum greater than 0.6 (in exudative effusions)
  - acute inflammatory white blood cells and microorganisms (in empyema).

Key treatments

- Supplemental O_2 therapy
- Thoracentesis to remove fluid
- Thoracotomy if thoracentesis isn't effective
- Antibiotics most effective in treating the organism that causes empyema

Key interventions

- Explain thoracentesis to the patient. Before the procedure, tell the patient to expect a stinging sensation from the local anesthetic and a feeling of pressure when the needle is inserted.
- Instruct the patient to tell you immediately if he feels uncomfortable or has trouble breathing during the procedure.
- Administer O_2.
- Administer antibiotics.
- Provide chest tube care carefully to prevent dislodging the chest tube.
- Ensure chest tube patency by watching for bubbles in the underwater seal chamber.
- Record the amount, color, and consistency of any tube drainage.

PLEURISY

Key signs and symptoms

- Pleural friction rub (a coarse, creaky sound heard during late inspiration and early expiration)
- Sharp, stabbing pain that increases with respiration

Key test results

- Although diagnosis generally rests on the patient's history and respiratory assessment, diagnostic tests help rule out other causes and pinpoint the underlying disorder.

Key treatments

- Bed rest
- Analgesic: acetaminophen with oxycodone (Percocet)
- Anti-inflammatory: indomethacin (Indocin)

Key interventions

- Stress the importance of bed rest, and allow the patient as much uninterrupted rest as possible.
- Administer antitussives and pain medication as needed.
- Encourage the patient to cough. During coughing exercises, apply firm pressure at the pain site.

Respiratory refresher *(continued)*

PNEUMOCYSTIS CARINII PNEUMONIA

Key signs and symptoms

- Generalized fatigue
- Low-grade, intermittent fever
- Nonproductive cough
- Dyspnea
- Weight loss

Key test results

- Chest X-ray may show slowly progressing, fluffy infiltrates and occasionally nodular lesions or a spontaneous pneumothorax. These findings must be differentiated from findings in other types of pneumonia or acute respiratory distress syndrome.
- Histologic study results confirm *P. carinii.* In patients with human immunodeficiency virus (HIV) infection, initial examination of a first morning sputum specimen (induced by inhaling an ultrasonically dispersed saline mist) may be sufficient; however, this technique is usually ineffective in patients without HIV infection.

Key treatments

- O_2 therapy, which may include ET intubation and mechanical ventilation
- Antibiotics most effective in treating causative organism

Key interventions

- Monitor the patient's respiratory status and pulse oximetry values.
- Administer O_2 therapy as needed. Encourage the patient to ambulate and to perform deep-breathing exercises and incentive spirometry.
- Administer antipyretics as needed.
- Monitor intake and output and weigh the patient daily. Replace fluids as needed.
- Administer antimicrobial drugs as ordered. Never give pentamidine (NebuPent) I.M. Administer the I.V. form slowly over 60 minutes.
- Monitor the patient for adverse reactions to antimicrobial drugs. If he's receiving co-trimoxazole (Bactrim), watch for nausea, vomiting, rash, bone marrow suppression, thrush, fever, hepatotoxicity, and anaphylaxis. If he's receiving pentamidine, watch for cardiac arrhythmias, hypotension, dizziness, azotemia, hypocalcemia, and hepatic disturbances.
- Supply nutritional supplements as needed. Encourage the patient to eat a high-calorie, protein-rich diet. Offer small, frequent meals if the patient can't tolerate large amounts of food.

PNEUMONIA

Key signs and symptoms

- Chills, fever
- Crackles, rhonchi, and pleural friction rub on auscultation
- Dyspnea, tachypnea, and accessory muscle use
- Sputum that's rusty, green, or bloody with pneumococcal pneumonia and yellow-green with bronchopneumonia

Key test results

- Chest X-ray shows pulmonary infiltrates.
- Sputum study identifies the causative organism.

Key treatments

- Antibiotics most effective in treating causative organism
- Supplemental O_2 therapy; intubation and mechanical ventilation if condition deteriorates

Key interventions

- Monitor and record intake and output.
- Monitor pulse oximetry values.
- Monitor respiratory status.
- Force fluids to 3 to 4 L/day and maintain I.V. fluids.

PNEUMOTHORAX AND HEMOTHORAX

Key signs and symptoms

- Diminished or absent breath sounds unilaterally
- Dyspnea, tachypnea, subcutaneous emphysema, and cough
- Sharp chest pain that increases with exertion

Key test results

- Chest X-rays confirm the diagnosis.

Key treatments

- Chest tube to water-seal drainage

Key interventions

- Monitor and record vital signs.
- Monitor respiratory status and pulse oximetry values.
- Monitor chest tube site for subcutaneous emphysema.
- Monitor chest tube drainage.
- Evaluate cardiovascular status.
- Maintain chest tube to water-seal drainage. The water-seal chamber prevents air from entering the chest tube when the patient inhales.

PULMONARY EMBOLISM

Key signs and symptoms

- Sudden onset of dyspnea, tachypnea, and crackles

Key test results

- ABG levels typically show decreased Pa_{O_2} and Pa_{CO_2}.
- Lung scan shows ventilation-perfusion mismatch.

(continued)

Respiratory refresher *(continued)*

PULMONARY EMBOLISM *(continued)*

Key treatments

- Vena cava filter insertion
- Anticoagulants: heparin (Heparin Sodium Injection), warfarin (Coumadin)
- Fibrinolytics: streptokinase (Streptase), tissue plasminogen activator (Activase)

Key interventions

- Monitor respiratory status and pulse oximetry values.
- Evaluate cardiovascular status and monitor ECG.
- Administer O_2.

RESPIRATORY ACIDOSIS

Key signs and symptoms

- Cardiovascular abnormalities, such as tachycardia, hypertension, atrial and ventricular arrhythmias and, in severe acidosis, hypotension with vasodilation

Key test results

- ABG measurements confirm that the patient has respiratory acidosis. $Paco_2$ exceeds the normal level of 45 mm Hg, and pH is usually below the normal range of 7.35 to 7.45. The patient's bicarbonate level is normal in the acute stage and elevated in the chronic stage.

Key treatments

- Correction of the underlying cause
- Sodium bicarbonate in severe cases

Key interventions

- Closely monitor the patient's blood pH level.
- Be alert for critical changes in the patient's respiratory, central nervous system (CNS), and cardiovascular functions. Maintain adequate hydration.
- If acidosis requires mechanical ventilation, maintain a patent airway and provide adequate humidification. Perform tracheal suctioning regularly and vigorous chest physiotherapy if needed.

RESPIRATORY ALKALOSIS

Key signs and symptoms

- Agitation
- Cardiac arrhythmias that fail to respond to conventional treatment (severe respiratory alkalosis)
- Circumoral or peripheral paresthesia (a prickling sensation around the mouth or extremities)
- Deep, rapid breathing, possibly exceeding 40 breaths/minute (cardinal sign)
- Light-headedness or dizziness (from decreased cerebral blood flow)

Key test results

- ABG analysis confirms respiratory alkalosis and rules out respiratory compensation for metabolic acidosis. $Paco_2$ is below 35 mm Hg, and pH is elevated in proportion to the fall in $Paco_2$ in the acute stage but drops toward normal in the chronic stage. Bicarbonate level is normal in the acute stage but below normal in the chronic stage.

Key treatments

- Having the patient breathe into a paper bag, which helps relieve acute anxiety and increases CO_2 levels (for severe respiratory alkalosis)

Key interventions

- Watch for and report any changes in neurologic, neuromuscular, or cardiovascular function.
- Monitor respiratory status.

SARCOIDOSIS

Key signs and symptoms

Initial signs

- Arthralgia in the wrists, ankles, and elbows
- Fatigue
- Malaise
- Weight loss

Respiratory

- Breathlessness
- Substernal pain

Cutaneous

- Erythema nodosum
- Subcutaneous skin nodules with maculopapular eruptions

Ophthalmic

- Anterior uveitis (common)

Musculoskeletal

- Muscle weakness
- Pain

Hepatic

- Granulomatous hepatitis (usually produces no symptoms)

Genitourinary

- Hypercalciuria (excessive calcium in the urine)

Cardiovascular

- Arrhythmias (premature beats, bundle-branch block, or complete heart block)

Central nervous system

- Cranial or peripheral nerve palsies

Respiratory refresher *(continued)*

SARCOIDOSIS *(continued)*

• Basilar meningitis (inflammation of the meninges at the base of the brain)

Key test results

• Positive Kveim-Siltzbach skin test supports the diagnosis. In this test, the patient receives an intradermal injection of an antigen prepared from human sarcoidal spleen or lymph nodes from patients with sarcoidosis. If the patient has active sarcoidosis, granuloma develops at the injection site in 2 to 6 weeks. This reaction is considered positive when a biopsy of the skin at the injection site shows discrete epithelioid cell granuloma.

Key treatments

• A low-calcium diet
• Avoidance of direct exposure to sunlight (in patients with hypercalcemia)
• O_2 therapy
• Corticosteroid: prednisone (Deltasone)
• Cytotoxic agents: methotrexate (Rheumatrex), azathioprine (Imuran)

Key interventions

• Provide a nutritious, high-calorie diet and plenty of fluids. If the patient has hypercalcemia, suggest a low-calcium diet.
• Weigh the patient regularly.

SEVERE ACUTE RESPIRATORY SYNDROME

Key signs and symptoms

• High fever (usually >100.4° F [38° C])
• Dry cough
• Dyspnea

Key test results

• History reveals recent travel to an area with documented severe acute respiratory syndrome (SARS) cases or close contact with a person suspected of having SARS.
• Chest X-ray shows atypical pneumonia.
• Reverse transcription polymerase chain reaction test detects ribonucleic acid of the SARS virus.

Key treatments

• Supplemental O_2; may require ET intubation and mechanical ventilation
• Droplet precautions
• Antiviral agents: oseltamivir (Tamiflu), ribavirin (Vibrazole), interferon beta-1a (Avonex)

Key interventions

• Monitor respiratory status.
• Administer supplemental O_2 as prescribed.
• Maintain droplet precautions.

TUBERCULOSIS

Key signs and symptoms

• Fever
• Night sweats

Key test results

• Mantoux skin test is positive.
• Sputum study results are positive for acid-fast bacillus and *Mycobacterium tuberculosis*.

Key treatments

• Standard and airborne precautions (While the patient is contagious, everyone entering the patient's room must wear a respirator with a high-efficiency particulate air filter.)
• Antitubercular agents: isoniazid (INH), ethambutol (Myambutol), rifampin (Rifadin), pyrazinamide (Pyrazinamide)

Key interventions

• Monitor respiratory status and pulse oximetry values.
• Maintain infection-control precautions.
• Instruct the patient to cover his nose and mouth when sneezing.
• Provide a room with negative pressure ventilation.

move from an area of high concentration to an area of low concentration. Because the concentration of carbon dioxide is greater in the alveoli, it diffuses out into the lungs and is exhaled. Because the lungs contain a greater concentration of oxygen, oxygen diffuses out of the lungs and into the alveoli, to be carried to the rest of the body.

A pleura-lity of coverings

The **pleura** is the membrane covering the lungs and lining the thoracic cavity. The visceral pleura covers the lungs, while the parietal pleura lines the thoracic cavity. Pleural fluid lubricates the pleura to reduce friction during respiration.

Keep abreast of diagnostic tests

Here are some important tests used to diagnose respiratory disorders, along with common nursing interventions associated with each test.

After any invasive test involving the airway—such as a bronchoscopy—assess respiratory status to ensure the patient's safety.

Deep, direct visualization

A **bronchoscopy** involves the use of a bronchoscope to directly visualize the trachea and bronchial tree. During a bronchoscopy, the physician may take biopsies, perform deep tracheal suctioning, and remove foreign objects.

Nursing actions

Before the procedure

- Withhold food and fluids for 6 to 12 hours, if possible.
- Make sure that written, informed consent has been obtained.

After the procedure

- Check the patient's cough and gag reflexes to minimize the risk of aspiration.
- Monitor sputum and respiratory status.
- Withhold food and fluids until the gag reflex returns.
- Monitor heart rate during and after the procedure for bradycardia, which may be caused by a vasovagal response.

Patients who are allergic to iodine or seafood are at risk for reactions in any test involving radiopaque dyes.

Looking in from the outside

A **chest X-ray** produces a radiographic picture of lung tissue. It can detect tumors, inflammation, air, and fluid in and around the lungs. It can also be used to monitor equipment, such as catheters and chest tubes.

Nursing actions

- Determine the patient's ability to inhale and hold his breath.
- Make sure that the patient removes jewelry before the X-ray is taken.

Dye-ing to see the lungs

With **pulmonary angiography,** the patient receives an injection of a radiopaque dye through a catheter. This provides a radiographic picture of pulmonary circulation.

Nursing actions

Before the procedure

- Note any patient allergies to iodine, seafood, or radiopaque dyes.
- Withhold food and fluids for 8 hours.
- Make sure that written, informed consent has been obtained.
- Inform the patient about the possibility of flushing of the face or burning in the throat after the dye is injected.

After the procedure

- Monitor peripheral neurovascular status.
- Check the insertion site for bleeding.
- Avoid taking blood pressure measurements in the extremity used for dye injection for 24 hours after the procedure.

Sensitive about sputum

A **sputum study** is a laboratory test that provides a microscopic evaluation of sputum, evaluating it for culture and sensitivity, Gram stain, and acid-fast bacillus.

Nursing actions

- Obtain an early-morning sterile specimen from suctioning or expectoration.
- Make sure that the specimen is truly sputum—not saliva—before sending it to the laboratory.

Focusing on intrapleural fluid

With **thoracentesis,** a needle is used to remove fluid from the pleural space or to obtain a sample of intrapleural fluid to determine the cause of an infection or empyema. It's performed using local anesthesia.

Nursing actions

Before the procedure

- Make sure that written, informed consent has been obtained.
- Reassure the patient.
- Place the patient in the proper position (either sitting on the edge of the bed or, if the patient is unable to sit up, on his unaffected side with the arm of his affected side raised above his head; elevate the head of the bed 30 to 45 degrees, if possible).

After the procedure

- Monitor the patient's respiratory status.
- Monitor vital signs frequently.

• Position the patient on the affected side, as ordered, for at least 1 hour to seal the puncture site.
• Check the puncture site for fluid leakage.

Finding out about lung function

Pulmonary function tests (PFTs) are noninvasive tests that measure lung volume, ventilation, and diffusing capacity using a spirometer. The patient breathes through a mouthpiece following specific directions. A computer then calculates the volumes.

Nursing actions

• Tell the patient to refrain from smoking or eating a heavy meal for 4 to 6 hours before testing.
• Document bronchodilators or opioids used before testing.

From the artery to the lab

Arterial blood gas (ABG) analysis is a laboratory test that assesses the arterial blood for tissue oxygenation, ventilation, and acid-base status.

Nursing actions

Before the procedure
• Note the patient's temperature.
• Document oxygen and assisted mechanical ventilation used.
After the procedure
• Apply pressure to the site for at least 5 minutes (for an extended period if coagulopathy is present).
• Assess the puncture site for bleeding or hematoma formation.
• Maintain a pressure dressing for at least 30 minutes.
• Monitor circulation distal to the puncture site.

Image through inhalation or injection

A **lung scan,** or ventilation/perfusion ($\dot{V}/\dot{Q}$) scan, uses inhalation or I.V. injection of radioisotopes to create an image of blood flow in the lungs.

Nursing actions

• Note any patient allergies to iodine, seafood, or radiopaque dyes.
• Make sure that written, informed consent has been obtained.
• Instruct the patient to remove all metal objects before the procedure.
• Confirm that the patient is able to lie still for about 1 hour during the procedure.
• Check the catheter insertion site for bleeding after the procedure.

TB or not TB?

With a **Mantoux intradermal skin test,** the patient receives an injection of tuberculin to detect tuberculosis (TB) antibodies.

Nursing actions

• Document any dermatitis or rashes.
• Document exposure to bacille Calmette-Guérin immunization.
• Circle the test site and note it in the patient's record.
• Note the date and time for a follow-up reading (48 to 72 hours after the injection).

Let's look at the larynx

Laryngoscopy uses a laryngoscope to directly visualize the larynx.

Nursing actions

Before the procedure
• Make sure that written, informed consent has been obtained.
• Withhold food and fluids for 6 to 8 hours.
• Explain that the patient will receive a sedative to promote relaxation.
After the procedure
• Monitor respiratory status and check for presence of the gag reflex.
• Allay the patient's anxiety.
• Withhold food and fluid until the gag reflex returns.

Little bit of lung tissue

A **lung biopsy** involves the removal of a small amount of lung tissue for histologic evaluation. A lung biopsy may be done by surgical exposure of the lung (open biopsy) or by endoscopy using a needle designed to remove a core of lung tissue.

Time to switch gears. Now that you're familiar with diagnostic tests, get ready to review common disorders.

Nursing actions

Before the procedure

- Withhold food and fluid for 8 hours.
- Make sure that written, informed consent has been obtained.

After the procedure

- Monitor and record vital signs.
- Monitor respiratory status for signs of pneumothorax, air embolism, hemoptysis, and hemorrhage.
- Check the incision site for bleeding.

Analyzing blood, part A

A **blood chemistry test** assesses a blood sample for potassium, sodium, calcium, phosphorus, glucose, bicarbonate, blood urea nitrogen, creatinine, protein, albumin, osmolality, and alpha$_1$-antitrypsin.

Nursing actions

- Withhold food and fluids before the procedure as directed.
- Check the site for bleeding after the procedure.

Analyzing blood, part B

With **hematologic and coagulation studies,** a blood sample is used to analyze red blood cells (RBCs), white blood cells (WBCs), prothrombin time, International Normalized Ratio, partial thromboplastin time, erythrocyte sedimentation rate (ESR), platelets, hemoglobin (Hb), and hematocrit (HCT).

Nursing actions

- Note current drug therapy before the procedure.
- Check the venipuncture site for bleeding after the procedure.

Polish up on patient care

Major respiratory disorders include acute respiratory distress syndrome (ARDS), acute respiratory failure, asbestosis, asphyxia, asthma, atelectasis, bronchiectasis, chronic bronchitis, cor pulmonale, emphysema, Legionnaires' disease, lung cancer, pleural effusion and empyema, pleurisy, *Pneumocystis carinii* pneumonia, pneumonia, pneumothorax and hemothorax, pulmonary embolism, respiratory acidosis, respiratory alkalosis, sarcoidosis, severe acute respiratory syndrome (SARS), and TB.

Acute respiratory distress syndrome

With ARDS, fluid builds up in the lungs and causes them to stiffen. This impairs breathing, thereby reducing the amount of oxygen in the capillaries that supply the lungs. When severe, ARDS can cause an unmanageable and ultimately fatal lack of oxygen. However, people who recover may have little or no permanent lung damage.

CAUSES

- Aspiration
- Decreased surfactant production
- Fat emboli
- Fluid overload
- Near drowning
- Neurologic injuries
- Oxygen toxicity
- Respiratory infection
- Sepsis
- Shock
- Trauma

DATA COLLECTION FINDINGS

- Anxiety and restlessness
- Cough
- Crackles, rhonchi, and decreased breath sounds
- Cyanosis
- Dyspnea or tachypnea

DIAGNOSTIC FINDINGS

- ABG levels show respiratory acidosis and hypoxemia that doesn't respond to increased fraction of inspired oxygen.
- Blood culture results show an infectious organism.
- Chest X-ray shows bilateral infiltrates (in early stages) and lung fields with a "ground-glass" appearance and, with irreversible

hypoxemia, massive consolidation of both lung fields (in later stages).
• Sputum study identifies the infectious organism.

NURSING DIAGNOSES

• Impaired gas exchange
• Ineffective breathing pattern
• Ineffective tissue perfusion: Cardiopulmonary

TREATMENT

• Oxygen therapy
• Intubation and mechanical ventilation using positive end-expiratory pressure (PEEP) or pressure-controlled inverse ratio ventilation
• Bed rest with alternating supine and prone positioning, if possible; passive range-of-motion exercises
• Chest physiotherapy, postural drainage, and suction
• Dietary changes, including restricting fluid intake or, if intubated, nothing by mouth
• Extracorporeal membrane oxygenation, if available
• Transfusion therapy: platelets, packed RBCs

Drug therapy

• Anesthetic: propofol (Diprivan) (if intubated)
• Analgesic: morphine
• Antibiotics most effective in treating the causative organism
• Anticoagulant: heparin
• Antianxiety agent: lorazepam (Ativan)
• Diuretics: furosemide (Lasix), ethacrynic acid (Edecrin)
• Exogenous surfactant: beractant (Survanta)
• Mucosal barrier fortifier: sucralfate (Carafate)
• Neuromuscular blocking agents: pancuronium (Pavulon), vecuronium (Norcuron) (if intubated)
• Steroids: hydrocortisone (Solu-Cortef), methylprednisolone (Solu-Medrol)

INTERVENTIONS AND RATIONALES

• Monitor respiratory, cardiovascular, and neurologic status *to detect evidence of hypoxemia, such as tachycardia, tachypnea, and irritability.*
• Monitor electrocardiogram (ECG) *to detect arrhythmias or ischemia.*
• Monitor pulse oximetry values continuously *to determine the effectiveness of therapy.*
• Monitor and record intake and output *to determine fluid status and hemodynamic variables.*
• Maintain mechanical ventilation and provide suction, as needed, *to aid in removal of secretions.*
• Maintain bed rest, with alternating supine and prone positioning if possible, *to promote oxygenation.*
• Maintain fluid restrictions *to reduce fluid overload.*
• Provide chest physiotherapy and postural drainage *to promote drainage and keep airways clear.*
• Place the patient in high Fowler's position *to promote chest expansion.*
• Maintain total parenteral nutrition or enteral feedings, as appropriate, *to prevent respiratory muscle impairment and maintain nutritional status.*
• Administer medications, as prescribed, *to optimize respiratory and hemodynamic status.*
• Organize rest periods for the patient *to conserve energy and avoid overexertion and fatigue.*
• Weigh the patient daily *to detect fluid retention.*
• Encourage the patient to express fear of suffocation *to reduce anxiety and oxygen demand.*

Memory jogger

Remember what happens in **ARDS:**

Assault to the pulmonary system

Respiratory distress

Decreased lung compliance

Severe respiratory failure.

Teaching topics

• Recognizing the signs and symptoms of respiratory distress
• Performing coughing and deep-breathing exercises
• Avoiding chemical irritants and pollutants

Acute respiratory failure

With acute respiratory failure, the respiratory system can't adequately supply the body with the oxygen it needs or adequately remove carbon dioxide. A patient is considered to be in respiratory failure when his partial pressure of arterial oxygen (Pa_{O_2}) is 50 mm Hg or less, his partial pressure of arterial carbon dioxide (Pa_{CO_2}) is 50 mm Hg or more, and his pH is 7.25 or less.

Acute respiratory failure can be classified as ventilatory failure or oxygenation failure. Ventilatory failure is characterized by alveolar hypoventilation. Oxygenation failure is characterized by $\dot{V}/\dot{Q}$ mismatching (blood flow to areas of the lung with reduced ventilation, or ventilation to lung tissue that's experiencing reduced blood flow) or physiologic shunting (blood moving from the right side of the heart to the left without being oxygenated).

CAUSES

- Abdominal or thoracic surgery
- Anesthesia
- ARDS
- Atelectasis
- Brain tumor
- Chronic obstructive pulmonary disease (COPD)
- Drug overdose
- Encephalitis
- Flail chest
- Guillain-Barré syndrome
- Head trauma
- Hemothorax
- Meningitis
- Multiple sclerosis
- Muscular dystrophy
- Myasthenia gravis
- Pleural effusion
- Pneumonia
- Pneumothorax
- Poliomyelitis
- Polyneuritis
- Pulmonary edema
- Pulmonary embolism
- Sepsis
- Stroke

DATA COLLECTION FINDINGS

- Adventitious breath sounds (crackles, rhonchi, wheezing, and pleural friction rub)
- Anxiety and change in mental activity
- Chest pain
- Cough, sputum production, hemoptysis
- Cyanosis, diaphoresis
- Decreased respiratory excursion, accessory muscle use, retractions
- Dyspnea, tachypnea, orthopnea
- Fatigue
- Nasal flaring
- Tachycardia

DIAGNOSTIC FINDINGS

- ABG levels show hypoxemia, acidosis, alkalosis, and hypercapnia.
- Chest X-ray shows pulmonary infiltrates, interstitial edema, and atelectasis.
- Hematology tests reveal increased WBC count and ESR.
- Lung scan shows $\dot{V}/\dot{Q}$ ratio mismatching.
- Pulse oximetry shows decreased levels (< 90%).
- Sputum study identifies causative organism.

NURSING DIAGNOSES

- Ineffective airway clearance
- Anxiety
- Ineffective breathing pattern

TREATMENT

- Supplemental oxygen therapy, intubation and mechanical ventilation, possibly with PEEP.
- Chest physiotherapy, postural drainage, and incentive spirometry
- Chest tube insertion if pneumothorax develops from high PEEP administration
- Dietary and fluid changes based on the cause of the disorder
- Treatment of underlying cause

Drug therapy

- Analgesic: morphine
- Anesthetic: propofol (Diprivan) (if intubated)
- Antianxiety agent: lorazepam (Ativan)
- Antibiotics most effective in treating the causative organism (for respiratory infection)
- Anticoagulants: heparin, warfarin (Coumadin), enoxaparin (Lovenox)

• Bronchodilators: terbutaline (Brethine), aminophylline (Phyllocontin); via nebulizer: albuterol (Proventil), ipratropium (Atrovent), metaproterenol (Alupent)
• Diuretic: furosemide (Lasix) if fluid overload is the cause
• Histamine-2 blockers: famotidine (Pepcid), ranitidine (Zantac), nizatidine (Axid)
• Neuromuscular blocking agents: pancuronium (Pavulon), vecuronium (Norcuron), atracurium (Tracrium) (if intubated)
• Steroids: hydrocortisone (Solu-Cortef), methylprednisolone (Solu-Medrol)

INTERVENTIONS AND RATIONALES

• Administer oxygen *to reduce hypoxemia and relieve respiratory distress.*
• Monitor respiratory status *to detect early signs of compromise and hypoxemia.*
• Monitor and record intake and output *to detect fluid excess, which may lead to pulmonary edema.*
• Monitor pulse oximetry values *to detect a change in oxygen saturation.*
• Monitor and record vital signs. *Tachycardia and tachypnea may indicate hypoxemia.*
• Record color, consistency, and amount of sputum *to determine hydration status, effectiveness of therapy, and presence of infection.*
• Provide suctioning; help the patient with turning, coughing, and deep breathing; and perform chest physiotherapy and postural drainage *to facilitate removal of secretions.* (See *Performing oronasopharyngeal suctioning,* page 84.)
• Maintain prescribed mechanical ventilation *to prevent complications and optimize* Pa_{O_2}.
• Maintain bed rest *to reduce the amount of oxygen required.*
• Place the patient in semi-Fowler's or high Fowler's position *to promote chest expansion and ventilation.*
• Maintain diet restrictions. *Fluid restrictions and a low-sodium diet may be necessary to avoid fluid overload.*
• Administer medications, as prescribed, *to treat infection, dilate airways, and reduce inflammation.*
• Monitor chest tube system if indicated *to assess for lung reexpansion.*

Teaching topics

• Recognizing the early signs and symptoms of respiratory difficulty
• Performing deep-breathing and coughing exercises

Asbestosis

Asbestosis is characterized by widespread filling and inflammation of lung spaces with asbestos fibers. The asbestos fibers assume a longitudinal orientation in the airway, move in the direction of airflow, and penetrate respiratory bronchioles and alveolar walls. This causes diffuse interstitial fibrosis (tissue filled with fibers).

Asbestosis can develop as long as 15 to 20 years after regular exposure to asbestos has ended. It increases the risk of lung cancer in cigarette smokers.

CAUSES

• Inhalation of asbestos fibers

DATA COLLECTION FINDINGS

• Dry crackles at lung bases
• Dry cough
• Dyspnea on exertion (usually first symptom)
• Dyspnea at rest (with advanced disease)
• Finger clubbing
• Pleuritic chest pain
• Tachypnea

DIAGNOSTIC FINDINGS

• ABG analysis reveals decreased Pa_{O_2} and Pa_{CO_2}.
• Chest X-rays show fine, irregular, and linear diffuse infiltrates; extensive fibrosis results in a "honeycomb" or "ground-glass" appearance. X-rays may also show pleural thickening and calcification, with bilateral obliteration of costophrenic angles and, in later stages, an enlarged heart with a classic "shaggy" heart border.
• PFTs show decreased vital capacity, forced vital capacity, total lung capacity, and diffusing capacity of the lungs.

Stepping up

Performing oronasopharyngeal suctioning

WHY YOU DO IT

Oronasopharyngeal suctioning removes secretions from the pharynx by a suction catheter inserted through the mouth or nostril. Used to maintain a patent airway, this procedure helps the patient who can't clear his airway effectively by coughing and expectoration. Typically, these patients are unconscious or severely debilitated. The frequency and duration of suctioning depend on the patient's tolerance of the procedure and on the occurrence of complications.

A catheter may inadvertently slip into the lower airway or esophagus. For that reason, oronasopharyngeal suction is a sterile procedure that requires sterile equipment. Apply suction for only 10 to 15 seconds at a time to minimize tissue trauma and prevent hypoxia.

GETTING READY

- Check for a doctor's order if your facility requires one.
- Check vital signs and pulse oximetry values. Evaluate the patient's ability to cough and breathe deeply.
- Describe the procedure to the patient and explain that it may cause coughing or gagging. Reassure the patient throughout the procedure.
- Position the patient in semi-Fowler's or high Fowler's position, if tolerated.
- Turn on the suction from the wall or portable unit, and set the pressure (usually between 80 and 120 mm Hg). Block the end of the connecting tubing momentarily to check suction pressure.
- Using strict sterile technique, open the suction catheter kit or the packages containing the sterile catheter, disposable container, gloves, saline solution, and lubricant.
- Put on the gloves. Consider your dominant hand sterile and your nondominant hand nonsterile. Using your nondominant hand, pour saline solution into the sterile container.
- With your nondominant hand, place a small amount of water-soluble lubricant on the sterile area.
- Pick up the catheter with your dominant (sterile) hand, and attach it to the connecting tubing. Use your nondominant hand to control the suction valve while your dominant hand manipulates the catheter.

INSERTING THE CATHETER

The technique you'll use depends on whether the catheter is inserted nasally or orally.

For nasal insertion

- Raise the tip of the patient's nose with your nondominant hand to straighten the passageway and facilitate insertion of the catheter. Without applying suction, gently insert the suction catheter into the patient's nostril. Roll the catheter between your fingers to help advance it through the turbinates. Continue to advance the catheter 5″ to 6″ (12.7 to 15.2 cm) until you reach the pool of secretions or until the patient begins to cough.

For oral insertion

- Without applying suction, gently insert the catheter into the patient's mouth. Advance it 3″ to 4″ (7.6 to 10.2 cm) along the side of the patient's mouth until you reach the pool of secretions or the patient begins to cough. Suction both sides of the patient's mouth and pharyngeal area.

SUCTIONING THE PATIENT

- Using intermittent suction, withdraw the catheter from either the mouth or the nose with a continuous rotating motion. Between passes, wrap the catheter around your dominant hand.
- If secretions are thick, clear the catheter tube by dipping it in normal saline solution and applying suction.
- Repeat the procedure until gurgling or bubbling sounds stop and respirations are quiet.
- After completing suction, pull off your sterile glove over the coiled catheter and then remove your nonsterile glove. Discard both gloves and the container of water.
- Flush the connecting tubing with normal saline solution.
- If the patient has excessive oral secretions, consider using a tonsil tip catheter. This allows the patient to remove oral secretions independently.
- Let the patient rest after suctioning while you continue to observe him.

WHAT YOU SHOULD DOCUMENT

- Date, time, and reason for suctioning
- Technique used
- Amount, color, consistency, and odor (if any) of the secretions
- Patient's respiratory status before and after the procedure
- Complications and the actions taken in response
- Patient's tolerance of the procedure

NURSING DIAGNOSES
- Imbalanced nutrition: Less than body requirements
- Fatigue
- Impaired gas exchange

TREATMENT
- Chest physiotherapy
- Fluid intake of at least 3 L/day
- Oxygen therapy or mechanical ventilation (with advanced cases)

Drug therapy
- Antibiotics: most effective in treating the causative organism (for respiratory tract infection)
- Cardiac glycoside: digoxin (Lanoxin)
- Diuretic: furosemide (Lasix)
- Mucolytic inhalation therapy: acetylcysteine (Mucomyst)

INTERVENTIONS AND RATIONALES
- Provide chest physiotherapy techniques, such as controlled coughing and segmental bronchial drainage, with chest percussion and vibration *to relieve respiratory symptoms.* Aerosol therapy, inhaled mucolytics, and increased fluid intake (at least 3 L daily) *may also help relieve respiratory symptoms.*
- Administer medications as ordered *to treat the disorder.*
- Administer oxygen by cannula or mask (1 to 2 L/minute), or by mechanical ventilation if Pao_2 can't be maintained above 40 mm Hg, *to prevent complications of hypoxemia.*

Teaching topics
- Preventing infections by avoiding crowds, avoiding people with infections, and receiving influenza and pneumococcal vaccines

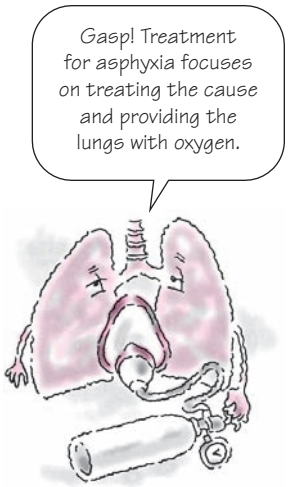
Asphyxia

With asphyxia, interference with adequate respiration leads to insufficient oxygen and accumulating carbon dioxide in the blood and tissues. Asphyxia leads to cardiopulmonary arrest and is fatal without prompt treatment.

CAUSES
- Extrapulmonary obstruction, such as tracheal compression from a tumor, strangulation, trauma, or suffocation
- Hypoventilation resulting from opioid abuse, medullary disease, hemorrhage, pneumothorax, respiratory muscle paralysis, or cardiopulmonary arrest
- Inhalation of toxic agents, such as carbon monoxide, smoke, and excessive oxygen
- Intrapulmonary obstruction caused by such factors as airway obstruction, severe asthma, foreign body aspiration, pulmonary edema, pneumonia, and near-drowning

DATA COLLECTION FINDINGS
- Agitation
- Altered mental status
- Altered respiratory rate (apnea, bradypnea, and occasionally tachypnea)
- Anxiety
- Central and peripheral cyanosis (cherry-red mucous membranes in late-stage carbon monoxide poisoning)
- Decreased breath sounds
- Dyspnea
- Fast, slow, or absent pulse
- Seizures

DIAGNOSTIC FINDINGS
- ABG measurement indicates decreased Pao_2 (less than 60 mm Hg) and increased $Paco_2$ (more than 50 mm Hg).
- Chest X-rays may show a foreign body, pulmonary edema, or atelectasis.
- PFTs may indicate respiratory muscle weakness.
- Pulse oximetry reveals decreased oxygen saturation.
- Toxicology tests may show drugs, chemicals, or abnormal Hb.



NURSING DIAGNOSES
- Impaired gas exchange
- Impaired spontaneous ventilation
- Risk for suffocation

TREATMENT
- Oxygen therapy, which may include endotracheal (ET) intubation and mechanical ventilation

• Bronchoscopy (for extraction of a foreign body)
• Gastric lavage (for poisoning)

Drug therapy
• Opioid antagonist: naloxone (Narcan) (for opioid overdose)

INTERVENTIONS AND RATIONALES
• Monitor cardiac and respiratory status *to detect early signs of compromise.*
• Position the patient upright, if his condition allows, *to promote lung expansion and improve oxygenation.*
• Reassure the patient during treatment *to ease anxiety associated with respiratory distress.*
• Give prescribed medications *to promote ventilation and oxygenation.*
• Suction carefully, as needed, and encourage deep breathing *to mobilize secretions and maintain a patent airway.*
• Closely monitor vital signs and ECG *to evaluate and guide the treatment plan.*

Teaching topics
• Understanding the need for follow-up medical care
• Avoiding a combination of alcohol and other central nervous system (CNS) depressants

Asthma

Asthma is a form of COPD in which the bronchial linings overreact to various stimuli, causing episodic spasms and inflammation that severely restrict the airways. Symptoms range from mild wheezing and labored breathing to life-threatening respiratory failure.

Asthma can be extrinsic or intrinsic (or a person may have both). **Extrinsic (atopic) asthma** is caused by sensitivity to specific external allergens. **Intrinsic (nonatopic)** asthma is caused by a reaction to internal, nonallergenic factors.

CAUSES
Extrinsic asthma
• Allergens (pollen, dander, cockroach debris, dust mites, dust, sulfite food additives)

Intrinsic asthma
• Endocrine changes
• Exercise
• Noxious fumes
• Respiratory infection
• Stress
• Temperature and humidity

DATA COLLECTION FINDINGS
• Absent or diminished breath sounds during severe obstruction
• Chest tightness
• Dyspnea
• Productive cough that expels thick mucus
• Prolonged expiration
• Tachypnea, tachycardia
• Use of accessory muscles
• Lack of symptoms between attacks (common)
• Wheezing, primarily on expiration but sometimes also on inspiration

DIAGNOSTIC FINDINGS
• ABG levels in acute severe asthma show decreased Pa_{O_2} and decreased, normal, or increased Pa_{CO_2}.
• Blood tests: Serum immunoglobulin (Ig) E may increase because of an allergic reaction; complete blood count (CBC) may reveal increased eosinophil count.
• Chest X-ray shows hyperinflated lungs with air trapping during an attack.
• PFTs during attacks show decreased forced expiratory volume that improves with therapy and increased residual volume and total lung capacity.
• Skin tests may identify allergens.

NURSING DIAGNOSES
• Ineffective airway clearance
• Impaired gas exchange
• Ineffective therapeutic regimen management

TREATMENT

- Desensitization to allergens (see *An ounce of prevention*)
- Oxygen therapy
- Intubation and mechanical ventilation if respiratory status worsens
- Fluids up to 3,000 ml/day as tolerated

Drug therapy

- Antibiotics: most effective in treating the infection (for respiratory infections)
- Antileukotrienes: zileuton (Zyflo), zafirlukast (Accolate)
- Beta-adrenergic drugs: epinephrine (Adrenalin), salmeterol (Serevent), formoterol (Foradil)
- Bronchodilators: terbutaline (Brethine), aminophylline (Phyllocontin), theophylline (Theo-Dur); via metered-dose inhaler: albuterol (Proventil), ipratropium (Atrovent), metaproterenol (Alupent)
- Mast cell stabilizers: cromolyn (Intal), nedocromil (Tilade)
- Anti-immunoglobulin E agent: omalizumab (Xolair)
- Steroids: hydrocortisone (Solu-Cortef), methylprednisolone (Solu-Medrol)
- Steroids (via metered-dose inhaler): beclomethasone (Vanceril), triamcinolone (Azmacort)

INTERVENTIONS AND RATIONALES

- Administer low-flow humidified oxygen *to reduce inflammation of the airways, ease breathing, and increase oxygen saturation.*
- Administer medications, as prescribed, *to reduce inflammation and obstruction of airways.*
- Encourage the patient to express his fear of suffocation *to reduce anxiety.* As breathlessness and hypoxemia are relieved, anxiety should be reduced.
- Allow activity, as tolerated, with rest periods *to reduce work of breathing and reduce oxygen demands.*
- Monitor respiratory status and pulse oximetry *to evaluate the effects of therapy.*
- Assist the patient with turning, coughing, deep breathing, and breathing retraining *to mobilize and clear secretions.*
- Place the patient in high Fowler's position *to improve ventilation.*
- Maintain the patient's diet and provide small, frequent meals and snacks *to reduce pressure on the diaphragm and increase caloric intake.*
- Encourage fluids *to treat dehydration and liquefy secretions to facilitate their removal.*
- Monitor and record the color, amount, and consistency of sputum. *Changes in sputum characteristics may signal a respiratory infection.*
- Monitor and record vital signs. *Tachycardia may indicate worsening asthma or drug toxicity. Hypertension may indicate hypoxemia. Fever may signal infection.*
- Provide chest physiotherapy, postural drainage, incentive spirometry, and suction *to aid in the removal of secretions.*

Teaching topics

- Recognizing the early signs and symptoms of respiratory infection and hypoxia
- Taking medications properly, including the use of a metered-dose inhaler
- Using a peak flow meter
- Performing pursed-lip, diaphragmatic breathing and coughing and deep-breathing exercises
- Avoiding exposure to allergens, chemical irritants, and pollutants
- Avoiding spicy foods, extremely hot or cold foods, and foods that produce gas
- Beginning a smoking-cessation program (for patient and family members, if appropriate)
- Increasing fluid intake to 3,000 ml/day
- Contacting the American Lung Association

Atelectasis

Atelectasis is the incomplete expansion of lobules (clusters of alveoli) or lung segments, which may cause partial or complete lung collapse. The collapsed areas are unavailable for gas exchange; blood that lacks oxygen passes through unchanged and produces hypoxemia.

Atelectasis may be chronic or acute. It occurs to some degree in many pa-

An ounce of prevention

Many patients with asthma can use prevention techniques to avoid asthma attacks. It's important to educate the patient about these techniques.

Begin by helping the patient identify attack triggers, such as exercise, stress, anxiety, and cold air. Then teach the patient about how to avoid them. Explain that when the patient can't avoid these triggers, he should use a metered-dose inhaler to avoid an attack. Also, teach the patient how to use a peak flow meter to quickly identify when his respiratory status is deteriorating.

Atelectasis is the incomplete expansion of lobules of a lung, which may cause partial or complete collapse.

tients undergoing upper abdominal or thoracic surgery. The prognosis depends on prompt removal of any airway obstruction, relief of hypoxia, and reexpansion of the collapsed lung.

CAUSES

- Bronchial occlusion by mucus plugs, as in patients with COPD, bronchiectasis, or cystic fibrosis or those who smoke heavily
- CNS depression
- External compression applied from upper abdominal surgical incisions, rib fractures, pleuritic chest pain, tight dressings around the chest, obesity, or other factors
- Occlusion by foreign bodies, bronchogenic carcinoma, and inflammatory lung disease
- Prolonged immobility

DATA COLLECTION FINDINGS

- Diminished or bronchial breath sounds
- Dyspnea
- Low-grade fever

In severe cases

- Anxiety
- Cyanosis
- Diaphoresis
- Severe dyspnea
- Substernal or intercostal retraction
- Tachycardia

DIAGNOSTIC FINDINGS

- Chest X-ray shows characteristic horizontal lines in the lower lung zones and, with segmental or lobar collapse, characteristic dense shadows (these are often associated with hyperinflation of neighboring lung zones in widespread atelectasis).
- Bronchoscopy shows the area and cause of obstruction.

NURSING DIAGNOSES

- Impaired gas exchange
- Ineffective breathing pattern
- Risk for infection

TREATMENT

- Bronchoscopy
- Chest physiotherapy
- Surgery or radiation therapy to remove an obstructing neoplasm

Stepping up

Using an incentive spirometer

WHY YOU DO IT

The purpose of incentive spirometry is for the patient to achieve maximum ventilation. Maximum ventilation is necessary to help prevent and reverse alveolar collapse, which can cause atelectasis and pneumonitis.

HOW YOU DO IT

- Evaluate the patient's condition.
- Explain the procedure and the importance of regularly using an incentive spirometer to maintain alveolar inflation.
- Position the patient in a comfortable sitting or semi-Fowler's position to promote optimal lung expansion.
- Instruct the patient to insert the mouthpiece in his mouth and to close his lips tightly around it to create a seal.
- Tell the patient to exhale normally and then inhale as slowly and as deeply as possible. Instruct him to retain the inhaled air for 3 seconds; if he's using a device with a light indicator, tell him to hold his breath until the light turns off.
- Tell the patient to remove the mouthpiece from his mouth and exhale normally.
- Repeat this sequence 5 to 10 times during every waking hour.
- Document the patient's response and tidal volumes.

Drug therapy

- Analgesic: morphine
- Bronchodilator: albuterol (Proventil)
- Mucolytic inhalation therapy: acetylcysteine (Mucomyst)

INTERVENTIONS AND RATIONALES

- Encourage postoperative and other high-risk patients to cough and deep-breathe every hour during their waking hours *to prevent atelectasis.*
- Postoperatively, teach the patient to splint his incision while breathing deeply and moving *to minimize pain during coughing exercises.* Gently reposition these patients often and help them walk as soon as possible *to prevent atelectasis.*
- Administer analgesics *to control pain. Pain may prevent the patient from taking deep breaths, which leads to atelectasis.*
- Teach the patient to use an incentive spirometer *to encourage deep inspiration through positive reinforcement.* Encourage him to use it every hour during his waking hours. (See *Using an incentive spirometer.*)
- Humidify inspired air and encourage adequate fluid intake *to mobilize secretions.* Use postural drainage and chest percussion *to promote loosening and clearance of secretions.*
- If the patient is intubated or uncooperative, provide suctioning as needed. Use sedatives with discretion *because they suppress respiration, the cough reflex, and sighing.*
- Monitor breath sounds and ventilatory status frequently and be alert for any changes *to prevent respiratory compromise.*
- Encourage the patient to stop smoking and lose weight, as needed. Refer him to appropriate support groups for help *to modify risk factors.*
- Provide reassurance and emotional support *because the patient may be frightened by his limited breathing capacity.*

Teaching topics

- Performing respiratory care, such as postural drainage, coughing, and deep breathing
- Stopping smoking and losing weight, if appropriate
- Performing relaxation techniques

Bronchiectasis

Bronchiectasis is the chronic abnormal dilation of the bronchi (large air passages of the lungs) and destruction of the bronchial walls.

Bronchiectasis has three forms: cylindrical (fusiform), varicose, and saccular (cystic). It can occur throughout the tracheobronchial tree, or it may be confined to one segment or lobe. However, it's usually bilateral and involves the basilar segments of the lower lobes.

The disorder affects people of both sexes and all ages and, once established, is irreversible. Because of the availability of antibiotics to treat acute respiratory tract infections, the incidence of bronchiectasis has dramatically decreased in the past 20 years.

CAUSES

- Inhalation of corrosive gas or repeated aspiration of gastric juices into the lungs
- Immunologic disorders such as agammaglobulinemia
- Mucoviscidosis (in cases of cystic fibrosis)
- Obstruction (by a foreign body, tumor, or stenosis) in association with recurrent infection
- Recurrent, inadequately treated bacterial respiratory tract infections, such as TB and complications of measles, pneumonia, pertussis, or influenza

DATA COLLECTION FINDINGS

- Chronic cough that produces copious, foul-smelling, mucopurulent secretions, possibly totaling several cupfuls daily
- Coarse crackles during inspiration over involved lobes or segments
- Dyspnea
- Hemoptysis
- Occasional wheezing
- Weight loss

DIAGNOSTIC FINDINGS

- Bronchoscopy helps to identify the source of bleeding in hemoptysis or to remove secretions.
- Chest X-rays show peribronchial thickening, areas of atelectasis, and scattered cystic changes.

• CBC detects anemia and leukocytosis.
• PFTs detect decreased vital capacity and expiratory flow and hypoxemia.
• Sputum culture and Gram stain identify predominant organisms.

NURSING DIAGNOSES

• Imbalanced nutrition: Less than body requirements
• Impaired gas exchange
• Ineffective airway clearance

TREATMENT

• Bronchoscopy (to mobilize secretions)
• Chest physiotherapy
• Oxygen therapy

Drug therapy

• Antibiotics most effective in treating the causative organism (in bacterial respiratory tract infection)
• Bronchodilator: albuterol (Proventil)

INTERVENTIONS AND RATIONALES

• Monitor respiratory status and pulse oximetry values *to detect early signs of decompensation.*
• Provide supportive care and help the patient adjust to the permanent changes in lifestyle that irreversible lung damage necessitates *to facilitate positive coping.*
• Administer antibiotics, as needed, *to eradicate infection.*
• Explain all diagnostic tests to the patient *to decrease anxiety.*
• Perform chest physiotherapy, including postural drainage and chest percussion designed for involved lobes, several times per day. Tell the patient to maintain each position for 10 minutes, perform percussion, and then cough. *These measures mobilize secretions.*

Teaching topics

• Using home oxygen therapy
• Instructing family members on how to perform chest physiotherapy
• Beginning a smoking-cessation program, if appropriate
• Understanding dietary considerations, such as avoiding milk products, which increase the viscosity of secretions
• Properly disposing of secretions to prevent the spread of infection to others

Chronic bronchitis

Chronic bronchitis, a form of COPD, develops from irritants and infections that increase mucus production, impair airway clearance, and cause irreversible narrowing of the small airways. This causes a severe $\dot{V}/\dot{Q}$ imbalance, which leads to hypoxemia and carbon dioxide retention.

CAUSES

• Prolonged exposure to airborne irritants and pollutants
• Chronic respiratory infections
• Smoking

DATA COLLECTION FINDINGS

• Cyanosis
• Dyspnea
• Finger clubbing (later in the disease)
• Increased sputum production
• Productive cough
• Prolonged expiration
• Rhonchi and wheezing
• Use of accessory muscles
• Weight gain, edema, and jugular vein distention

DIAGNOSTIC FINDINGS

• ABG analysis shows decreased Pa_{O_2} and normal or increased Pa_{CO_2}.
• Chest X-ray shows hyperinflation and increased bronchovascular markings.
• ECG shows atrial arrhythmias; peaked P waves in leads II, III, and aV_F; and, occasionally, right ventricular hypertrophy.
• PFTs may reveal increased residual volume, decreased vital capacity and forced expiratory volumes, and normal static compliance and diffusion capacity.
• Sputum culture may reveal many microorganisms and neutrophils.

NURSING DIAGNOSES

• Activity intolerance
• Ineffective airway clearance
• Ineffective breathing pattern

TREATMENT

- Chest physiotherapy, postural drainage, and incentive spirometry
- Dietary changes, including the adoption of a diet high in protein, vitamin C, calories, and nitrogen
- Fluid intake up to 3,000 ml/day, if not contraindicated by other conditions
- Intubation and mechanical ventilation, if respiratory status deteriorates
- Oxygen therapy at 2 to 3 L/minute

Drug therapy

- Antibiotics most effective in treating the causative organism
- Bronchodilators: terbutaline (Brethine), aminophylline (Phyllocontin), theophylline (Theo-Dur); via nebulizer or metered-dose inhaler: albuterol (Proventil), ipratropium (Atrovent), metaproterenol (Alupent)
- Diuretic: furosemide (Lasix) for edema
- Expectorant: guaifenesin (Robitussin)
- Influenza and Pneumovax vaccines
- Steroids: hydrocortisone (Solu-Cortef), methylprednisolone (Solu-Medrol)
- Steroids (via nebulizer or metered-dose inhaler): beclomethasone (Vanceril), triamcinolone (Azmacort)

INTERVENTIONS AND RATIONALES

- Administer low-flow oxygen. *Patients with chronic bronchitis have chronic hypercapnia and, consequently, they have a hypoxic respiratory drive. Higher flow rates may eliminate this hypoxic respiratory drive.*
- Administer medications, as prescribed, *to relieve symptoms and prevent complications.*
- Allow activity, as tolerated, *to avoid fatigue and reduce oxygen demands.*
- Monitor respiratory status and pulse oximetry values *to detect respiratory compromise, severe hypoxemia, and hypercapnia.*
- Help the patient with turning, coughing, and deep breathing *to mobilize and facilitate removal of secretions.*
- Assist with diaphragmatic and pursed-lip breathing *to strengthen respiratory muscles.*
- Place the patient in high Fowler's position *to improve ventilation.*
- Maintain the patient's diet and provide small meals and snacks *to avoid fatigue when eating and reduce pressure on the diaphragm from a full stomach.*
- Monitor and record the color, amount, and consistency of sputum. *Changes in sputum characteristics may signal a respiratory infection.*
- Monitor and record cardiovascular status and vital signs. *Edema, jugular vein distention, and tachycardia suggest right-sided heart failure. An irregular pulse may indicate an arrhythmia caused by altered oxygen status. Tachycardia and tachypnea may indicate hypoxemia.*
- Monitor intake and output and weigh the patient daily *to detect fluid overload associated with right-sided heart failure. Dehydration impairs the removal of secretions.*
- Provide chest physiotherapy, postural drainage, incentive spirometry, and suction *to aid in removal of secretions.*

Teaching topics

- Participating in pulmonary rehabilitation
- Recognizing the early signs and symptoms of respiratory infection and hypoxia
- Using home oxygen and nebulizer equipment properly
- Performing pursed-lip, diaphragmatic breathing and coughing and deep-breathing exercises
- Avoiding exposure to chemical irritants and pollutants
- Avoiding spicy foods, extremely hot or cold foods, and foods that produce gas
- Beginning a smoking-cessation program, if appropriate
- Increasing fluid intake to 3,000 ml/day, if not contraindicated
- Contacting the American Lung Association

Cor pulmonale

With cor pulmonale, a chronic heart condition, the heart's right ventricle becomes enlarged from diseases affecting the function or the structure of the lungs. To compensate for the extra work needed to force blood through the lungs, the right ventricle dilates and hypertrophies.

Cor pulmonale patients with underlying COPD shouldn't receive high concentrations of oxygen; this could lead to subsequent respiratory depression.

Invariably, cor pulmonale follows some disorder of the lungs, pulmonary vessels, chest wall, or respiratory control center. For instance, COPD produces pulmonary hypertension, which leads to right ventricular hypertrophy and right-sided heart failure. Because cor pulmonale generally occurs late during the course of COPD and other irreversible diseases, the prognosis is generally poor.

CAUSES

- COPD (about 25% of patients with COPD eventually develop cor pulmonale)
- Living at high altitudes (chronic mountain sickness)
- Loss of lung tissue after extensive lung surgery
- Obesity hypoventilation syndrome (pickwickian syndrome) and upper airway obstruction
- Obstructive lung diseases, such as bronchiectasis and cystic fibrosis
- Pulmonary vascular diseases, such as recurrent thromboembolism, primary pulmonary hypertension, schistosomiasis, and pulmonary vasculitis
- Respiratory insufficiency without pulmonary disease, as seen in chest wall disorders, such as kyphoscoliosis, neuromuscular incompetence resulting from muscular dystrophy or amyotrophic lateral sclerosis, polymyositis, and spinal cord lesions above C6
- Restrictive lung diseases, such as pneumoconiosis, interstitial pneumonitis, scleroderma, and sarcoidosis

Pulmonary peril. In cor pulmonale, my right ventricle enlarges because of diseases that affect the lungs.

DATA COLLECTION FINDINGS

- Chronic productive cough
- Dyspnea on exertion
- Edema
- Fatigue
- Orthopnea
- Tachypnea
- Weakness
- Wheezing respirations

DIAGNOSTIC FINDINGS

- ABG analysis shows decreased Pao_2 (less than 70 mm Hg).
- Blood tests show HCT greater than 50%.
- Chest X-ray shows large central pulmonary arteries and suggests right ventricular enlargement by rightward enlargement of cardiac silhouette on an anterior chest film.
- Echocardiography or angiography indicates right ventricular enlargement, and angiography can estimate pulmonary artery pressure (PAP).
- ECG commonly shows arrhythmias, such as premature atrial and ventricular contractions and atrial fibrillation, during severe hypoxia. It may also show right bundle-branch block, right axis deviation, prominent P waves and an inverted T wave in right precordial leads, and right ventricular hypertrophy.
- PAP measurements show increased right ventricular pressure as a result of increased pulmonary vascular resistance.
- PFTs show results consistent with the underlying pulmonary disease.

NURSING DIAGNOSES

- Activity intolerance
- Excess fluid volume
- Impaired gas exchange

TREATMENT

- Diet: low-sodium with restricted fluid intake
- Oxygen therapy by mask or cannula in concentrations ranging from 24% to 40% (concentration depends on Pao_2) and, in acute cases, mechanical ventilation
- Lung or heart and lung transplantation (primary pulmonary hypertension)

Drug therapy

- Angiotensin-converting enzyme inhibitor: captopril (Capoten)
- Antibiotics: most effective in treating causative organism (for respiratory infection)
- Anticoagulant: heparin (Heparin Sodium Injection)
- Calcium channel blocker: diltiazem (Cardizem)
- Cardiac glycoside: digoxin (Lanoxin)
- Diuretic: furosemide (Lasix) to reduce edema
- Vasodilators: diazoxide (Proglycem), hydralazine (Apresoline), nitroprusside (Nipride)

INTERVENTIONS AND RATIONALES

- Monitor respiratory status and pulse oximetry values *to detect complications*
- Monitor cardiovascular status *to detect worsening condition.*
- Provide small, frequent meals and snacks rather than three heavy meals *because the patient may lack energy and tire easily when eating.*
- Limit the patient's fluid intake to 1,000 to 2,000 ml/day and provide a low-sodium diet *to prevent fluid retention.*
- Teach the patient to check his radial pulse before taking a cardiac glycoside and to report any changes in pulse rate *to avoid complications of digoxin therapy.*
- Reposition bedridden patients often *to prevent atelectasis.*
- Provide meticulous respiratory care, including oxygen therapy and, for COPD patients, pursed-lip breathing exercises, *to improve oxygenation.*
- Watch for signs of respiratory failure, such as a change in pulse rate; deep, labored respirations; and increased fatigue produced by exertion. *Monitoring these parameters helps detect early signs of worsening respiratory status.*

Teaching topics

- Keeping follow-up appointments
- Using home oxygen therapy
- Beginning a smoking-cessation program, if appropriate

Emphysema

Emphysema is a form of COPD in which recurrent pulmonary inflammation damages and eventually destroys the alveolar walls, creating large air spaces. This breakdown leaves the alveoli unable to recoil normally after expanding and, upon expiration, results in bronchiolar collapse. This traps air in the lungs, leading to overdistention and reduced gas exchange.

CAUSES

- Deficiency of alpha$_1$-antitrypsin
- Smoking

DATA COLLECTION FINDINGS

- Anorexia, weight loss
- Barrel chest
- Decreased breath sounds
- Dyspnea
- Finger clubbing (late in the disease)
- Prolonged expiration
- Pursed-lip breathing
- Use of accessory muscles for breathing
- Weakness

DIAGNOSTIC FINDINGS

- ABG analysis shows reduced Pa_{O_2}, with normal Pa_{CO_2} until late in the disease.
- Chest X-ray in advanced disease reveals a flattened diaphragm, reduced vascular markings in the lung periphery, enlarged anteroposterior chest diameter, and a vertical heart.
- CBC shows increased Hb levels late in disease when patient has severe persistent hypoxia.
- ECG shows tall, symmetrical P waves in leads II, III, and aV_F; a vertical QRS axis; and signs of right ventricular hypertrophy late in the disease.
- PFTs show increased residual volume, total lung capacity, and compliance as well as decreased vital capacity, diffusing capacity, and expiratory volumes.

NURSING DIAGNOSES

- Fatigue
- Impaired gas exchange
- Risk for infection

TREATMENT

- Oxygen therapy at 2 to 3 L/minute, transtracheal therapy for home oxygen therapy
- Chest physiotherapy, postural drainage, and incentive spirometry
- Dietary changes, including establishing a diet high in protein, vitamin C, calories, and nitrogen
- Fluid intake up to 3,000 ml/day, if not contraindicated by heart failure
- Intubation and mechanical ventilation if respiratory status deteriorates
- Ultrasonic or mechanical nebulizer treatments
- Lung volume reduction surgery

Drug therapy

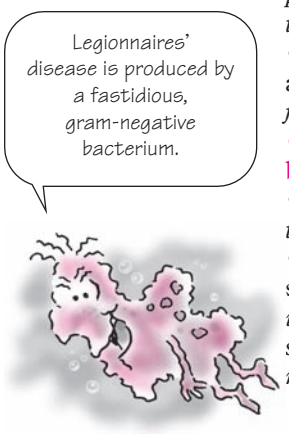
- Alpha$_1$-antitrypsin therapy
- Antibiotics most effective in treating the infection (for respiratory infections)
- Bronchodilators: terbutaline (Brethine), aminophylline (Phyllocontin), theophylline (Theo-Dur); via nebulizer: albuterol (Proventil), ipratropium (Atrovent), metaproterenol (Alupent)
- Diuretics (for edema): furosemide (Lasix)
- Expectorant: guaifenesin (Robitussin)
- Influenza and Pneumovax vaccine
- Steroids: hydrocortisone (Solu-Cortef), methylprednisolone (Solu-Medrol)
- Steroids (via nebulizer): beclomethasone (Vanceril), triamcinolone (Azmacort)

INTERVENTIONS AND RATIONALES

- Administer low-flow oxygen *because emphysema patients have chronic hypercapnia, which means they have a hypoxic respiratory drive. Higher flow rates may eliminate this hypoxic respiratory drive.*
- Administer medications, as prescribed, *to relieve symptoms and prevent complications.*
- Allow activity, as tolerated, *to avoid fatigue and reduce oxygen demands.*
- Monitor respiratory status and pulse oximetry values *to detect respiratory compromise, severe hypoxemia, and hypercapnia.*
- Monitor and record cardiovascular status and vital signs. *An irregular pulse may indicate an arrhythmia caused by altered oxygenation. Tachycardia and tachypnea may indicate hypoxemia. Late in the disease, pulmonary hypertension may lead to right ventricular hypertrophy and right-sided heart failure.*
- Help the patient with turning, coughing, and deep breathing *to mobilize secretions and facilitate removal.*
- Assist with diaphragmatic and pursed-lip breathing *to strengthen respiratory muscles.*
- Place the patient in high Fowler's position *to improve ventilation.*
- Maintain the patient's diet and provide small frequent meals and snacks *to avoid tiring him when he eats. Small meals relieve pressure on the diaphragm and allow fuller lung movement.*
- Monitor and record the color, amount, and consistency of sputum. *Changes in sputum may signal a respiratory infection.*
- Monitor intake and output and daily weight *to detect fluid overload associated with right-sided heart failure. Dehydration may impair the removal of secretions.*
- Encourage fluids, unless contraindicated, *to liquefy secretions.*
- Provide chest physiotherapy, postural drainage, incentive spirometry, and suction *to aid in removal of secretions.*

Teaching topics

- Participating in pulmonary rehabilitation
- Recognizing the early signs and symptoms of respiratory infection and hypoxia
- Using home oxygen and nebulizer equipment properly
- Performing pursed-lip, diaphragmatic breathing and coughing and deep-breathing exercises
- Avoiding exposure to chemical irritants and pollutants
- Avoiding spicy foods, extremely hot or cold foods, and foods that produce gas
- Beginning a smoking-cessation program, if appropriate
- Increasing fluid intake to 3,000 ml/day, if not contraindicated
- Avoiding people with respiratory infections
- Receiving vaccinations (influenza, Pneumovax)
- Contacting the American Lung Association



Legionnaires' disease

Legionnaires' disease is an acute bronchopneumonia, an inflammation of the lungs that begins in the terminal bronchioles. It's produced by a fastidious, gram-negative bacillus (rod-shaped bacterium).

Legionnaires' disease derives its name from the peculiar, highly publicized disease that struck 182 people (29 of whom died) at an American Legion convention in Philadelphia in July 1976.

This disease may occur epidemically or sporadically, most often in late summer or early fall. Its severity ranges from a mild illness,

with or without pneumonitis, to multilobar pneumonia, with a mortality as high as 15%. A milder, self-limiting form (Pontiac fever) subsides within a few days but leaves the patient fatigued for several weeks; this form mimics Legionnaires' disease but produces few or no respiratory symptoms, no pneumonia, and no fatalities. No treatment is required for Pontiac fever.

CAUSES

- *Legionella pneumophila*

DATA COLLECTION FINDINGS

- Amnesia
- Anorexia
- Bradycardia
- Cough that's initially nonproductive but that eventually can produce grayish, nonpurulent, blood-streaked sputum
- Diarrhea
- Diffuse myalgias
- Fever
- Generalized weakness
- Headache
- Malaise
- Mental sluggishness
- Recurrent chills

DIAGNOSTIC FINDINGS

- Blood tests show leukocytosis, increased ESR, increased liver enzyme levels (alanine aminotransferase, aspartate aminotransferase, alkaline phosphatase), and hyponatremia.
- Chest X-ray shows patchy, localized infiltration, which progresses to multilobar consolidation (usually involving the lower lobes), pleural effusion and, in fulminant disease, opacification of the entire lung.
- Direct immunofluorescence of *L. pneumophila* and indirect fluorescent serum antibody testing compare findings from initial blood studies with findings from those done at least 3 weeks later. A convalescent serum sample showing a fourfold or greater rise in antibody titer for *L. pneumophila* confirms the diagnosis.
- Sputum test eliminates other organisms.

NURSING DIAGNOSES

- Hyperthermia
- Impaired gas exchange
- Risk for injury

TREATMENT

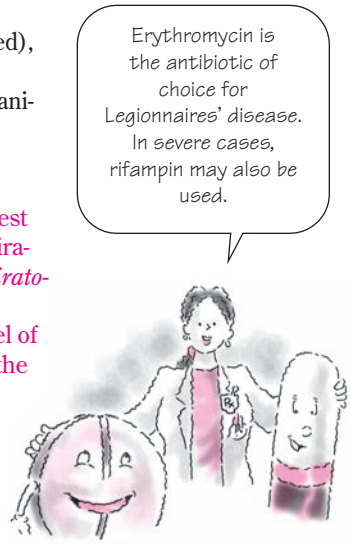
- I.V. fluids as indicated
- Oxygen therapy; possibly intubation and mechanical ventilation if the patient's condition deteriorates

Drug therapy

- Antibiotics: erythromycin (Erythrocin), rifampin (Rifadin), tetracycline (Achromycin V)
- Antipyretics: acetaminophen (Tylenol), aspirin
- Inotropic agent: dopamine (Intropin)
- Vasopressors: norepinephrine (Levophed), phenylephrine (Neo-Synephrine)
- Anesthetic: propofol (Diprivan) if mechanical ventilation is necessary

INTERVENTIONS AND RATIONALES

- Monitor respiratory status. Evaluate chest wall expansion, depth and pattern of respirations, cough, and chest pain *to detect respiratory decompensation*.
- Monitor vital signs, pulse oximetry, level of consciousness, and dryness and color of the lips and mucous membranes. Watch for signs of shock (decreased blood pressure, thready pulse, diaphoresis, clammy skin) *to avoid crisis*.
- Provide mouth care frequently. If needed, apply soothing cream to the nostrils *to promote comfort and prevent skin breakdown*.
- Administer I.V. fluids as ordered to provide hydration.
- Maintain mechanical ventilation and provide respiratory therapy, as needed, *to promote oxygenation*.
- Administer antibiotics, as needed, *to eradicate infection*, and observe the patient carefully for adverse effects *to prevent complications*.



Teaching topics

- Performing coughing and deep-breathing exercises
- Understanding the importance of continuing treatment until recovery is complete

In lung cancer, unregulated cell growth and uncontrolled cell division result in the development of a neoplasm.

Lung cancer

In lung cancer, unregulated cell growth and uncontrolled cell division result in the development of a neoplasm. Cancer may also spread (metastasize) to the lungs from other organs, mainly the liver, brain, bone, kidneys, and adrenal glands.

The four histologic types of lung cancer are:

- **squamous cell** (epidermoid), a slow-growing cancer that originates in the bronchial epithelium (it metastasizes late to the surrounding area and may cause bronchial obstruction)
- **adenocarcinoma,** a moderately growing cancer located in peripheral areas of the lung (it metastasizes through the bloodstream to other organs)
- **large-cell anaplastic,** a very fast-growing cancer associated with early and extensive metastasis (it's more common in peripheral lung tissue)
- **small-cell** (oat cell cancer), a very fast-growing cancer that metastasizes very early through lymph vessels and the bloodstream to other organs.

CAUSES

- Cigarette smoking
- Exposure to environmental pollutants
- Exposure to occupational pollutants
- May be unknown

In a patient with lung cancer, a chest X-ray shows the lesion or mass.

DATA COLLECTION FINDINGS

- Chest pain
- Chills, fever
- Cough, hemoptysis
- Dyspnea, wheezing
- Weakness, fatigue
- Weight loss, anorexia

DIAGNOSTIC FINDINGS

- Biopsy reveals malignant cells and identifies the type of cancer.
- Chest X-ray shows a lesion or mass.
- Lung scan shows a mass.
- Open lung biopsy reveals lung cancer.
- Sputum study reveals positive cytology for cancer cells.

NURSING DIAGNOSES

- Activity intolerance
- Anxiety
- Impaired gas exchange

TREATMENT

- Dietary changes, including the adoption of a high-protein, high-calorie diet and providing small, frequent meals or enteral nutrition if mechanical ventilation is indicated
- Incentive spirometry
- Laser photocoagulation
- Oxygen therapy, intubation and, if the condition deteriorates, mechanical ventilation
- Radiation therapy
- I.V. fluids
- Resection of the affected lobe (lobectomy) or lung (pneumonectomy)

Drug therapy

- Analgesics: morphine, fentanyl (Sublimaze)
- Antiemetics: prochlorperazine (Compazine), ondansetron (Zofran), dolasetron (Anzemet)
- Antineoplastics: cyclophosphamide (Cytoxan), doxorubicin (Adriamycin), cisplatin (Platinol), vincristine (Oncovin), vinorelbine (Novelbine), gemcitabine (Gemzar), paclitaxel (Taxol), docetaxel (Taxotere), irinotecan (Camptosor)
- Diuretics: furosemide (Lasix), ethacrynic acid (Edecrin)

INTERVENTIONS AND RATIONALES

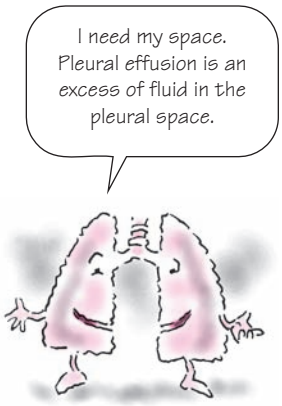
- Monitor respiratory status *to detect respiratory complications. Cyanosis may suggest respiratory failure, and an increase in sputum production may suggest an infection.*
- Monitor pain level and administer analgesics, as prescribed, *to control pain. Assessment allows changes to care as needed.*
- Monitor and record vital signs. *Tachycardia and tachypnea may indicate hypoxemia. An elevated temperature suggests an infection.*
- Monitor and record intake and output *to evaluate fluid status.*

• Monitor for bleeding, infection, and electrolyte imbalance (especially hypercalcemia) from the effects of chemotherapy. *A low WBC count increases the risk of infection. A low platelet count increases the risk of bleeding. An electrolyte imbalance involving excessive calcium can lead to a variety of symptoms and can be severe or life-threatening.*
• Monitor pulse oximetry values, and report any drop in oxygen saturation, *which suggests hypoxemia.*
• Administer oxygen *to maintain tissue oxygenation.*
• Encourage fluid intake and maintain I.V. fluids *to provide hydration and liquefy secretions to facilitate removal. Drinking moistens mucous membranes.*
• Provide suctioning and help the patient with turning, coughing, and deep breathing *to facilitate removal of secretions.*
• Place the patient in semi-Fowler's position *to maximize ventilation.*
• Administer enteral feedings as prescribed if the patient is receiving mechanical ventilation *to optimize nutritional status.*
• Administer medications, as prescribed, *to treat the cancer and provide pain relief.*
• Encourage the patient to express feelings about changes in body image and his fear of dying *to reduce anxiety.*
• Perform mouth care *to improve comfort and reduce risk of stomatitis (with chemotherapy).*
• Perform skin care *to minimize adverse effects of radiation therapy.*
• Provide rest periods *to enhance tissue oxygenation.*

Teaching topics

• Performing deep-breathing and coughing exercises
• Alternating rest periods with activity
• Following dietary recommendations and restrictions
• Taking measures to prevent infection, such as avoiding crowds and infected individuals, especially children with communicable diseases
• Contacting the American Cancer Society

Pleural effusion and empyema



Pleural effusion is an excess of fluid in the pleural space (the thin space between the lung tissue and the membranous sac that protects it). Normally, the pleural space contains a small amount of extracellular fluid that lubricates the pleural surfaces. Increased production or inadequate removal of this fluid results in pleural effusion.

Empyema is the accumulation of pus and necrotic tissue in the pleural space. Blood (hemothorax) and chyle (chylothorax) may also collect in this space.

CAUSES

• Bacterial or fungal pneumonitis or empyema
• Chest trauma
• Collagen disease (lupus erythematosus and rheumatoid arthritis)
• Heart failure
• Hepatic disease with ascites
• Hypoalbuminemia
• Infection in the pleural space
• Malignancy
• Myxedema
• Pancreatitis
• Peritoneal dialysis
• Pulmonary embolism with or without infarction
• Subphrenic abscess
• TB

DATA COLLECTION FINDINGS

• Anorexia
• Decreased breath sounds
• Dyspnea
• Fever
• Malaise
• Pleuritic chest pain

DIAGNOSTIC FINDINGS

• Chest X-ray shows radiopaque fluid in dependent regions.
• Thoracentesis shows lactate dehydrogenase (LD) levels less than 200 IU and protein levels less than 3 g/dl (in transudative effusions);

ratio of protein in pleural fluid to protein in serum greater than or equal to 0.5, LD in pleural fluid greater than or equal to 200 IU, and ratio of LD in pleural fluid to LD in serum greater than 0.6 (in exudative effusions); and acute inflammatory WBCs and microorganisms (in empyema).
• Tuberculin skin test rules out TB as the cause.

NURSING DIAGNOSES
• Hyperthermia
• Impaired gas exchange
• Risk for infection

TREATMENT
• Thoracentesis (to remove fluid)
• Thoracotomy if thoracentesis isn't effective
• Possibly supplemental oxygen therapy

Drug therapy
• Antibiotics (for empyema): most effective in treating the causative organism

INTERVENTIONS AND RATIONALES
• Explain thoracentesis to the patient. Before the procedure, tell the patient to expect a stinging sensation from the local anesthetic and a feeling of pressure when the needle is inserted. *These explanations may allay the patient's anxiety.*
• Instruct the patient to tell you immediately if he feels uncomfortable or has trouble breathing during thoracentesis. *Difficulty breathing may indicate pneumothorax, which requires immediate chest tube insertion.*
• Reassure the patient during thoracentesis *to allay anxiety.* Remind him to breathe normally and to avoid sudden movements, such as coughing and sighing. *Remaining still may prevent improper placement of the needle.*
• Monitor vital signs and watch for syncope *to prevent injury.*
• Watch for respiratory distress or pneumothorax (sudden onset of dyspnea and cyanosis) after thoracentesis *to detect complications.*
• Administer oxygen *to improve oxygenation.*
• Administer antibiotics *to treat empyema.*
• Encourage the patient to do deep-breathing exercises *to promote lung expansion.* Teach him how to use an incentive spirometer *to promote deep breathing.*
• Carefully provide chest tube care to avoid dislodging the chest tube.
• Ensure chest tube patency by watching for bubbles in the underwater seal chamber *to prevent respiratory distress resulting from chest tube obstruction.*
• Record the amount, color, and consistency of any tube drainage *to monitor the effectiveness of treatment.*
• Refer patients who will be discharged with the tube in place to visiting nurses *because weeks of such drainage may be necessary to eliminate the excessive fluid.*

Teaching topics
• Seeking prompt medical attention for chest colds (if pleural effusion was a complication of pneumonia or influenza)
• Understanding the importance of continuing antibiotic therapy for the duration prescribed
• Performing chest tube care, if necessary, after discharge

Pleurisy

Also known as pleuritis, pleurisy is an inflammation of the visceral and parietal pleurae, the serous membranes that line the inside of the thoracic cage and envelop the lungs.

CAUSES
• Cancer
• Chest trauma
• Dressler's syndrome
• Pneumonia
• Pulmonary infarction
• Rheumatoid arthritis
• Systemic lupus erythematosus
• TB
• Uremia
• Viruses

DATA COLLECTION FINDINGS
• Dyspnea
• Pleural friction rub (a coarse, creaky sound heard during late inspiration and early expiration)

• Sharp, stabbing pain that increases with respiration

DIAGNOSTIC FINDINGS

Although diagnosis generally rests on the patient's history and respiratory assessment, diagnostic tests help rule out other causes and pinpoint the underlying disorder.

• ECG rules out coronary artery disease as the source of the patient's pain.
• Chest X-rays can identify pneumonia.

NURSING DIAGNOSES

• Activity intolerance
• Ineffective breathing pattern
• Acute pain

TREATMENT

• Bed rest
• Thoracentesis (for pleurisy with pleural effusion)

Drug therapy

• Analgesic: acetaminophen with oxycodone (Percocet)
• Anti-inflammatories: indomethacin (Indocin), ibuprofen (Motrin)

INTERVENTIONS AND RATIONALES

• Stress the importance of bed rest and allow the patient as much uninterrupted rest as possible *to prevent fatigue.*
• Administer antitussive and pain medication, as needed, *to relieve cough and pain.*
• If an opioid analgesic is prescribed, warn any patient about to be discharged to avoid overuse. *Too much of these medications depress coughing and respiration.*
• Encourage the patient to cough. Apply firm pressure at the pain site during coughing exercises *to minimize pain.*

Teaching topics

• Performing coughing and deep-breathing exercises
• Implementing all procedures, including thoracentesis if appropriate
• Understanding the importance of regular rest periods

Pneumocystis carinii pneumonia

The microorganism *Pneumocystis carinii* is part of the normal flora in most healthy people. However, in the immunocompromised patient, *P. carinii* becomes an aggressive pathogen. *P. carinii* pneumonia (PCP) is an opportunistic infection strongly associated with human immunodeficiency virus (HIV) infection.

PCP occurs in up to 90% of HIV-infected patients in the United States at some point during their lifetime. It's the leading cause of death in these patients. Disseminated infection doesn't occur. PCP is also associated with other immunocompromised conditions, including organ transplantation, leukemia, and lymphoma.

P. carinii is part of the normal flora in most healthy people. However, in the immunocompromised patient, it becomes an aggressive pathogen.

CAUSES

• *P. carinii*

DATA COLLECTION FINDINGS

• Anorexia
• Dyspnea
• Generalized fatigue
• Low-grade, intermittent fever
• Nonproductive cough
• Tachypnea
• Weight loss

DIAGNOSTIC FINDINGS

• ABG studies detect hypoxia and an increased alveolar-arterial gradient.
• Chest X-ray may show slowly progressing, fluffy infiltrates and occasionally nodular lesions or a spontaneous pneumothorax. These findings must be differentiated from findings in other types of pneumonia or ARDS.
• Fiber-optic bronchoscopy confirms PCP.
• Gallium scan may show increased uptake over the lungs even when the chest X-ray appears relatively normal.
• Histologic studies confirm *P. carinii*. In patients with HIV infection, initial examination of a first morning sputum specimen (induced by inhaling an ultrasonically dispersed saline mist) may be sufficient. This technique is usually ineffective in patients not infected by HIV.

NURSING DIAGNOSES
- Ineffective protection
- Impaired gas exchange
- Risk for infection

TREATMENT
- Diet modification, including maintaining adequate nutrition
- Oxygen therapy, which may include ET intubation and mechanical ventilation
- I.V. fluids

Drug therapy
- Antibiotics: co-trimoxazole (Bactrim), pentamidine (NebuPent)

INTERVENTIONS AND RATIONALES
- Monitor respiratory status and pulse oximetry values *to detect early signs of hypoxemia.*
- Administer oxygen therapy as needed. Encourage ambulation, deep-breathing exercises, and incentive spirometry. *These measures facilitate effective gas exchange.*
- Administer an antipyretic, as ordered, *to relieve fever.*
- Monitor intake and output and weigh the patient daily *to evaluate fluid balance.* Replace fluids as necessary *to correct fluid deficit.*
- Administer antimicrobial drugs as ordered. Never give pentamidine (NebuPent) I.M. *because it can cause pain and sterile abscesses.*
- Monitor the patient for adverse reactions to antimicrobial drugs. If he's receiving co-trimoxazole (Bactrim), watch for nausea, vomiting, rash, bone marrow suppression, thrush, fever, hepatotoxicity, and anaphylaxis. If he's receiving pentamidine, watch for cardiac arrhythmias, hypotension, dizziness, azotemia, hypocalcemia, and hepatic disturbances. *These measures detect problems early to avoid crisis.*
- Provide diversional activities and coordinate health care team activities *to allow adequate rest periods between procedures.*
- Supply nutritional supplements as needed. Encourage the patient to eat a high-calorie, protein-rich diet. Offer small, frequent meals if the patient can't tolerate large amounts of food. *These measures ensure that the patient's nutritional intake meets metabolic needs.*
- Provide a relaxing environment, eliminate excessive environmental stimuli, and allow ample time for meals *to reduce anxiety.*
- Give emotional support and help the patient identify and use meaningful support systems *to promote emotional well-being.*

Teaching topics
- Practicing energy-conservation techniques
- Using home oxygen therapy
- Recognizing adverse reactions to medications

Pneumonia

Pneumonia refers to a bacterial, viral, parasitic, or fungal infection that causes inflammation of the alveolar spaces. In pneumonia, microorganisms enter alveolar spaces through droplet inhalation, resulting in inflammation and an increase in alveolar fluid. Ventilation decreases as secretions thicken.

CAUSES
- Aspiration
- Chemical irritants
- Organisms such as *Escherichia coli, Haemophilus influenzae, Staphylococcus aureus, Pneumocystis carinii, Streptococcus pneumoniae,* and *Pseudomonas*

DATA COLLECTION FINDINGS
- Chills, fever
- Cough
- Crackles, rhonchi, pleural friction rub on auscultation
- Malaise
- Pleuritic pain
- Restlessness, confusion
- Dyspnea, tachypnea, accessory muscle use
- Sputum that's rusty, green, or bloody with pneumococcal pneumonia and yellow-green with bronchopneumonia

DIAGNOSTIC FINDINGS
- ABG levels initially show hypoxemia and respiratory alkalosis, which may progress to respiratory acidosis.
- Chest X-ray shows pulmonary infiltrates.

• Hematology results show increased WBC count and ESR.
• Sputum study identifies the causative organism.

NURSING DIAGNOSES

• Ineffective airway clearance
• Risk for aspiration
• Impaired spontaneous ventilation

TREATMENT

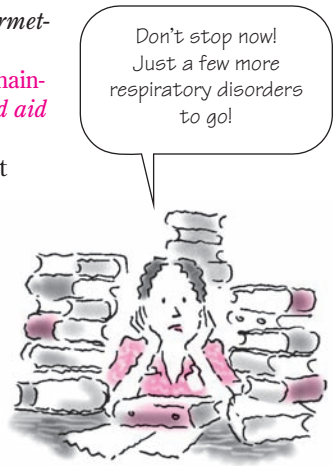
• Chest physiotherapy, postural drainage, and incentive spirometry
• Dietary changes, including establishing a high-calorie, high-protein diet and forcing fluids
• Supplemental oxygen therapy; intubation and mechanical ventilation, if condition deteriorates
• Nutritional support, including enteral nutrition if the patient requires intubation
• I.V. fluids

Drug therapy

• Antibiotics: most effective in treating causative organism
• Antipyretics: aspirin, acetaminophen (Tylenol)
• Bronchodilators: metaproterenol (Alupent), isoetharine (Bronkosol), albuterol (Proventil)

INTERVENTIONS AND RATIONALES

• Monitor and record intake and output. *Insensible water loss secondary to fever may cause dehydration.*
• Monitor pulse oximetry values *to detect respiratory compromise.*
• Monitor respiratory status *to detect early signs of compromise.*
• Monitor and record vital signs. *An elevated temperature increases oxygen demands. Hypotension and tachycardia may suggest hypovolemic shock.*
• Monitor and record color, consistency, and amount of sputum. *Sputum amount and consistency may indicate hydration status and effectiveness of therapy. Foul-smelling sputum suggests respiratory infection.*
• Administer oxygen *to help relieve respiratory distress.*
• Maintain the patient's diet *to offset hypermetabolic state caused by infection.*
• Encourage fluids to 3,000 ml/day and maintain I.V. fluids *to help liquefy secretions and aid in their removal.*
• Perform suctioning and help the patient with turning, coughing, and deep breathing *to promote mobilization and removal of secretions.*
• Perform chest physiotherapy *to facilitate removal of secretions.*
• Administer medications, as prescribed, *to treat infection and improve ventilation.*
• Encourage the patient to express fear of suffocation *to reduce his anxiety.*
• Provide tissues and a bag for hygienic sputum disposal *to prevent spread of infection.*
• Provide oral care *to promote comfort and improve nutrition.*



Teaching topics

• Recognizing the early signs and symptoms of respiratory infections
• Avoiding exposure to people with infections
• Increasing fluid intake to 3,000 ml/day

Pneumothorax and hemothorax

With pneumothorax, loss of negative intrapleural pressure results in the collapse of a lung. Pneumothorax may be described as spontaneous, open, closed, or tension:
• **Spontaneous pneumothorax** results from the rupture of a bleb.
• **Open pneumothorax** occurs when an opening through the chest wall allows air to flow between the pleural space and the outside of the body.
• **Closed pneumothorax** occurs when air enters the pleural space from within the lung. This causes increased pleural pressure and prevents lung expansion during inspiration. It may be called **traumatic pneumothorax** when blunt chest trauma causes lung tissue to rupture, resulting in air leakage.
• **Tension pneumothorax** results from a buildup of air in the pleural space that can't escape. Tension pneumothorax can develop

from either spontaneous or traumatic pneumothorax.

In all cases, the surface area for gas exchange is reduced, resulting in hypoxia and hypercapnia.

In hemothorax, blood accumulates in the pleural space when a rib lacerates lung tissue or an intercostal artery. This compresses the lung and limits respiratory capacity. Hemothorax can also result from rupture of large or small pulmonary vessels.

CAUSES

- Blunt chest trauma
- Central venous catheter insertion
- Penetrating chest injuries
- Rupture of a bleb
- Thoracentesis
- Thoracic surgeries
- Pacemaker insertion
- Tracheotomy

DATA COLLECTION FINDINGS

- Anxiety
- Asymetrical chest expansion
- Diaphoresis, pallor
- Diminished or absent breath sounds unilaterally
- Dullness on chest percussion (in hemothorax and tension pneumothorax)
- Dyspnea, tachypnea, subcutaneous emphysema, cough
- Hypotension (in hemothorax)
- Sharp chest pain that increases with exertion
- Tachycardia
- Tracheal shift (in tension pneumothorax)

DIAGNOSTIC FINDINGS

- Chest X-rays confirm the diagnosis by revealing air in the pleural space and, possibly, a mediastinal shift. Sequential chest X-rays show whether thoracostomy was effective in resolving pneumothorax.
- ABG levels show respiratory acidosis and hypoxemia.
- Pulse oximetry may initially show decreased oxygen saturation, which typically returns to normal within 24 hours.

NURSING DIAGNOSES

- Ineffective breathing pattern
- Impaired gas exchange
- Acute pain

TREATMENT

- Active range-of-motion (ROM) exercises with affected arm
- Blood transfusions for hemothorax, as indicated
- Chest tube to water-seal drainage or emergent needle thoracostomy for tension pneumothorax
- Incentive spirometry
- Occlusive dressing (for open pneumothorax)
- Oxygen therapy

Drug therapy

- Analgesic: morphine

INTERVENTIONS AND RATIONALES

- Monitor and record vital signs. *Hypotension, tachycardia, and tachypnea suggest tension pneumothorax.*
- Check the chest drainage system for air leaks *that can impair lung expansion.*
- Monitor respiratory status and pulse oximetry values. Monitor around chest tube site for subcutaneous emphysema. *Dyspnea, tachypnea, diminished breath sounds, subcutaneous emphysema, and use of accessory muscles suggest accumulation of air in pleural space.*
- Monitor chest tube drainage. *An increase in the amount of bloody drainage suggests new bleeding or an increase in bleeding. Check tubing for kinks if there's a sudden reduction in drainage.*
- Monitor and record vital signs. *Hypotension, tachycardia, and tachypnea suggest tension pneumothorax.*
- Evaluate cardiovascular status. *Tachycardia, hypotension, and jugular vein distention suggest tension pneumothorax.*
- Monitor pain level and administer medications, as prescribed, *to control pain.*
- Administer oxygen *to relieve respiratory distress caused by hypoxemia.*
- Assist the patient with turning, coughing, deep breathing, and incentive spirometry *to*

enhance mobilization of secretions and prevent atelectasis.
• Maintain chest tube to water-seal drainage. *The water-seal chamber prevents air from entering the chest tube when the patient inhales.*
• Place the patient in high Fowler's position *to enhance chest expansion.*

Teaching topics
• Recognizing the early signs and symptoms of pneumothorax and respiratory infection
• Avoiding heavy lifting

Pulmonary embolism

Pulmonary embolism results when an undissolved substance (such as fat, air, or thrombus) in the pulmonary vessels obstructs the patient's blood flow. The embolus travels from the venous circulation to the right side of the heart and pulmonary artery, obstructing blood flow and resulting in pulmonary hypertension and possible infarction.

CAUSES
• Abdominal, pelvic, or thoracic surgery
• Central venous catheter insertion
• Flat, long bone fractures
• Heart failure
• Hypercoagulability
• Malignant tumors
• Obesity
• Hormonal contraceptives
• Polycythemia vera
• Pregnancy
• Prolonged bed rest
• Sickle cell anemia
• Thrombophlebitis
• Venous stasis

DATA COLLECTION FINDINGS
• Anxiety
• Chest pain
• Cough, hemoptysis
• Fever
• Hypotension
• Sudden onset of dyspnea, tachypnea, crackles
• Tachycardia, arrhythmias

DIAGNOSTIC FINDINGS
• ABG levels typically show decreased PaO_2 and $PaCO_2$.
• Blood chemistry tests reveal increased LD level.
• Chest X-ray shows dilated pulmonary arteries, pneumoconstriction, and diaphragm elevation on the affected side.
• ECG shows tachycardia, nonspecific ST-segment changes, and right axis deviation.
• Pulmonary angiography shows location of embolism and filling defect of pulmonary artery.
• Lung scan shows $\dot{V}/\dot{Q}$ mismatch.

If the patient has a pulmonary embolism, interventions are likely to include administering an anticoagulant such as heparin.

NURSING DIAGNOSES
• Anxiety
• Impaired gas exchange
• Ineffective tissue perfusion: Cardiopulmonary

TREATMENT
• Bed rest with active and passive ROM and isometric exercises
• Vena cava filter insertion
• Oxygen therapy, intubation, and mechanical ventilation, if necessary
• I.V. fluids
• Sequential compression device

Drug therapy
• Analgesic: morphine
• Anticoagulants: heparin (Heparin Sodium Injection), followed by warfarin (Coumadin)
• Diuretic: furosemide (Lasix) if right ventricular failure develops
• Fibrinolytics: streptokinase (Streptase), tissue plasminogen activator (Activase)

INTERVENTIONS AND RATIONALES
• Monitor respiratory status and pulse oximetry values *to detect respiratory distress.*
• Evaluate cardiovascular status and monitor ECG. *An irregular pulse may signal arrhythmia caused by hypoxemia. If pulmonary embolism is caused by thrombophlebitis, temperature may be elevated.*
• Monitor and record intake and output *to detect fluid volume overload and renal perfusion.*

Memory jogger

To remember the significance of **pH**, think "**p**ercentage **h**ydrogen," recalling that H is the symbol for hydrogen. The term **pH** refers to the balance of hydrogen ions (acids) and bicarbonate ions (base) in a solution.

When H goes up, pH goes down. Normal arterial pH is 7.35 to 7.45. In acidosis, hydrogen ions (acids) accumulate and pH goes down. In alkalosis, hydrogen ions decrease and pH goes up.

- Check for positive Homans' sign *to detect thromboembolism as a cause of pulmonary embolus.*
- Administer oxygen *to enhance arterial oxygenation.*
- Assist the patient with turning, coughing, and deep breathing *to mobilize secretions and clear airways.*
- Place the patient in high Fowler's position *to enhance ventilation.*
- Perform suctioning, and monitor and record color, consistency, and amount of sputum. *A productive cough and blood-tinged sputum may be present with pulmonary embolism.*
- Maintain I.V. fluids *to maintain hydration.*
- Administer medications, as prescribed, *to enhance tissue oxygenation.*

Teaching topics

- Recognizing the early signs and symptoms of respiratory distress
- Avoiding activities that promote venous thrombosis (prolonged sitting and standing, wearing constrictive clothing, crossing legs when seated, using hormonal contraceptives)
- Reporting signs of bleeding from excessive anticoagulant therapy

Respiratory acidosis

Respiratory acidosis is an acid-base disturbance characterized by an excess of carbon dioxide in the blood (hypercapnia), indicated by a $Paco_2$ greater than 45 mm Hg. It results from reduced alveolar ventilation and can be acute (as from a sudden failure in ventilation) or chronic (as from long-term pulmonary disease).

CAUSES

- Airway obstruction or parenchymal lung disease
- Chest trauma
- CNS trauma
- Chronic metabolic alkalosis
- Drugs, such as opioids, anesthetics, hypnotics, and sedatives
- Neuromuscular diseases, such as myasthenia gravis, Guillain-Barré syndrome, and poliomyelitis

DATA COLLECTION FINDINGS

- Cardiovascular abnormalities, such as tachycardia, hypertension, atrial and ventricular arrhythmias and, in severe acidosis, hypotension
- Coma
- Confusion
- Dyspnea and tachypnea with papilledema and depressed reflexes
- Fine or flapping tremor (asterixis)
- Headaches
- Hypoxemia
- Restlessness

DIAGNOSTIC FINDINGS

- ABG measurements confirm respiratory acidosis. $Paco_2$ exceeds the normal level of 45 mm Hg, and pH is usually below the normal range of 7.35 to 7.45. The patient's bicarbonate level is normal in the acute stage and elevated in the chronic stage.

NURSING DIAGNOSES

- Fear
- Impaired gas exchange
- Ineffective breathing pattern

TREATMENT

Treatment of respiratory acidosis is designed to correct the underlying source of alveolar hypoventilation. It may include:

- I.V. fluids
- incentive spirometry
- ET intubation and mechanical ventilation
- dialysis to remove toxic drugs
- removal of foreign body, if appropriate.

Drug therapy

- Antibiotics if pneumonia is present
- Bronchodilators: metaproterenol (Alupent), albuterol (Proventil)
- Sodium bicarbonate in severe cases

INTERVENTIONS AND RATIONALES

- Be alert for critical changes in the patient's respiratory, CNS, and cardiovascular func-

tions. Maintain adequate hydration. *These measures help detect life-threatening complications.*
• Maintain a patent airway and provide adequate oxygenation. Perform tracheal suctioning regularly and vigorous chest physiotherapy *to ensure adequate oxygenation.*
• Closely monitor patients with COPD and chronic carbon dioxide retention for signs of acidosis. Also, administer oxygen at low flow rates and closely monitor all patients who receive opioids and sedatives *to prevent respiratory acidosis.*
• Instruct the patient who has received a general anesthetic to use the incentive spirometer once every hour during his waking hours. Tell him to also turn, cough, and do deep-breathing exercises frequently *to prevent the onset of respiratory acidosis.*

Teaching topics
• Using home oxygen therapy
• Performing coughing and deep-breathing exercises and using an incentive spirometer
• Following the medication regimen and recognizing possible adverse reactions

Respiratory alkalosis

Respiratory alkalosis is characterized by a deficiency of carbon dioxide in the blood (hypocapnia), as indicated by a decrease in $Paco_2$ to below 35 mm Hg (normal level is 45 mm Hg).

This condition is caused by alveolar hyperventilation. Elimination of carbon dioxide by the lungs exceeds the production of carbon dioxide at the cellular level, leading to deficiency of carbon dioxide in the blood.

Uncomplicated respiratory alkalosis leads to a decrease in hydrogen ion concentration, which causes elevated blood pH.

CAUSES

Pulmonary causes
• Acute asthma
• Interstitial lung disease
• Pneumonia
• Pulmonary vascular disease

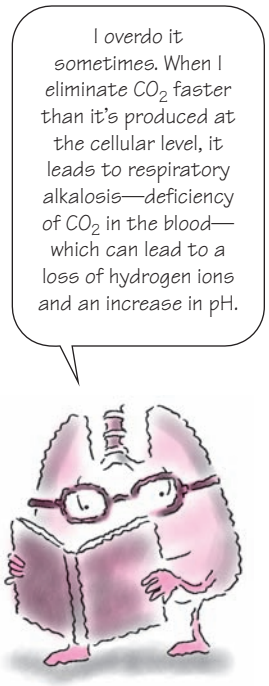
Nonpulmonary causes
• Anxiety
• Aspirin toxicity
• CNS disease (inflammation or tumor)
• Fever
• Hepatic failure
• Metabolic acidosis
• Pregnancy
• Sepsis

DATA COLLECTION FINDINGS
• Agitation
• Cardiac arrhythmias that fail to respond to conventional treatment (in severe respiratory alkalosis)
• Carpopedal spasms (spasms affecting the wrists and the feet)
• Circumoral or peripheral paresthesia (a prickling sensation around the mouth or extremities)
• Deep, rapid breathing, possibly exceeding 40 breaths/minute (cardinal sign)
• Light-headedness or dizziness (from decreased cerebral blood flow)
• Muscle weakness
• Seizures with severe respiratory alkalosis
• Twitching, possibly progressing to tetany

DIAGNOSTIC FINDINGS
• ABG analysis confirms respiratory alkalosis and rules out respiratory compensation for metabolic acidosis. In the acute stage, $Paco_2$ is below 35 mm Hg and pH is elevated in proportion to the fall in $Paco_2$. In the chronic stage, pH drops toward normal. Bicarbonate level is normal in the acute stage but below normal in the chronic stage.

NURSING DIAGNOSES
• Anxiety
• Impaired gas exchange
• Ineffective breathing pattern

TREATMENT
Treatment seeks to eradicate the underlying condition. It may include:
• removal of ingested toxins
• treatment of CNS disease
• treatment of fever or sepsis.



With severe respiratory alkalosis

- Having the patient breathe into a paper bag, which helps relieve acute anxiety and increases carbon dioxide levels

INTERVENTIONS AND RATIONALES

- Watch for and report any changes in neurologic, neuromuscular, or cardiovascular function *to ensure prompt recognition and treatment of complications.*
- Monitor respiratory status *to detect worsening condition.*

Teaching topics

- Performing relaxation techniques
- Breathing into a paper bag during an acute anxiety attack

Sarcoidosis

Sarcoidosis is a multisystemic, granulomatous disorder (this means it affects many body systems and produces nodules of chronically inflamed tissue). Sarcoidosis may lead to lymphadenopathy (disease of the lymph nodes), pulmonary infiltration, and skeletal, liver, eye, or skin lesions.

Sarcoidosis occurs most often in young adults (ages 20 to 40). In the United States, it occurs predominantly among blacks and affects twice as many women as men.

Acute sarcoidosis usually resolves within 2 years. Chronic, progressive sarcoidosis, which is uncommon, is associated with pulmonary fibrosis and progressive pulmonary disability.

CAUSES

Although the cause of sarcoidosis is unknown, the following explanations are possible:

- hypersensitivity response (possibly from a T-cell imbalance) to such agents as mycobacteria, fungi, and pine pollen
- genetic predisposition (suggested by a slightly higher incidence of sarcoidosis within specific families)
- exposure to chemicals, such as zirconium or beryllium, which can lead to illnesses resembling sarcoidosis.

DATA COLLECTION FINDINGS

Initial signs

- Arthralgia in the wrists, ankles, and elbows
- Fatigue
- Malaise
- Weight loss

Respiratory

- Breathlessness
- Cor pulmonale (in advanced pulmonary disease)
- Cough (usually nonproductive)
- Pulmonary hypertension (in advanced pulmonary disease)
- Substernal pain

Cutaneous

- Erythema nodosum
- Subcutaneous skin nodules with maculopapular eruptions
- Extensive nasal mucosal lesions

Ophthalmic

- Anterior uveitis (common)
- Glaucoma and blindness (rare)

Lymphatic

- Lymphadenopathy
- Splenomegaly (enlarged spleen)

Musculoskeletal

- Muscle weakness
- Polyarthralgia (pain affecting many joints)
- Pain
- Punched-out lesions on phalanges

Hepatic

- Granulomatous hepatitis (usually produces no symptoms)

Genitourinary

- Hypercalciuria (excessive calcium in the urine)

Cardiovascular

- Arrhythmias (premature beats, bundle-branch block, or complete heart block)
- Cardiomyopathy (rare)

Central nervous system

- Cranial or peripheral nerve palsies
- Basilar meningitis (inflammation of the meninges at the base of the brain)
- Seizures
- Pituitary and hypothalamic lesions producing diabetes insipidus

DIAGNOSTIC FINDINGS

- A positive Kveim-Siltzbach skin test supports the diagnosis. In this test, the patient receives an intradermal injection of an antigen prepared from human sarcoidal spleen or lymph nodes from patients with sarcoidosis. If the patient has active sarcoidosis, granuloma develops at the injection site in 2 to 6 weeks. This reaction is considered positive when a biopsy of the skin at the injection site shows discrete epithelioid cell granuloma.
- ABG analysis shows decreased Pa_{O_2}.
- Chest X-ray shows bilateral hilar and right paratracheal adenopathy with or without diffuse interstitial infiltrates; occasionally, large nodular lesions are present in lung parenchyma.
- Lymph node, skin, or lung biopsy reveals noncaseating granulomas with negative cultures for mycobacteria and fungi.
- A negative tuberculin skin test, fungal serologies, sputum cultures for mycobacteria and fungi, and negative biopsy cultures help rule out infection.
- Other laboratory data infrequently reveal increased serum calcium level, mild anemia, leukocytosis, or hyperglobulinemia.
- PFTs show decreased total lung capacity, compliance, and diffusing capacity.

NURSING DIAGNOSES

- Anxiety
- Impaired gas exchange
- Risk for injury

TREATMENT

- Low-calcium diet and avoidance of direct exposure to sunlight (in patients with hypercalcemia)
- Oxygen therapy
- No treatment (for sarcoidosis that produces no symptoms)

Drug therapy

- Corticosteroids: prednisone (Deltasone)
- Cytotoxic agents: methotrexate (Rheumatrex), azathioprine (Imuran)

INTERVENTIONS AND RATIONALES

- Watch for and report complications. Be aware of any abnormal laboratory results *that could alter patient care.*
- Administer analgesics as needed *to promote patient comfort.* Record signs of progressive muscle weakness *to detect deterioration in the patient's condition.*
- Provide a nutritious, high-calorie diet and plenty of fluids *to ensure that nutritional intake meets the patient's metabolic needs.* If the patient has hypercalcemia, suggest a low-calcium diet *to prevent the complications of hypercalcemia (muscle weakness, heart block, hypertension, and cardiac arrest).*
- Weigh the patient daily *to detect weight loss.*
- Monitor the patient's respiratory function. Record increase in sputum. If the patient has pulmonary hypertension or end-stage cor pulmonale, administer oxygen as needed. *These measures promptly detect deterioration in the patient's condition.*
- Perform fingerstick glucose tests at least every 12 hours at the beginning of steroid therapy *because steroids may induce or worsen diabetes mellitus.*
- Evaluate for fluid retention, electrolyte imbalance (especially hypokalemia), moonface, hypertension, and personality change, *which are adverse effects of steroids.*

Teaching topics

- Understanding the need for compliance with prescribed steroid therapy and regular, careful follow-up examinations and treatment
- Obtaining information on community support and resource groups and contacting the American Foundation for the Blind if necessary

Severe acute respiratory syndrome

Severe acute respiratory syndrome (SARS) is a viral respiratory illness caused by a coronavirus. After incubating for 2 to 10 days, the SARS virus seems to spread by close person-to-person contact. Experts believe that SARS is transmitted via respiratory droplets produced when an infected person coughs or sneezes. Coughing or sneezing propels the virus a short distance (typically up to 3 feet) through the air. It's then deposited on the mucous membranes of the mouth, nose, or eyes of a nearby person. The virus can also spread when a person touches a surface or object contaminated with infectious droplets and then touches his mouth, nose, or eyes.

CAUSES

- Coronavirus

DATA COLLECTION FINDINGS

- Chills
- Diarrhea
- Dry cough
- High fever (usually greater than 100.4° F [38° C])
- Malaise
- Recent (within the past 10 days) travel to an area with documented SARS cases or close contact with a person suspected of having SARS
- Dyspnea

DIAGNOSTIC FINDINGS

- Chest X-ray shows atypical pneumonia.
- ABG studies reveal hypoxia.
- Reverse transcription polymerase chain reaction test detects the ribonucleic acid of the SARS virus.
- Fluids from nasopharyngeal or oropharyngeal secretions, blood, or stool specimens test positive for the virus.
- Serum test detects the antibodies IgM and IgG.

NURSING DIAGNOSES

- Anxiety
- Hyperthermia
- Impaired gas exchange

TREATMENT

- Supplemental oxygen; possible ET intubation and mechanical ventilation
- Droplet precautions
- I.V. fluids

DRUG THERAPY

- Antiviral agents: oseltamivir (Tamiflu), ribavirin (Vibrazole), interferon beta-1a (Avonex)
- Antipyretic: acetaminophen (Tylenol)

INTERVENTIONS AND RATIONALES

- Monitor respiratory status *to detect respiratory complications.*
- Administer supplemental oxygen as prescribed *to prevent hypoxemia.*
- Monitor pulse oximetry values *to detect hypoxia.*
- Maintain infection control precautions to reduce the spread of infectious organisms.
- Maintain droplet precautions *to prevent the spread of infection.*
- Administer medications as prescribed *to alleviate symptoms.*
- Monitor and record vital signs *to detect indications of compromise.*
- Assist the patient with turning, coughing, and deep breathing, and provide suction as necessary *to mobilize and remove secretions.*
- Provide frequent oral hygiene *to promote comfort.*
- Monitor and record intake and output *to detect early signs of dehydration.*

Teaching topics

- Completing the entire course of antiviral therapy
- Preventing the spread of infection

Tuberculosis

TB is an airborne, infectious, communicable disease that can occur acutely or chronically. In TB, alveoli become the focus of infection from inhaled droplets containing bacteria. Tubercle bacilli multiply, spread through the

lymphatics, and drain into the systemic circulation. Cell-mediated immunity to the mycobacteria, which develops 3 to 6 weeks later, usually contains the infection and arrests the disease.

If the infection reactivates, the body's response characteristically leads to caseation—the conversion of necrotic tissue to a cheese-like material. The caseum may localize, undergo fibrosis, or excavate and form cavities. The walls of these cavities are studded with multiplying tubercle bacilli. If this occurs, infected caseous debris may spread throughout the lungs via the tracheobronchial tree.

CAUSES

- *Mycobacterium tuberculosis*

DATA COLLECTION FINDINGS

- Anorexia, weight loss
- Cough, yellow and mucoid sputum, hemoptysis
- Crackles
- Dyspnea
- Fatigue, malaise, irritability
- Fever
- Night sweats
- Tachycardia

DIAGNOSTIC FINDINGS

- Chest X-ray shows active or calcified lesions.
- Hematology shows increased WBC count and ESR.
- Mantoux skin test is positive.
- Sputum study is positive for acid-fast bacillus and *M. tuberculosis.*

NURSING DIAGNOSES

- Ineffective airway clearance
- Fatigue
- Social isolation

TREATMENT

- Chest physiotherapy, postural drainage, and incentive spirometry
- Dietary changes, including the adoption of a diet high in carbohydrates, protein, vitamins B_6 and C, and calories
- Standard and airborne precautions (while the patient is contagious, everyone entering his room must wear a respirator with a high-efficiency particulate air filter)
- Supplemental oxygen therapy
- I.V. fluids as indicated

Drug therapy

- Antibiotic: streptomycin
- Antitubercular agents: isoniazid (INH), ethambutol (Myambutol), rifampin (Rifadin), pyrazinamide

INTERVENTIONS AND RATIONALES

- Monitor respiratory status and pulse oximetry values *to detect respiratory complications such as pleural effusion.*
- Monitor and record vital signs and laboratory studies *to detect signs of compromise.*
- Maintain the patient's diet and provide small, frequent meals *to increase caloric intake.*
- Perform chest physiotherapy and postural drainage *to facilitate mobilization of secretions.*
- Assist the patient with turning, coughing, and deep breathing and provide suction, if necessary, *to mobilize and remove secretions.*
- Administer medications, as prescribed, *to avoid development of drug-resistant organisms.*
- Maintain infection-control precautions *to reduce the spread of infectious organisms.*
- Tell the patient to cover his nose and mouth when sneezing *to reduce transmission of virus by droplets.*
- Encourage fluids *to liquefy secretions.*
- Provide frequent oral hygiene *to promote comfort and improve appetite.*
- Provide a negative pressure room *to prevent the spread of infection.*
- Monitor vital signs. *Fever, tachycardia, and tachypnea may be present with TB.*
- Monitor and record intake and output *to assess hydration. Adequate hydration is necessary to facilitate removal of secretions.*

Teaching topics

- Preventing the spread of droplets of sputum
- Finishing the entire course of medication (6 to 18 months)
- Contacting the American Lung Association

Pump up on practice questions

1. During the insertion of a rigid scope for bronchoscopy, a client experiences a vasovagal response. The nurse should expect:

1. the client's pupils to become dilated.
2. the client to experience bronchodilation.
3. a decrease in gastric secretions.
4. a drop in the client's heart rate.

Answer: 4. During a bronchoscopy, a vasovagal response may be caused by stimulating the pharynx which, in turn, may cause stimulation of the vagus nerve. The client may experience a sudden drop in the heart rate leading to syncope. Stimulation of the vagus nerve doesn't lead to mydriasis (pupillary dilation) or bronchodilation. Stimulation of the vagus nerve increases gastric secretions.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

2. A client with right-lower-lobe pneumonia is prescribed percussion and postural drainage. When performing these therapies, the nurse should position the client:

1. in semi-Fowler's position with the knees bent.
2. in a right side-lying position with the foot of the bed elevated.
3. in a prone or supine position with the foot of the bed elevated higher than the head.
4. bent at the waist and leaning slightly forward.

Answer: 3. The aim of percussion and postural drainage is to mobilize pulmonary secretions so they can be effectively expectorated. In right-lower-lobe bronchopneumonia, the nurse should position the client with the lower lobes elevated above the upper lobes. This would employ gravity in mobilizing pulmonary secretions. Semi-Fowler's position and being bent at the waist would hamper mobilization of secretions from the right lower lobe.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

3. A client with acquired immunodeficiency syndrome (AIDS) develops *Pneumocystis carinii* pneumonia. Which nursing diagnosis has the highest priority for this client?

1. Impaired gas exchange
2. Impaired oral mucous membrane
3. Imbalanced nutrition: Less than body requirements
4. Activity intolerance

Answer: 1. While all these nursing diagnoses are appropriate for a client with AIDS, impaired gas exchange is the priority nursing diagnosis for a client with *P. carinii* pneumonia. Airway, breathing, and circulation take top priority for any client.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

4. A client has chronic bronchitis. A nurse is teaching him breathing exercises. Which instruction should the nurse include in the teaching?

1. Make exhalation longer than inhalation.
2. Exhale through an open mouth.
3. Use diaphragmatic breathing.
4. Use chest breathing.

Answer: 3. With chronic bronchitis, the diaphragm is flat and weak. Diaphragmatic breathing helps to strengthen the diaphragm and maximizes ventilation. Exhalation should be no longer than inhalation to prevent collapse of the bronchioles. The client with chronic bronchitis should exhale through pursed lips to prolong exhalation, keep the bronchioles from collapsing, and prevent air trapping. Diaphragmatic breathing, not chest breathing, increases lung expansion.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

5. In a client with emphysema, the initiative to breathe is triggered by:

1. high carbon dioxide levels.
2. low carbon dioxide levels.
3. high oxygen levels.
4. low oxygen levels.

Answer: 4. Because of long-standing hypercapnia, breathing in a client with emphysema is triggered by low oxygen levels. In a client with a normal respiratory drive, the initiative to breathe is triggered by increased carbon dioxide levels.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

6. A client experiencing acute respiratory failure will most likely demonstrate:

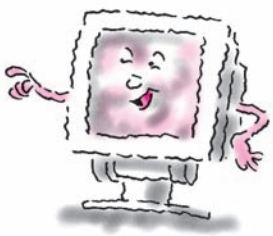
1. hypocapnia, hypoventilation, and hyperoxemia.
2. hypocapnia, hyperventilation, and hyperoxemia.
3. hypercapnia, hyperventilation, and hypoxemia.
4. hypercapnia, hypoventilation, and hypoxemia.

Answer: 4. Acute respiratory failure is marked by hypercapnia (elevated arterial carbon dioxide), hypoventilation, and hypoxemia (subnormal oxygen).

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

7. During an asthmatic episode, a client receives a beta$_2$-adrenergic agonist. What's the best evidence that the drug is effective?

1. Normal drug serum levels
2. Productive cough
3. Clear breath sounds
4. Improved heart rate



Answer: 3. Beta$_2$-adrenergic agonists cause bronchodilation, which is the opening up of narrowed airways. In an asthmatic episode, the client wheezes. Treating the client with a beta$_2$-adrenergic agonist should decrease the wheezing. Beta$_2$-adrenergic agonists aren't monitored for serum levels. Beta$_2$-adrenergic agonists aren't expectorants, so a productive cough wouldn't indicate the drug is effective. Beta$_2$-adrenergic agonists are cardiac stimulants and cause tachycardia, which in itself isn't evidence of bronchodilation.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Analysis

8. A 40-year-old client is undergoing insertion of a chest tube necessitated by pneumothorax. The nursing care in this case includes:

1. maintaining a chest tube that's attached to an underwater drainage system that allows the escape of air or fluid.
2. milking the chest tube every 4 hours.
3. emptying the drainage system every 8 hours.
4. positioning the client on the unaffected side or the abdomen.

Answer: 1. The underwater drainage system in a chest tube creates a seal that prevents the reflux of air into the chest. The nurse needs to maintain the chest tube to ensure proper functioning. The chest tube should be milked every 2 hours. The closed-drainage system isn't emptied, but the amount of drainage is noted on the output record. The client's position should be changed frequently to promote comfort and drainage.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

9. Following a pneumothorax, a client receives a chest tube attached to a three-chamber chest drainage system. During the night, the client becomes disoriented, gets out of bed, and steps on the drainage device, causing it to crack open and lose its seal. The nurse should immediately:

1. clamp the chest tube close to the client's thorax.
2. attach the chest tube directly to low wall suction.
3. place the device on a sterile field and call the physician.
4. place the end of the chest tube in a container of sterile water.

Answer: 4. When a chest drainage system cracks open, the closed system between the pleural space and the device is broken. This will allow air to move through the tubing into the pleural space, exacerbating the pneumothorax. The nurse should immediately place the distal end of the tube in sterile water, closing the system again. The tube shouldn't be clamped because this would increase the pressure against the pleural space. It's inappropriate to attach the drain directly to wall suction. The nurse should call the physician after correcting the problem.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

10. A client with clinically active pulmonary tuberculosis is prescribed isoniazid, rifampin, pyrazinamide, and ethambutol. Which findings best indicate the effectiveness of drug therapy?

1. Cavities are no longer evident on the chest X-ray.
2. Tuberculin skin test is negative.
3. The client is afebrile and no longer coughing.
4. The sputum culture results convert to negative.

Answer: 4. A change in sputum culture from positive to negative is the best indication of the effectiveness of antitubercular medication. Cavities disappearing from the chest X-ray aren't a reliable indicator of drug effectiveness. Tuberculin skin tests don't convert from positive to negative. Disappearance of symptoms isn't the best indicator of the treatment's effectiveness.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

5 Hematologic & immune systems

In this chapter, you'll review:

- components of the hematologic and immune systems and their functions
- tests used to diagnose hematologic and immune disorders
- common hematologic and immune disorders.

Brush up on key concepts

The immune system and hematologic system are closely related. The immune system consists of specialized cells and structures that defend the body against invasion by harmful organisms or chemical toxins. The hematologic system also functions as an important part of the body's defenses. Blood transports the components of the immune system throughout the body. In addition, blood delivers oxygen and nutrients to all tissues and removes wastes. Both immune system cells and blood cells originate in the bone marrow.

The key components of the immune system are the lymph nodes, thymus, spleen, and tonsils. The key components of the hematologic system are blood and bone marrow. Blood components play a vital role in transporting electrolytes and regulating acid-base balance.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 114 to 123.

Fluid movers

Lymphatic vessels consist of capillary-like structures that are permeable to large molecules. Lymphatic vessels prevent edema by moving fluid and proteins from interstitial spaces to venous circulation. They also reabsorb fats from the small intestine.

Bacteria filters

Lymph nodes are tissues that filter out bacteria and other foreign cells. They're grouped by region:

- cervicofacial
- supraclavicular
- axillary
- epitrochlear
- inguinal
- femoral.

Water plus

Lymph is the fluid that's found in interstitial spaces and that circulates in the lymph vessels. Lymph is composed of water and the end products of cell metabolism.

Bodyguards

The **tonsils,** which are located at the back of the mouth in the oropharynx, fight off pathogens entering the mouth and nose. They're made of lymphatic tissue and produce lymphocytes.

Filters blood, kills bacteria

The **spleen** is a major lymphatic organ that:

- destroys bacteria
- filters blood
- serves as a blood reservoir
- forms lymphocytes and monocytes
- traps formed particles.

Home of hematopoiesis

Bone marrow may be described as either red or yellow:

- Red bone marrow is a source of lymphocytes and macrophages. Hematopoiesis is carried out by red bone marrow. Hematopoiesis is the process by which erythrocytes, leukocytes, and thrombocytes are produced.
- Yellow bone marrow is red bone marrow that has changed to fat.

Marrow makeup

Bone marrow contains **stem cells,** which may develop into several different cell types during hematopoiesis:

(Text continues on page 123.)

Cheat sheet

Hematologic and immunologic refresher

ACQUIRED IMMUNODEFICIENCY SYNDROME

Key signs and symptoms

- Anorexia, weight loss, recurrent diarrhea
- Disorientation, confusion, dementia
- History of night sweats
- History of opportunistic infections

Key test results

- $CD4^+$ T-cell level is less than 200 cells/μl.
- Enzyme-linked immunosorbent assay shows positive human immunodeficiency virus antibody titer.
- Western blot test is positive.

Key treatments

- Transfusion therapy: fresh frozen plasma, platelets, and packed red blood cells (RBCs)
- Antibiotic: co-trimoxazole (Bactrim)
- Antiprotozoal agent: pentamidine (NebuPent)

Combination therapy

- Nonnucleoside reverse transcriptase inhibitors: delavirdine (Rescriptor), nevirapine (Viramune), efavirenz (Sustiva)
- Nucleoside reverse transcriptase inhibitors: lamivudine (Epivir), zalcitabine (Hivid), zidovudine (Retrovir), abacavir (Ziagen), didanosine (Videx), emtricitabine (Emtriva), stavudine (Zerit), tenofovir (Viread)
- Protease inhibitors: indinavir (Crixivan), nelfinavir (Viracept), ritonavir (Norvir), saquinavir (Invirase), amprenavir (Agenerase), atazanavir (Reyataz), fosamprenavir (Lexiva)
- Fusion inhibitor: enfuvirtide (Fuzeon)

Key interventions

- Monitor for opportunistic infections.
- Maintain the patient's diet.
- Provide mouth care.
- Maintain standard precautions.
- Make referrals to community agencies for support.
- Monitor respiratory status.

ANAPHYLAXIS

Key signs and symptoms

- Cardiovascular symptoms (hypotension, shock, cardiac arrhythmias) that may precipitate circulatory collapse if untreated
- Sudden physical distress within seconds or minutes after exposure to an allergen (may include feeling of impending doom or fright, weakness, sweating, sneezing, shortness of breath, nasal pruritus, urticaria, and angioedema, followed rapidly by symptoms in one or more target organs)
- Respiratory symptoms (nasal mucosal edema; profuse, watery rhinorrhea; itching; nasal congestion; sudden sneezing attacks; edema of the upper respiratory tract that causes hoarseness, stridor, and dyspnea [early sign of acute respiratory failure])

Key test result

- Anaphylaxis can be diagnosed by the rapid onset of severe respiratory or cardiovascular symptoms after an insect sting or after ingestion or injection of a drug, vaccine, diagnostic agent, food, or food additive.

Key treatment

- Immediate subcutaneous (subQ) injection of epinephrine 1:1,000 aqueous solution, 0.1 to 0.5 ml, repeated every 10 to 15 minutes as necessary

Key interventions

- In the early stages of anaphylaxis, give epinephrine I.M. or subQ and help it move into the circulation faster by massaging the injection site. In severe reactions, epinephrine should be given I.V.
- Maintain airway patency. Observe for early signs of laryngeal edema (stridor, hoarseness, and dyspnea), and prepare for endotracheal tube insertion or a tracheotomy and oxygen therapy.
- Monitor blood pressure and urine output.

Hematologic and immunologic refresher *(continued)*

ANKYLOSING SPONDYLITIS

Key signs and symptoms

- Intermittent lower back pain (the first indication), usually most severe in the morning or after a period of inactivity
- Mild fatigue, fever, anorexia, or weight loss; unilateral acute anterior uveitis
- Stiffness and limited motion of the lumbar spine

Key test results

- Typical symptoms, a family history, and the presence of HLA-B27 strongly suggest ankylosing spondylitis.
- Confirmation requires characteristic X-ray findings: blurring of the bony margins of joints in the early stage, bilateral sacroiliac involvement, patchy sclerosis with superficial bony erosions, eventual squaring of vertebral bodies, and "bamboo spine" with complete ankylosis.

Key treatments

- Good posture, stretching and deep-breathing exercises and, in some patients, braces and lightweight supports to delay further deformity
- Anti-inflammatory agents: aspirin, ibuprofen (Motrin), indomethacin (Indocin), sulfasalazine (Azulfidine), sulindac (Clinoril) to control pain and inflammation

Key interventions

- Offer support and reassurance. Keep in mind that the patient's limited range of motion makes simple tasks difficult.
- Administer medications as needed.
- Apply local heat and provide massage. Assess mobility and degree of discomfort frequently.

APLASTIC ANEMIA

Key signs and symptoms

- Dyspnea, tachypnea
- Epistaxis
- Melena
- Palpitations, tachycardia
- Purpura, petechiae, ecchymosis, pallor

Key test result

- Bone marrow biopsy shows a decrease in activity or no cell production.

Key treatments

- Transfusion of platelets and packed RBCs
- Antithymocyte globulin (Atgam)
- Hematopoietic growth factor: epoetin alfa (Epogen)

Key interventions

- Monitor for infection, bleeding, and bruising.
- Administer oxygen.
- Monitor transfusion therapy as prescribed.
- Maintain protective precautions.
- Avoid giving the patient I.M. injections.

CALCIUM IMBALANCE

Key signs and symptoms

Hypocalcemia

- Cardiac arrhythmias
- Chvostek's sign
- Tetany
- Trousseau's sign

Hypercalcemia

- Anorexia
- Decreased muscle tone
- Lethargy
- Muscle weakness
- Nausea
- Polydipsia
- Polyuria

Key test results

- A serum calcium level less than 4.5 mEq/L confirms hypocalcemia; a level greater than 5.5 mEq/L confirms hypercalcemia. (Because approximately one-half of serum calcium is bound to albumin, changes in serum protein must be considered when interpreting serum calcium levels.)
- Electrocardiogram reveals a lengthened QT interval, a prolonged ST segment, and arrhythmias in hypocalcemia; in hypercalcemia, a shortened QT interval and heart block.

Key treatments

Hypocalcemia

- Diet: adequate intake of calcium, vitamin D, and protein
- Ergocalciferol (vitamin D_2), cholecalciferol (vitamin D_3), calcitriol (Rocaltrol), dihydrotachysterol (synthetic form of vitamin D_2) for severe deficiency
- Immediate correction by I.V. calcium gluconate or calcium chloride for acute hypocalcemia (an emergency)

Hypercalcemia

- Calcitonin (Calcimar)
- Loop diuretics: ethacrynic acid (Edecrin) and furosemide (Lasix) to promote calcium excretion (thiazide diuretics are contraindicated in hypercalcemia because they inhibit calcium excretion)

(continued)

Hematologic and immunologic refresher *(continued)*

CALCIUM IMBALANCE *(continued)*

Key interventions

Hypocalcemia

• Monitor serum calcium levels every 12 to 24 hours. When giving calcium supplements, frequently check the pH level. Check for Trousseau's and Chvostek's signs.

Hypercalcemia

• Monitor serum calcium levels frequently.
• Increase fluid intake.

CHLORIDE IMBALANCE

Key signs and symptoms

Hypochloremia

• Muscle hypertonicity (in conditions related to loss of gastric secretions)
• Muscle weakness
• Shallow, depressed breathing
• Twitching

Hyperchloremia

• Agitation
• Deep, rapid breathing
• Diminished cognitive ability
• Hypertension
• Pitting edema
• Tachycardia
• Weakness

Key test results

• Serum chloride level less than 98 mEq/L confirms hypochloremia; supportive values with metabolic alkalosis include a serum pH greater than 7.45 and a serum carbon dioxide level greater than 32 mEq/L.
• Serum chloride level greater than 108 mEq/L confirms hyperchloremia; with metabolic acidosis, serum pH is less than 7.35 and the serum carbon dioxide level is less than 22 mEq/L.

Key treatments

Hypochloremia

• Acidifying agent: ammonium chloride
• Diet: salty broth
• Saline solution I.V.

Hyperchloremia

• Alkalinizing agent: sodium bicarbonate I.V.
• Lactated Ringer's solution

Key interventions

Hypochloremia

• Monitor electrolyte levels.
• Watch for excessive or continuous loss of gastric secretions.

Hyperchloremia

• Monitor electrolyte levels.

DISSEMINATED INTRAVASCULAR COAGULATION

Key signs and symptoms

• Abnormal bleeding without an accompanying history of serious hemorrhagic disorder
• Oliguria
• Shock

Key test results

• Blood tests show PT greater than 15 seconds; PTT greater than 60 seconds; fibrinogen levels less than 150 mg/dl; platelets less than 100,000/µl; and fibrin degradation products commonly greater than 100 µg/ml.
• A positive D-dimer test is specific for disseminated intravascular coagulation.

Key treatments

• Anticoagulant: heparin I.V. (Heparin Sodium Injection)
• Bed rest
• Transfusion therapy: fresh frozen plasma, platelets, packed RBCs

Key interventions

• Enforce complete bed rest during bleeding episodes. If the patient is agitated, pad the side rails.
• Check all I.V. and venipuncture sites frequently for bleeding. Apply pressure to injection sites for at least 10 minutes. Alert other personnel to the patient's tendency to hemorrhage.
• Watch for transfusion reactions and signs of fluid overload.
• Weigh the patient daily, particularly in renal involvement.
• Monitor the results of serial blood studies (particularly hematocrit [HCT], hemoglobin [Hb] level, and coagulation times).

HEMOPHILIA

Key signs and symptoms

• Hematuria
• Joint tenderness
• Pain and swelling in a weight-bearing joint
• Prolonged bleeding after major trauma or surgery (in mild hemophilia)
• Spontaneous or severe bleeding after minor trauma (in severe hemophilia)
• SubQ and I.M. hematomas (in moderate hemophilia)
• Tarry stools

Key test results

• Factor VIII assay reveals 0% to 25% of normal factor VIII (hemophilia A).

Hematologic and immunologic refresher *(continued)*

HEMOPHILIA *(continued)*

• Factor IX assay shows deficiency (hemophilia B).

Key treatments

• Administration of Factor VIII or cryoprecipitate antihemophilic factor (AHF) and lyophilized (dehydrated) AHF to encourage normal hemostasis (for hemophilia A)
• Administration of purified factor IX to promote hemostasis (for hemophilia B)
• Administration of analgesics to control joint pain (for both types)

Key interventions

• During bleeding episodes, monitor clotting factor or plasma administration. Also administer analgesics.
• Avoid I.M. injections.
• Aspirin and aspirin-containing medications are contraindicated.
• If the patient has bled into a joint, immediately elevate the joint.

IRON DEFICIENCY ANEMIA

Key signs and symptoms

• Pallor
• Sensitivity to cold
• Weakness and fatigue

Key test result

• Hematology shows decreased Hb, HCT, iron, ferritin, reticulocytes, red cell indices, transferrin, and saturation; absent hemosiderin; and increased iron-binding capacity.

Key treatments

• Diet: high in iron, fiber, and protein with increased fluids; avoidance of teas and coffee, which reduce absorption of iron
• Vitamins: pyridoxine (vitamin B_6), ascorbic acid (vitamin C)
• Iron supplements: ferrous sulfate (Feosol), iron dextran (DexFerrum)

Key interventions

• Monitor cardiovascular and respiratory status.
• Monitor stool, urine, and vomitus for occult blood.
• Administer medications as prescribed. Administer iron injection deep into muscle using Z-track technique.
• Provide mouth, skin, and foot care.

KAPOSI'S SARCOMA

Key signs and symptoms

• One or more obvious lesions in various shapes, sizes, and colors (ranging from red-brown to dark purple) that appear most commonly on the skin, buccal mucosa, hard and soft palates, lips, gums, tongue, tonsils, conjunctivae, and sclerae
• Pain (if the sarcoma advances beyond the early stages or if a lesion breaks down or impinges on nerves or organs)

Key test result

• Tissue biopsy identifies the lesion's type and stage.

Key treatments

• High-calorie, high-protein diet
• Radiation therapy
• Antineoplastics: doxorubicin (Adriamycin), etoposide (VePesid), vinblastine (Velban), vincristine (Oncovin)
• Antiemetics: dolasetron (Anzemet), trimethobenzamide (Tigan)

Key interventions

• Inspect the patient's skin every shift. Look for new lesions and skin breakdown. If the patient has painful lesions, help him into a more comfortable position.
• Administer pain medications. Suggest distractions and help the patient with relaxation techniques.
• Urge the patient to share his feelings and provide encouragement.
• Supply the patient with high-calorie, high-protein meals. If he can't tolerate regular meals, provide him with frequent smaller meals. Consult with the dietitian, and plan meals around the patient's treatment.
• Be alert for adverse reactions to radiation therapy or chemotherapy—such as anorexia, nausea, vomiting, and diarrhea—and take steps to prevent or alleviate them.
• Explain infection-prevention techniques and, if necessary, demonstrate basic hygiene measures. Advise the patient not to share his toothbrush, razor, or other items that may be contaminated with blood. These measures are especially important if the patient also has human immunodeficiency virus infection or acquired immunodeficiency syndrome.

LEUKEMIA

Key signs and symptoms

• Enlarged lymph nodes, spleen, and liver
• Frequent infections
• Weakness and fatigue

Key test result

• Bone marrow biopsy shows large numbers of immature leukocytes.

Key treatments

• Antimetabolites: fluorouracil (Adrucil), methotrexate (Trexall)
• Alkylating agents: busulfan (Myleran), chlorambucil (Leukeran)
• Vinca alkaloids: vinblastine (Velban) , vincristine (Oncovin)

(continued)

Hematologic and immunologic refresher *(continued)*

LEUKEMIA *(continued)*

- Antineoplastic antibiotics: doxorubicin (Adriamycin), plicamycin (Mithracin)
- Hematopoietic growth factor: epoetin alfa (Epogen)

Key interventions

- Monitor for bleeding.
- Place the patient with epistaxis in an upright position, leaning slightly forward.
- Monitor for infection. Promptly report temperature over 101° F (38.3° C) and decreased white blood cell (WBC) counts.
- Monitor transfusion therapy for adverse reactions.
- Provide gentle mouth and skin care.

LYMPHOMA

Key signs and symptoms

- Predictable pattern of spread (Hodgkin's disease)
- Enlarged, nontender, firm, and movable lymph nodes in lower cervical regions (Hodgkin's disease)
- Less predictable pattern of spread (malignant lymphoma)
- Prominent, painless, generalized lymphadenopathy (malignant lymphoma)

Key test results

- Lymph node biopsy is positive for Reed-Sternberg cells (Hodgkin's disease).
- Bone marrow aspiration and biopsy reveals small, diffuse lymphocytic or large, follicular-type cells (malignant lymphoma).

Key treatments

- Radiation therapy
- Transfusion of packed RBCs
- Chemotherapy for Hodgkin's disease: mechlorethamine (Mustargen), vincristine (Oncovin), procarbazine (Matulane), doxorubicin (Adriamycin), bleomycin (Blenoxane), vinblastine (Velban), dacarbazine (DTIC-Dome)
- Chemotherapy for malignant lymphoma: cyclophosphamide (Cytoxan), vincristine (Oncovin), doxorubicin (Adriamycin)

Key interventions

- Monitor for bleeding, infection, jaundice, and electrolyte imbalance.
- Provide mouth and skin care.
- Encourage fluids.
- Administer medications as prescribed and monitor for adverse effects.
- Maintain transfusion therapy as prescribed and monitor for adverse reactions.

MAGNESIUM IMBALANCE

Key signs and symptoms

Hypomagnesemia

- Arrhythmias
- Neuromuscular irritability
- Chvostek's sign
- Mood changes
- Confusion

Hypermagnesemia

- Diminished deep tendon reflexes
- Weakness
- Confusion
- Heart block
- Nausea
- Vomiting

Key test results

- Blood test that shows decreased serum magnesium levels (less than 1.5 mEq/L) confirms hypomagnesemia.
- Blood test that shows increased serum magnesium levels (greater than 2.5 mEq/L) confirms hypermagnesemia.

Key treatments

Hypomagnesemia

- Daily magnesium supplements I.M. or by mouth
- High-magnesium diet
- Magnesium sulfate I.V. (10 to 40 mEq/L diluted in I.V. fluid) for severe cases

Hypermagnesemia

- Diet: low magnesium with increased fluid intake
- Loop diuretic: furosemide (Lasix)
- Magnesium antagonist: calcium gluconate (10%)
- Peritoneal dialysis or hemodialysis if renal function fails or if excess magnesium can't be eliminated

Key interventions

Hypomagnesemia

- Monitor serum electrolyte levels (including magnesium, calcium, and potassium) daily for mild deficits and every 6 to 12 hours during replacement therapy.
- Measure intake and output frequently. (Urine output shouldn't fall below 25 ml/hour or 600 ml/day.)
- Monitor vital signs during I.V. therapy. Infuse magnesium replacement slowly, and watch for bradycardia, heart block, and decreased respiratory rate.
- Have calcium gluconate I.V. available to reverse hypermagnesemia from overcorrection.

Hematologic and immunologic refresher *(continued)*

MAGNESIUM IMBALANCE *(continued)*

Hypermagnesemia

- Frequently check level of consciousness (LOC), muscle activity, and vital signs.
- Keep accurate intake and output records. Provide sufficient fluids.
- Correct abnormal serum electrolyte levels immediately.
- Monitor the patient receiving cardiac glycosides and calcium gluconate simultaneously.

METABOLIC ACIDOSIS

Key signs and symptoms

- Central nervous system depression
- Kussmaul's respirations
- Lethargy

Key test result

- Arterial blood gas (ABG) analysis reveals pH below 7.35 and bicarbonate level less than 24 mEq/L.

Key treatments

- Correction of underlying cause
- Sodium bicarbonate I.V. or orally for chronic metabolic acidosis

Key interventions

- Keep sodium bicarbonate ampules handy.
- Frequently monitor vital signs, laboratory results, and LOC.
- Record intake and output.

METABOLIC ALKALOSIS

Key signs and symptoms

- Atrial tachycardia
- Confusion
- Diarrhea
- Hypoventilation
- Twitching
- Vomiting

Key test results

- ABG analysis reveals pH greater than 7.45 and a bicarbonate level above 29 mEq/L.

Key treatments

- Treatment of underlying cause
- Acidifying agent: ammonium chloride I.V.

Key interventions

- Monitor ammonium chloride 0.9% infusion.
- Monitor vital signs, and record intake and output.

MULTIPLE MYELOMA

Key signs and symptoms

- Anemia, thrombocytopenia, hemorrhage
- Constant, severe bone pain
- Pathologic fractures, skeletal deformities of the sternum and ribs, loss of height

Key test results

- Bence Jones protein assay is positive.
- X-ray shows diffuse, round, punched-out bone lesions; osteoporosis; osteolytic lesions of the skull; and widespread demineralization.

Key treatments

- Orthopedic devices: braces, splints, casts
- Alkylating agents: melphalan (Alkeran), cyclophosphamide (Cytoxan)
- Androgen: fluoxymesterone (Halotestin)
- Antibiotics: doxorubicin (Adriamycin), plicamycin (Mithracin)
- Antigout agent: allopurinol (Zyloprim)
- Antineoplastics: vinblastine (Velban), vincristine (Oncovin)
- Glucocorticoid: prednisone (Deltasone)

Key interventions

- Monitor renal status.
- Evaluate bone pain.
- Maintain I.V. fluids.

PERNICIOUS ANEMIA

Key signs and symptoms

- Paresthesia of hands and feet
- Weight loss, anorexia, dyspepsia

Key test results

- Bone marrow aspiration shows increased megaloblasts, few maturing erythrocytes, and defective leukocyte maturation.
- Peripheral blood smear reveals oval, macrocytic, hyperchromic erythrocytes.

Key treatment

- Vitamins: pyridoxine (vitamin B_6), ascorbic acid (vitamin C), cyanocobalamin (vitamin B_{12}), folic acid (vitamin B_9)

Key interventions

- Monitor cardiovascular status.
- Administer medications as prescribed.
- Provide mouth care before and after meals.
- Prevent the patient from falling.

(continued)

Hematologic and immunologic refresher *(continued)*

PHOSPHORUS IMBALANCE

Key signs and symptoms

Hypophosphatemia
- Anorexia
- Muscle weakness
- Paresthesia
- Tremor

Hyperphosphatemia
- Usually produces no symptoms

Key test results

- Serum phosphorus level less than 1.7 mEq/L (or 2.5 mg/dl) confirms hypophosphatemia. A urine phosphorus level more than 1.3 g/24 hours supports this diagnosis.
- Serum phosphorus level exceeding 2.6 mEq/L (or 4.5 mg/dl) confirms hyperphosphatemia. Supportive values include decreased levels of serum calcium (less than 9 mg/dl) and urine phosphorus (less than 0.9 g/24 hours).

Key treatments

Hypophosphatemia
- High-phosphorus diet
- Phosphate supplements

Hyperphosphatemia
- Low-phosphorus diet
- Calcium supplement: calcium acetate (PhosLo)

Key interventions

Hypophosphatemia
- Record intake and output accurately. Assess renal function, and be alert for hypocalcemia when giving phosphate supplements.
- Advise the patient to follow a high-phosphorus diet containing milk and milk products, kidney, liver, turkey, and dried fruits.

Hyperphosphatemia
- Monitor intake and output. If urine output falls below 25 ml/hour or 600 ml/day, notify the doctor immediately.
- Watch for signs of hypocalcemia, such as muscle twitching and tetany, which commonly accompany hyperphosphatemia.
- Advise the patient to eat foods low in phosphorus such as vegetables. Obtain dietary consultation if the condition results from chronic renal insufficiency.

POLYCYTHEMIA VERA

Key signs and symptoms

- Clubbing of the digits
- Dizziness
- Headache
- Hypertension
- Ruddy cyanosis of the nose
- Thrombosis of smaller vessels
- Visual disturbances (blurring, diplopia, engorged veins of fundus and retina)

Key test result

- Blood tests show elevated hemoglobin, RBC count, WBC count, platelet count, and leukocyte alkaline phosphatase, serum B_{12}, and uric acid levels.

Key treatments

- Phlebotomy (typically, 350 to 500 ml of blood is removed every other day until the patient's HCT is reduced to the low-normal range)
- Plasmapheresis
- Antineoplastics: busulfan (Myleran), chlorambucil (Leukeran), melphalan (Alkeran)
- Antigout agent: allopurinol (Zyloprim)

Key interventions

- Check blood pressure, pulse rate, and respirations before and during phlebotomy.
- During phlebotomy, make sure the patient is lying down comfortably.
- Stay alert for tachycardia, clamminess, or complaints of vertigo. If these effects occur, the procedure should be stopped.
- Immediately after phlebotomy, check blood pressure and pulse rate. Have the patient sit up for about 5 minutes before allowing him to walk. Also, administer 24 oz (710 ml) of juice or water.
- Tell the patient to watch for and report symptoms of iron deficiency (pallor, weight loss, weakness, glossitis).
- Give additional fluids, administer allopurinol, and alkalinize the urine.
- Warn an outpatient who develops leukopenia that his resistance to infection is low; advise him to avoid crowds and to watch for the symptoms of infection.
- Tell the patient about possible adverse effects of alkylating agents (nausea, vomiting, and risk of infection).
- Have the patient lie down during I.V. administration and for 15 to 20 minutes afterward.

RHEUMATOID ARTHRITIS

Key signs and symptoms

- Painful, swollen joints; crepitus; morning stiffness
- Symmetrical joint swelling (mirror image of affected joints)

Key test results

- Antinuclear antibody test is positive.
- Rheumatoid factor test is positive.

Hematologic and immunologic refresher *(continued)*

RHEUMATOID ARTHRITIS *(continued)*

Key treatments

- Cold therapy during acute episodes
- Heat therapy to relax muscles and relieve pain in chronic disease
- Antirheumatic: hydroxychloroquine (Plaquenil)
- Cyclo-oxygenase-2 inhibitor: celecoxib (Celebrex)
- Glucocorticoids: prednisone (Deltasone), hydrocortisone (Hydrocortone)
- Nonsteroidal anti-inflammatory drugs (NSAIDs): indomethacin (Indocin), ibuprofen (Advil, Motrin), sulindac (Clinoril), piroxicam (Feldene), flurbiprofen (Ansaid), diclofenac sodium (Voltaren), naproxen (Naprosyn), diflunisal (Dolobid)

Key interventions

- Check joints for swelling, pain, and redness.
- Splint inflamed joints.
- Provide warm or cold therapy as prescribed.

SCLERODERMA

Key signs and symptoms

- Pain
- Signs and symptoms of Raynaud's phenomenon, such as blanching, cyanosis, and erythema of the fingers and toes in response to stress or exposure to cold
- Stiffness
- Swelling of fingers and joints
- Taut, shiny skin over the entire hand and forearm
- Tight and inelastic facial skin, causing a masklike appearance and "pinching" of the mouth
- Signs and symptoms of renal involvement, usually accompanied by malignant hypertension, the main cause of death

Key test results

- Blood studies show slightly elevated erythrocyte sedimentation rate (ESR), positive rheumatoid factor in 25% to 35% of patients, and positive antinuclear antibody test.
- Skin biopsy may show changes consistent with the progress of the disease, such as marked thickening of the dermis and occlusive vessel changes.

Key treatments

- Physical therapy to maintain function and promote muscle strength
- Immunosuppressants: cyclosporine (Sandimmune), cyclophosphamide (Cytoxan), azathioprine (Imuran), mycophenolate (Cellcept)

Key interventions

- Evaluate motion restrictions, pain, vital signs, intake and output, respiratory function, and daily weight.
- Teach the patient to monitor blood pressure at home and to report any increases above baseline.
- Whenever possible, let the patient participate in treatment.

SEPTIC SHOCK

Key signs and symptoms

Early stage

- Chills
- Oliguria
- Sudden fever (over 101° F [38.3° C])

Late stage

- Altered LOC
- Anuria
- Hyperventilation
- Hypotension
- Hypothermia
- Restlessness
- Tachycardia
- Tachypnea

Key test results

- Blood cultures isolate the organism.
- Blood tests show decreased platelet count and leukocytosis (15,000 to 30,000/µl), increased blood urea nitrogen and creatinine levels, decreased creatinine clearance, and abnormal PT and PTT.

Key treatments

- Removing and replacing any I.V. or urinary drainage catheters that may be the source of infection
- Oxygen therapy (may require endotracheal intubation and mechanical ventilation)
- Colloid or crystalloid infusion to increase intravascular volume
- Diuretic: furosemide (Lasix) after sufficient fluid volume has been replaced to maintain urine output above 20 ml/hour
- Antibiotics: according to sensitivity of causative organism
- Human-activated protein C: drotrecogin alfa (Xigris)
- Vasopressors: dopamine (Intropin), norepinephrine (Levophed), or phenylephrine (Neo-Synephrine), if fluid resuscitation fails to increase blood pressure

Key interventions

- Remove any I.V. or urinary drainage catheters, and send them to the laboratory. New catheters can be reinserted.

(continued)

Hematologic and immunologic refresher *(continued)*

SEPTIC SHOCK *(continued)*

• Maintain an I.V. infusion with normal saline solution or lactated Ringer's solution, usually using a large-bore (14G to 18G) catheter.
• If the patient's systolic blood pressure drops below 80 mm Hg, increase oxygen flow rate and call the doctor immediately.
• Keep accurate intake and output records.
• Administer antibiotics I.V. and monitor drug levels.

SICKLE CELL ANEMIA

Key signs and symptoms

• Aching bones
• Jaundice (worsens during painful crisis), pallor
• Unexplained dyspnea or dyspnea on exertion
• Tachycardia
• Severe pain (during sickle cell crisis)

Key test results

• Blood tests show low RBC counts, elevated WBC and platelet counts, decreased ESR, increased serum iron levels, decreased RBC survival, and reticulocytosis.
• Hb electrophoresis shows hemoglobin S.

Key treatments

• Iron and folic acid supplements to prevent anemia
• I.V. fluid therapy to prevent dehydration and vessel occlusion
• Analgesics: meperidine (Demerol) or morphine (to relieve pain from vaso-occlusive crises)

Key interventions

• Apply warm compresses to painful areas, and cover the patient with a blanket.
• Maintain bed rest.
• Encourage fluid intake, and maintain prescribed I.V. fluids.

SODIUM IMBALANCE

Key signs and symptoms

Hyponatremia
• Abdominal cramps
• Cold, clammy skin
• Cyanosis
• Hypotension
• Oliguria or anuria
• Seizures
• Tachycardia

Hypernatremia
• Dry, sticky mucous membranes
• Excessive weight gain
• Flushed skin
• Hypertension
• Intense thirst
• Oliguria
• Pitting edema
• Rough, dry tongue
• Tachycardia

Key test results

• Serum sodium level less than 135 mEq/L indicates hyponatremia.
• Serum sodium level greater than 145 mEq/L indicates hypernatremia.

Key treatments

Hyponatremia
• I.V. infusion of saline solution
• Potassium supplement: potassium chloride (K-Lor)

Hypernatremia
• Diet: sodium restrictions
• Salt-free solution (such as dextrose in water), followed by infusion of 0.45% sodium chloride to prevent hyponatremia

Key interventions

Hyponatremia
• Watch for extremely low serum sodium and accompanying serum chloride levels. Monitor urine specific gravity and other laboratory results. Record fluid intake and output accurately, and weigh the patient daily.
• During administration of isosmolar or hyperosmolar saline solution, watch closely for signs of hypervolemia (dyspnea, crackles, engorged neck or hand veins).

Hypernatremia
• Measure serum sodium levels every 6 hours or at least daily. Monitor vital signs for changes, especially for rising pulse rate. Watch for signs of hypervolemia, especially in the patient receiving I.V. fluids.
• Record fluid intake and output accurately, checking for body fluid loss. Weigh the patient daily.

SYSTEMIC LUPUS ERYTHEMATOSUS

Key signs and symptoms

• Butterfly rash on face (rash may vary in severity from malar erythema to discoid lesions)
• Fatigue
• Migratory pain, joint stiffness and swelling

Key test result

• Lupus erythematosus cell preparation is positive.

Key treatments

• Cytotoxic drug: methotrexate (Trexall) to delay or prevent deteriorating renal status

Hematologic and immunologic refresher *(continued)*

SYSTEMIC LUPUS ERYTHEMATOSUS *(continued)*

- Immunosuppressants: azathioprine (Imuran), cyclophosphamide (Cytoxan)
- NSAIDs: indomethacin (Indocin), ibuprofen (Motrin), sulindac (Clinoril), piroxicam (Feldene), flurbiprofen (Ansaid), diclofenac sodium (Voltaren), naproxen (Naprosyn), diflunisal (Dolobid)

Key interventions

- Evaluate musculoskeletal status.
- Monitor renal status.
- Provide prophylactic skin, mouth, and perineal care.
- Maintain seizure precautions.
- Minimize environmental stress, and provide rest periods.

VASCULITIS

Key signs and symptoms

Wegener's granulomatosis

- Cough
- Fever
- Malaise
- Signs and symptoms of pulmonary congestion
- Weight loss

Temporal arteritis

- Fever
- Headache (associated with polymyalgia rheumatica syndrome)
- Jaw claudication
- Myalgia
- Visual changes

Takayasu's arteritis

- Arthralgias
- Bruits
- Loss of distal pulses
- Malaise
- Pain or paresthesia distal to affected area
- Syncope
- Weight loss

Key test results

Wegener's granulomatosis

- Tissue biopsy shows necrotizing vasculitis with granulomatous inflammation.

Temporal arteritis

- Tissue biopsy shows panarteritis with infiltration of mononuclear cells, giant cells within vessel wall, fragmentation of internal elastic lamina, and proliferation of intima.

Takayasu's arteritis

- Arteriography shows calcification and obstruction of affected vessels.
- Tissue biopsy shows inflammation of adventitia and intima of vessels and thickening of vessel walls.

Key treatments

- Removal of identified environmental antigen
- Diet: elimination of antigenic food, if identifiable
- Corticosteroid: prednisone (Deltasone)
- Antineoplastic: cyclophosphamide (Cytoxan)

Key interventions

- Regulate environmental temperature.
- Monitor vital signs. Use a Doppler ultrasonic flowmeter, if available.
- Monitor intake and output. Check daily for edema. Keep the patient well hydrated (3 L daily).

- Some stem cells evolve into lymphocytes; lymphocytes may become B cells or T cells.
- Other stem cells evolve into phagocytes.

Oxygen carriers

Erythrocytes (also called **red blood cells** or RBCs) are formed in the bone marrow and contain hemoglobin (Hb). Oxygen binds with Hb to form oxyhemoglobin, which is then carried by RBCs throughout the body.

Clotting contributors

Thrombocytes (also called **platelets**) are formed in the bone marrow and function in the coagulation of blood.

Infection fighters

Leukocytes (also called **white blood cells** or WBCs) are formed in the bone marrow and lymphatic tissue and include granulocytes and agranulocytes. WBCs provide immunity and protection from infection by phagocytosis (engulfing, digesting, and destroying microorganisms).

Liquid partner

Plasma is the liquid portion of the blood, and its composition is water, protein (albumin and globulin), glucose, and electrolytes.

Memory jogger

Think **PLATE** to remember key blood components:

Plasma
Leukocytes
AB antigens
Thrombocytes
Erythrocytes.

Of donors and recipients

A person's **blood type** is determined by a system of antigens located on the surface of RBCs. The four blood types are:

- A antigen
- B antigen
- AB (both A and B) antigens
- O (no antigens).

Because group O blood lacks both A and B antigens, it can be transfused in limited amounts in an emergency to any patient, regardless of the recipient's blood type, with little risk of adverse reaction. That's why people with group O blood are called universal donors. A person with AB blood type has neither anti-A nor anti-B antibodies. This person may receive A, B, AB, or O blood, which makes him a universal recipient.

In addition, the antigen Rh factor is found on the RBCs of approximately 85% of people. A person with the Rh factor is Rh positive. A person without the factor is Rh negative. A person may only receive blood from a person with the same Rh factor.

T time

In cell-mediated immunity, T cells respond directly to antigens (foreign substances, such as bacteria or toxins, that induce antibody formation). This response involves destruction of target cells—such as virus-infected cells and cancer cells—through secretion of lymphokines (lymph proteins). Examples of cell-mediated immunity are rejection of transplanted organs and delayed immune responses that fight disease.

About 80% of blood cells are T cells. They probably originate from stem cells in the bone marrow; the thymus gland controls their maturity. In the process, a large number of antigen-specific cells are produced.

Killer, helper, or suppressor

T cells can be killer, helper, or suppressor T cells:

- Killer cells bind to the surface of the invading cell, disrupt the membrane, and destroy it by altering its internal environment.
- Helper cells stimulate B cells to mature into plasma cells, which begin to synthesize and secrete immunoglobulin (Ig; proteins with known antibody activity).
- Suppressor cells reduce the humoral response.

Don't forget B cells

B cells act in a different way than T cells to recognize and destroy antigens. B cells are responsible for humoral or Ig-mediated immunity. B cells originate in the bone marrow and mature into plasma cells that produce antibodies (Ig molecules that interact with a specific antigen). Antibodies destroy bacteria and viruses, thereby preventing them from entering host cells.

A word about immunoglobulins

Five major classes of Ig exist:

- IgG makes up about 80% of plasma antibodies. It appears in all body fluids and is the major antibacterial and antiviral antibody.
- IgM is the first Ig produced during an immune response. It's too large to easily cross membrane barriers and is usually present only in the vascular system.
- IgA is found mainly in body secretions, such as saliva, sweat, tears, mucus, bile, and colostrum. It defends against pathogens on body surfaces, especially those that enter the respiratory and GI tracts.
- IgD is present in plasma and is easily broken down. It's the predominant antibody on the surface of B cells and is mainly an antigen receptor.
- IgE is the antibody involved in immediate hypersensitivity reactions, or allergic reactions that develop within minutes of exposure to an antigen. IgE stimulates the release of mast cell granules, which contain histamine and heparin.

Keep abreast of diagnostic tests

Here are some important tests used to diagnose hematologic and immune disorders, along with common nursing actions associated with each test.

Blood sample study #1

A **blood chemistry test** uses a blood sample to measure potassium, sodium, calcium, blood urea nitrogen (BUN), creatinine, protein, albumin, and bilirubin levels.

Nursing actions

- Before the procedure, withhold food and fluids as directed.
- After the procedure, check the venipuncture site for bleeding.
- Handle the sample gently to prevent hemolysis.

Blood sample study #2

A **hematologic study** uses a blood sample to analyze WBCs, RBCs, erythrocyte sedimentation rate (ESR), Hb, hematocrit (HCT), platelet count, red cell indices, Hb electrophoresis, iron and total iron binding capacity, sickle cell test, and CD4 cell count.

Nursing actions

- Before the procedure, note the patient's current drug therapy.
- After the procedure, check the venipuncture site for bleeding.

Check on immune status

Immunologic studies use a small sample of blood to analyze rheumatoid factor, lupus erythematosus cell preparation, antinuclear antibodies, and serum protein electrophoresis.

Nursing actions

- Before the procedure, note the patient's current drug therapy.
- After the procedure, check the venipuncture site for bleeding.

HIV detector

Enzyme-linked immunosorbent assay (ELISA) uses a blood sample to detect the human immunodeficiency virus (HIV) antibody.

Nursing actions

Before the procedure

- Verify that informed consent has been obtained and documented.
- Provide the patient with appropriate pretest counseling.

After the procedure

- Check the venipuncture site for bleeding.

Confirming the diagnosis

A **Western blot test** uses a blood sample to detect the presence of specific viral proteins to confirm HIV infection.

Nursing actions

Before the procedure

- Verify that informed consent has been obtained and documented.
- Provide the patient with appropriate pretest counseling.

After the procedure

- Check the venipuncture site for bleeding.

Small specimen

A **urine test** uses a small specimen of urine to analyze hemosiderin and Hb.

Nursing actions

- Collect a random urine specimen of about 30 ml.

Radiographic snapshot

A **lymphangiography** involves an injection of radiopaque dye through a catheter, which provides a radiographic picture of the lymphatic system and the dissection of lymph vessels.

Nursing actions

Before the procedure

- Note the patient's allergies to iodine, seafood, and radiopaque dyes.
- Inform the patient of possible throat irritation and flushing of his face after injection of the dye.
- Make sure that written, informed consent has been obtained.
- Withhold food and fluids as directed.

After the procedure

- Monitor vital signs and peripheral pulses.
- Check the catheter insertion site for bleeding.
- Encourage oral fluids.
- Advise the patient that skin, stool, and urine will have a blue discoloration for about 48 hours following the procedure.

Marrow removal

A **bone marrow examination,** also called aspiration or biopsy, involves the percutaneous removal of bone marrow and an examination of RBCs, WBCs, thrombocytes, and precursor cells.

Nursing actions

Before the procedure

- Make sure that written, informed consent has been obtained.
- Determine the patient's ability to lie still during the procedure.
- Tell the patient that he may experience a burning sensation as the bone marrow is aspirated.

After the procedure

- Maintain pressure dressing.
- Check the aspiration site for bleeding and infection.
- Maintain bed rest as ordered.

Swallow this and wait

A **Schilling test** involves the administration of an oral radioactive cyanocobalamin and an intramuscular cyanocobalamin. Following this is microscopic examination of a 24-hour urine specimen for cyanocobalamin (vitamin B_{12}).

Nursing actions

- Withhold food and fluids for 12 hours before the test.
- Withhold laxatives during the test.
- After the test, instruct the patient to save all voided urine for 24 hours and to keep the urine at room temperature.

What's in the stomach?

Gastric analysis involves the aspiration of stomach contents through a nasogastric (NG) tube. A fasting analysis of gastric secretions is then performed to measure acidity and to diagnose pernicious anemia.

Nursing actions

Before the procedure

- Withhold food and fluids for 12 hours.
- Instruct the patient not to smoke or chew gum for at least 8 hours before the test.
- Withhold medications that can affect gastric secretions.

After the procedure

- Obtain vital signs.
- Assess for reactions to gastric acid stimulant, if used.

No red meats or turnips

A **fecal occult blood test** involves a microscopic analysis of Hb to detect occult blood in stool.

Nursing actions

- Before the test, instruct the patient to maintain a high-fiber diet and to refrain from eating red meats, beets, turnips, and horseradish for 48 to 72 hours.
- Tell the patient that the test requires collection of three stool specimens.
- Withhold iron preparations, iodides, rauwolfia derivatives, indomethacin, colchicine, salicylates, phenylbutazone, steroids, and ascorbic acid for 48 hours before the test and throughout the collection period.

RBC longevity measure

Erythrocyte life span determination involves a reinjection of the patient's blood that has been tagged with chromium 51. Its purpose is to measure the life span of circulating RBCs.

Nursing actions

- Inform the patient that frequent blood samples will be drawn over a 2-week period.
- Check the venipuncture site for bleeding.
- Apply a pressure dressing to the venipuncture site after the procedure.

Balancing act

The **Romberg test** is a physical test in which the patient stands with his feet together, his eyes open, and his arms at either side while the examiner stands and protects the patient from falling. The patient is then asked to close his eyes. If he loses his balance or sways to one side, the Romberg test is positive. This is done to assess loss of balance in pernicious anemia.

Nursing actions

- Explain the procedure to the patient.
- Monitor the patient for imbalance.

• Prevent the patient from falling.

How fast does it burst?

In the **erythrocyte fragility test,** a blood sample is used to measure the rate at which RBCs burst in varied hypotonic solutions.

Nursing actions

• Explain the procedure to the patient.
• After the procedure, check the venipuncture site for bleeding.
• Send the sample to the laboratory.

Bone picture

A **bone scan** permits imaging of the skeleton by a scanning camera after I.V. injection of a radioisotope. This creates a visual image of bone metabolism.

Nursing actions

Before the procedure
• Verify that informed consent has been obtained and documented.
• Determine the patient's ability to lie still for approximately 1 hour.
• Advise the patient to drink lots of fluids to maintain hydration and reduce the radiation dose to the bladder. (Have the patient do this during the interval between the injection of the tracer and the actual scanning.)
After the procedure
• Check the injection site for redness or swelling.
• Avoid scheduling any other radionuclide test for 24 to 48 hours.
•Tell the patient to drink lots of fluids and to empty his bladder frequently for 24 to 48 hours.
• Provide analgesics for pain resulting from positioning on the scanning table, as needed.

Clot measure

A **coagulation study** tests a blood sample to analyze platelet function, prothrombin time (PT), International Normalized Ratio, partial thromboplastin time (PTT), coagulation time, and bleeding time.

Nursing actions

• Note the patient's current drug therapy before the procedure.
• Check the venipuncture site for bleeding after the procedure.

Polish up on patient care

Most NCLEX questions focus on what a nurse should do in a specific situation. Always look for the patient care angle.

Major hematologic and immune disorders include acquired immunodeficiency syndrome (AIDS), anaphylaxis, ankylosing spondylitis, aplastic anemia, calcium imbalance, chloride imbalance, disseminated intravascular coagulation (DIC), hemophilia, iron deficiency anemia, Kaposi's sarcoma, leukemia, lymphoma, magnesium imbalance, metabolic acidosis, metabolic alkalosis, multiple myeloma, pernicious anemia, phosphorus imbalance, polycythemia vera, rheumatoid arthritis, scleroderma, septic shock, sickle cell anemia, sodium imbalance, systemic lupus erythematosus (SLE), and vasculitis.

Acquired immunodeficiency syndrome

AIDS is a defect in T-cell–mediated immunity caused by HIV. AIDS places a patient at significant risk for developing potentially fatal opportunistic infections. A diagnosis of AIDS is based on laboratory evidence of HIV infection coexisting with one or more indicator diseases, such as herpes simplex virus, cytomegalovirus, mycobacterial, or candidal infection; *Pneumocystis carinii* pneumonia; Kaposi's sarcoma; wasting syndrome; or dementia.

CAUSES

• Exposure to blood containing HIV: transfusions, tissue transplantation, contaminated needles, handling of blood
• Exposure to semen and vaginal secretions containing HIV: unprotected sexual intercourse, handling of semen and vaginal secretions
• Transmission from an infected mother across the placental barrier to the fetus

• Transmission from an infected mother to the neonate through contact with the cervix or maternal blood during delivery
• Transmission from an infected mother to the neonate through breast milk

DATA COLLECTION FINDINGS

• Anorexia, weight loss, recurrent diarrhea
• Disorientation, confusion, dementia
• Fatigue and weakness
• Fever
• Lymphadenopathy
• Signs and symptoms of poor nutrition
• History of night sweats
• History of opportunistic infections
• Pallor

Combination therapy to treat HIV and AIDS usually includes nonnucleoside reverse transcriptase inhibitors, nucleoside reverse transcriptase inhibitors, and protease inhibitors.

DIAGNOSTIC FINDINGS

• Blood chemistry shows increased transaminase, alkaline phosphatase, and gamma globulin levels and a decreased albumin level.
• $CD4^+$ T-cell level is less than 200 cells/µl.
• ELISA shows positive HIV antibody titer.
• Hematology shows decreased WBCs, RBCs, and platelets.
• Western blot test is positive.

NURSING DIAGNOSES

• Ineffective protection
• Hopelessness
• Social isolation

TREATMENT

• Activity: as tolerated, active and passive range-of-motion (ROM) exercises
• Diet: high calorie, high protein in small, frequent feedings
• Nutritional support: total parenteral nutrition (TPN), enteral feedings if needed
• Respiratory treatments: chest physiotherapy, postural drainage, and incentive spirometry
• Specialized bed: air therapy bed
• Standard precautions
• Transfusion therapy: fresh frozen plasma, platelets, and packed RBCs

Drug therapy

• Antibiotic: co-trimoxazole (Bactrim) for opportunistic infections
• Antifungals: fluconazole (Diflucan), amphotericin B (Fungizone) for opportunistic infections
• Antiprotozoal agent: pentamidine (NebuPent)
• Interferon alfa-2a, recombinant (Roferon-A)
• Antineoplastics: to combat associated cancers

Combination drug therapy to fight HIV

Highly active antiretroviral therapy combines three or more antiretroviral medications in a daily regimen. The Food and Drug Administration has approved four classes of antiretroviral drugs:
• Nonnucleoside reverse transcriptase inhibitors: delavirdine (Rescriptor), nevirapine (Viramune), efavirenz (Sustiva)
• Nucleoside reverse transcriptase inhibitors: lamivudine (Epivir), zalcitabine (Hivid), zidovudine (Retrovir), abacavir (Ziagen), didanosine (Videx), emtricitabine (Emtriva), stavudine (Zerit), tenofovir (Viread)
• Protease inhibitors: indinavir (Crixivan), nelfinavir (Viracept), ritonavir (Norvir), saquinavir (Invirase), amprenavir (Agenerase), atazanavir (Reyataz), fosamprenavir (Lexiva)
• Fusion inhibitor: enfuvirtide (Fuzeon)

INTERVENTIONS AND RATIONALES

• Monitor respiratory status *to detect signs of hypoxia.*
• Monitor neurologic status *to detect AIDS-related dementia.*
• Monitor and record vital signs *to detect evidence of compromise.*
• Monitor for opportunistic infections *because early treatment may limit complications.*
• Administer oxygen *to enhance oxygenation.*
• Provide incentive spirometry and assist with turning, coughing, and deep breathing *to mobilize and remove secretions.*
• Encourage fluids or maintain I.V. fluids *to prevent dehydration.*
• Maintain the patient's diet *to fight opportunistic infection and maintain weight.*
• Maintain TPN and enteral feedings, if necessary, *to bolster nutritional reserves and the immune system.*

• Administer medications, as prescribed, *to reduce the risk of complications and halt reproduction of HIV.*
• Maintain activity, as tolerated, *to encourage independence.*
• Provide rest periods *to reduce oxygen demands and prevent fatigue.*
• Provide mouth care *to prevent infection, provide comfort, and enhance taste of meals.*
• Maintain standard precautions *to avoid exposure to blood, body fluids, and secretions.*
• Encourage the patient to express feelings about changes in body image, a fear of dying, and social isolation *to help him cope with chronic illness and reduce anxiety.*
• Suggest community agencies for support *to enhance quality of life and independence.*
• Monitor intake and output, daily weight, and urine specific gravity *for early recognition and treatment of dehydration.*

Teaching topics

• Refraining from donating blood
• Avoiding use of alcohol and recreational drugs
• Using latex condoms during sexual intercourse
• Practicing safer sex practices
• If using I.V. drugs, cleaning drug paraphernalia with bleach
• Taking prescribed medication exactly as prescribed for as long as prescribed

Anaphylaxis

Anaphylaxis is a dramatic and widespread acute atopic reaction. It's marked by the sudden onset of rapidly progressive urticaria and respiratory distress. The severity of the reaction is inversely related to the interval between the exposure to an allergen and the onset of symptoms—the longer the interval, the less severe the reaction. A severe anaphylactic reaction may cause vascular collapse, leading to systemic shock and, sometimes, death.

CAUSES

Systemic exposure to or ingestion of sensitizing drugs or other substances, such as:
• allergen extracts
• diagnostic chemicals (sulfobromophthalein, sodium dehydrocholate, and radiographic contrast media)
• enzymes (such as L-asparaginase)
• foods (legumes, nuts, berries, seafood, and egg albumin) and sulfite-containing food additives
• hormones
• insect venom (honeybees, wasps, hornets, yellow jackets, fire ants, mosquitoes, and certain spiders)
• local anesthetics
• penicillin and other antibiotics
• polysaccharides
• ruptured hydatid cyst (rarely)
• salicylates
• serums (usually horse serum)
• sulfonamides
• vaccines.

DATA COLLECTION FINDINGS

• Cardiovascular symptoms (hypotension, shock, cardiac arrhythmias) that may precipitate circulatory collapse if untreated
• Sudden physical distress within seconds or minutes after exposure to an allergen (may include feeling of impending doom or fright, weakness, sweating, sneezing, shortness of breath, nasal pruritus, urticaria, and angioedema, followed rapidly by symptoms in one or more target organs)
• GI and genitourinary (GU) symptoms (severe stomach cramps, nausea, diarrhea, urinary urgency and incontinence)
• Respiratory symptoms (nasal mucosal edema; profuse, watery rhinorrhea; itching; nasal congestion; sudden sneezing attacks; edema of upper respiratory tract that causes hoarseness, stridor, and dyspnea [early sign of acute respiratory failure])

DIAGNOSTIC FINDINGS

• Anaphylaxis can be diagnosed by the rapid onset of severe respiratory or cardiovascular symptoms after ingestion or injection of a drug, vaccine, diagnostic agent, food, or food additive, or after an insect sting.
• If symptoms occur without a known allergic stimulus, other possible causes of shock (such as acute myocardial infarction [MI],

status asthmaticus, or heart failure) need to be ruled out.

NURSING DIAGNOSES

- Risk for suffocation
- Decreased cardiac output
- Anxiety

TREATMENT

- Cardiopulmonary resuscitation (CPR) in case of cardiac arrest
- Endotracheal (ET) tube insertion or a tracheotomy and oxygen therapy in case of laryngeal edema
- Other therapy as indicated by clinical response

Drug therapy

- Immediate subcutaneous (subQ) injection of epinephrine 1:1,000 aqueous solution, 0.1 to 0.5 ml, repeated every 10 to 15 minutes as necessary
- Other medications given after initial emergency (may include subQ epinephrine, longer-acting epinephrine, corticosteroids, diphenhydramine [Benadryl] I.V. for long-term management)
- Vasopressors: norepinephrine (Levophed), phenylephrine (Neo-Synephrine), and dopamine (Intropin), if hypotensive

INTERVENTIONS AND RATIONALES

- In the early stages of anaphylaxis, give epinephrine I.M. or subQ and help it move into the circulation faster by massaging the injection site. In severe reactions, give epinephrine I.V. *to prevent crisis.*
- Maintain airway patency. Observe for early signs of laryngeal edema (stridor, hoarseness, and dyspnea), and prepare for ET tube insertion or a tracheotomy and oxygen therapy *to prevent cerebral anoxia.*
- In case of cardiac arrest, begin CPR, including closed-chest heart massage and assisted ventilation, as well as other therapy as indicated by clinical response. *These measures are necessary to prevent irreversible organ damage.*
- Monitor blood pressure and urine output *to monitor response to treatment.*
- After the initial emergency, administer other medications, such as subQ epinephrine, longer-acting epinephrine, corticosteroids, and diphenhydramine, for long-term management *to prevent recurrence of symptoms.*
- If a patient must receive a drug to which he's allergic, make sure he receives careful desensitization with gradually increasing doses of the antigen or advance administration of steroids *to prevent a severe reaction.*
- A person with a known history of allergies should receive a drug with a high anaphylactic potential only after cautious pretesting for sensitivity. Closely monitor the patient during testing and make sure that resuscitative equipment and epinephrine are ready *to prevent a severe reaction that may lead to cardiopulmonary arrest.*
- When any patient needs a drug with high anaphylactic potential (particularly parenteral drugs), make sure he receives each dose under close medical observation *to prevent a severe reaction.*
- Closely monitor a patient undergoing diagnostic tests that use radiographic contrast dyes, such as cardiac catheterization, excretory urography, and angiography, *to detect early signs of anaphylaxis.*

Teaching topics

- Understanding risks of delayed symptoms and need to report any recurrence of shortness of breath, chest tightness, sweating, angioedema, or other symptoms
- Preventing anaphylaxis (avoiding exposure to known allergens, including all forms of the offending food or drug; avoiding open fields and wooded areas during the insect season in case of reaction to insect bite or sting; carrying an anaphylaxis kit containing epinephrine, an antihistamine, and a tourniquet)
- Wearing a medical identification bracelet identifying the patient's allergies
- Using emergency medication such as epinephrine (Epi-Pen)

Ankylosing spondylitis

Ankylosing spondylitis is a chronic, usually progressive inflammatory disease that primarily affects the spine and adjacent soft tissue. Generally, the disease begins in the sacroiliac joints (between the sacrum and the ileum) and gradually progresses to the lumbar, thoracic, and cervical regions of the spine. Deterioration of bone and cartilage can lead to fibrous tissue formation and eventual fusion of the spine or peripheral joints. Symptoms may progress unpredictably; the disease can go into remission, exacerbation, or arrest at any stage.

Ankylosing spondylitis affects five times as many males as females. Progressive disease is well recognized in men, but the diagnosis is commonly overlooked in women, who tend to have more peripheral joint involvement.

CAUSES

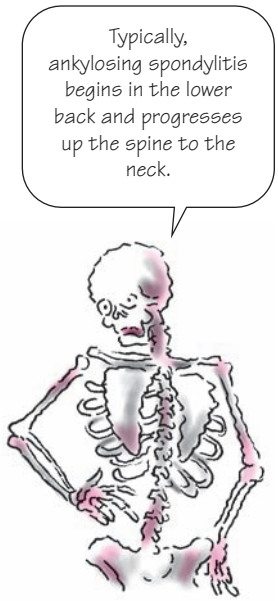
- Familial tendency strongly suggested
- Possible link to underlying infection
- Presence of histocompatibility antigen HLA-B27 and circulating immune complexes suggests immunologic activity
- If secondary, may be associated with reactive arthritis (Reiter's syndrome), psoriatic arthritis, or inflammatory bowel disease

DATA COLLECTION FINDINGS

- Intermittent lower back pain (the first indication) usually most severe in morning or after period of inactivity
- Kyphosis in advanced stages and associated limited ROM
- Mild fatigue, fever, anorexia, or loss of weight; unilateral acute anterior uveitis
- Pain and limited expansion of the chest
- Pain or tenderness at tendon insertion sites (enthesitis), especially the Achilles or patellar tendon
- Peripheral arthritis involving the shoulders, hips, and knees
- Signs and symptoms of severe neurologic complications, such as cauda equina syndrome or paralysis, secondary to fracture of a rigid cervical spine or C1-C2 subluxation
- Stiffness and limited motion of the lumbar spine
- Tenderness over the site of inflammation

DIAGNOSTIC FINDINGS

- Confirmation requires characteristic X-ray findings: blurring of the bony margins of joints in the early stage, bilateral sacroiliac involvement, patchy sclerosis with superficial bony erosions, eventual squaring of vertebral bodies, and "bamboo spine" with complete ankylosis.
- ESR and alkaline phosphatase and creatine kinase levels may be slightly elevated. A negative rheumatoid factor helps rule out rheumatoid arthritis, which produces similar symptoms.
- Typical symptoms, a family history, and the presence of HLA-B27 strongly suggest ankylosing spondylitis.



NURSING DIAGNOSES

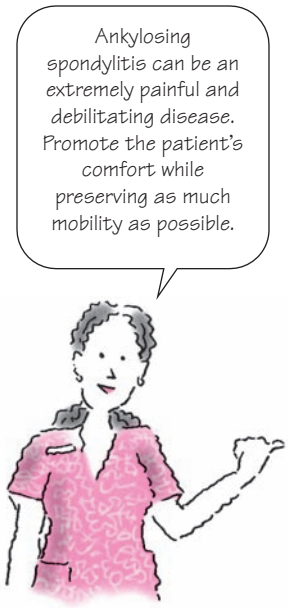
- Chronic pain
- Impaired physical mobility
- Activity intolerance

TREATMENT

- Good posture, stretching and deep-breathing exercises and, in some patients, braces and lightweight supports to delay further deformity
- Long-term daily exercise program
- Spinal wedge osteotomy to separate and reposition vertebrae in case of severe spinal involvement (performed only on selected patients because of risk of spinal cord damage and long convalescence)
- Surgical hip replacement in case of severe hip involvement

Drug therapy

- Anti-inflammatory agents: aspirin, ibuprofen (Motrin), indomethacin (Indocin), sulfasalazine (Azulfidine), sulindac (Clinoril) to control pain and inflammation
- Cyclo-oxygenase-2 (Cox-2)-inhibitor: celecoxib (Celebrex)
- Tumor necrosis factor alpha inhibitor: etanercept (Enbrel)



INTERVENTIONS AND RATIONALES

- Offer support and reassurance. *Ankylosing spondylitis can be an extremely painful and crippling disease; the caregiver's main responsibility is to promote the patient's comfort while preserving as much mobility as possible.* Keep in mind that the patient's limited ROM makes simple tasks difficult.
- Administer medications as needed, *to decrease inflammation and pain.*
- Apply local heat and provide massage *to relieve pain.* Evaluate mobility and degree of discomfort frequently *to monitor for disease progression.*
- Teach and assist with daily exercises, as needed, *to maintain strength and function.* Stress the importance of maintaining good posture *to prevent kyphosis.*
- If treatment includes surgery, provide postoperative care *to prevent such postoperative complications as wound infection, thrombophlebitis, and pneumonia.*

Teaching topics

- Avoiding any physical activity that places undue stress on the back, such as lifting heavy objects
- Standing upright; sitting upright in a high, straight chair; and avoiding leaning over a desk
- Sleeping in a prone position on a hard mattress and avoiding use of pillows under the neck or knees
- Avoiding prolonged walking, standing, sitting, or driving
- Performing regular stretching and deep-breathing exercises and swimming regularly, if possible
- Having height measured every 3 to 4 months to detect any tendency toward kyphosis
- Seeking vocational counseling if the patient's work requires standing or prolonged sitting at a desk
- Contacting the local Arthritis Foundation chapter for a support group or the Spondylitis Association of America

Aplastic anemia

Aplastic anemia, also known as pancytopenia, results from suppression, destruction, or aplasia of the bone marrow. This damage to the bone marrow makes it unable to produce adequate amounts of erythrocytes, leukocytes, and platelets.

CAUSES

- Chemotherapy
- Drug-induced from chloramphenicol (Chloromycetin) or phenytoin (Dilantin)
- Exposure to chemicals
- Idiopathic
- Radiation
- Viral hepatitis

DATA COLLECTION FINDINGS

- Anorexia
- Dyspnea, tachypnea
- Epistaxis
- Fever
- Fatigue, weakness
- Gingivitis
- Headache
- Bleeding from gums, rectum, or vagina
- Melena
- Palpitations, tachycardia
- Purpura, petechiae, ecchymosis, pallor

DIAGNOSTIC FINDINGS

- Bone marrow biopsy shows a decrease in activity or no cell production.
- Fecal occult blood test is positive.
- Hematology shows decreased granulocytes, thrombocytes, and RBCs.
- Peripheral blood smear shows pancytopenia.
- Urine chemistry reveals hematuria.

NURSING DIAGNOSES

- Activity intolerance
- Risk for deficient fluid volume
- Risk for infection

TREATMENT

- Reversal of the underlying cause
- Bone marrow transplantation
- Transfusion of platelets and packed RBCs

Drug therapy

- Analgesic: acetaminophen (Tylenol)
- Androgens: fluoxymesterone (Halotestin), oxymetholone (Anadrol-50)
- Antibiotics: according to the sensitivity of the infecting organism
- Antithymocyte globulin (Atgam)
- Hematopoietic growth factor: epoetin alfa (Epogen)
- Human granulocyte colony-stimulating factor: filgrastim (Neupogen)

INTERVENTIONS AND RATIONALES

- Monitor respiratory status *to detect hypoxemia caused by low Hb levels.*
- Monitor vital signs *for signs of hemorrhage, infection, and activity intolerance.*
- Monitor and record intake and output and urine specific gravity *to determine fluid balance.*
- Check stool, urine, and vomitus *for occult blood loss caused by reduced platelet levels.*
- Monitor for infection, bleeding, and bruising *caused by reduced levels of WBCs and platelets.*
- Encourage fluids and maintain I.V. fluids *to replace fluids lost by fever and bleeding.*
- Administer oxygen to improve tissue oxygenation *because low Hb levels reduce the oxygen-carrying capacity of the blood.*
- Assist with turning, coughing, and deep breathing *to mobilize and remove secretions.*
- Monitor transfusion therapy, as prescribed, *to replace low blood components.*
- Administer medications, as prescribed, *to treat the patient's disorder and prevent complications.*
- Maintain the patient's diet *to promote RBC production and fight infection.*
- Encourage verbalization of concerns and fears *to allay the patient's anxiety.*
- Alternate rest periods with activity *to conserve energy and reduce weakness caused by anemia.*
- Provide cooling blankets and tepid sponge baths for fever *to promote comfort and reduce metabolic demands.*
- Maintain protective precautions *to prevent infection and hemorrhage.*
- Provide mouth care before and after meals *to enhance the taste of meals.*
- Provide skin care *to prevent skin breakdown due to bed rest, dehydration, and fever.*
- Protect the patient from falls *to reduce the risk of hemorrhage.*
- Avoid giving the patient I.M. injections *to reduce the risk of hemorrhage.*
- Avoid using hard toothbrushes and straight razors on the patient *to reduce the risk of hemorrhage.*

Teaching topics

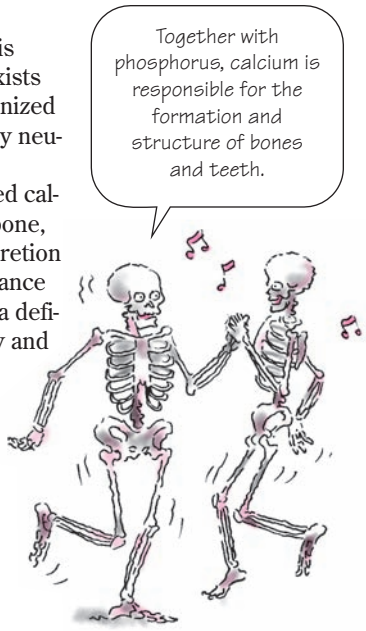
- Recognizing the early signs and symptoms of bleeding and infection
- Avoiding contact sports
- Wearing a medical identification bracelet
- Refraining from using over-the-counter (OTC) medications
- Monitoring stool for occult blood
- Using an electric razor to avoid bleeding
- Refraining from taking aspirin or nonsteroidal anti-inflammatory drugs (NSAIDs)

Calcium imbalance

Calcium plays an indispensable role in cell permeability, formation of bones and teeth, blood coagulation, transmission of nerve impulses, and normal muscle contraction.

Nearly all (99%) of the body's calcium is found in the bones. The remaining 1% exists in ionized form in serum; maintaining ionized calcium in the serum is critical to healthy neurologic function.

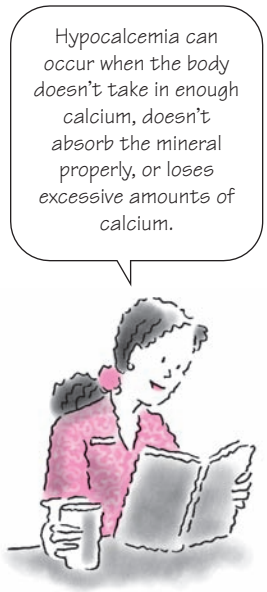
The parathyroid glands regulate ionized calcium and determine its resorption into bone, absorption from the GI mucosa, and excretion in urine and stool. Severe calcium imbalance requires emergency treatment because a deficiency (hypocalcemia) can lead to tetany and seizures; an excess (hypercalcemia), to cardiac arrhythmias and coma.



CAUSES

Hypocalcemia

- Hypomagnesemia
- Hypoparathyroidism



- Inadequate intake of calcium and vitamin D
- Malabsorption or loss of calcium from the GI tract
- Overcorrection of acidosis
- Pancreatic insufficiency
- Renal failure
- Severe infections or burns

Hypercalcemia

- Hyperparathyroidism
- Hypervitaminosis D
- Multiple fractures and prolonged immobilization
- Multiple myeloma
- Tumors
- Other causes (milk-alkali syndrome, sarcoidosis, hyperthyroidism, adrenal insufficiency, and thiazide diuretics)

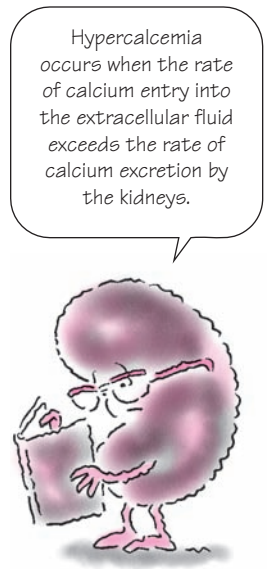
DATA COLLECTION FINDINGS

Hypocalcemia

- Cardiac arrhythmias
- Carpopedal spasm
- Chvostek's sign
- Perioral paresthesia
- Seizures
- Tetany
- Trousseau's sign
- Twitching

Hypercalcemia

- Anorexia
- Cardiac arrhythmias and eventual coma with severe hypercalcemia (serum levels greater than 5.7 mEq/L)
- Constipation
- Decreased muscle tone
- Dehydration
- Lethargy
- Muscle weakness
- Nausea
- Polydipsia
- Polyuria
- Vomiting



DIAGNOSTIC FINDINGS

- A serum calcium level less than 4.5 mEq/L confirms hypocalcemia; a level greater than 5.5 mEq/L confirms hypercalcemia. (Because approximately one-half of serum calcium is bound to albumin, changes in serum protein must be considered when interpreting serum calcium levels.)
- Sulkowitch urine test shows increased urine calcium precipitation in hypercalcemia.
- Electrocardiogram (ECG) reveals a lengthened QT interval, a prolonged ST segment, and arrhythmias in hypocalcemia; in hypercalcemia, a shortened QT interval and heart block.

NURSING DIAGNOSES

Hypocalcemia

- Imbalanced nutrition: Less than body requirements
- Acute pain

Hypercalcemia

- Impaired physical mobility
- Impaired urinary elimination

TREATMENT

Hypocalcemia

- Diet: adequate intake of calcium, vitamin D, and protein

Drug therapy

- Ergocalciferol (vitamin D_2), cholecalciferol (vitamin D_3), calcitriol (Rocaltrol), dihydrotachysterol (synthetic form of vitamin D_2) for severe deficiency
- Immediate correction by I.V. calcium gluconate or calcium chloride for acute hypocalcemia (an emergency)
- Vitamin D in multivitamin preparation for mild hypocalcemia
- Vitamin D supplements to facilitate GI absorption of calcium to treat chronic hypocalcemia

Hypercalcemia

- Hydration with normal saline solution to eliminate excess serum calcium through urine excretion
- Diet: Low calcium with increased oral fluid intake

Drug therapy

- Calcitonin (Calcimar)
- Corticosteroids: prednisone (Deltasone), hydrocortisone (Solu-Cortef) for treating sarcoidosis, hypervitaminosis D, and certain tumors
- Loop diuretics: ethacrynic acid (Edecrin), furosemide (Lasix) to promote calcium excretion (thiazide diuretics are contraindicated in hypercalcemia because they inhibit calcium excretion)
- Plicamycin (Mithracin) to lower serum calcium level (especially in hypercalcemia secondary to certain tumors)
- Sodium phosphate solution administered by mouth or by retention enema (promotes calcium deposits in bone and inhibits absorption from GI tract)

INTERVENTIONS AND RATIONALES

- Watch for hypocalcemia in patients receiving massive transfusions of citrated blood and in those with chronic diarrhea, severe infections, and insufficient dietary intake of calcium and protein (especially elderly patients). *Identifying patients at risk can ensure early treatment.*

For hypocalcemia

- Monitor serum calcium levels every 12 to 24 hours; a calcium level below 4.5 mEq/L requires immediate attention. When giving calcium supplements, frequently check the pH level; an alkalotic state that exceeds 7.45 pH inhibits calcium ionization. Check for Trousseau's and Chvostek's signs, *which indicate hypocalcemia.*
- When the patient is receiving calcium solutions, watch for anorexia, nausea, and vomiting, *which are possible signs of overcorrection to hypercalcemia.*
- Monitor the patient closely for a possible drug interaction if he's receiving digoxin (Lanoxin) with large doses of oral calcium supplements. *Administration of digoxin concomitantly with calcium supplements may cause synergistic effects of digoxin that precipitate arrhythmias.* Watch for signs of digoxin toxicity (anorexia, nausea, vomiting, yellow vision, and cardiac arrhythmias). Administer oral calcium supplements 1 to 1½ hours after meals or with milk *to promote absorption.*
- Provide a quiet, stress-free environment for the patient with tetany *to prevent seizure activity.* Observe seizure precautions for patients with severe hypocalcemia that may lead to seizures, *to prevent patient injury.*

For hypercalcemia

- Monitor serum calcium levels frequently. Increase fluid intake *to dilute calcium in serum and urine and to prevent renal damage and dehydration.*
- Watch for signs of heart failure in patients receiving normal saline solution diuresis therapy. *Infusion of large volumes of normal saline may cause excess fluid volume, leading to heart failure.*
- Monitor intake and output, and check the urine for renal calculi and acidity. Provide acid-ash drinks, such as cranberry or prune juice, *because calcium salts are more soluble in acid than in alkali.*
- Check the patient's vital signs frequently. In the patient receiving cardiac glycosides, watch for signs of toxicity, such as anorexia, nausea, vomiting, and bradycardia (often with arrhythmias). *Fatal arrhythmias may result when digoxin is administered in hypercalcemia.*
- Help the patient walk as soon as possible. Handle the patient with chronic hypercalcemia gently *to prevent pathologic fractures.*
- If the patient is bedridden, reposition him frequently and encourage ROM exercises *to promote circulation and prevent urinary stasis and calcium loss from bone.*

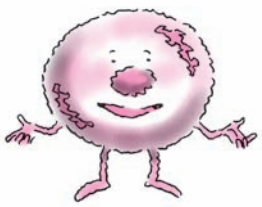
Teaching topics

- Stressing the importance of calcium for normal bone formation and blood coagulation
- Eating foods rich in calcium, vitamin D, and protein, such as fortified milk and cheese, to prevent hypocalcemia
- Avoiding chronic laxative use and overuse of antacids to prevent hypocalcemia
- Eating a low-calcium diet and increasing fluid intake to prevent recurrence of hypercalcemia

Because nearly one-half of all calcium is bound to the protein albumin, serum protein abnormalities can influence total serum calcium levels.

Take note! Calcium supplements may cause synergistic effects in patients taking digoxin.

Chloride is quite an anion. It helps maintain acid-base balance and assists in carbon dioxide transport in red blood cells.



Chloride imbalance

Hypochloremia and hyperchloremia are, respectively, conditions of deficient or excessive serum levels of the anion chloride (an anion is a negatively charged ion). Chloride appears predominantly in extracellular fluid (ECF; fluid outside the cells) and accounts for two-thirds of all serum anions.

Secreted by stomach mucosa as hydrochloric acid, chloride provides an acid medium conducive to digestion and activation of enzymes. It also participates in maintaining acid-base and body water balances, influences the osmolality or tonicity of ECF, plays a role in the exchange of oxygen and carbon dioxide in RBCs, and helps activate salivary amylase (which, in turn, activates the digestive process).

CAUSES

Hypochloremia

- Administration of dextrose I.V. without electrolytes
- Loss of hydrochloric acid in gastric secretions from vomiting, gastric suctioning, or gastric surgery
- Low dietary sodium intake
- Metabolic alkalosis
- Potassium deficiency
- Prolonged diarrhea or diaphoresis
- Sodium deficiency

Hyperchloremia

- Hyperingestion of ammonium chloride
- Ureterointestinal anastomosis, which can lead to hyperchloremia by allowing reabsorption of chloride by the bowel

Sodium imbalance? Or chloride imbalance? These two conditions commonly produce similar data collection findings, such as muscle twitching, weakness, and dyspnea.

DATA COLLECTION FINDINGS

Hypochloremia

- Muscle hypertonicity (in conditions related to loss of gastric secretions)
- Muscle weakness
- Shallow, depressed breathing
- Tetany
- Twitching

Hyperchloremia

- Agitation
- Coma
- Deep, rapid breathing
- Diminished cognitive ability
- Dyspnea
- Hypertension
- Pitting edema
- Tachycardia
- Weakness

DIAGNOSTIC FINDINGS

- Serum chloride level less than 98 mEq/L confirms hypochloremia; supportive values with metabolic alkalosis include a serum pH greater than 7.45 and a serum carbon dioxide level greater than 32 mEq/L.
- Serum chloride level greater than 108 mEq/L confirms hyperchloremia; with metabolic acidosis, serum pH is less than 7.35 and the serum carbon dioxide level is less than 22 mEq/L.

NURSING DIAGNOSES

Hypochloremia

- Ineffective breathing pattern
- Risk for injury

Hyperchloremia

- Excess fluid volume
- Disturbed thought processes

TREATMENT

Hypochloremia

- Diet: salty broth
- Saline solution I.V.

Drug therapy

- Acidifying agent: ammonium chloride

Hyperchloremia

- Lactated Ringer's solution

Drug therapy

- Alkalinizing agent: sodium bicarbonate I.V.

INTERVENTIONS AND RATIONALES

- Monitor serum chloride levels frequently, particularly during I.V. therapy, *to guide the treatment plan.*
- Watch for signs of hyperchloremia or hypochloremia. Be alert for respiratory difficulty *to prevent respiratory distress.*

For hypochloremia

• Monitor serum electrolyte levels and fluid intake and output of patients who are vulnerable to chloride imbalance, particularly those recovering from gastric surgery, *to prevent hypochloremia.*

• Watch for excessive or continuous loss of gastric secretions as well as prolonged infusion of dextrose in water without saline *to prevent chloride imbalance.*

For hyperchloremia

• Check serum electrolyte levels every 3 to 6 hours. If the patient is receiving high doses of sodium bicarbonate, watch for signs of overcorrection (metabolic alkalosis, respiratory depression) or lingering signs of hyperchloremia, which indicate inadequate treatment. *Frequent monitoring of electrolyte levels helps guide the treatment plan and avoids complications of chloride imbalance.*

Teaching topics

• Explanation of all tests and procedures

• Dietary sources of sodium, potassium, and chloride for the patient experiencing hypochloremia

Disseminated intravascular coagulation

DIC, also called consumption coagulopathy and defibrination syndrome, occurs as a complication of diseases and conditions that accelerate clotting. This accelerated clotting process causes small blood vessel occlusion, organ necrosis, depletion of circulating clotting factors and platelets, and activation of the fibrinolytic system—which, in turn, can provoke severe hemorrhage.

Clotting in the microcirculation usually affects the kidneys and extremities but may occur in the brain, lungs, pituitary and adrenal glands, and GI mucosa. Other conditions, such as vitamin K deficiency and hepatic disease, and anticoagulant therapy may cause a similar hemorrhage.

DIC is generally an acute condition but may be chronic in cancer patients. The prognosis depends on early detection and treatment, the severity of the hemorrhage, and treatment of the underlying disease or condition.

CAUSES

• Disorders that produce necrosis, such as extensive burns and trauma, brain tissue destruction, transplant rejection, and hepatic necrosis

• Infection (the most common cause of DIC), including gram-negative or gram-positive septicemia; viral, fungal, or rickettsial infection; and protozoal infection (falciparum malaria)

• Neoplastic disease, including acute leukemia and metastatic carcinoma

• Obstetric complications, such as abruptio placentae, amniotic fluid embolism, and retained dead fetus

DATA COLLECTION FINDINGS

• Abnormal bleeding (petechiae, hematomas, ecchymosis, cutaneous oozing) without an accompanying history of a serious hemorrhagic disorder

• Abdominal distention

• Coma

• Dyspnea

• Nausea

• Oliguria

• Seizures

• Severe muscle, back, and abdominal pain

• Shock

• Vertigo

• Vomiting

DIAGNOSTIC FINDINGS

• Blood tests show prolonged PT greater than 15 seconds; prolonged PTT greater than 60 seconds; fibrinogen levels less than 150 mg/dl; platelets less than 100,000/µl; and fibrin degradation products commonly greater than 100 µg/ml.

• Positive D-dimer test is specific for DIC.

NURSING DIAGNOSES

• Risk for deficient fluid volume

• Ineffective tissue perfusion: Peripheral

• Fatigue

TREATMENT

- Treatment of the underlying cause
- Bed rest
- Transfusion therapy: fresh frozen plasma, platelets, packed RBCs

Drug therapy

- Anticoagulant: heparin I.V. (Heparin Sodium Injection)

INTERVENTIONS AND RATIONALES

- Don't scrub bleeding areas, *to prevent clots from dislodging and causing fresh bleeding.* Use pressure, cold compresses, and topical hemostatic agents *to control bleeding.*
- Enforce complete bed rest during bleeding episodes. If the patient is agitated, pad the side rails *to protect him from injury.*
- Check all I.V. and venipuncture sites frequently for bleeding. Apply pressure to injection sites for at least 10 minutes. Alert other personnel to the patient's tendency to hemorrhage. *These measures prevent hemorrhage.*
- Monitor intake and output hourly in acute DIC, especially when administering blood products, *to monitor the effectiveness of volume replacement.*
- Watch for transfusion reactions and signs of fluid overload. Weigh dressings and linen and record drainage *to measure the amount of blood lost.*
- Weigh the patient daily, particularly in renal involvement, *to monitor for excess fluid volume.*
- Watch for bleeding from the GI and GU tracts *to detect early signs of hemorrhage.* Measure the patient's abdominal girth at least every 4 hours and monitor closely for signs of shock *to detect intra-abdominal bleeding.*
- Monitor the results of serial blood studies (particularly HCT, Hb, and coagulation times) *to guide the treatment plan.*
- Provide emotional support for the patient and family. As needed, enlist the aid of a social worker, a chaplain, and other members of the health care team in providing such support. *Providing support in a crisis situation reduces the family's anxiety.*

Teaching topics

- Explaining the disorder and treatment options to the patient and family
- Bleeding prevention

Hemophilia

A hereditary bleeding disorder that typically affects males, hemophilia produces mild to severe abnormal bleeding. After a platelet plug develops at a bleeding site, the lack of clotting factor prevents a stable fibrin clot from forming. Although hemorrhaging doesn't usually happen immediately, delayed bleeding is common. Two types of hemophilia exist:

- hemophilia A, or classic hemophilia (deficiency or nonfunction of factor VIII)
- hemophilia B, or Christmas disease (deficiency or nonfunction of factor IX).

Severity and prognosis of hemophilia vary with the degree of deficiency and the site of bleeding.

CAUSES

- Genetic inheritance: both types of hemophilia inherited as X-linked recessive traits

DATA COLLECTION FINDINGS

- Hematemesis (bloody vomitus)
- Hematomas on the extremities, torso, or both
- Hematuria (bloody urine)
- History of prolonged bleeding after small cuts, surgery, dental extractions, or trauma
- Joint tenderness
- Limited ROM
- Pain and swelling in a weight-bearing joint (such as the hip, knee, or ankle)
- Signs of decreased tissue perfusion: chest pain, confusion, cool and clammy skin, decreased urine output, hypotension, pallor, restlessness, anxiety, tachycardia
- Signs of internal bleeding such as abdominal, chest, or flank pain
- Tarry stools

Severe hemophilia

- Excessive bleeding following circumcision (commonly the first sign of the disease)

• Large subQ and deep I.M. hematomas
• Spontaneous or severe bleeding after minor trauma

Moderate hemophilia
• Occasional spontaneous bleeding
• SubQ and I.M. hematomas

Mild hemophilia
• No spontaneous bleeding
• Prolonged bleeding after major trauma or surgery (blood may ooze slowly or intermittently for up to 8 days following surgery)

DIAGNOSTIC FINDINGS

Hemophilia A
• PTT is prolonged.
• Factor VIII assay reveals 0% to 25% of normal factor VIII.
• Platelet count and function, bleeding time, and PT are normal.

Hemophilia B
• Baseline coagulation result is similar to that of hemophilia A, with normal factor VIII.
• Factor IX assay shows deficiency.

NURSING DIAGNOSES

• Impaired gas exchange
• Acute pain
• Parental role conflict

TREATMENT

Hemophilia A
• Administration of Factor VIII or cryoprecipitate antihemophilic factor (AHF) and lyophilized (dehydrated) AHF to encourage normal hemostasis (arrest of bleeding)
• Immediate notification of doctor following injury, especially to the head, neck, or abdomen

Hemophilia B
• Administration of purified factor IX to promote hemostasis
• Immediate notification of doctor following injury, especially to the head, neck, or abdomen

Drug therapy (both types)
• Non-aspirin-containing analgesics to control joint pain

INTERVENTIONS AND RATIONALES

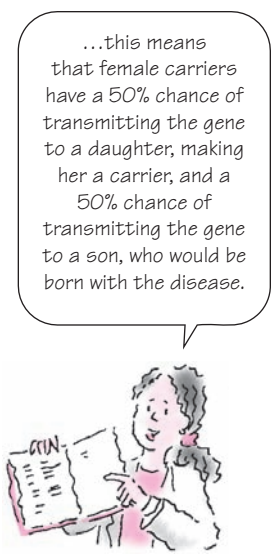
• Provide emotional support *because hemophilia is a chronic disorder.*
• Refer new patients to a hemophilia treatment center *for education, evaluation, and development of a treatment plan.*
• Refer patients and carriers for genetic counseling *to determine the risk of passing the disease to offspring.*

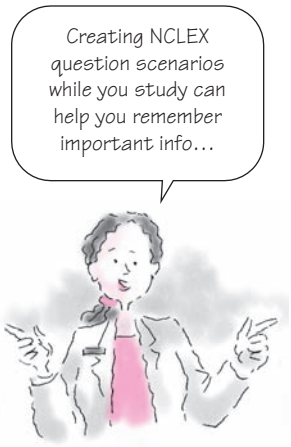
During bleeding episodes
• Apply pressure to cuts and during epistaxis *to stop bleeding. In many cases, pressure is the only treatment needed for surface cuts.*
• Apply cold compresses or ice bags and elevate the injured part *to control bleeding.*
• Give sufficient clotting factor or plasma, as ordered, *to promote hemostasis.* The body uses AHF in 48 to 72 hours, so repeat infusions may be necessary.
• Administer analgesics *to control pain.* Avoid I.M. injections because they may cause hematomas at the injection site. Aspirin and aspirin-containing medications are contraindicated because they decrease platelet adherence and may increase bleeding.

If the patient has bled into a joint
• Immediately elevate the joint *to control bleeding.*
• Begin ROM exercises, if ordered, at least 48 hours after the bleeding has been controlled *to restore joint mobility.*
• Don't allow the patient to bear weight on the affected joint until bleeding stops and swelling subsides *to prevent deformities due to hemarthrosis.*

After bleeding episodes and surgery
• Watch for signs of further bleeding *to detect and control bleeding as soon as possible.*
• Closely monitor PTT. *Prolonged times increase risk of bleeding.*

Teaching topics
• Recognizing signs of severe internal bleeding

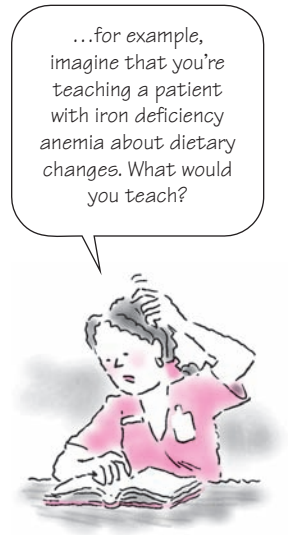




- Notifying the primary care provider even after a minor injury
- Wearing medical identification bracelet
- Protecting a child from injury
- Importance of medical follow-up
- Risk of infection, such as hepatitis, from blood component administration
- Caring for injuries
- Administering blood factor components at home, as appropriate
- Contacting the National Hemophilia Foundation

Iron deficiency anemia

Iron deficiency anemia is a chronic, slowly progressing disease involving circulating RBCs. Iron deficiency results when an individual absorbs inadequate amounts of iron, has an inadequate dietary intake of iron, or loses excessive amounts of iron (such as through chronic bleeding). This decreased iron affects formation of Hb and RBCs, which, in turn, decreases the capacity of the blood to transport oxygen.



CAUSES

- Acute and chronic bleeding
- Alcohol abuse
- Use of certain drugs
- Gastrectomy
- Inadequate intake of iron-rich foods
- Malabsorption syndrome
- Menstruation
- Pregnancy
- Vitamin B_6 deficiency

DATA COLLECTION FINDINGS

- Cheilosis (fissures and redness of the angles of the lips)
- Dizziness
- Dyspnea
- Koilonychia (spoon-shaped nails)
- Pale, dry mucous membranes
- Pallor
- Palpitations
- Papillae atrophy of the tongue
- Sensitivity to cold
- Stomatitis
- Weakness and fatigue

DIAGNOSTIC FINDINGS

- Hematology shows decreased Hb, HCT, iron, ferritin, reticulocytes, red cell indices, transferrin, and saturation; absent hemosiderin; and increased iron-binding capacity.
- Peripheral blood smear reveals microcytic and hypochromic RBCs.

NURSING DIAGNOSES

- Activity intolerance
- Imbalanced nutrition: Less than body requirements
- Impaired gas exchange

TREATMENT

- Diet: high in iron, fiber, and protein with increased fluids; avoidance of teas and coffee, which reduce absorption of iron
- Transfusion therapy with packed RBCs, if necessary
- Vitamins: pyridoxine (vitamin B_6), ascorbic acid (vitamin C)

Drug therapy

- Iron supplements: ferrous sulfate (Feosol), iron dextran (DexFerrum)

INTERVENTIONS AND RATIONALES

- Monitor intake and output *to detect fluid imbalances.*
- Monitor cardiovascular and respiratory status *to detect decreased activity intolerance and dyspnea on exertion.*
- Monitor and record vital signs *to determine activity intolerance.*
- Monitor stool, urine, and vomitus for occult blood *to identify the cause of anemia.*
- Administer oxygen, as necessary, *to treat hypoxemia caused by reduced Hb.*
- Provide a diet high in iron *to replace iron stores in the body.*
- Administer medications, as prescribed, *to replace iron stores in the body.* Administer iron injection deep into muscle using Z-track technique *to avoid subcutaneous irritation and discoloration from leaking drug.* Administer liquid preparations with a straw *to prevent staining of the teeth.*
- Encourage fluids *to avoid dehydration.*
- Provide rest periods *to avoid fatigue and reduce oxygen demands.*

• Provide mouth, skin, and foot care *because the tongue or lips may be dry or inflamed and the nails may be brittle.*
• Protect the patient from falls caused by weakness and fatigue. *Falls may result in bleeding and bruising.*
• Keep the patient warm *to enhance comfort.*

Teaching topics
• Eating foods rich in iron and vitamin C
• Recognizing signs and symptoms of bleeding
• Monitoring stools for occult blood
• Recognizing stool color changes caused by oral iron supplementation (stools will be black)
• Refraining from using hot pads and hot water bottles
• Preventing constipation

Kaposi's sarcoma

At one time, this cancer of the lymphatic cell wall was rare, occurring mostly in elderly Italian and Jewish men. The incidence of Kaposi's sarcoma has risen dramatically along with the incidence of AIDS. Currently, it's the most common AIDS-related cancer.

Kaposi's sarcoma causes structural and functional damage. When associated with AIDS, it progresses aggressively, involving the lymph nodes, the viscera and, possibly, GI structures.

CAUSES
• Unknown; possibly related to immunosuppression

DATA COLLECTION FINDINGS
• Dyspnea (in cases of pulmonary involvement), wheezing, hypoventilation, and respiratory distress from bronchial blockage
• Edema from lymphatic obstruction
• One or more obvious lesions in various shapes, sizes, and colors (ranging from red-brown to dark purple) appearing most commonly on the skin, buccal mucosa, hard and soft palates, lips, gums, tongue, tonsils, conjunctivae, and sclerae
• Pain (if the sarcoma advances beyond the early stages or if a lesion breaks down or impinges on nerves or organs)

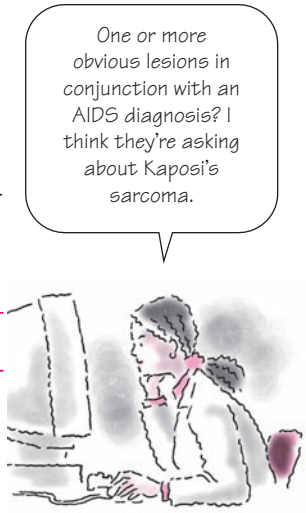
DIAGNOSTIC FINDINGS
• Computed tomography scan detects and evaluates metastasis.
• Tissue biopsy identifies the lesion's type and stage.

NURSING DIAGNOSES
• Ineffective protection
• Risk for infection
• Disturbed body image

TREATMENT
• High-calorie, high-protein diet
• Radiation therapy
• I.V. fluid therapy

Drug therapy
• Antineoplastics: doxorubicin (Adriamycin), etoposide (VePesid), vinblastine (Velban), vincristine (Oncovin)
• Biological response modifier: interferon alfa-2b (ineffective in advanced disease)
• Antiemetics: dolasetron (Anzemet), trimethobenzamide (Tigan)
• Analgesics to control pain

INTERVENTIONS AND RATIONALES
• Suggest a referral for psychological counseling *to assist the patient who's coping poorly.* Family members may also need help in coping with the patient's disease and with any associated demands that the disorder places on them.
• Allow the patient to participate in self-care decisions and encourage him to participate in self-care measures whenever possible. *Involving the patient in the treatment plan helps him gain some sense of control over his situation.*
• Inspect the patient's skin every shift. Look for new lesions and skin breakdown. If the patient has painful lesions, help him into a more comfortable position *to alleviate pain and promote patient comfort.*
• Administer pain medications. Suggest distractions and help the patient with relaxation techniques *to divert the patient from his pain and promote comfort.*



• Urge the patient to share his feelings and provide encouragement *to help him adjust to changes in his appearance.*
• Monitor the patient's weight daily *to evaluate whether nutritional needs are being met.*
• Supply the patient with high-calorie, high-protein meals. If he can't tolerate regular meals, provide him with frequent smaller meals. Consult with the dietitian, and plan meals around the patient's treatment. *Adverse reactions to medications and the disease itself may make it difficult for the patient's nutritional intake to meet his metabolic needs.*
• If the patient can't take food by mouth, maintain I.V. fluids *to prevent dehydration*. Also, provide antiemetics *to combat nausea and encourage nutritional intake.*
• Be alert for adverse reactions to radiation therapy or chemotherapy—such as anorexia, nausea, vomiting, and diarrhea—and take steps to prevent or alleviate them. *Adverse reactions are common and can further compromise the patient's condition.*
• Reinforce the explanation of treatments. Make sure the patient understands which adverse reactions to expect and how to manage them *to ensure prompt intervention and treatment*. For example, during radiation therapy, instruct the patient to keep irradiated skin dry *to avoid breakdown and subsequent infection.*
• Explain all prescribed medications, including any possible adverse effects and drug interactions, *to promote compliance with the medication regimen*.
• Explain infection-prevention techniques and, if necessary, demonstrate basic hygiene measures *to prevent infection*. Advise the patient not to share his toothbrush, razor, or other items that may be contaminated with blood. These measures are especially important if the patient also has HIV infection or AIDS. *These measures prevent the spread of infection to others.*
• Encourage the patient to set priorities, accept the help of others, and delegate nonessential tasks. Help the patient plan daily periods of alternating activity and rest *to help him cope with fatigue*.
• Explain the proper use of assistive devices, when appropriate, *to ease ambulation and promote independence.*
• As appropriate, refer the patient to support groups offered by the social services department *to promote emotional well-being.*
• If the patient's prognosis is poor (less than 6 months to live), suggest hospice care. *Hospice care provides much-needed support to caregivers and helps the patient through the dying process.*

Teaching topics

• Employing energy-conservation techniques
• Consuming a high-calorie, high-protein diet, in small, frequent amounts if necessary
• Following appropriate infection-control measures
• Understanding the importance of following ongoing treatment and care
• Knowing the benefits of initiating and executing advance directives and a durable power of attorney

Leukemia

Leukemia is characterized by an uncontrolled proliferation of WBC precursors that fail to mature. Leukemia occurs when normal hemopoietic cells are replaced by leukemic cells in bone marrow. Immature forms of WBCs circulate in the blood, infiltrating the liver, spleen, and lymph nodes. Types of leukemia include:
• acute lymphocytic
• acute myelogenous
• chronic lymphocytic
• chronic myelocytic.

CAUSES

• Altered immune system
• Exposure to chemicals
• Genetics
• Radiation
• Virus

DATA COLLECTION FINDINGS

• Enlarged lymph nodes, spleen, and liver
• Epistaxis
• Fever
• Frequent infections
• Generalized pain
• Gingivitis and stomatitis
• Hematemesis

- Hypotension
- Jaundice
- Joint, abdominal, and bone pain
- Melena
- Night sweats
- Petechiae and ecchymoses
- Prolonged menses
- Tachycardia
- Weakness and fatigue

DIAGNOSTIC FINDINGS

- Bone marrow biopsy reveals a large number of immature leukocytes.
- Hematology shows decreased HCT, Hb, RBCs, and platelets; increased ESR; and immature WBCs.
- Coagulation studies reveal a prolonged bleeding time.

NURSING DIAGNOSES

- Imbalanced nutrition: Less than body requirements
- Chronic pain
- Risk for infection

TREATMENT

- Diet: high-protein, high-vitamin, and high-mineral diet consisting of soft, bland foods in small, frequent feedings
- Stem cell transplant
- Transfusion of platelets, packed RBCs, and whole blood

Drug therapy

- Alkylating agents: busulfan (Myleran), chlorambucil (Leukeran)
- Antineoplastic antibiotics: doxorubicin (Adriamycin), plicamycin (Mithracin)
- Antimetabolites: fluorouracil (Adrucil), methotrexate (Trexall)
- Vinca alkaloids: vinblastine (Velban), vincristine (Oncovin)
- Hematopoietic growth factor: epoetin alfa (Epogen)

INTERVENTIONS AND RATIONALES

- Monitor and record vital signs *to promptly detect deterioration in patient's condition.*
- Monitor intake, output, and daily weight *because body weight may decrease as a result of fluid loss.*
- Monitor for bleeding. *Regular assessment may help anticipate or alleviate problems.*
- Place the patient with epistaxis in an upright position leaning slightly forward *to reduce vascular pressure and prevent aspiration.*
- Monitor for infection. *Damage to bone marrow may suppress WBC formation.* Promptly report temperature over 101° F (38.3° C) and decreased WBC counts *so that antibiotic therapy may be initiated.*
- Monitor oxygen therapy. *Oxygen therapy increases alveolar oxygen concentration and enhances arterial blood oxygenation.*
- Encourage fluids *to maintain adequate hydration.*
- Maintain I.V. fluids *to replace fluid loss.*
- Encourage turning every 2 hours *to prevent venous stasis and skin breakdown.*
- Encourage coughing and deep breathing *to help remove secretions and prevent pulmonary complications.*
- Place the patient in semi-Fowler's position when in bed *to promote chest expansion and ventilation of basilar lung fields.*
- Maintain the patient's diet *to provide necessary nutrition.*
- Monitor TPN, if needed, *to provide the patient with electrolytes, amino acids, and other nutrients tailored to his needs.*
- Monitor transfusion therapy for adverse reactions. *Transfusion reactions may occur during blood administration and may further compromise the patient's condition.*
- Administer medications, as prescribed, *to combat disease and promote wellness.*
- Provide gentle mouth and skin care *to prevent oral mucous membrane or skin breakdown.*
- Encourage the patient to express his feelings about changes in his body image and fear of dying *to reduce anxiety.* (See *Alleviating anxiety,* page 144.)
- Avoid giving the patient I.M. injections and enemas and taking rectal temperature *to prevent bleeding and infection.*

Teaching topics

- Recognizing signs and symptoms of occult bleeding
- Preventing constipation
- Using an electric razor

Alleviating anxiety

Anxiety can be overwhelming for the patient with leukemia. It can also aggravate complications of the disease. Therefore, it's important to allow the patient time to verbalize his concerns about the disease and its effect on him and his family as well as his fears about death.

STRATEGIC PLANNING
Help the patient and his family find coping strategies that can effectively deal with their anxiety. Make sure to allow ample time for their questions.

REST AND RELAXATION
Teaching the patient relaxation techniques can help reduce anxiety. Explain that resting frequently throughout the day is also helpful. Provide comfort measures, and encourage the family's participation.

KNOWLEDGE FACTOR
You can also reduce the patient's anxiety level by teaching him what to expect from the disease process and his treatment plan. After a teaching session, allow plenty of time for questions. In addition, provide the patient and his family with uninterrupted time alone when needed.

- Refraining from using OTC medications (unless cleared by the patient's doctor)
- Increasing fluid intake
- Contacting the American Cancer Society

Lymphoma

Lymphoma can be classified as either Hodgkin's disease or malignant lymphoma (also called non-Hodgkin's lymphoma).

In Hodgkin's disease, Reed-Sternberg cells proliferate in a single lymph node and travel contiguously through the lymphatic system to other lymphatic nodes and organs. (See *Stages of Hodgkin's disease*.)

In malignant lymphoma, tumors occur throughout lymph nodes and lymphatic organs in unpredictable patterns. Malignant lymphoma may be categorized as:
- lymphocytic
- histiocytic
- mixed cell types.

Placing the lymphoma patient in semi-Fowler's position promotes ventilation and chest expansion.

CAUSES
- Environmental (Hodgkin's disease)
- Genetic (Hodgkin's disease)
- Immunologic
- Viral

DATA COLLECTION FINDINGS
- Anorexia and weight loss
- Cough
- Hepatomegaly
- Malaise and lethargy
- Night sweats
- Recurrent infection
- Recurrent, intermittent fever
- Severe pruritus
- Splenomegaly
- Abdominal pain

Hodgkin's disease
- Bone pain
- Dysphagia
- Dyspnea
- Edema and cyanosis of face and neck
- Enlarged, nontender, firm, and movable lymph nodes in lower cervical regions

Malignant lymphoma
- Nausea
- Prominent, painless, generalized lymphadenopathy
- Vomiting

DIAGNOSTIC FINDINGS
Hodgkin's disease
- Blood chemistry shows increased alkaline phosphatase.
- Chest X-ray reveals lymphadenopathy.
- Hematology shows decreased Hb, HCT, and platelets and increased ESR, immature leukocytes, and gammaglobulin.

Stages of Hodgkin's disease

Hodgkin's disease occurs in four stages:

- Stage I: Disease occurs in a single lymph node region or single extralymphatic organ.
- Stage II: Disease occurs in two or more nodes on same side of the diaphragm or in an extralymphatic organ.
- Stage III: Disease spreads to both sides of the diaphragm and perhaps to an extralymphatic organ, the spleen, or both.
- Stage IV: Disease disseminates.

Remember, in Hodgkin's disease, tumors follow a pattern; in malignant lymphoma, tumors occur more randomly.

• Lymph node biopsy is positive for Reed-Sternberg cells.
• Lymphangiogram shows positive lymph node involvement.

Malignant lymphoma

• Bone marrow aspiration and biopsy reveals small, diffuse lymphocytic or large, follicular-type cells.

NURSING DIAGNOSES

• Ineffective protection
• Impaired tissue integrity
• Risk for infection

TREATMENT

• Establishing a diet high in protein, calories, vitamins, minerals, iron, and calcium that should consist of bland, soft foods
• Radiation therapy
• Transfusion of packed RBCs

Drug therapy

• Antiemetics: aprepitant (Emend), dolasetron (Anzemet)

Chemotherapy

• Hodgkin's disease: mechlorethamine (Mustargen), vincristine (Oncovin), procarbazine (Matulane), doxorubicin (Adriamycin), bleomycin (Blenoxane), vinblastine (Velban), dacarbazine (DTIC-Dome)
• Malignant lymphoma: cyclophosphamide (Cytoxan), vincristine (Oncovin), doxorubicin (Adriamycin)

INTERVENTIONS AND RATIONALES

• Monitor and record vital signs *to allow for early detection of complications.*
• Monitor intake and output and specific gravity. *Low urine output and high specific gravity indicate hypovolemia.*
• Monitor for bleeding, infection, jaundice, and electrolyte imbalance *to detect complications associated with lymphoma.*
• Place the patient in semi-Fowler's position when in bed *to promote chest expansion and ventilation of basilar lung fields.*
• Administer oxygen. *Supplemental oxygen helps reduce hypoxemia.*
• Encourage turning every 2 hours *to prevent skin breakdown* and coughing and deep breathing *to help remove secretions and prevent pulmonary complications.*
• Provide mouth and skin care *to prevent breakdown of oral mucous membrane and skin.*
• Help the patient maintain his diet *to ensure nutritional requirements are met.*
• Encourage fluids *to prevent dehydration and complications associated with chemotherapy drugs.*
• Maintain I.V. fluids, as prescribed, *to replace fluid loss.*
• Administer medications, as prescribed, and monitor for adverse effects *to prevent further complications.*
• Monitor transfusion therapy for adverse reactions. *Transfusion reactions during blood administration may further compromise the patient's condition.*
• Provide rest periods *to enhance immune function and decrease weakness caused by anemia.*

• Encourage the patient to express his feelings about changes in his body image and a fear of dying *to allay the patient's anxiety.*

Teaching topics

• Recognizing early signs and symptoms of motor and sensory deficits
• Increasing fluid intake
• Using an electric razor only
• Refraining from using OTC medications (unless cleared by the patient's doctor)
• Contacting the American Cancer Society

By acting on the myoneural junctions, magnesium affects the irritability and contractility of skeletal muscles…

Magnesium imbalance

Magnesium is the second most common cation (positively charged ion) in intracellular fluid. Its major function is to enhance neuromuscular integration. Magnesium regulates muscle contractions. By acting on the myoneural junctions (the sites where nerve and muscle fibers meet), magnesium affects the irritability and contractility of skeletal and cardiac muscles.

Magnesium also stimulates parathyroid hormone (PTH) secretion, thus regulating intracellular fluid calcium levels. Therefore, magnesium deficiency (hypomagnesemia) may result in transient hypoparathyroidism and may also interfere with the peripheral action of PTH.

In addition, magnesium activates many enzymes for proper carbohydrate and protein metabolism, aids in cell metabolism and the transport of sodium and potassium across cell membranes, and influences sodium, potassium, calcium, and protein levels.

Approximately one-third of the magnesium taken into the body is absorbed through the small intestine and is eventually excreted in urine; the remaining unabsorbed magnesium is excreted in stool.

Because many common foods contain magnesium, a dietary deficiency is rare. Hypomagnesemia generally follows impaired absorption, too-rapid excretion, or inadequate intake during TPN. It frequently coexists with other electrolyte imbalances, especially low calcium and potassium levels. Magnesium excess (hypermagnesemia) is common in patients with renal failure and excessive intake of antacids containing magnesium.

…and cardiac muscles, too.

CAUSES

Hypomagnesemia usually results from impaired absorption of magnesium in the intestines or excessive excretion in the urine or stools. Hypermagnesemia results from the kidneys' inability to excrete magnesium that was either absorbed from the intestines or was infused.

Hypomagnesemia

• Chronic alcoholism
• Excessive loss of magnesium, as in severe dehydration and diabetic acidosis
• Decreased magnesium intake or absorption, as in malabsorption syndrome, chronic diarrhea, or postoperative complications after bowel resection
• Hyperaldosteronism and hypoparathyroidism, which result in hypokalemia and hypocalcemia
• Hyperparathyroidism and hypercalcemia, excessive release of adrenocortical hormones
• Prolonged diuretic therapy, NG suctioning, or administration of parenteral fluids without magnesium salts; starvation or malnutrition

Hypermagnesemia

• Chronic renal insufficiency
• Overcorrection of hypomagnesemia
• Overuse of antacids containing magnesium
• Severe dehydration (resulting oliguria can cause magnesium retention)
• Use of laxatives (magnesium sulfate, milk of magnesia, and magnesium citrate solutions), especially with renal insufficiency

DATA COLLECTION FINDINGS

Hypomagnesemia

• Arrhythmias
• Neuromuscular irritability
• Leg and foot cramps
• Chvostek's sign
• Mood changes
• Confusion
• Delusions
• Hallucinations
• Seizures

Hypermagnesemia

- Diminished deep tendon reflexes
- Weakness
- Flaccid paralysis
- Respiratory muscle paralysis (severe hypermagnesemia)
- Drowsiness
- Confusion
- Diminished sensorium that may progress to coma
- Bradycardia
- Weak pulse
- Hypotension
- Heart block
- Cardiac arrest (severe hypermagnesemia)
- Nausea
- Vomiting

DIAGNOSTIC FINDINGS

- Blood test that shows decreased serum magnesium levels (less than 1.5 mEq/L) confirms hypomagnesemia.
- Blood test that shows increased serum magnesium levels (greater than 2.5 mEq/L) confirms hypermagnesemia.

NURSING DIAGNOSES

- Risk for injury
- Decreased cardiac output
- Impaired gas exchange

TREATMENT

Hypomagnesemia

- Daily magnesium supplements I.M. or by mouth
- High-magnesium diet
- I.V. fluid therapy
- Magnesium sulfate I.V. (10 to 40 mEq/L diluted in I.V. fluid) for severe cases

Hypermagnesemia

- Diet: low magnesium with increased fluid intake
- Loop diuretic: furosemide (Lasix)
- Magnesium antagonist: calcium gluconate (10%)
- Peritoneal dialysis or hemodialysis if renal function fails or if excess magnesium can't be eliminated

INTERVENTIONS AND RATIONALES

For hypomagnesemia

- Monitor serum electrolyte levels (including magnesium, calcium, and potassium) daily for mild deficits and every 6 to 12 hours during replacement therapy *to guide the treatment plan.*
- Measure intake and output frequently. (Urine output shouldn't fall below 25 ml/hour or 600 ml/day.) *The kidneys excrete excess magnesium, and hypermagnesemia could occur with renal insufficiency.*
- Monitor vital signs during I.V. therapy. Infuse magnesium replacement slowly and watch for bradycardia, heart block, and decreased respiratory rate *to prevent complications that may occur with rapid infusion.*
- Have calcium gluconate I.V. available *to reverse hypermagnesemia from overcorrection.*
- Advise patients to eat foods high in magnesium, such as grains, nuts, and legumes, *to help raise magnesium level with dietary sources.*
- Watch for and report signs of hypomagnesemia in patients with predisposing diseases or conditions, especially those not permitted anything by mouth or who receive I.V. fluids without magnesium, *to prevent complications associated with magnesium deficiency.*

For hypermagnesemia

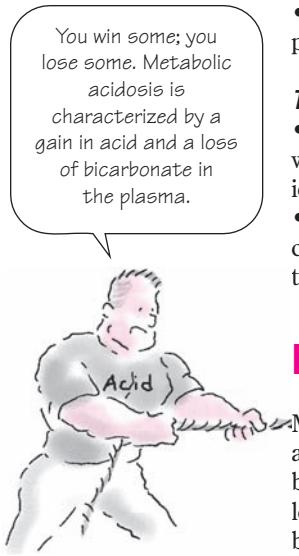
- Frequently check level of consciousness (LOC), muscle activity, and vital signs *to detect complications of magnesium excess.*
- Keep accurate intake and output records. Provide sufficient fluids *for adequate hydration and maintenance of renal function.*
- Correct abnormal serum electrolyte levels immediately *to prevent complications of magnesium excess.*
- Monitor the patient receiving cardiac glycosides and calcium gluconate simultaneously *because excessive calcium enhances cardiac glycoside action, predisposing the patient to digoxin toxicity.*
- Watch for signs of hypermagnesemia in predisposed patients. Observe closely for respiratory distress if serum magnesium levels exceed 10 mEq/L *to prevent respiratory decompensation.*

Teaching topics for hypomagnesemia

- Consuming foods high in magnesium, such as seed grains, nuts, and legumes (fresh meat, fish, and fresh fruits usually contain small amounts of magnesium)
- Avoiding laxative and diuretic abuse (this practice may result in loss of magnesium)

Teaching topics for hypermagnesemia

- For patients with renal failure, checking with the doctor before taking any OTC medications
- Avoiding abuse of laxatives and antacids containing magnesium, particularly if the patient is elderly or has impaired renal function



Metabolic acidosis

Metabolic acidosis refers to a state of excess acid accumulation and deficient base bicarbonate. It's produced by an underlying pathologic disorder. Symptoms result from the body's attempts to correct the acidotic condition through compensatory mechanisms in the lungs, kidneys, and cells.

Metabolic acidosis is more prevalent among children, who are vulnerable to acid-base imbalance because their metabolic rates are faster and their ratios of water to total body weight are lower. Severe or untreated metabolic acidosis can be fatal.

CAUSES

- Anaerobic carbohydrate metabolism
- Chronic alcoholism
- Diabetic ketoacidosis
- Diarrhea or intestinal malabsorption
- Low-carbohydrate, high-fat diet
- Malnutrition
- Renal insufficiency and failure

DATA COLLECTION FINDINGS

- Central nervous system (CNS) depression
- Drowsiness
- Headache
- Kussmaul's respirations
- Lethargy
- Stupor

DIAGNOSTIC FINDINGS

- Arterial blood gas (ABG) analysis reveals pH below 7.35 and bicarbonate level less than 24 mEq/L.

NURSING DIAGNOSES

- Ineffective breathing pattern
- Disturbed thought processes
- Decreased cardiac output

TREATMENT

- Correction of underlying cause
- ET intubation and mechanical ventilation to ensure adequate respiratory compensation (in severe cases)

Drug therapy

- Sodium bicarbonate I.V. or orally for chronic metabolic acidosis
- Insulin administration and I.V. fluid administration if diabetic ketoacidosis is the cause

INTERVENTIONS AND RATIONALES

- Keep sodium bicarbonate ampules handy *for emergency administration.*
- Frequently monitor vital signs, laboratory results, and LOC *because changes can occur rapidly.*
- In diabetic acidosis, watch for secondary changes due to hypovolemia, such as decreasing blood pressure, *to prevent complications of hypoperfusion.*
- Record intake and output *to monitor renal function.*
- Watch for signs of excessive serum potassium—weakness, flaccid paralysis, and arrhythmias, possibly leading to cardiac arrest. After treatment, check for overcorrection to hypokalemia *to prevent complications of potassium imbalance.*
- Prepare for possible seizures with seizure precautions *to prevent injury.*
- Provide good oral hygiene. Use sodium bicarbonate washes *to neutralize mouth acids,* and lubricate the patient's lips *to prevent skin breakdown.*
- Carefully observe patients receiving I.V. therapy or who have intestinal tubes in place as well as those suffering from shock, hyperthyroidism, hepatic disease, circulatory fail-

ure, or dehydration *to prevent metabolic acidosis.*

Teaching topics

- Testing urine for sugar and acetone
- Encouraging strict adherence to insulin or oral antidiabetic therapy
- Undergoing medication therapy and possible adverse reactions

Metabolic alkalosis

Metabolic alkalosis is a clinical state marked by decreased amounts of acid or increased amounts of base bicarbonate. It causes metabolic, respiratory, and renal responses, producing characteristic symptoms—most notably, hypoventilation. This condition always occurs secondary to an underlying cause. With early diagnosis and prompt treatment, the prognosis is good; however, untreated metabolic alkalosis may lead to coma and death.

CAUSES

- Loss of acid from vomiting, NG tube drainage, or lavage without adequate electrolyte replacement; fistulas; the use of steroids and certain diuretics (furosemide, thiazides, and ethacrynic acid); or hyperadrenocorticism
- Retention of base from excessive intake of bicarbonate of soda or other antacids (usually for treatment of gastritis or peptic ulcer), excessive intake of absorbable alkali (as in milk-alkali syndrome), administration of excessive amounts of I.V. fluids with high concentrations of bicarbonate or lactate, or respiratory insufficiency

DATA COLLECTION FINDINGS

- Apnea
- Atrial tachycardia
- Confusion
- Cyanosis
- Diarrhea
- Hypoventilation
- Irritability
- Nausea
- Picking at bedclothes (carphology)
- Twitching
- Vomiting

DIAGNOSTIC FINDINGS

- ABG analysis reveals pH greater than 7.45 and a bicarbonate level above 29 mEq/L.

NURSING DIAGNOSES

- Disturbed thought processes
- Decreased cardiac output
- Risk for injury

TREATMENT

- Treatment of underlying cause

Drug therapy

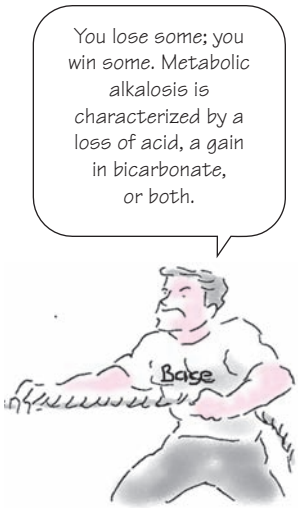
- Acidifying agent: ammonium chloride I.V.
- Potassium supplement: potassium chloride I.V.

INTERVENTIONS AND RATIONALES

- Monitor ammonium chloride 0.9% infusion (should infuse in 1¼ hours)*; faster administration may cause hemolysis of RBCs.* Avoid overdosage *because it may cause overcorrection to metabolic acidosis.* Don't give ammonium chloride to a patient with signs of hepatic or renal disease *to avoid toxicity.*
- Monitor vital signs frequently and record intake and output *to evaluate respiratory, fluid, and electrolyte status. Respiratory rate usually decreases in an effort to compensate for alkalosis. Hypotension and tachycardia may indicate electrolyte imbalance, especially hypokalemia.*
- Irrigate NG tubes with isotonic saline solution instead of plain water *to prevent loss of gastric electrolytes.* Monitor I.V. fluid concentrations of bicarbonate or lactate *to prevent acid-base imbalance.*

Teaching topics

- For patients with ulcers, recognizing signs of milk-alkali syndrome: a distaste for milk, anorexia, weakness, and lethargy
- Avoiding overuse of alkaline agents



Multiple myeloma

Multiple myeloma involves the abnormal proliferation of plasma cells. These plasma cells

Because multiple myeloma causes bone destruction, bone pain and fractures are data collection findings to remember for this disorder.

are immature and malignant and invade the bone marrow, lymph nodes, liver, spleen, and kidneys, triggering osteoblastic activity and leading to bone destruction throughout the body.

CAUSES

- Environmental
- Genetic
- Unknown

DATA COLLECTION FINDINGS

- Anemia, thrombocytopenia, hemorrhage
- Constant, severe bone pain
- Headaches
- Hepatomegaly
- History of multiple infections
- History of pathologic fractures, skeletal deformities of sternum and ribs, loss of height
- History of renal calculi
- Splenomegaly
- Vascular insufficiency

DIAGNOSTIC FINDINGS

- Bence Jones protein assay is positive.
- Blood chemistry tests show increased calcium, uric acid, BUN, and creatinine.
- Bone marrow biopsy shows increased number of immature plasma cells.
- Bone scan reveals increased uptake.
- Hematology shows decreased HCT, WBCs, and platelets and increased ESR.
- Immunoelectrophoresis shows monoclonal spike.
- Urine chemistry shows increased calcium and uric acid.
- X-rays show diffuse, round, punched-out bone lesions; osteoporosis; osteolytic lesions of the skull; and widespread demineralization.

NURSING DIAGNOSES

- Chronic pain
- Impaired physical mobility
- Risk for infection

TREATMENT

- Allogenic bone marrow transplantation
- Diet: high protein, high carbohydrate, high vitamin, and high mineral in small, frequent feedings
- Orthopedic devices: braces, splints, casts
- Peritoneal dialysis or hemodialysis
- Radiation therapy
- Transfusion therapy: packed RBCs

Drug therapy

- Alkylating agents: melphalan (Alkeran), cyclophosphamide (Cytoxan)
- Analgesic: morphine
- Androgen: fluoxymesterone (Halotestin)
- Antibiotics: doxorubicin (Adriamycin), plicamycin (Mithracin)
- Antiemetics: prochlorperazine (Compazine), aprepitant (Emend), dolasetron (Anzemet)
- Antigout agent: allopurinol (Zyloprim)
- Antineoplastics: vinblastine (Velban), vincristine (Oncovin)
- Diuretic: furosemide (Lasix)
- Glucocorticoid: prednisone (Deltasone)
- Histamine-2 (H_2)–receptor antagonists: famotidine (Pepcid), nizatidine (Axid)

INTERVENTIONS AND RATIONALES

- Monitor renal status *to detect renal calculi and renal failure secondary to hypercalcemia.*
- Monitor and record vital signs *to allow for early detection of complications.*
- Monitor intake and output, urine specific gravity, and daily weight *to identify fluid volume excess or deficit.*
- Monitor laboratory studies. *RBCs, WBCs, Hb, HCT, and platelets may be affected by chemotherapy.*
- Monitor cardiovascular and respiratory status *to detect signs of compromise.*
- Evaluate bone pain *to determine patient's response to analgesics.*
- Monitor for infection and bruising *to detect complications.*
- Maintain the patient's diet *to ensure nutritional requirements are met.*
- Encourage fluids *to prevent dehydration and dilute calcium.*
- Maintain I.V. fluids *to replace fluid loss, dilute calcium, and prevent renal protein precipitation.*
- Assist with turning, coughing, and deep breathing *to mobilize and remove secretions.*
- Monitor transfusion therapy, as prescribed, *to replace blood components.*

• Administer medications, as prescribed, and monitor for adverse effects *to prevent complications.*
• Maintain seizure precautions *to prevent injury.*
• Provide skin and mouth care *to prevent breakdown of oral mucous membrane and skin.*
• Alternate rest periods with activity *to prevent fatigue.*
• Prevent the patient from falling *because he's vulnerable to fractures.*
• Move the patient gently, keeping the body in alignment, *to prevent injury.*
• Apply and maintain braces, splints, and casts *to prevent injury and reduce pain.*

Teaching topics

• Exercising regularly, with particular attention to muscle-strengthening exercises
• Recognizing signs and symptoms of renal calculi, fractures, and seizures
• Avoiding lifting, constipation, and OTC medications
• Monitoring stool for occult blood
• Using braces, splints, and casts
• Contacting the American Cancer Society

Pernicious anemia

Pernicious anemia is a chronic, progressive, macrocytic anemia caused by a deficiency of intrinsic factor, a substance normally secreted by the stomach. Without intrinsic factor, dietary vitamin B_{12} can't be absorbed by the ileum, inhibiting normal deoxyribonucleic acid (DNA) synthesis and resulting in defective maturation of RBCs.

CAUSES

• Autoimmune disease
• Bacterial or parasitic infections
• Lack of intrinsic factor
• Gastric mucosal atrophy
• Genetics
• Failure to administer vitamin B_{12} after small-bowel resection or total gastrectomy
• Malabsorption
• Prolonged iron deficiency
• Vegetarian diets (especially strict vegan diets)

DATA COLLECTION FINDINGS

• Constipation or diarrhea
• Depression
• Delirium
• Dyspnea
• Glossitis, sore mouth
• Mild jaundice of sclera
• Pallor
• Paralysis, gait disturbances
• Tachycardia, palpitations
• Paresthesia of hands and feet
• Weakness, fatigue
• Weight loss, anorexia, dyspepsia

DIAGNOSTIC FINDINGS

• Blood chemistry tests reveal increased bilirubin and lactate dehydrogenase levels.
• Bone marrow aspiration shows increased megaloblasts, few maturing erythrocytes, and defective leukocyte maturation.
• Gastric analysis shows hypochlorhydria.
• Hematology shows decreased HCT and Hb.
• Peripheral blood smear reveals oval, macrocytic, hyperchromic erythrocytes.
• Romberg's test is positive.
• Schilling test is positive.
• Upper GI series shows atrophy of gastric mucosa.

NURSING DIAGNOSES

• Activity intolerance
• Imbalanced nutrition: Less than body requirements
• Risk for injury

TREATMENT

• Establishing a diet high in iron and protein and restricting highly seasoned, coarse, or extremely hot foods
• Transfusion therapy with packed RBCs
• Vitamins: pyridoxine (vitamin B_6), ascorbic acid (vitamin C), cyanocobalamin (vitamin B_{12}), folic acid (vitamin B_9)

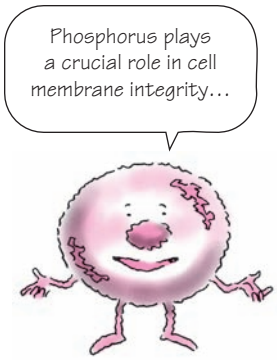
Drug therapy

• Iron supplements: ferrous sulfate (Feosol), iron dextran (DexFerrum)

INTERVENTIONS AND RATIONALES

• Monitor cardiovascular status *to detect signs of compromise as the heart works harder to*

compensate for the reduced oxygen-carrying capacity of the blood.
- Monitor and record vital signs *to allow for early detection of compromise.*
- Monitor and record amount, consistency, and color of stool *to allow for early detection and treatment of diarrhea and constipation.*
- Maintain the patient's diet *to ensure adequate intake of vitamins, iron, and protein.*
- Administer medications as prescribed. *Vitamin B_{12} injections are given monthly and are lifelong.*
- Maintain activity, as tolerated, *to avoid fatigue.*
- Provide mouth care before and after meals *to provide comfort and reduce the risk of oral mucous membrane breakdown.*
- Use soft toothbrushes *to avoid injuring mucous membranes.*
- Maintain a warm environment *for patient comfort.*
- Provide foot and skin care *because sensation to the feet may be reduced.*
- Prevent the patient from falling *because of reduced coordination, paresthesia of the feet, and reduced thought processes.*
- Monitor neurologic status *because poor memory and confusion increase the risk of injury.*



Teaching topics
- Recognizing the signs and symptoms of skin breakdown
- Altering activities of daily living (ADLs) to compensate for paresthesia
- Complying with lifelong, monthly injections of vitamin B_{12}
- Avoiding the use of heating pads and electric blankets
- Recognizing dietary sources of vitamin B_{12}

Phosphorus imbalance

Phosphorus exists primarily in inorganic combination with calcium in teeth and bones. In ECF, the phosphate ion supports several metabolic functions: utilization of B vitamins, acid-base homeostasis, bone formation, nerve and muscle activity, cell membrane integrity, transmission of hereditary traits, and metabolism of carbohydrates, proteins, and fats.

Renal tubular reabsorption of phosphate is inversely regulated by calcium levels—an increase in phosphorus causes a decrease in calcium. An imbalance causes hypophosphatemia or hyperphosphatemia. Incidence of hypophosphatemia varies with the underlying cause; hyperphosphatemia occurs most commonly in patients who tend to consume large amounts of phosphorus-rich foods and beverages and in those with renal insufficiency.

CAUSES
Hypophosphatemia
- Chronic diarrhea
- Vitamin D deficiency
- Hyperparathyroidism with resultant hypercalcemia
- Hypomagnesemia
- Inadequate dietary intake, such as from malnutrition resulting from a prolonged catabolic state or chronic alcoholism
- Intestinal malabsorption

Hyperphosphatemia
- Hypervitaminosis D
- Hypocalcemia
- Hypoparathyroidism
- Overuse of phosphate enemas or laxatives with phosphates
- Renal failure

DATA COLLECTION FINDINGS
Hypophosphatemia
- Anorexia
- Muscle weakness
- Osteomalacia (inadequate mineralization of bone)
- Paresthesia
- Tremor

Hyperphosphatemia
- Usually produces no symptoms
- Tetany and seizures (with hypocalcemia)

DIAGNOSTIC FINDINGS
- Serum phosphorus level less than 1.7 mEq/L (or 2.5 mg/dl) confirms hypophosphatemia. A urine phosphorus level more than 1.3 g/24 hours supports this diagnosis.

• Serum phosphorus level exceeding 2.6 mEq/L (or 4.5 mg/dl) confirms hyperphosphatemia. Supportive values include decreased levels of serum calcium (less than 9 mg/dl) and urine phosphorus (less than 0.9 g/24 hours).

NURSING DIAGNOSES

• Imbalanced nutrition: Less than or more than body requirements
• Risk for injury
• Deficient knowledge (phosphorus balance)

TREATMENT

Hypophosphatemia

• High-phosphorus diet

Drug therapy

• Phosphate supplements
• Potassium phosphate I.V. (in severe deficiency)

Hyperphosphatemia

• Low-phosphorus diet
• Peritoneal dialysis or hemodialysis (in severe cases)

Drug therapy

• Calcium supplement: calcium acetate (PhosLo)

INTERVENTIONS AND RATIONALES

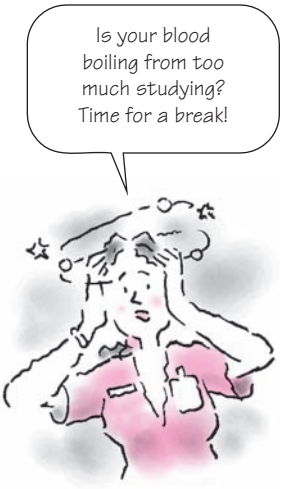
• Carefully monitor serum electrolyte levels, including calcium, magnesium, and phosphorus. Report any changes immediately *to guide the treatment plan.*

For hypophosphatemia

• Record intake and output accurately *to evaluate renal function.* Be alert for hypocalcemia when giving phosphate supplements. If phosphate salt tablets cause nausea, use capsules instead *to encourage compliance with the treatment regimen.*
• Advise the patient to follow a high-phosphorus diet containing milk and milk products, kidney, liver, turkey, and dried fruits *to prevent recurrence.*

For hyperphosphatemia

• Monitor intake and output. If urine output falls below 25 ml/hour or 600 ml/day, notify the doctor immediately *because decreased output can seriously affect renal clearance of excess serum phosphorus.*
• Watch for signs of hypocalcemia, such as muscle twitching and tetany, which commonly accompany hyperphosphatemia, *to ensure timely intervention.*
• Advise the patient to eat foods with low phosphorus content, such as vegetables, *to prevent recurrence.* Obtain dietary consultation if the condition results from chronic renal insufficiency *to aid the patient in making sound nutritional choices that help prevent hyperphosphatemia.*



Teaching topics for hypophosphatemia

• Consuming a high-phosphorus diet
• Taking phosphate supplements

Teaching topics for hyperphosphatemia

• Following the medication regimen and recognizing possible adverse reactions
• Avoiding OTC drugs that contain phosphorus, such as laxatives and enemas

Polycythemia vera

Polycythemia vera is a chronic myeloproliferative disorder characterized by increased RBC mass, leukocytosis, thrombocytosis, and increased Hb concentration, with normal or increased plasma volume. It usually occurs between ages 40 and 60, most commonly among males of Jewish ancestry; it rarely affects children or blacks and doesn't appear to be familial. It may also be known as primary polycythemia, erythremia, polycythemia rubra vera, splenomegalic polycythemia, or Vaquez-Osler disease.

The prognosis depends on age at diagnosis, the treatment used, and complications. Mortality is high if polycythemia is untreated or is associated with leukemia or myeloid metaplasia.

Phlebotomy is usually the first treatment for polycythemia vera. The patient may have 350 to 500 ml of blood removed every other day.

CAUSES

• Unknown (possibly due to a multipotential stem cell defect)

DATA COLLECTION FINDINGS

• Clubbing of the digits
• Dizziness
• Dyspnea
• Feeling of fullness in the head
• Headache
• Hypertension
• Ruddy cyanosis of the nose
• Thrombosis of smaller vessels
• Visual disturbances (blurring, diplopia, engorged veins of fundus and retina)
• Weight loss

DIAGNOSTIC FINDINGS

• Blood tests show elevated Hb, RBC count, WBC count, platelet count, and leukocyte alkaline phosphatase, serum B_{12}, and uric acid levels.

NURSING DIAGNOSES

• Ineffective tissue perfusion: Cardiopulmonary
• Imbalanced nutrition: Less than body requirements
• Disturbed sensory perception (visual)

TREATMENT

• I.V. fluids to decrease the viscosity of the blood
• Phlebotomy (typically, 350 to 500 ml of blood is removed every other day until the patient's HCT is reduced to the low-normal range)
• Plasmapheresis

Drug therapy

• Antineoplastics: busulfan (Myleran), chlorambucil (Leukeran), melphalan (Alkeran)
• Myelosuppressive drugs: hydroxyurea (Hydrea), radioactive phosphorus (^{32}P)
• Antigout agent: allopurinol (Zyloprim)

Patients receiving myelosuppressive treatment should avoid crowds to decrease their risk of infection.

INTERVENTIONS AND RATIONALES

• Check blood pressure, pulse rate, and respirations before and during phlebotomy *to monitor the patient's tolerance of the procedure.*
• During phlebotomy, make sure the patient is lying down comfortably *to prevent vertigo and syncope.*
• Stay alert for tachycardia, clamminess, or complaints of vertigo. If these effects occur, the procedure should be stopped. *These signs and symptoms indicate hypovolemia.*
• Immediately after phlebotomy, check blood pressure and pulse rate. Have the patient sit up for about 5 minutes before allowing him to walk *to prevent vasovagal attack and orthostatic hypotension.* Also, administer 24 oz (710 ml) of juice or water *to replace fluid volume lost during the procedure.*
• Tell the patient to watch for and report symptoms of iron deficiency (pallor, weight loss, weakness, glossitis). *After repeated phlebotomies, the patient will develop iron deficiency, which stabilizes RBC production and reduces the need for phlebotomy.*
• Keep the patient active and ambulatory *to prevent thrombosis.* If bed rest is absolutely necessary, recommend a daily program of both active and passive ROM exercises *to prevent thrombosis and maintain joint mobility.*
• Watch for complications, such as hypervolemia, thrombocytosis, and signs of an impending stroke, *to ensure early treatment intervention.*
• Give additional fluids, administer allopurinol, and alkalinize the urine *to compensate for increased uric acid production and prevent uric acid calculi.*
• If the patient has symptomatic splenomegaly, suggest or provide small, frequent meals, followed by a rest period, *to prevent nausea and vomiting.*
• Report acute abdominal pain immediately *to avoid treatment delay. Acute pain may signal splenic infarction, renal calculi, or abdominal organ thrombosis.*

During myelosuppressive treatment

• Monitor complete blood count and platelet count before and during therapy. Warn an outpatient who develops leukopenia that his resistance to infection is low; advise him to avoid crowds and to watch for the symptoms of infection. *These measures protect the patient from developing life-threatening infection.*

• If leukopenia develops in a hospitalized patient who needs protective isolation, follow facility guidelines. If thrombocytopenia develops, tell the patient to watch for signs of bleeding (blood in urine, nosebleeds, black stools) *to prevent hemorrhage.*

• Tell the patient about possible adverse effects of alkylating agents (nausea, vomiting, and risk of infection) *to allay the patient's anxiety and ensure early treatment.*

• Watch for adverse reactions. If nausea and vomiting occur, begin antiemetic therapy and adjust the patient's diet *to promote patient comfort.*

• Use of ^{32}P requires radiation precautions *to prevent contamination.*

Teaching topics

• Learning about the disease process and treatment options

• Understanding the importance of remaining as active as possible

• Avoiding infection

• Keeping the environment free from hazards that could cause falls

• Using an electric razor to prevent bleeding

• Following measures to prevent adverse reaction to treatment, such as using antiemetics to prevent nausea and vomiting

• Contacting available community resources

Rheumatoid arthritis

Believed to be an autoimmune disorder, rheumatoid arthritis is a systemic inflammatory disease that affects the synovial lining of the joints. Antibodies first attack the synovium of the joint, causing it to become inflamed and swollen. Eventually, the articular cartilage and surrounding tendons and ligaments are affected.

Inflammation of the synovial membranes is followed by formation of pannus (granulation tissue) and destruction of cartilage, bone, and ligaments. Pannus is replaced by fibrotic tissue and calcification, which causes subluxation of the joint. The joint becomes ankylosed—or fused—leaving a very painful joint and limited ROM.

CAUSES

• Autoimmune disease

• Genetic transmission

DATA COLLECTION FINDINGS

• Anorexia and weight loss

• Dry eyes and mucous membranes

• Enlarged lymph nodes

• Fatigue

• Fever

• History of leukopenia and anemia

• Limited ROM

• Malaise

• Painful, swollen joints; crepitus; and morning stiffness

• Paresthesia of the hands and the feet

• Signs and symptoms of pericarditis

• Signs and symptoms of Raynaud's phenomenon

• Splenomegaly

• Subcutaneous nodules

• Symmetrical joint swelling (mirror image of affected joints)

DIAGNOSTIC FINDINGS

• Antinuclear antibody (ANA) test is positive.

• Hematology shows increased ESR, WBC and platelets as well as anemia.

• Rheumatoid factor test is positive.

• Serum protein electrophoresis shows elevated serum globulins.

• Synovial fluid analysis shows increased WBC count, increased volume and turbidity, and decreased viscosity and complement (C_3 and C_4 levels).

• X-rays reveal bone demineralization and soft-tissue swelling in early stages; in later stages, X-rays reveal a loss of cartilage, a narrowing of joint spaces, cartilage and bone destruction, and erosion, subluxations, and deformity.

With rheumatoid arthritis, antibodies attack the synovial lining of the joints, the membrane that lines the joint space between the bones and allows bones to move against one another.

NURSING DIAGNOSES

- Activity intolerance
- Disturbed body image
- Chronic pain

TREATMENT

- Cold therapy during acute episodes
- Heat therapy to relax muscles and relieve pain in chronic disease
- Physical therapy (to forestall loss of joint function), passive ROM exercises, and observance of rest periods
- Weight control because obesity adds stress to joints
- Well-balanced diet
- Protein A immunoadsorption therapy

Drug therapy

- Analgesic: aspirin
- Biological response modifiers: etanercept (Enbrel), infliximab (Remicade), adalimumab (Humira), anakinra (Kineret)
- Antimetabolite: methotrexate (Rheumatrex)
- Antirheumatic: hydroxychloroquine (Plaquenil)
- Cox-2 inhibitor: celecoxib (Celebrex)
- Glucocorticoids: prednisone (Deltasone), hydrocortisone (Hydrocortone)
- Gold therapy: gold sodium thiomalate (Aurolate)
- NSAIDs: indomethacin (Indocin), ibuprofen (Advil, Motrin), sulindac (Clinoril), piroxicam (Feldene), flurbiprofen (Ansaid), diclofenac sodium (Voltaren), naproxen (Naprosyn), diflunisal (Dolobid)

INTERVENTIONS AND RATIONALES

- Monitor vital signs *to allow for early detection of complications.*
- Monitor neuromuscular status *to determine patient's capabilities.*
- Check joints for swelling, pain, and redness *to determine the extent of disease and effectiveness of treatment.*
- Administer medications, as prescribed, *to enhance the treatment regimen.*
- Provide passive ROM exercises *to prevent joint contractures and muscle atrophy.*
- Splint inflamed joints *to maintain joints in a functional position and prevent musculoskeletal deformities.*
- Provide warm or cold therapy, as prescribed, *to help alleviate pain.*
- Provide skin care *to prevent skin breakdown.*
- Minimize environmental stress and plan rest periods *to help the patient cope with the disease.*
- Encourage the patient to express his feelings about changes in his body image *to help the patient express doubts and resolve concerns.*

Teaching topics

- Identifying ways to reduce stress
- Needing 8 to 10 hours of sleep every night
- Avoiding cold, stress, and infection
- Performing complete skin and foot care daily
- Contacting groups such as the Arthritis Foundation

Scleroderma

Scleroderma is a diffuse connective tissue disease characterized by inflammatory and then degenerative and fibrotic changes in skin, blood vessels, synovial membranes, skeletal muscles, and internal organs (especially the esophagus, intestinal tract, thyroid, heart, lungs, and kidneys). The disease, also known as progressive systemic sclerosis, affects more women than men, especially those between ages 30 and 50.

CAUSES

- Unknown

DATA COLLECTION FINDINGS

- Pain
- Signs and symptoms of Raynaud's phenomenon, such as blanching, cyanosis, and erythema of the fingers and toes in response to stress or exposure to cold
- Slowly healing ulcerations on the tips of the fingers or toes that may lead to gangrene
- Stiffness
- Swelling of fingers and joints
- Taut, shiny skin over the entire hand and forearm
- Tight and inelastic facial skin, causing a masklike appearance and "pinching" of the mouth

• Signs and symptoms of cardiac and pulmonary fibrosis (in advanced disease)
• Signs and symptoms of renal involvement such as malignant hypertension, the main cause of death

DIAGNOSTIC FINDINGS

• Blood studies show slightly elevated ESR, positive rheumatoid factor in 25% to 35% of patients, and positive ANA test.
• Chest X-rays show bilateral basilar pulmonary fibrosis.
• ECG reveals possible nonspecific abnormalities related to myocardial fibrosis.
• GI X-rays show distal esophageal hypomotility and stricture, duodenal loop dilation, small-bowel malabsorption pattern, and large diverticula.
• Hand X-rays show terminal phalangeal tuft resorption, subcutaneous calcification, and joint space narrowing and erosion.
• Pulmonary function studies show decreased diffusion and vital capacity.
• Skin biopsy may show changes consistent with the progress of the disease, such as marked thickening of the dermis and occlusive vessel changes.
• Urinalysis reveals proteinuria, microscopic hematuria, and casts (with renal involvement).

NURSING DIAGNOSES

• Impaired physical mobility
• Chronic pain
• Impaired skin integrity

TREATMENT

• Physical therapy to maintain function and promote muscle strength (currently, no cure exists for scleroderma)
• Exercise to improve overall health

Drug therapy

• Immunosuppressants: cyclosporine (Sandimmune), cyclophosphamide (Cytoxan), azathioprine (Imuran), mycophenolate (Cellcept)
• Calcium channel blockers: nifedipine (Procardia), amlodipine (Norvasc), diltiazem (Cardizem)
• Angiotensin II receptor antagonists: losartan (Cozaar), valsartan (Diovan)
• H_2-receptor antagonists: famotidine (Pepcid), nizatidine (Axid)
• Proton pump inhibitors: omeprazole (Prilosec), lansoprazole (Prevacid), esomeprazole (Nexium)
• NSAIDs: flurbiprofen (Ansaid), ibuprofen (Motrin), meloxicam (Mobic)
• Analgesics: acetaminophen (Tylenol), tramadol (Ultram)
• Prostaglandin derivatives: epoprostenol (Flolan), treprostinil (Remodulin)

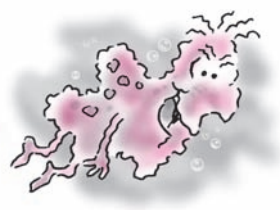
INTERVENTIONS AND RATIONALES

• Evaluate motion restrictions, pain, vital signs, intake and output, respiratory function, and daily weight *to monitor disease progression and guide the treatment plan.*
• Teach the patient to monitor blood pressure at home and to report any increases above baseline. *Malignant hypertension is the main cause of death in patients diagnosed with scleroderma.*
• Warn against fingerstick blood tests *because of compromised circulation.*
• Help the patient and family adjust to the patient's new body image and to the limitations and dependence that these changes cause. *Patients and their families need time to adjust to the overwhelming effects of illness.*
• Help the patient and family accept the fact that this condition is incurable. Encourage them to express their feelings, and help them cope with their fears and frustrations by offering information about the disease, its treatment, and relevant diagnostic tests. *Providing information helps alleviate anxiety and provides the patient with knowledge necessary for informed decision making.*
• Whenever possible, let the patient participate in treatment *to help the patient gain a sense of control over his condition.*
• Involve the patient's family in treatment *to help the family overcome feelings of helplessness.*

Teaching topics

• Recognizing an impending relapse
• Managing symptoms, such as tension, nervousness, insomnia, decreased ability to concentrate, and apathy
• Avoiding air conditioning and tobacco use, which may aggravate Raynaud's phenomenon

What a shock! Septic shock is caused by bacterial infection. Without prompt treatment, it may rapidly progress to death.



• Avoiding fatigue by pacing activities and organizing schedules to include necessary rest
• Complying with the medication regimen (follow-up visits for drug dosing if the patient takes a slow-release formulation) and reporting any adverse reactions instead of discontinuing drugs
• Contacting the Scleroderma Foundation

Septic shock

Septic shock is usually the result of bacterial infection. It causes inadequate blood perfusion to organs and circulatory collapse.

Septic shock occurs most often among hospitalized patients, especially men older than age 40 and women ages 25 to 45. It's second only to cardiogenic shock as the leading cause of shock-related death. About 25% of patients who develop gram-negative bacteremia go into shock. Unless vigorous treatment begins promptly, preferably before symptoms fully develop, septic shock rapidly progresses to death (commonly within a few hours) in up to 80% of these patients.

CAUSES

• Infection from gram-negative bacteria (in two-thirds of patients): *Escherichia coli, Klebsiella, Enterobacter, Proteus, Pseudomonas,* and *Bacteroides*
• Infection from gram-positive bacteria: *Streptococcus pneumoniae, S. pyogenes,* and *Actinomyces*

Hypotension, altered LOC, and hyperventilation may be the only signs of septic shock among infants and elderly people.

DATA COLLECTION FINDINGS

Indications of septic shock vary according to the stage of the shock, the organism causing it, and the age of the patient.

Early stage

• Chills
• Diarrhea
• Nausea
• Oliguria
• Prostration
• Sudden fever (over 101° F [38.3° C])
• Vomiting

Late stage

• Altered LOC
• Anuria
• Apprehension
• Hyperventilation
• Hypotension
• Hypothermia
• Irritability
• Restlessness
• Tachycardia
• Tachypnea
• Thirst from decreased cerebral tissue perfusion

DIAGNOSTIC FINDINGS

• ABG analysis indicates respiratory alkalosis (low partial pressure of carbon dioxide, low or normal bicarbonate level, and high pH) that may progress to metabolic acidosis.
• Blood cultures isolate the organism.
• Blood tests show decreased platelet count and leukocytosis (15,000 to 30,000/µl), increased BUN and creatinine levels, decreased creatinine clearance, and abnormal PT and PTT.
• ECG shows ST-segment depression, inverted T waves, and arrhythmias resembling MI.

NURSING DIAGNOSES

• Decreased cardiac output
• Deficient fluid volume
• Risk for injury

TREATMENT

• Removing and replacing any I.V. or urinary drainage catheter that may be causing the infection
• Oxygen therapy (may require ET intubation and mechanical ventilation)
• Colloid or crystalloid infusion to increase intravascular volume
• Diuretics, such as furosemide (Lasix), after sufficient fluid volume has been replaced to maintain urine output above 20 ml/hour
• Blood transfusion, if anemia is present
• Surgery to drain abscesses, if present

Drug therapy

• Antibiotics: according to sensitivity of causative organism

• Human-activated protein C: drotrecogin alfa (Xigris)
• Vasopressors: dopamine (Intropin), norepinephrine (Levophed), or phenylephrine (Neo-Synephrine), if fluid resuscitation fails to increase blood pressure

INTERVENTIONS AND RATIONALES

• Remove any I.V. or urinary drainage catheters and send them to the laboratory *to culture the causative organism.* New catheters can be reinserted *to provide access for fluid resuscitation and to ensure accurate measurement of urine output.*
• Maintain an I.V. infusion with normal saline solution or lactated Ringer's solution, usually using a large-bore (14G to 18G) catheter, *to allow easier infusion.*
• If the patient's systolic blood pressure drops below 80 mm Hg, increase oxygen flow rate and call the doctor immediately. *A progressive drop in blood pressure accompanied by a thready pulse generally signifies inadequate cardiac output from reduced vascular volume.*
• Keep accurate intake and output records. Maintain adequate urine output (0.5 to 1 ml/kg/hour) and systolic pressure *to prevent kidney damage and fluid overload.*
• Administer antibiotics I.V. *to achieve effective blood levels quickly,* and monitor drug levels *to prevent toxicity.*
• Watch closely for complications of septic shock—DIC (abnormal bleeding), renal failure (oliguria, increased specific gravity), heart failure (dyspnea, edema, tachycardia, distended neck veins), GI ulcers (hematemesis, melena), and hepatic abnormalities (jaundice, hypoprothrombinemia, and hypoalbuminemia)—*to prevent crisis.*

Teaching topics

• Disease process and treatment options
• Potential outcomes of treatment

Sickle cell anemia

Sickle cell anemia is a hereditary hematologic disease that causes impaired circulation, chronic ill health, and premature death. Although it's most common in tropical Africa and in people of African descent, it also occurs in people from Puerto Rico, Turkey, India, the Middle East, and the Mediterranean.

In patients with sickle cell anemia, a change in the gene that encodes the beta chain of Hb results in a defect in the hemoglobin S (HbS) cell. When hypoxia (oxygen deficiency) occurs, the HbS in the RBCs becomes insoluble. The cells become rigid and rough, forming an elongated sickle shape and impairing circulation. Infection, stress, dehydration, and conditions that provoke hypoxia—strenuous exercise, high altitude, unpressurized aircraft, cold, and vasoconstrictive drugs—may all provoke periodic crises. Crises can occur in different forms, including painful crisis, aplastic crisis, and acute sequestration crisis.

CAUSES

• Genetic inheritance: results from homozygous inheritance of an autosomal recessive gene that produces a defective Hb molecule (HbS); heterozygous inheritance results in sickle cell trait (people with this trait are carriers who can then pass the gene to their offspring)

DATA COLLECTION FINDINGS

• Aching bones
• Chronic fatigue
• Family history of the disease
• History of frequent infections
• Jaundice, pallor
• Joint pain and swelling
• Leg ulcers (especially on ankles)
• Severe localized and generalized pain
• Tachycardia
• Unexplained dyspnea or dyspnea on exertion
• Unexplained, painful erections (priapism)

Sickle cell crisis (general symptoms)

• Hematuria
• Irritability
• Lethargy
• Pale lips, tongue, palms, and nail beds
• Severe pain

Painful crisis (vaso-occlusive crisis, which appears periodically after age 5)

• Dark urine

- Low-grade fever
- Severe abdominal, thoracic, muscle, or bone pain
- Tissue anoxia and necrosis, caused by blood vessel obstruction by tangled sickle cells
- Worsening of jaundice

Aplastic crisis (generally associated with viral infection)

- Dyspnea
- Lethargy, sleepiness
- Pallor
- Possible coma

Acute sequestration crisis (rare; occurs in infants ages 8 months to 2 years)

- Signs and symptoms of hypovolemic shock
- Lethargy
- Liver enlargement
- Pallor
- Worsened chronic jaundice

DIAGNOSTIC FINDINGS

- Blood tests show low RBC counts, elevated WBC and platelet counts, decreased ESR, increased serum iron levels, decreased RBC survival, and reticulocytosis.
- Hb electrophoresis shows HbS.
- Hb levels may be low or normal.
- Stained blood smear shows sickle cells.

NURSING DIAGNOSES

- Impaired gas exchange
- Acute pain
- Ineffective tissue perfusion: Peripheral

TREATMENT

- Application of warm compresses for pain relief
- Blood transfusion therapy if Hb levels drop
- Iron and folic acid supplements to prevent anemia
- I.V. fluid therapy to prevent dehydration and vessel occlusion

Drug therapy

- Analgesics: meperidine (Demerol) or morphine

INTERVENTIONS AND RATIONALES

- Provide emotional support *to allay the patient's anxiety.*
- Refer the patient for genetic counseling *to decrease anxiety and help the patient to understand the chances of passing the disease to offspring.*
- Refer the patient and his family to community support groups *to help the patient and his family cope with his illness.*

During a crisis

- Apply warm compresses to painful areas, and cover the patient with a blanket. *Cold compresses and temperature can aggravate the condition.*
- Administer an analgesic-antipyretic, such as aspirin or acetaminophen, *for pain relief.* (Additional pain relief may be necessary during an acute crisis.)
- Maintain bed rest *to reduce workload on the heart and reduce pain.*
- Monitor the administration of blood components (packed RBCs), as ordered, *for aplastic crisis caused by bone marrow suppression.*
- Administer oxygen *to enhance oxygenation and reduce sickling.*
- Encourage fluid intake *to prevent dehydration, which can precipitate a crisis.*
- Maintain prescribed I.V. fluids *to ensure fluid balance and renal perfusion.*
- Give antibiotics, as ordered, *to treat infections and avoid precipitating a crisis.*

Teaching topics

- Avoiding circulation restriction
- Receiving normal childhood immunizations
- Obtaining prompt treatment for infections
- Maintaining increased fluid intake to prevent dehydration
- Preventing hypoxia
- Avoiding known triggers

In the autosomal recessive inheritance pattern, if two carriers have offspring, each child has a one-in-four chance of developing the disease.

Sodium imbalance

Sodium is the major cation (positively charged ion) in ECF. Its functions include maintaining tonicity and concentration of ECF, acid-base balance (reabsorption of sodium ions and excretion of hydrogen ions), nerve conduction and neuromuscular function, glandular secretion, and water balance.

The sodium-potassium pump is constantly at work in every body cell. Potassium is the major cation in intracellular fluid. According to the laws of diffusion, a substance moves from an area of high concentration to an area of lower concentration. Sodium ions, normally most abundant outside the cells, want to diffuse inward. Potassium ions, normally abundant inside the cells, want to diffuse outward. The sodium-potassium pump works to combat this ionic diffusion and maintain normal sodium-potassium balance.

During repolarization, the sodium-potassium pump continually shifts sodium into the cells and potassium out of the cells; during depolarization, it does the reverse.

The body requires only 2 to 4 g of sodium daily. However, most Americans consume 6 to 10 g daily (mostly sodium chloride, as table salt), excreting excess sodium through the kidneys and skin.

A low-sodium diet or excessive use of diuretics may induce hyponatremia (decreased serum sodium concentration); dehydration may induce hypernatremia (increased serum sodium concentration).

CAUSES

Hyponatremia

- Diarrhea
- Excessive perspiration or fever
- Excessive water intake
- Low-sodium diet
- Malnutrition
- Potent diuretics
- Starvation
- Suctioning
- Trauma, wound drainage, or burns
- Vomiting

Hypernatremia

- Decreased water intake
- Diabetes insipidus
- Excess adrenocortical hormones, as in Cushing's syndrome
- Severe vomiting and diarrhea with water loss that exceeds sodium loss

DATA COLLECTION FINDINGS

Hyponatremia

- Abdominal cramps
- Anxiety
- Cold, clammy skin
- Cyanosis
- Headaches
- Hypotension
- Muscle twitching and weakness
- Nausea and vomiting
- Oliguria or anuria
- Seizures
- Tachycardia

Hypernatremia

- Agitation and restlessness
- Signs and symptoms of circulatory disorders
- Decreased LOC
- Dry, sticky mucous membranes
- Dyspnea
- Excessive weight gain
- Fever
- Flushed skin
- Hypertension
- Intense thirst
- Oliguria
- Pitting edema
- Signs and symptoms of pulmonary edema
- Rough, dry tongue
- Seizures
- Tachycardia

DIAGNOSTIC FINDINGS

- Serum sodium level less than 135 mEq/L indicates hyponatremia.
- Serum sodium level greater than 145 mEq/L indicates hypernatremia.

NURSING DIAGNOSES

Hyponatremia

- Deficient fluid volume
- Risk for injury

Hypernatremia
- Excess fluid volume
- Disturbed thought processes

TREATMENT

Hyponatremia
- Antibiotic: demeclocycline (Declomycin)
- I.V. infusion of saline solution
- Potassium supplement: potassium chloride (K-Lor)

Hypernatremia
- Diet: sodium restrictions
- Salt-free solution (such as dextrose in water), followed by infusion of 0.45% sodium chloride to prevent hyponatremia

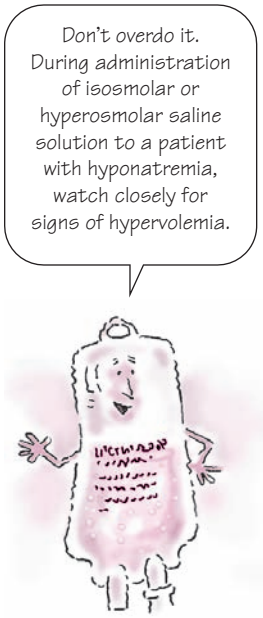
INTERVENTIONS AND RATIONALES

For hyponatremia
- Watch for extremely low serum sodium and accompanying serum chloride levels. Monitor urine specific gravity and other laboratory results. Record fluid intake and output accurately and weigh the patient daily *to guide the treatment plan.*
- During administration of isosmolar or hyperosmolar saline solution, watch closely for signs of hypervolemia (dyspnea, crackles, engorged neck or hand veins) *to prevent respiratory distress.*
- Note conditions that may cause excessive sodium loss—diaphoresis, prolonged diarrhea or vomiting, or severe burns—*to prevent hyponatremia.*
- Refer the patient receiving a maintenance dosage of diuretics to a dietitian for instruction about dietary sodium intake *to increase dietary intake of sodium and decrease the risk of hyponatremia.*

For hypernatremia
- Measure serum sodium levels every 6 hours or at least daily. Monitor vital signs for changes, especially for rising pulse rate. Watch for signs of hypervolemia, especially in the patient receiving I.V. fluids, *to guide the treatment regimen.*
- Record fluid intake and output accurately, checking for body fluid loss, *to prevent dehydration and accompanying hypernatremia.* Weigh the patient daily *to monitor fluid volume status.*
- Obtain a drug history *to check for drugs that promote sodium retention.*

Teaching topics for hyponatremia
- Maintaining fluid restriction if necessary
- Increasing dietary intake of sodium
- Following medication regimen and knowing possible adverse reactions

Teaching topics for hypernatremia
- Following sodium restrictions and planning a low-sodium diet



Systemic lupus erythematosus

SLE is an autoimmune disorder that involves most organ systems. It's chronic in nature and characterized by periods of exacerbation and remission.

In SLE, a depression of T-cell activity and an increase in the production of antibodies—specifically antibodies to DNA and ribonucleic acid and anti-erythrocyte, antinuclear, and antiplatelet antibodies—occur. The immune response results in an inflammatory process involving the veins and arteries (vasculitis), which causes pain, swelling, and tissue damage in any area of the body.

CAUSES
- Autoimmune disease
- Drug-induced: procainamide (Pronestyl), hydralazine (Apresoline), and phenytoin (Dilantin)
- Genetic
- Unknown
- Viral

DATA COLLECTION FINDINGS
- Alopecia
- Anorexia and weight loss
- Anemia, leukopenia, and thrombocytopenia
- Butterfly rash on face (rash may vary in severity from malar erythema to discoid lesions)
- Erythema on palms
- Fatigue

- Signs and symptoms of glomerulonephritis, renal dysfunction and failure (with renal involvement)
- Impaired cognitive function, psychosis, depression, seizures, peripheral neuropathies, strokes, organic brain syndrome (with CNS involvement)
- Low-grade fever
- Lymphadenopathy, splenomegaly, and hepatomegaly
- Migratory pain, joint stiffness and swelling
- Oral and nasopharyngeal ulcerations
- Photosensitivity
- Signs and symptoms of pleurisy, pericarditis, myocarditis, noninfectious endocarditis, and hypertension (with cardiac involvement)
- Signs and symptoms of Raynaud's phenomenon

DIAGNOSTIC FINDINGS

- ANA test is positive.
- Blood chemistry shows decreased complement fixation.
- Hematology shows decreased Hb, HCT, WBC, and platelets and an increased ESR.
- Lupus erythematosus cell preparation is positive.
- Rheumatoid factor is positive.
- Urine chemistry shows proteinuria and hematuria.

NURSING DIAGNOSES

- Impaired physical mobility
- Ineffective breathing pattern
- Risk for infection

TREATMENT

- Diet high in iron, protein, and vitamins (especially vitamin C)
- Hemodialysis or kidney transplant, if renal failure occurs
- Limited exertion and maintenance of adequate rest
- Plasmapheresis

Drug therapy

- Analgesic: aspirin
- Iron supplements: ferrous sulfate (Feosol), ferrous gluconate (Fergon)
- Antirheumatic: hydroxychloroquine (Plaquenil)
- Cytotoxic drugs: methotrexate (Trexall) to delay or prevent deteriorating renal status
- Glucocorticoid: prednisone (Deltasone)
- Immunosuppressants: azathioprine (Imuran), cyclophosphamide (Cytoxan)
- NSAIDs: indomethacin (Indocin), ibuprofen (Motrin), sulindac (Clinoril), piroxicam (Feldene), flurbiprofen (Ansaid), diclofenac sodium (Voltaren), naproxen (Naprosyn), diflunisal (Dolobid)

INTERVENTIONS AND RATIONALES

- Evaluate musculoskeletal status *to determine the patient's baseline functional abilities.*
- Monitor renal status. *Decreased urine output without lowered fluid intake may indicate decreased renal perfusion, a possible indication of decreased cardiac output.*
- Monitor vital signs *to promptly determine whether the patient's condition is deteriorating and evaluate the effectiveness of treatment. Fever can signal an exacerbation.*
- Provide prophylactic skin, mouth, and perineal care *to prevent skin and oral mucous membrane breakdown.*
- Administer medications, as prescribed, *to comply with the treatment regimen.*
- Maintain seizure precautions *to prevent patient injury.*
- Monitor dietary intake *to help ensure adequate nutritional intake.*
- Minimize environmental stress and provide rest periods *to help the patient avoid fatigue and cope with illness.*
- Promote independence in ADLs *to help the patient develop self-esteem.*
- Administer antiemetics *to alleviate nausea and vomiting.*
- Administer antidiarrheals, as prescribed, *to alleviate diarrhea.*
- Encourage the patient to express feelings about changes in his body image and the chronic nature of the disease *to help the patient express doubts and resolve concerns.*

Teaching topics

- Quitting smoking (if appropriate)
- Reducing stress
- Recognizing early signs and symptoms of renal failure
- Avoiding exposure to people with infections

• Monitoring for infection, fatigue, and joint pain
• Performing daily, complete mouth care
• Avoiding OTC medications
• Avoiding exposure to sunlight
• Avoiding hair spray or hair coloring
• Avoiding hormonal contraceptives
• Using liquid cosmetics to cover rashes
• Contacting groups such as the Lupus Foundation of America

One name, many disorders. Vasculitis refers to various disorders characterized by inflammation and necrosis of blood vessels.

Vasculitis

Vasculitis is a broad spectrum of disorders characterized by inflammation and necrosis of blood vessels. Its clinical effects depend on the vessels involved and reflect tissue ischemia caused by blood flow obstruction.

The prognosis is also variable. For example, hypersensitivity vasculitis is usually a benign disorder limited to the skin, but more extensive polyarteritis nodosa can be rapidly fatal.

Vasculitis can occur at any age, except for mucocutaneous lymph node syndrome, which occurs only during childhood. Vasculitis may be a primary disorder or secondary to other disorders, such as rheumatoid arthritis or SLE.

CAUSES

• Excessive levels of an antigen
• High-dose antibiotic therapy
• Often associated with serious infectious disease, such as hepatitis B or bacterial endocarditis

DATA COLLECTION FINDINGS

A few examples of vasculitis and their specific data collection findings are listed here.

Wegener's granulomatosis

This form of vasculitis affects medium- to large-sized vessels of the upper and lower respiratory tract and kidneys; it may also involve small arteries and veins. Data collection findings include:
• anorexia
• cough
• fever
• malaise
• mild to severe hematuria
• signs and symptoms of pulmonary congestion
• weight loss.

Temporal arteritis

This type of vasculitis affects medium- to large-sized arteries, most commonly branches of the carotid artery; involvement may skip segments. Data collection findings include:
• fever
• headache (associated with polymyalgia rheumatica syndrome)
• jaw claudication
• myalgia
• visual changes.

Takayasu's arteritis

Also known as aortic arch syndrome, Takayasu's arteritis affects medium- to large-sized arteries, particularly the aortic arch and its branches and, possibly, the pulmonary artery. Data collection findings include:
• anorexia
• arthralgias
• bruits
• signs and symptoms of stroke (with disease progression)
• diplopia and transient blindness, if carotid artery is involved
• signs and symptoms of heart failure (with disease progression)
• loss of distal pulses
• malaise
• nausea
• night sweats
• pain or paresthesia distal to affected area
• pallor
• syncope
• weight loss.

DIAGNOSTIC FINDINGS

Wegener's granulomatosis

• Tissue biopsy shows necrotizing vasculitis with granulomatous inflammation.
• Blood studies show leukocytosis, elevated ESR, IgA, and IgG; low-titer rheumatoid factor; and circulating immune complexes: antineutrophil cytoplasmic antibody in more than 90% of patients.
• Renal biopsy shows focal segmental glomerulonephritis.

Temporal arteritis

• Blood studies show decreased Hb and elevated ESR.
• Tissue biopsy shows panarteritis with infiltration of mononuclear cells, giant cells within vessel wall (seen in 50%), fragmentation of internal elastic lamina, and proliferation of intima.

Takayasu's arteritis

• Blood studies show decreased Hb, leukocytosis, positive lupus erythematosus cell preparation, and elevated ESR.
• Arteriography shows calcification and obstruction of affected vessels.
• Tissue biopsy shows inflammation of adventitia and intima of vessels and thickening of vessel walls.

NURSING DIAGNOSES

• Ineffective tissue perfusion: Peripheral
• Risk for injury
• Disturbed sensory perception (tactile)

TREATMENT

• Removal of identified environmental antigen
• Diet: elimination of antigenic food, if identifiable

Drug therapy

• Corticosteroid: prednisone (Deltasone)
• Antineoplastic: cyclophosphamide (Cytoxan)

INTERVENTIONS AND RATIONALES

• Check for dry nasal mucosa in patients with Wegener's granulomatosis. Instill nose drops *to lubricate the mucosa and help diminish crusting*. Or, irrigate the nasal passages with warm normal saline solution *to combat drying*.
• Regulate environmental temperature *to prevent additional vasoconstriction caused by cold.*
• Monitor vital signs. Use a Doppler ultrasonic flowmeter, if available, *to auscultate blood pressure in patients with Takayasu's arteritis, whose peripheral pulses are frequently difficult to palpate.*
• Monitor intake and output. Check daily for edema. Keep the patient well hydrated (3 L daily) *to reduce the risk of hemorrhagic cystitis associated with cyclophosphamide therapy.*
• Provide emotional support *to help the patient and his family cope with an altered body image*—the result of the disorder or its therapy. (For example, Wegener's granulomatosis may be associated with saddle nose, steroids may cause weight gain, and cyclophosphamide may cause alopecia.)

Teaching topics

• Recognizing adverse reactions to medication
• Increasing fluids during cyclophosphamide therapy

Pump up on practice questions

1. A client with major abdominal trauma needs an emergency blood transfusion. The client's blood type is AB negative. Of the blood types available, the safest type for the nurse to administer is:

1. AB positive.
2. A positive.
3. B negative.
4. O positive.

Answer: 3. Individuals with AB negative blood (AB type, Rh negative) can receive A negative, B negative, and AB negative blood. It's unsafe to give Rh-positive blood to an Rh-negative person.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

2. The nurse is preparing a client with systemic lupus erythematosus (SLE) for discharge. Which instructions should the nurse include in the teaching plan?

1. Exposure to sunlight will help control skin rashes.
2. There are no activity limitations between flare-ups.
3. Monitor body temperature.
4. Corticosteroids may be stopped when symptoms are relieved.

Answer: 3. The client should monitor his temperature, because fever can signal an exacerbation and should be reported to the physician. Sunlight and other sources of ultraviolet light may precipitate severe skin reactions and exacerbate the disease. Fatigue can cause a flare-up of SLE, and clients should be encouraged to pace activities and plan for rest periods. Corticosteroids must be gradually tapered because they can suppress the function of the adrenal gland. Abruptly stopping corticosteroids can cause adrenal insufficiency, a potentially life-threatening situation.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

3. A client with rheumatoid arthritis has a history of long-term nonsteroidal anti-inflammatory drug (NSAID) use and has developed peptic ulcer disease. To prevent or treat this adverse effect, the nurse would administer:

1. cyanocobalamin (vitamin B_{12}).
2. ticlopidine (Ticlid).
3. prednisone (Deltasone).
4. misoprostol (Cytotec).

Answer: 4. NSAIDs decrease prostaglandin synthesis. Misoprostol, a synthetic analog of prostaglandin, is used to treat and prevent NSAID-induced gastric ulcers. Cyanocobalamin is used to treat vitamin B_{12} deficiency. Ticlopidine is an antiplatelet agent used to reduce the risk of stroke. Prednisone is a glucocorticoid used to treat several inflammatory disorders and may promote gastric ulcer development.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Comprehension

4. A client with thrombocytopenia secondary to leukemia develops epistaxis. The nurse should instruct the client to:

1. lie supine with his neck extended.
2. sit upright, leaning slightly forward.
3. blow his nose and then put lateral pressure on his nose.
4. hold his nose while bending forward at the waist.

Answer: 2. The upright position, leaning slightly forward, avoids increasing the vascular pressure in the nose and helps the client avoid aspirating blood. Lying supine won't prevent aspiration of the blood. Nose blowing can dislodge any clotting that has occurred. Bending at the waist increases vascular pressure in the nose and promotes bleeding rather than halting it.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

5. A nurse is teaching a client diagnosed with pernicious anemia. Which point should the nurse include?

1. Importance of receiving monthly vitamin B_{12} injections for the rest of the client's life
2. Establishing a low-protein diet
3. Discontinuing his vegetarian diet
4. Using heating pads or electric blankets to warm his feet

Answer: 1. The nurse should teach the client with pernicious anemia the importance of receiving lifelong monthly injections of vitamin B_{12}. The client should also be taught to consume a diet high in iron and protein. The client doesn't have to stop his vegetarian diet as long as he includes foods that are high in these nutrients. The use of heating pads or electric blankets should be avoided because sensation in the foot may be reduced.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

6. A nurse is reviewing the laboratory report of a client who underwent a bone marrow biopsy. The finding that would most strongly support a diagnosis of acute leukemia is the existence of a large number of immature:

1. lymphocytes.
2. thrombocytes.
3. reticulocytes.
4. leukocytes.

Answer: 4. Leukemia is manifested by an abnormal overproduction of immature leukocytes in the bone marrow. The other cells listed aren't diagnostic for leukemia.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

7. A nurse is reviewing findings data for a client diagnosed with stage III lymphoma. This diagnosis is most strongly supported by lymphatic involvement in both sides of the:

1. blood-brain barrier.
2. diaphragm.
3. descending aorta.
4. spinal column.

Answer: 2. In stage III lymphoma, malignant cells are widely disseminated to lymph nodes on both sides of the diaphragm.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

8. A nurse is providing care for a client with acquired immunodeficiency syndrome and *Pneumocystis carinii* pneumonia. The client is receiving aerosolized pentamidine isethionate (NebuPent). What's the best evidence that the therapy is succeeding?

1. A sudden weight gain
2. Whitening of lung fields on the chest X-ray
3. Improving client vitality and activity tolerance
4. Afebrile body temperature and development of leukocytosis

Answer: 3. *P. carinii* pneumonia is a protozoal infection of the lungs. Pentamidine isethionate is one of the agents used to treat this infection. Because a common manifestation of the infection is activity intolerance and loss of vitality, improvements in these areas would suggest success of the therapy. Sudden weight gain, whitening of the lung fields on chest X-ray, and development of leukocytosis aren't evidence of therapeutic success.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

9. A nurse is documenting her care for a client with iron deficiency anemia. Which nursing diagnosis is most appropriate?

1. Impaired gas exchange
2. Deficient fluid volume
3. Ineffective airway clearance
4. Ineffective breathing pattern

Answer: 1. Iron is necessary for hemoglobin (Hb) synthesis. Hb is responsible for oxygen transport in the body. Iron deficiency anemia causes subnormal Hb levels, which leads to impaired tissue oxygenation and calls for a nursing diagnosis of impaired gas exchange. Iron deficiency anemia doesn't cause deficient fluid volume and is less directly related to ineffective airway clearance and breathing pattern than it is to ineffective gas exchange.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

10. A nurse is administering cyanocobalamin (vitamin B_{12}) to a client with pernicious anemia secondary to gastrectomy. Which route should the nurse use to administer the vitamin most effectively?

1. Topical route
2. Transdermal route
3. Enteral route
4. Parenteral route

Answer: 4. Following a gastrectomy, the client no longer has the intrinsic factor available to promote vitamin B_{12} absorption in his GI tract. Therefore, vitamin B_{12} is administered parenterally (I.M. or deep subQ). Topical and transdermal forms aren't available, and the enteral route is inappropriate after a gastrectomy.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

6 Neurosensory system

In this chapter, you'll review:

- components of the neurosensory system and their functions
- tests used to diagnose neurosensory disorders
- common neurosensory disorders.

Brush up on key concepts

The neurosensory system serves as the body's communication network. It processes information from the outside world (through the sensory portion) and coordinates and organizes the functions of all other body systems. Major parts of the neurosensory system include the brain, spinal cord, peripheral nerves, eyes, and ears.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 170 to 176.

The little conductor that could

The **neuron,** or nerve cell, is the basic functional unit of the neurosensory system. This highly specialized conductor cell receives and transmits electrochemical nerve impulses. From its cell body, delicate, threadlike nerve fibers called axons and dendrites extend and transmit signals. Axons carry impulses away from the cell body; dendrites carry impulses toward the cell body.

A covering called a myelin sheath protects the entire neuron. Substances known as neurotransmitters (acetylcholine, serotonin, dopamine, endorphins, gamma-aminobutyric acid, and norepinephrine) help conduct impulses across a synapse and into the next neuron.

House of intelligence

The **central nervous system** (CNS) includes the brain and spinal cord. These fragile structures are protected by the skull and vertebrae, cerebrospinal fluid (CSF), and three membranes: the dura mater, the pia mater, and the arachnoid membrane.

The **cerebrum,** the largest part of the brain, houses the nerve center that controls motor and sensory functions and intelligence. It's divided into hemispheres. Because motor impulses descending from the brain cross in the medulla, the right hemisphere controls the left side of the body and the left hemisphere controls the right side of the body. Several fissures divide the cerebrum into four lobes:

- frontal lobe—the site of personality, memory, reasoning, concentration, and motor control of speech
- parietal lobe—the site of sensation, integration of sensory information, and spatial relationships
- temporal lobe—the site of hearing, speech, memory, and emotion
- occipital lobe—the site of vision and involuntary eye movements.

Brain networking

The **thalamus** is a structure located deep within the brain that consists of two oval-shaped parts, one located in each hemisphere. The thalamus is referred to as the relay station of the brain because it receives input from all of the senses except olfaction (smell), analyzes that input, and then transmits that information to other parts of the brain.

The **hypothalamus,** located beneath the thalamus, controls sleep and wakefulness, temperature, respiration, blood pressure, sexual arousal, fluid balance, and emotional response.

Movement, balance, and posture

The **cerebellum,** at the base of the brain, coordinates muscle movements, maintains balance, and controls posture.

(Text continues on page 177.)

Cheat sheet

Neurosensory refresher

ACUTE HEAD INJURY

Key signs and symptoms

- Altered mental status
- Unequal pupil size, loss of pupillary reaction (late sign)

Key test results

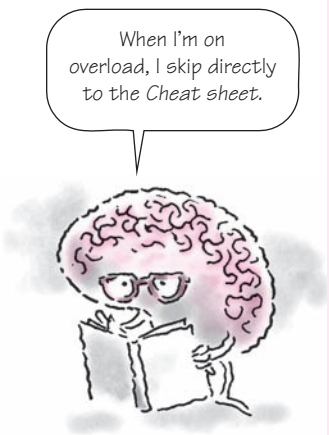
- Computed tomography (CT) scan shows hemorrhage, cerebral edema, or shift of midline structures.
- Magnetic resonance imaging (MRI) shows hemorrhage, cerebral edema, or shift of midline structures.

Key treatments

- Cervical collar (until neck injury is ruled out)
- Anticonvulsant: phenytoin (Dilantin)
- Barbiturate: pentobarbital (Nembutal) if unable to control intracranial pressure (ICP) with diuresis
- Diuretics: mannitol (Osmitrol), furosemide (Lasix) to combat cerebral edema
- Vasopressors: dopamine (Intropin) or phenylephrine (Neo-Synephrine) to maintain cerebral perfusion pressure above 60 mm Hg (if blood pressure is low and ICP is elevated)
- Glucocorticoid: dexamethasone (Decadron) to reduce cerebral edema
- Histamine-2 (H_2)-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)
- Mucosal barrier fortifier: sucralfate (Carafate)
- Posterior pituitary hormone: vasopressin (Pitressin), if patient develops diabetes insipidus

Key interventions

- Monitor neurologic and respiratory status.
- Keep the patient free from stimuli.
- Monitor and record vital signs, intake and output, urine specific gravity, laboratory studies, and pulse oximetry values.
- Check for signs of diabetes insipidus (low urine specific gravity, high urine output).
- Allow a rest period between nursing activities.



AMYOTROPHIC LATERAL SCLEROSIS

Key signs and symptoms

- Awkwardness of fine finger movements
- Dysphagia
- Fatigue
- Muscle weakness of hands and feet

Key test results

- Creatine kinase level is elevated.
- Electromyography (EMG) shows impaired impulse conduction in the muscles.

Key treatments

- Symptomatic relief
- Neuroprotective agent: riluzole (Rilutek)

Key interventions

- Monitor neurologic and respiratory status.
- Evaluate swallow and gag reflexes.
- Monitor and record vital signs and intake and output.
- Devise an alternate method of communication when necessary.
- Suction the oropharynx as necessary.

BELL'S PALSY

Key signs and symptoms

- Inability to close eye completely on the affected side
- Pain around the jaw or ear
- Unilateral facial weakness

Key test results

- EMG helps predict the level of expected recovery by distinguishing temporary conduction defects from a pathologic interruption of nerve fibers.

Key treatments

- Moist heat
- Corticosteroid: prednisone (Deltasone) to reduce facial nerve edema and improve nerve conduction and blood flow
- Artificial tears to protect the cornea from injury

Key interventions

- During treatment with prednisone, watch for adverse reactions, especially GI distress and fluid retention.

Neurosensory refresher *(continued)*

BELL'S PALSY *(continued)*

- Apply moist heat to the affected side of the face, taking care not to burn the skin.
- Massage the patient's face with a gentle upward motion two or three times daily for 5 to 10 minutes, or have him massage his face himself. When he's ready for active facial exercises, teach him to grimace in front of a mirror.
- Arrange for privacy at mealtimes.
- Offer psychological support. Give reassurance that recovery is likely within 1 to 8 weeks.

BRAIN ABSCESS

Key signs and symptoms

- Headache
- Chills
- Fever
- Confusion
- Drowsiness

Key test results

- Physical examination shows increased ICP.
- Enhanced CT scan reveals the abscess site.
- A CT-guided stereotactic biopsy may be performed to drain and culture the abscess.

Key treatments

- Penicillinase-resistant antibiotics: nafcillin, methicillin
- Surgical aspiration or drainage of the abscess

Key interventions

- Frequently monitor neurologic status.
- Monitor and record vital signs at least once every hour.
- Monitor fluid intake and output carefully.
- After surgery, monitor neurologic status. Monitor vital signs and intake and output.
- Watch for signs of meningitis (nuchal rigidity, headaches, chills, sweats).
- Change the dressing when damp. Never allow bandages to remain damp.
- Position the patient on the operative side.
- Measure drainage from a Jackson-Pratt drain or other type of drain as instructed by the surgeon.

BRAIN TUMOR

Key sign or symptom

- Vary, depending on location of tumor

Key test results

- CT scan shows location and size of tumor.
- MRI shows location and size of tumor.

Key treatments

- Craniotomy
- Anticonvulsant: phenytoin (Dilantin)
- Glucocorticoid: dexamethasone (Decadron)
- H_2-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)
- Mucosal barrier fortifier: sucralfate (Carafate)

Key interventions

- Monitor neurologic and respiratory status.
- Evaluate pain.
- Observe for signs and symptoms of increased ICP.
- Monitor for signs and symptoms of syndrome of inappropriate antidiuretic hormone (edema, weight gain, positive fluid balance, high urine specific gravity).
- Encourage the patient to express feelings about changes in body image and a fear of dying.

CATARACT

Key signs and symptoms

- Dimmed or blurred vision
- Poor night vision
- Yellow, gray, or white pupil

Key test result

- Ophthalmoscopy or slit-lamp examination confirms the diagnosis by revealing a dark area in the normally homogeneous red reflex.

Key treatment

- Extracapsular cataract extraction and intracapsular lens implant

Key interventions

- Provide a safe environment for the patient.
- Modify the environment to help the patient meet his self-care needs (for example, by placing items on the unaffected side).

CEREBRAL ANEURYSM

Key sign or symptom

- Sudden headache (commonly described by the patient as the worst he's ever had)

Key test results

- Cerebral angiogram identifies the aneurysm.
- CT scan may show a shift of intracranial midline structures and blood in the subarachnoid space.

Key treatments

- Aneurysm clipping
- Anticonvulsant: phenytoin (Dilantin)
- Calcium channel blocker: nimodipine (Nimotop) preferred to prevent cerebral vasospasm

(continued)

Neurosensory refresher *(continued)*

CEREBRAL ANEURYSM *(continued)*

- Glucocorticoid: dexamethasone (Decadron)
- H_2-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)
- Stool softener: docusate sodium (Colace)

Key interventions

- Monitor neurologic status.
- Maintain crystalloid solutions after aneurysm clipping.
- Take vital signs every 1 to 2 hours initially and then every 4 hours when the patient becomes stable.
- Allow a rest period between nursing activities.

CONJUNCTIVITIS

Key signs and symptoms

- Excessive tearing
- Itching, burning
- Mucopurulent discharge

Key test result

- Culture and sensitivity tests identify the causative bacterial organism and indicate appropriate antibiotic therapy.

Key treatments

- Antiviral agents: vidarabine ointment (Vira-A) or oral acyclovir (Zovirax), if herpes simplex is the cause
- Corticosteroids: dexamethasone (Maxidex), fluorometholone (Fluor-Op Ophthalmic), if the cause is nonviral
- Mast cell stabilizer: cromolyn (Opticrom) for allergic conjunctivitis
- Topical antibiotics: according to the sensitivity of the infective organism (if bacterial)

Key interventions

- Teach proper hand-washing technique.
- Stress the risk of spreading infection to family members by sharing washcloths, towels, and pillows. Warn against rubbing the infected eye, which can spread the infection to the other eye and to other persons.
- Apply warm compresses and therapeutic ointment or drops. Don't irrigate the eye.
- Have the patient wash his hands before he uses the medication, and tell him to use clean washcloths or towels frequently.
- Teach the patient to instill eyedrops and ointments correctly—without touching the bottle tip to his eye or lashes.

CORNEAL ABRASION

Key signs and symptoms

- Burning
- Increased tearing
- Redness

Key test result

- Staining the cornea with fluorescein stain confirms the diagnosis: The injured area appears green when examined with a flashlight.

Key treatments

- Cycloplegic agent: tropicamide (Tropicacyl)
- Irrigation with saline solution
- Pressure patch (a tightly applied eye patch)
- Removal of a deeply embedded foreign body with a foreign body spud, using a topical anesthetic

Key interventions

- Assist with examination of the eye. Check visual acuity before beginning treatment.
- If a foreign body is visible, carefully irrigate the eye with normal saline solution.
- Tell the patient with an eye patch to leave the patch in place for 6 to 8 hours.
- Stress the importance of instilling prescribed antibiotic eyedrops.

ENCEPHALITIS

Key signs and symptoms

- Meningeal irritation (stiff neck and back) and neuronal damage (drowsiness, coma, paralysis, seizures, ataxia, and organic psychoses)
- Sudden onset of fever
- Headache
- Vomiting

Key test results

- Blood studies identify the virus and confirm the diagnosis.
- Cerebrospinal fluid (CSF) analysis identifies the virus.

Key treatments

- Endotracheal (ET) intubation and mechanical ventilation
- Nasogastric (NG) tube feedings or total parenteral nutrition (if unable to use the GI tract)
- Anticonvulsants: phenytoin (Dilantin), phenobarbital (Luminal)
- Analgesics and antipyretics: aspirin, acetaminophen (Tylenol) to relieve headache and reduce fever
- Diuretics: furosemide (Lasix), mannitol (Osmitrol) to reduce cerebral swelling
- Corticosteroid: dexamethasone (Decadron) to reduce cerebral inflammation and edema

Key interventions

- Monitor neurologic function often. Observe the patient's mental status and cognitive abilities.
- Avoid fluid overload. Measure and record intake and output accurately.

Neurosensory refresher *(continued)*

ENCEPHALITIS *(continued)*

- Carefully position the patient and turn him often.
- Assist with range-of-motion exercises.
- Maintain a quiet environment. Darken the room.

GLAUCOMA

Key signs and symptoms

Chronic open-angle glaucoma
- Initially asymptomatic

Acute angle-closure glaucoma
- Acute ocular pain
- Blurred vision
- Dilated pupil
- Halo vision

Key test results
- Ophthalmoscopy shows atrophy and cupping of optic nerve head.
- Tonometry shows increased intraocular pressure.

Key treatments

Chronic open-angle glaucoma
- Alpha-adrenergic agonist: brimonidine (Alphagan)
- Beta-adrenergic antagonist: timolol (Timoptic)

Acute angle-closure glaucoma
- Cholinergic: pilocarpine (Pilopine HS)
- Laser iridectomy or surgical iridectomy, if pressure doesn't decrease with drug therapy

Key interventions
- Monitor eye pain, and administer medication as prescribed.
- Modify the environment.

GUILLAIN-BARRÉ SYNDROME

Key sign or symptom
- Symmetrical muscle weakness (ascending from the legs to the arms)

Key test results
- A history of preceding febrile illness (usually a respiratory tract infection) and typical clinical features suggest Guillain-Barré syndrome.
- CSF protein level begins to rise, peaking in 4 to 6 weeks. The CSF white blood cell count remains normal but, in severe disease, CSF pressure may rise above normal.

Key treatments
- Anticoagulants: heparin, warfarin (Coumadin)
- Corticosteroid: prednisone (Deltasone)
- ET intubation or tracheotomy, possibly mechanical ventilation
- I.V. fluid therapy
- NG tube feedings or parenteral nutrition (if unable to use the GI tract)
- Plasmapheresis

Key interventions
- Watch for ascending sensory loss, which precedes motor loss. Also, monitor vital signs and level of consciousness.
- Monitor and treat respiratory dysfunction.
- Maintain respiratory support, if needed.
- Reposition the patient every 2 hours.
- If aspiration can't be minimized by diet and position modification, expect to provide NG tube feeding.
- Inspect the patient's legs regularly for signs of thrombophlebitis. Apply antiembolism stockings and sequential compression devices, and give prophylactic anticoagulants as needed.
- Encourage adequate fluid intake (2,000 ml/day), unless contraindicated.

HUNTINGTON'S DISEASE

Key signs and symptoms
- Dementia (can be mild at first but eventually disrupts the patient's personality)
- Gradual loss of musculoskeletal control, eventually leading to total dependence

Key test results
- Positron emission tomography detects the disease.
- Deoxyribonucleic acid analysis detects the disease.

Key treatments
- Antidepressant: imipramine (Tofranil) to alleviate depression
- Antipsychotics: chlorpromazine (Thorazine), haloperidol (Haldol) to help control choreic movements
- Supportive, protective treatment aimed at relieving symptoms (because Huntington's disease has no known cure)

Key interventions
- Provide physical support by attending to the patient's basic needs, such as hygiene, skin care, bowel and bladder care, and nutrition. Increase this support as mental and physical deterioration makes him increasingly immobile.
- Stay alert for possible suicide attempts. Control the patient's environment to protect him from suicide or other self-inflicted injury.
- Pad the side rails of the bed but avoid restraints.

MÉNIÈRE'S DISEASE

Key signs and symptoms
- Sensorineural hearing loss
- Severe vertigo
- Tinnitus

(continued)

Neurosensory refresher *(continued)*

MÉNIÈRE'S DISEASE *(continued)*

Key test result

• Audiometric studies indicate a sensorineural hearing loss and loss of discrimination and recruitment.

Key treatments

• Restriction of sodium intake to less than 2 g/day
• Anticholinergic: atropine (may stop an attack in 20 to 30 minutes)
• Antihistamine: diphenhydramine (Benadryl) for severe attack

Key interventions

• Advise the patient against reading and exposure to glaring lights during an attack.
• Stress safety measures. Tell the patient not to get out of bed or walk without assistance during an attack.
• Instruct the patient to avoid sudden position changes and tasks that vertigo makes hazardous.

Before surgery

• If the patient is vomiting, record fluid intake and output and characteristics of vomitus. Administer antiemetics as necessary, and give small amounts of fluid frequently.

After surgery

• Tell the patient to expect dizziness and nausea for 1 or 2 days after surgery.

MENINGITIS

Key signs and symptoms

• Chills
• Fever
• Headache
• Malaise
• Photophobia
• Positive Brudzinski's sign (patient flexes hips or knees when the nurse places her hands behind his neck and flexes it forward)—a sign of meningeal inflammation and irritation
• Positive Kernig's sign (pain or resistance when the patient's leg is flexed at the hip or knee while he's in a supine position)
• Stiff neck and back
• Vomiting

Key test result

• A lumbar puncture shows elevated CSF pressure, cloudy or milky white CSF, high protein level, positive Gram stain and culture that usually identifies the infecting organism (unless it's a virus) and depressed CSF glucose concentration.

Key treatments

• Bed rest
• Hypothermia
• I.V. fluid administration
• Oxygen therapy, possibly with ET intubation and mechanical ventilation
• Antibiotics: penicillin G (Pfizerpen), ampicillin (Omnipen), or nafcillin; tetracycline (Achromycin V) or chloramphenicol (Chloromycetin), if allergic to penicillin
• Diuretic: mannitol (Osmitrol)
• Anticonvulsants: phenytoin (Dilantin), phenobarbital (Luminal)
• Analgesics or antipyretics: acetaminophen (Tylenol), aspirin

Key interventions

• Monitor neurologic function often.
• Watch for deterioration in the patient's condition.
• Monitor fluid balance. Maintain adequate fluid intake
• Suction the patient only if necessary. Limit suctioning to 10 to 15 seconds per pass of the catheter.
• Hyperoxygenate the lungs with 100% oxygen for 1 minute before and after suctioning.
• Position the patient carefully.
• Darken the room.
• Relieve headache with a nonopioid analgesic, such as aspirin or acetaminophen, as needed.

MULTIPLE SCLEROSIS

Key signs and symptoms

• Nystagmus, diplopia, blurred vision, optic neuritis
• Weakness, paresthesia, impaired sensation, paralysis

Key test results

• CT scan eliminates other diagnoses such as brain or spinal cord tumors.
• MRI may reveal plaques associated with multiple sclerosis.

Key treatments

• Plasmapheresis (for antibody removal)
• Cholinergic: bethanechol (Urecholine)
• Glucocorticoids: prednisone (Deltasone), dexamethasone (Decadron), corticotropin (ACTH)
• Immunosuppressants: interferon beta-1b (Betaseron), cyclophosphamide (Cytoxan), methotrexate (Trexall), glatiramer (Copaxone)
• Skeletal muscle relaxants: dantrolene (Dantrium), baclofen (Lioresal)

Key interventions

• Monitor for changes in motor coordination, paralysis, or muscle weakness.
• Encourage the patient to express feelings about changes in body image.
• Establish a bowel and bladder program.
• Maintain activity as tolerated (alternating rest and activity).

Neurosensory refresher *(continued)*

MYASTHENIA GRAVIS

Key signs and symptoms

- Dysphagia, drooling
- Muscle weakness and fatigue (typically, muscles are strongest in the morning but weaken throughout the day, especially after exercise)
- Profuse sweating

Key test results

- EMG shows impaired impulse conduction in the muscles.
- Neostigmine (Prostigmin) or edrophonium (Tensilon) test relieves symptoms after medication administration—a positive indication of the disease.

Key treatments

- Anticholinesterase inhibitors: neostigmine (Prostigmin), pyridostigmine (Mestinon)
- Glucocorticoids: prednisone (Deltasone), dexamethasone (Decadron), corticotropin (ACTH)
- Immunosuppressants: azathioprine (Imuran), cyclophosphamide (Cytoxan)
- Thymectomy

Key interventions

- Monitor neurologic and respiratory status.
- Evaluate swallow and gag reflexes.
- Watch the patient for choking while eating.

OTOSCLEROSIS

Key signs and symptoms

- Progressive hearing loss
- Tinnitus

Key test result

- Audiometric testing confirms hearing loss.

Key treatment

- Stapedectomy and insertion of a prosthesis to restore partial or total hearing

Key intervention

- Develop alternative means of communication.

PARKINSON'S DISEASE

Key signs and symptoms

- "Pill-rolling" tremors, tremors at rest
- Masklike facial expression
- Shuffling gait, stiff joints, dyskinesia, "cogwheel" rigidity, stooped posture

Key test result

- EEG reveals minimal slowing of brain activity.

Key treatments

- Antidepressant: amitriptyline (Elavil)
- Antiparkinsonian agents: levodopa (Larodopa), carbidopa-levodopa (Sinemet), benztropine (Cogentin)

Key interventions

- Monitor neurologic and respiratory status.
- Reinforce gait training.
- Reinforce independence in care.

RETINAL DETACHMENT

Key signs and symptoms

- Painless change in vision (floaters and flashes of light)
- With progression of detachment, painless vision loss may be described as a "veil," "curtain," or "cobweb" that eliminates part of visual field

Key test results

- Indirect ophthalmoscopy shows retinal tear or detachment.
- Slit-lamp examination shows retinal tear or detachment.

Key treatment

- Scleral buckling to reattach the retina

Key interventions

- Postoperatively, instruct the patient to lie on his back or on his unoperated side.
- Discourage straining during defecation, bending down, and hard coughing, sneezing, or vomiting.

SPINAL CORD INJURY

Key signs and symptoms

- Loss of bowel and bladder control
- Paralysis below the level of the injury
- Paresthesia below the level of the injury

Key test results

- CT scan shows spinal cord edema, vertebral fracture, and spinal cord compression.
- MRI shows spinal cord edema, vertebral fracture, and spinal cord compression.

Key treatments

- Flat position, with neck immobilized in a cervical collar
- Maintenance of vertebral alignment through Crutchfield tongs or Halo vest
- Surgery for stabilization of the upper spine, such as insertion of Harrington rods
- Antianxiety agent: lorazepam (Ativan)
- Glucocorticoid: methylprednisolone (Solu-Medrol) given as infusion immediately following injury (may improve neurologic recovery when administered within 8 hours of injury)

(continued)

Neurosensory refresher *(continued)*

SPINAL CORD INJURY *(continued)*

- H_2-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)
- Laxative: bisacodyl (Dulcolax)
- Mucosal barrier fortifier: sucralfate (Carafate)
- Muscle relaxant: dantrolene (Dantrium)

Key interventions

- Monitor neurologic and respiratory status.
- Observe for signs and symptoms of spinal shock.
- Check for autonomic dysreflexia (sudden extreme rise in blood pressure).
- Provide skin care.

STROKE

Key signs and symptoms

- Garbled or impaired speech
- Inability to move, or difficulty moving, limbs or one side of the body
- Vision disturbances
- Headache
- Mental impairment
- Seizures
- Coma
- Vomiting

Key test results

- CT scan reveals intracranial bleeding, infarct (shows up 24 hours after the initial symptoms), or shift of midline structures.
- Digital subtraction angiography reveals occlusion or narrowing of vessels.
- MRI shows intracranial bleeding, infarct, or shift of midline structures.

Key treatments

- Anticoagulants: heparin, warfarin (Coumadin)
- Anticonvulsant: phenytoin (Dilantin)
- Glucocorticoid: dexamethasone (Decadron)
- Thrombolytic therapy: tissue plasminogen activator given within the first 3 hours of an ischemic stroke to restore circulation to the affected brain tissue and limit the extent of brain injury
- Antiplatelet aggregation agent: ticlopidine (Ticlid)

Key interventions

- Take vital signs every 1 to 2 hours initially and then every 4 hours when the patient becomes stable.
- Elevate the head of the bed 30 degrees.
- Conduct a neurologic assessment every 1 to 2 hours initially and then every 4 hours when the patient becomes stable.

TRIGEMINAL NEURALGIA

Key sign or symptom

- Searing pain in the facial area

Key test result

- Observation during the examination shows the patient favoring (splinting) the affected area. To ward off a painful attack, the patient often holds his face immobile when talking. He may also leave the affected side of his face unwashed and unshaven.

Key treatments

- Anticonvulsants: carbamazepine (Tegretol) or phenytoin (Dilantin)
- Microsurgery for vascular decompression

Key interventions

- Observe and record the characteristics of each attack, including the patient's protective mechanisms.
- Provide adequate nutrition in small, frequent meals at room temperature.
- Advise the patient to place food in the unaffected side of his mouth when chewing, to brush his teeth and rinse his mouth often, and to see a dentist twice per year to detect cavities.
- After surgical decompression of the root or partial nerve dissection, check neurologic and vital signs often.
- Watch for adverse reactions to prescribed medications.

WEST NILE ENCEPHALITIS

Key signs and symptoms

- Fever
- Headache
- Disorientation

Key test result

- Patient history reveals recent mosquito bites.

Key treatments

- Symptom control, such as I.V. fluids and respiratory support
- Antipyretic: acetaminophen (Tylenol)

Key interventions

- Monitor respiratory status.
- Administer supplemental oxygen as prescribed.
- Monitor neurologic status.
- Administer medications, as prescribed.
- Monitor pulse oximetry values

Conjunction junction

The **brain stem** provides the connection between the spinal cord and the brain. It contains three sections:

- the midbrain—mediates pupillary reflexes and eye movements; it's also the reflex center for the third and fourth cranial nerves
- the pons—helps regulate respiration; it's also the reflex center for the fifth through eighth cranial nerves and mediates chewing, tasting, saliva secretion, and equilibrium
- the medulla oblongata—contains the vomiting, vasomotor, respiratory, and cardiac centers.

Information superhighway

The **spinal cord** functions as a two-way conductor pathway between the brain stem and the peripheral nervous system. It consists of gray matter and white matter. The gray matter is made up of cell bodies, dendrites, and axons. The white matter contains ascending (sensory) and descending (motor) tracts, which send signals up to the brain and motor signals out to the muscles.

Messenger service

The **peripheral nervous system** delivers messages from the spinal cord to outlying areas of the body. The main nerves of this system are grouped into:

- 31 pairs of spinal nerves, which carry mixed (motor and sensory) impulses to and from the spinal cord
- 12 pairs of cranial nerves—olfactory, optic, oculomotor, trochlear, trigeminal, abducens, facial, acoustic, glossopharyngeal, vagus, spinal accessory, and hypoglossal.

Involuntary actions

The **autonomic nervous system,** a subdivision of the peripheral nervous system, controls involuntary body functions, such as digestion, respiration, and cardiovascular function.

It's divided into two cooperating systems to maintain homeostasis: the sympathetic nervous system and the parasympathetic nervous system. The sympathetic nervous system coordinates activities that handle stress (the fight-or-flight response). The parasympathetic nervous system conserves and restores energy stores.

Blink and you'll miss it

The **eyes** have external and internal structures. External structures include the eyelids, conjunctivae (thin, transparent mucous membranes that line the lids), lacrimal apparatuses (which lubricate and protect the cornea and conjunctivae by producing and absorbing tears), extraocular muscles (which hold the eyes parallel to create binocular vision), and the eyeballs themselves.

An inside view

Some of the eye's most important internal structures include:

- the iris—a thin, circular, pigmented muscular structure that gives color to the eye and divides the space between the cornea and lens into anterior and posterior chambers
- the cornea—a smooth, transparent tissue that works with the sclera to give the eye its shape
- the pupil—the circular aperture in the iris that changes size as the iris adapts to the amount of light entering the eye
- the lens—a biconvex, avascular, colorless, and transparent structure suspended behind the iris by the ciliary zonulae
- the anterior chamber—the space between the iris and cornea that's filled with aqueous humor, a watery, clear fluid that moistens and nourishes the lens and cornea
- the posterior chamber—the space behind the lens containing vitreous humor, a clear, gelatinous fluid
- the retina—a thin, semitransparent layer of nerve tissue that lines the eye wall
- retinal cones—visual cell segments responsible for visual acuity and color discrimination
- retinal rods—visual cell segments responsible for peripheral vision under decreased light conditions
- the optic nerve—a nerve located at the posterior portion of the eye that transmits visual impulses from the retina to the brain.

External, middle, and inner

The **ears** are composed of three sections: external, middle, and inner. The external ear in-

Memory jogger

To help you remember the cranial nerves (and their order), think of the mnemonic "On Old Olympus's Towering Tops, A Finn And German Viewed Some Hops."

Olfactory (CN I)
Optic (CN II)
Oculomotor (CN III)
Trochlear (CN IV)
Trigeminal (CN V)
Abducens (CN VI)
Facial (CN VII)
Acoustic (CN VIII)
Glossopharyngeal (CN IX)
Vagus (CN X)
Spinal accessory (CN XI)
Hypoglossal (CN XII)

cludes the pinna (auricle) and external auditory canal. It's separated from the middle ear by the tympanic membrane.

The middle ear, known as the tympanum, is an air-filled cavity in the temporal bone. It contains three small bones (malleus, incus, and stapes).

The inner ear, known as the labyrinth, is the portion of the ear that consists of the cochlea, vestibule, and semicircular canals.

Keep abreast of diagnostic tests

Here are some important tests used to diagnose neurosensory disorders, along with common nursing actions associated with each test.

Electrical graph

An **electroencephalogram** (EEG) records the electrical activity of the brain. Using electrodes, this noninvasive test gives a graphic representation of brain activity.

Nursing actions

- Determine the patient's ability to lie still.
- Reassure the patient that electrical shock won't occur.
- Explain that the patient will be subjected to stimuli, such as lights and sounds.
- Withhold medications that may interfere with the results (such as anticonvulsants, antianxiety agents, sedatives, and antidepressants) and caffeine for 24 to 48 hours before the procedure.

Brain images

A **computed tomography (CT) scan,** used to identify brain abnormalities, produces a series of tomograms translated by a computer and displayed on a monitor, which represent cross-sectional images of various layers of the brain. It can be used to identify intracranial tumors, bleeding, and other brain lesions. It may be performed with or without the injection of contrast dye.

Nursing actions

- Note the patient's allergies to iodine, seafood, and radiopaque dyes, if dye will be used.
- Make sure that written, informed consent has been obtained, if appropriate.
- Inform the patient about possible throat irritation and facial flushing, if contrast dye is to be injected.

Magnetic snapshot

Magnetic resonance imaging (MRI) uses magnetic and radio waves to create a detailed visualization of the brain and its structures.

Nursing actions

- Make sure that written, informed consent has been obtained if appropriate.
- Be aware that patients with pacemakers, surgical and orthopedic hardware, or shrapnel can't undergo MRI scanning.
- Remove jewelry and metal objects from the patient.
- Determine the patient's ability to lie still for 45 to 60 minutes.
- Administer sedatives as prescribed.

Upstairs artery exam

A **cerebral angiogram** uses a radiopaque dye, in conjunction with X-rays, to examine the cerebral arteries.

Nursing actions

Before the procedure

- Note the patient's allergies to iodine, seafood, or radiopaque dyes.
- Make sure that written, informed consent has been obtained.
- Inform the patient about possible throat irritation and facial flushing from the dye.

After the procedure

- Monitor vital signs.
- Check the insertion site for bleeding, and assess pulses distal to the site.
- Monitor neurologic status.
- Force fluids, if the patient's condition allows.

Puncture reveals pressure

With a **lumbar puncture** (LP), a doctor inserts a needle into the lumbar subarachnoid space. This procedure allows measurement of

CSF pressure, collection of CSF fluid for testing, and the injection of radiopaque dye for a myelogram.

Nursing actions

Before the procedure

- Determine the patient's ability to lie still in a flexed, lateral, recumbent position.
- Explain the procedure to the patient.
- Make sure that written, informed consent has been obtained.
- Be aware that a substantial increase in intracranial pressure (ICP) is a contraindication for having the test.

After the procedure

- Monitor neurologic status.
- Keep the patient flat in bed as directed (from 20 minutes to a few hours).
- Administer analgesics as prescribed.
- Check the puncture site for bleeding or CSF leakage.
- Force fluids, if the patient's condition allows.

Fluid to the lab

Cerebrospinal fluid analysis is a laboratory test of CSF obtained by LP or ventriculostomy. It allows microscopic examination of CSF for blood, white blood cells (WBCs), immunoglobulins, bacteria, protein, glucose, and electrolytes.

Nursing actions

- Label specimens properly, and send them to the laboratory immediately.
- Adhere to nursing interventions that follow an LP.

Electric flex

Electromyography (EMG) uses electrodes to graphically record the electrical activity of a muscle at rest and during contraction.

Nursing actions

- Explain that the patient must flex and relax the muscles during the procedure.
- Explain that the patient will feel some discomfort but not pain.
- Administer analgesics, as prescribed, after the procedure.

See the spine

With **myelography,** an injection of radiopaque dye by LP, followed by fluoroscopy, allows visualization of the subarachnoid space, spinal cord, and vertebrae.

Nursing actions

Before the procedure

- Note the patient's allergies to iodine, seafood, or radiopaque dyes.
- Make sure that written, informed consent has been obtained.
- Inform the patient about possible throat irritation and facial flushing from dye injection.

After the procedure

- Monitor neurologic status.
- Keep the patient flat in bed as directed.
- Check the puncture site for bleeding or CSF leakage.
- Encourage fluids, if the patient's condition allows.

Snooping on the skull

Skull X-rays provide a radiographic picture of the head and neck bones.

Nursing actions

- Determine the patient's ability to lie still during the procedure.
- Explain the events that will occur during the procedure.

Marking blood flow in the brain

Positron emission tomography (PET) involves injection of a radioisotope, allowing visualization of the brain's oxygen uptake, blood flow, and glucose metabolism.

Nursing actions

- Determine the patient's ability to lie still during the procedure.
- Make sure that written, informed consent has been obtained.
- Withhold alcohol, tobacco, and caffeine for 24 hours before the procedure.
- Withhold medications, as directed, before the procedure.
- Check the injection site for bleeding after the procedure.

Memory jogger

To remember that increased intracranial pressure contraindicates a lumbar puncture, think:

Increased ICP—No LP.

Studying blood once...

A **blood chemistry test** analyzes a blood sample for potassium, sodium, calcium, phosphorus, protein, osmolality, glucose, bicarbonate, blood urea nitrogen, and creatinine.

Nursing actions

- Explain the reason for testing to the patient.
- Monitor the venipuncture site for bleeding after the procedure.

...Studying blood twice...

A **hematologic study** analyzes a blood sample for WBCs, red blood cells, erythrocyte sedimentation rate, platelets, hemoglobin, and hematocrit.

Nursing actions

- Note current drug therapy before the procedure.
- Check the venipuncture site for bleeding after the procedure.

...Studying blood three times

A **coagulation study** analyzes a blood sample for prothrombin time, International Normalized Ratio, and partial thromboplastin time.

Nursing actions

- Note current drug therapy before the procedure.
- Check the venipuncture site for bleeding after the procedure.

Ye olde eye chart

A **visual acuity test** measures clarity of vision using a letter chart (Snellen's) placed 20′ (6 m) from the patient. Acuity is expressed in a ratio that relates what a person with normal vision sees at 20′ to what the patient can see at 20′.

Nursing actions

- Explain the testing procedure to the patient.
- Remind the patient to bring eyeglasses or contact lenses, if presently prescribed.
- Advise the examiner if the patient is unable to read alphabet letters.
- Advise the examiner if the patient has difficulty hearing or following directions.

All lined up?

Extraocular eye muscle testing checks for parallel alignment of the eyes, muscle strength, and cranial nerve function.

Nursing actions

- Explain the testing procedure to the patient.
- Advise the examiner if the patient has difficulty hearing or following directions.

Seeing on the side

A **visual field examination** tests the degree of peripheral vision of each eye.

Nursing actions

- Explain the testing procedure to the patient.
- Advise the examiner if the patient has difficulty hearing or following directions.

Puff to measure pressure

A **tonometry test** measures intraocular fluid pressure using an applanation tonometer or an air-puff tonometer.

Nursing actions

- Ask the patient to remain still.
- Depending on the method of examination, advise the patient that a puff of air or the instrument may be felt touching the eye.

Tick-tock test

An **auditory acuity test** gives a general estimation of a patient's hearing. It evaluates the patient's ability to hear a whispered phrase or ticking watch.

Nursing actions

- Explain the testing procedure to the patient.
- Advise the examiner if the patient has difficulty following directions.

Scope inside the ear

An **otoscopic examination** uses an otoscope to visualize the tympanic membrane.

Nursing actions

- Advise the patient to hold still during the examination.
- Explain that a gentle pull will be felt on the auricle and that slight pressure will be felt in the ear.

Determining degree of deafness

Audiometry measures the patient's degree of deafness using pure-tone or speech methods.

Nursing actions

- Explain that the patient will need to wear earphones for the procedure.
- Explain that the patient will be asked to signal when a tone is heard while sitting in a soundproof room.

Polish up on patient care

Major neurosensory disorders include acute head injury, amyotrophic lateral sclerosis, Bell's palsy, brain abscess, brain tumor, cataract, cerebral aneurysm, conjunctivitis, corneal abrasion, encephalitis, glaucoma, Guillain-Barré syndrome, Huntington's disease, Ménière's disease, meningitis, multiple sclerosis, myasthenia gravis, otosclerosis, Parkinson's disease, retinal detachment, spinal cord injury, stroke, trigeminal neuralgia, and West Nile encephalitis.

Acute head injury

Acute head injury results from a trauma to the head, leading to brain injury or bleeding within the brain. Effects of injury may include edema and hypoxia. Manifestations of the injury can vary greatly from a mild cognitive effect to severe functional deficits.

A head injury is classified by brain injury type: fracture, hemorrhage, or trauma. Fractures can be depressed, comminuted, or linear. Hemorrhages are classified as epidural, subdural, intracerebral, or subarachnoid.

CAUSES

- Assault
- Automobile accident
- Blunt trauma
- Fall
- Penetrating trauma
- Sports injury

DATA COLLECTION FINDINGS

- Decreased level of consciousness (LOC)
- Altered mental status
- Complaint of pain or headache
- Elevated systolic blood pressure
- Bradycardia
- Respiratory depression
- Otorrhea, rhinorrhea, frequent swallowing (if a CSF leak occurs)
- Paresthesia
- Unequal pupil size, loss of pupillary reaction (late sign)

DIAGNOSTIC FINDINGS

- CT scan shows hemorrhage, cerebral edema, or shift of midline structures.
- EEG may reveal seizure activity.
- ICP monitoring shows increased ICP.
- MRI shows hemorrhage, cerebral edema, or shift of midline structures.
- Skull X-ray may show skull fracture.

NURSING DIAGNOSES

- Ineffective tissue perfusion: Cerebral
- Decreased intracranial adaptive capacity
- Risk for injury

TREATMENT

- Cervical collar (until neck injury is ruled out)
- Craniotomy: surgical incision into the cranium (may be necessary to evacuate a hematoma or evacuate contents to make room for swelling to prevent herniation)
- Oxygen therapy: intubation and mechanical ventilation, if necessary
- Restricted oral intake for 24 to 48 hours
- Ventriculostomy: insertion of a drain into the ventricles (to drain CSF in the presence of hydrocephalus, which may occur as a result of head injury; can also be used to monitor ICP)

Drug therapy

- Analgesic: codeine phosphate
- Anticonvulsant: phenytoin (Dilantin)
- Barbiturate: pentobarbital (Nembutal), if unable to control ICP with diuresis
- Diuretics: mannitol (Osmitrol), furosemide (Lasix) to combat cerebral edema

• Vasopressors: dopamine (Intropin) or phenylephrine (Neo-Synephrine) to maintain cerebral perfusion pressure above 60 mm Hg (if blood pressure is low and ICP is elevated)
• Glucocorticoid: dexamethasone (Decadron) to reduce cerebral edema
• Histamine-2 (H_2)–receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid) to prevent gastritis
• Mucosal barrier fortifier: sucralfate (Carafate)
• Posterior pituitary hormone: vasopressin (Pitressin), if patient develops diabetes insipidus

INTERVENTIONS AND RATIONALES

• Monitor neurologic and respiratory status *to monitor for signs of increased ICP and respiratory distress.*
• Elevate the head of the bed as ordered and keep the patient's neck aligned *to promote venous return and decrease ICP.*
• Keep the patient free from excessive stimuli *to prevent increased ICP.*
• Monitor and record vital signs, intake and output, urine, specific gravity, laboratory studies, and pulse oximetry *to detect early signs of compromise.*
• Observe for CSF leak as evidenced by otorrhea or rhinorrhea. *CSF leak could leave the patient at risk for infection.*
• Evalaute pain. *Pain may cause anxiety and increase ICP.*
• Check cough and gag reflex *to prevent aspiration.*
• Check for signs of diabetes insipidus (low urine specific gravity, high urine output) *to maintain hydration.*
• Maintain I.V. fluids *to prevent dehydration.*
• Administer oxygen and maintain position and patency of the endotracheal (ET) tube, if present, *to maintain airway and hyperventilate the patient to lower ICP.*
• Provide suctioning; if the patient is able, assist with turning, coughing, and deep breathing *to prevent pooling of secretions.*
• Maintain position, patency, and low suction of the nasogastric (NG) tube *to prevent vomiting.*
• Maintain seizure precautions *to maintain patient safety.* (See *Implementing seizure precautions.*)
• Administer medications as prescribed *to decrease ICP and pain.*
• Allow a rest period between nursing activities *to avoid an increase in ICP.*
• Encourage the patient to express feelings about changes in body image *to allay anxiety.*
• Provide appropriate sensory input and stimuli with frequent reorientation *to foster awareness of the environment.*
• Provide a means of communication, such as a communication board, *to prevent anxiety.*
• Provide eye, skin, and mouth care *to prevent tissue damage.*
• Turn the patient every 2 hours or maintain him in a rotating bed, if his condition allows, *to prevent skin breakdown.*
• Apply antiembolism stockings and a sequential compression device *to prevent thromboembolism formation.*

Teaching topics

• Recognizing the signs and symptoms of decreased LOC
• Recognizing the signs of seizures
• Adhering to fluid restrictions
• Contacting the National Head Injury Foundation

Amyotrophic lateral sclerosis

Amyotrophic lateral sclerosis (ALS), commonly known as Lou Gehrig's disease, is a progressive, degenerative disorder that leads to decreased motor function in the upper and lower motor neuron systems. With ALS, certain nerve cells degenerate, resulting in distorted or blocked nerve impulses. Nerve cells die and muscle fibers undergo atrophic changes, resulting in progressive motor dysfunction. The disease affects males three times more often than females.

CAUSES

• Exact cause unknown

Possible causes

• Nutritional deficiency related to a disturbance in enzyme metabolism

Stepping up

Implementing seizure precautions

WHY YOU DO IT

By taking appropriate precautions, you can help protect a patient from injury, aspiration, and airway obstruction in the event that he has a seizure. Plan your precautions using information obtained from the patient's history. What kind of seizure has the patient previously had? Is he aware of exacerbating factors? Sleep deprivation, missed doses of anticonvulsants, and even upper respiratory infections can increase seizure frequency in some people who have had seizures. Was his previous seizure an acute episode, or did it result from a chronic condition?

Remember that a patient with preexisting seizures who's being admitted for a change in medication, treatment of an infection, or detoxification may be at greater risk for seizures.

HOW YOU DO IT

- Explain the reasons for the precautions to the patient.
- To protect the patient's limbs, head, and feet from injury if he has a seizure while in bed, cover the side rails, headboard, and footboard with side rail pads or bath blankets. If you use blankets, keep them in place with adhesive tape.
- Keep the side rails raised while the patient is in bed to prevent falls. Keep the bed in a low position to minimize injuries that may occur if the patient climbs over the rails.
- Place an airway at the patient's bedside or tape it to the wall above the bed according to your facility's protocol. Keep suction equipment nearby in case you need to establish a patent airway. Explain to the patient how the airway will be used.
- If the patient has frequent or prolonged seizures, insert a heparin lock to facilitate administration of emergency medications.
- Document that seizure precautions have been implemented.

- Genetic predisposition
- Slow-acting virus

DATA COLLECTION FINDINGS

- Atrophy of tongue
- Awkwardness of fine finger movements
- Dysphagia
- Dyspnea
- Fasciculations of face
- Fatigue
- Muscle weakness of hands and feet
- Nasal quality of speech
- Spasticity
- Muscle cramps

DIAGNOSTIC FINDINGS

- Creatine kinase level is elevated.
- EMG shows impaired impulse conduction in the muscles.

NURSING DIAGNOSES

- Ineffective health maintenance
- Impaired physical mobility
- Ineffective airway clearance

TREATMENT

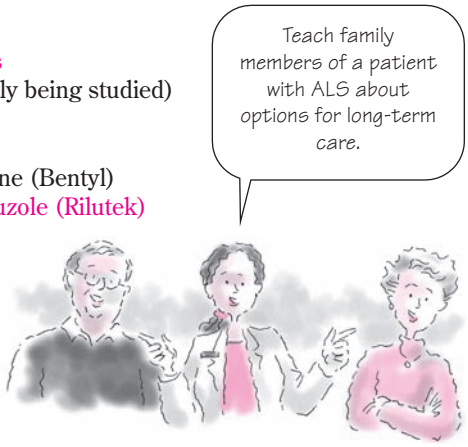
- Management of symptoms
- Stem cell therapy (currently being studied)

Drug therapy

- Anticholinergic: dicyclomine (Bentyl)
- Neuroprotective agent: riluzole (Rilutek)

INTERVENTIONS AND RATIONALES

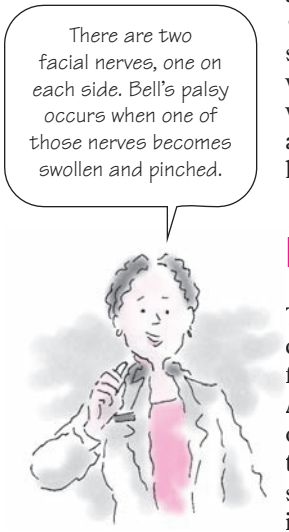
- Monitor neurologic and respiratory status *to detect decreases in neurologic functioning.*



- Evaluate swallow and gag reflexes *to decrease the risk of aspiration.*
- Monitor and record vital signs and intake and output *to determine baseline values and detect changes from baseline assessment.*
- Administer medications, as prescribed, *to help the patient achieve maximum potential.*
- Devise an alternate method of communication, when necessary, *to help the patient communicate and to decrease the patient's anxiety and frustration.*
- Encourage the patient to verbalize his feelings and maintain his independence for as long as possible *to decrease anxiety and promote self-esteem.*
- Suction the oropharynx as necessary *to stimulate cough and clear the airways.*
- Maintain the patient's diet *to improve nutritional status.*
- Apply antiembolism stockings and a sequential compression device *to prevent thromboembolism formation.*

Teaching topics

- Maintaining a tucked-chin position while eating or drinking
- Using a tonsillar suction tip to clear the oropharynx
- Using prosthetic devices to assist with activities of daily living (ADLs)
- For the patient's family, providing information about the disease, required treatment, and possible need for long-term care
- Contacting the Amyotrophic Lateral Sclerosis Association, which may supply the patient with some of the needed equipment, such as a wheelchair and communication board, as well as provide the patient with information about local support groups



Bell's palsy

This neurologic disorder affects the seventh cranial (facial) nerve and produces unilateral facial weakness or paralysis. Onset is rapid. Although Bell's palsy affects all age-groups, it occurs most commonly in persons younger than age 60. In 80% to 90% of patients, it subsides spontaneously, with complete recovery in 1 to 8 weeks; however, recovery may be delayed in older adults. If recovery is partial, contractures may develop on the paralyzed side of the face. Bell's palsy may recur on the same or opposite side of the face.

CAUSES

- Blockage of the seventh cranial nerve, resulting from infection, hemorrhage, tumor, meningitis, or local trauma

DATA COLLECTION FINDINGS

- Upward rolling and excessive tearing of the eye when the patient attempts to close it
- Inability to close eye completely on the affected side
- Pain around the jaw or ear
- Ringing in the ears
- Taste distortion on the anterior portion of the tongue on the affected side
- Unilateral facial weakness

DIAGNOSTIC FINDINGS

- EMG helps predict the level of expected recovery by distinguishing temporary conduction defects from a pathologic interruption of nerve fibers.

NURSING DIAGNOSES

- Acute pain
- Disturbed sensory perception (gustatory)
- Disturbed body image

TREATMENT

- With mild cases, no treatment because symptoms typically subside on their own
- Physical therapy to stimulate the facial nerve and help maintain muscle tone
- Relaxation techniques
- Biofeedback
- Electrical stimulation therapy
- Moist heat

Drug therapy

- Corticosteroid: prednisone (Deltasone) to reduce facial nerve edema and improve nerve conduction and blood flow
- Artificial tears to protect the cornea from injury
- Antiviral: acyclovir (Zovirax), if cause is thought to be viral

INTERVENTIONS AND RATIONALES

• If the patient has diabetes, prednisone must be used with caution and necessitates frequent monitoring of serum glucose levels. *Hyperglycemia is an adverse effect of prednisone therapy.*
• During treatment with prednisone, watch for adverse reactions, especially GI distress and fluid retention, *to ensure prompt intervention.*
• Apply moist heat to the affected side of the face, taking care not to burn the skin, *to reduce pain.*
• Massage the patient's face with a gentle upward motion two or three times daily for 5 to 10 minutes, or have him massage his face himself. When he's ready for active facial exercises, teach him to exercise by grimacing in front of a mirror *to help maintain muscle tone.*
• Arrange for privacy at mealtimes *to reduce embarrassment.*
• Give the patient frequent and complete mouth care, being careful to remove residual food that collects between the cheeks and gums *to prevent breakdown of oral mucosa.*
• Offer psychological support. Give reassurance that recovery is likely within 1 to 8 weeks *to allay the patient's anxiety.*

Teaching topics

• Protecting the eye by covering it with an eye patch, especially when outdoors and at night
• Keeping warm, avoiding exposure to dust and wind, and covering face when exposure is unavoidable
• Performing facial exercises

Brain abscess

A brain abscess is a free or encapsulated collection of pus that usually occurs in the temporal lobe, cerebellum, or frontal lobes. A brain abscess is rare. Although it can occur at any age, it's most common in people ages 10 to 35 and is rare in older adults.

An untreated brain abscess is usually fatal; with treatment, the prognosis is only fair.

CAUSES

• Infection, especially otitis media, sinusitis, dental abscess, and mastoiditis
• Subdural empyema
• Physical trauma

DATA COLLECTION FINDINGS

• Headache
• Chills
• Fever
• Malaise
• Confusion
• Drowsiness
• Behavior changes

Temporal lobe abscess

• Auditory-receptive dysphasia
• Central facial weakness
• Hemiparesis

Cerebellar abscess

• Dizziness
• Coarse nystagmus
• Gaze weakness on lesion side
• Tremor
• Ataxia

Frontal lobe abscess

• Expressive dysphasia
• Hemiparesis with unilateral motor seizure
• Drowsiness
• Inattention
• Mental function impairment
• Seizures

DIAGNOSTIC FINDINGS

• Physical examination shows signs of increased ICP.
• Enhanced CT scan reveals the abscess site.
• Arteriography highlights the abscess by a halo appearance.
• A CT-guided stereotactic biopsy may be performed to drain and culture the abscess.
• Culture and sensitivity of drainage identifies the causative organism.

NURSING DIAGNOSES

• Decreased intracranial adaptive capacity
• Disturbed thought processes
• Impaired physical mobility

Using the Glasgow Coma Scale

The Glasgow Coma Scale is used to assess a patient's level of consciousness. It was designed to help predict a patient's survival and recovery after a head injury. The scale scores three observations: eye opening response, best motor response, and best verbal response. Each response receives a point value. If the patient is alert, can follow simple commands, and is completely oriented to person, place, and time, his score will total 15 points. If the patient is comatose, his score will total 7 or less. A score of 3, the lowest possible score, indicates brain death.

Observation	Response	Score
Eye response	Opens spontaneously	4
	Opens to verbal command	3
	Opens to pain	2
	No response	1
Best motor response	Follows commands	6
	Localizes pain	5
	Flexion withdrawal	4
	Abnormal flexion	3
	Abnormal extension	2
	No response	1
Best verbal response	Is oriented and converses	5
	Is disoriented but converses	4
	Uses inappropriate words	3
	Makes incomprehensible sounds	2
	No response	1
Total score		Ranges between 3 and 15

TREATMENT

- ET intubation and mechanical ventilation
- I.V. therapy
- Surgical aspiration or drainage of the abscess

Drug therapy

- Antipyretics: acetaminophen (Tylenol), aspirin
- Diuretics: urea (Ureaphil), mannitol (Osmitrol)
- Corticosteroids: dexamethasone (Decadron)
- Penicillinase-resistant antibiotics: nafcillin, methicillin
- Anticonvulsants: phenytoin (Dilantin), phenobarbital (Luminal)
- Analgesics: codeine phosphate, codeine sulfate

INTERVENTIONS AND RATIONALES

- Provide intensive care and monitoring *to closely monitor ICP and provide necessary life support.*
- Frequently monitor neurologic status *to detect early signs of increased ICP.* (See *Using the Glasgow Coma Scale.*)
- Monitor and record vital signs at least once every hour *to detect trends that may signify increasing ICP, such as increasing blood pressure and slowing heart rate.*

- Monitor fluid intake and output carefully *because fluid overload could contribute to cerebral edema.*
- If surgery is necessary, explain the procedure to the patient and answer his questions *to allay anxiety.*
- After surgery, monitor neurologic status *to detect rises in ICP and deteriorating neurologic status.* Monitor vital signs and intake and output.
- Watch for signs of meningitis (nuchal rigidity, headaches, chills, sweating) *to avoid treatment delay.*
- Change the dressing when damp *to decrease the chances of infection.*
- Position the patient on the operative side *to promote drainage and prevent reaccumulation of the abscess.*
- Measure drainage from a Jackson-Pratt drain or another type of drain as instructed by the surgeon, *to determine effectiveness of the drains and detect signs of hemorrhage (blood accumulating in the drain).*
- Provide meticulous skin care *to prevent pressure ulcers* and position the patient *to preserve joint function and prevent muscle contractures.*
- Apply antiembolism stockings and a sequential compression device *to prevent thromboembolism formation.*
- Ambulate the patient as soon as possible *to prevent immobility and encourage independence.*
- Give prophylactic antibiotics as ordered after a compound skull fracture or penetrating head wound *to prevent brain abscess.*

Teaching topics

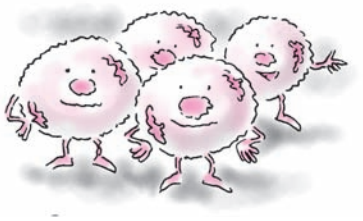
- Stressing the need for treatment of otitis media, mastoiditis, dental abscess, and other infections to prevent brain abscess

Brain tumor

A brain tumor is an abnormal mass found in the brain resulting from unregulated cell growth and division. These tumors can either infiltrate and destroy surrounding tissue or be encapsulated and displace brain tissue. The presence of the lesion causes compression of blood vessels, producing ischemia, edema, and increased ICP.

Signs and symptoms vary, depending on the location and size of the tumor in the brain. The tumor can be primary (originating in the brain tissue) or secondary (metastasizing from another area of the body). Tumors are classified according to the tissue of origin, such as gliomas (composed of neuroglial cells), meningiomas (originating in the meninges), and astrocytomas (composed of astrocytes).

A brain tumor is an abnormal mass found in the brain resulting from unregulated cell growth and division.



CAUSES

- Environmental
- Genetic

DATA COLLECTION FINDINGS

- Deficits in cerebral function
- Headache

Frontal lobe

- Aphasia
- Memory loss
- Personality changes

Temporal lobe

- Aphasia
- Seizures

Parietal lobe

- Motor seizures
- Sensory impairment

Occipital lobe

- Homonymous hemianopia (defective vision or blindness affecting the right or left half of the visual field of both eyes)
- Visual hallucinations
- Vision impairment

Cerebellum

- Impaired coordination
- Impaired equilibrium

DIAGNOSTIC FINDINGS

- CT scan shows location and size of tumor.
- MRI shows location and size of tumor.

NURSING DIAGNOSES

- Anxiety

- Risk for injury
- Disturbed sensory perception (kinesthetic)

TREATMENT

- Craniotomy
- High-calorie diet
- Radiation therapy

Drug therapy

- Analgesics: codeine, acetaminophen (Tylenol)
- Anticonvulsant: phenytoin (Dilantin)
- Antineoplastics: vincristine (Oncovin), lomustine (CeeNu), carmustine (BiCNU)
- Diuretics: mannitol (Osmitrol), furosemide (Lasix), if increased ICP
- Antiemetic: dolasetron (Anzemet), trimethobenzamide (Tigan), metoclopramide (Reglan)
- Glucocorticoid: dexamethasone (Decadron)
- H_2-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid) to prevent gastritis
- Mucosal barrier fortifier: sucralfate (Carafate)

INTERVENTIONS AND RATIONALES

- Monitor neurologic and respiratory status *to determine baseline and to detect deviations from baseline assessment.*
- Evaluate pain *to correlate the patient's subjective complaints and behavior with organic pathology.*
- Observe for signs and symptoms of increased ICP *to facilitate early intervention and prevent neurologic complications.*
- Monitor and record vital signs, intake and output, and laboratory studies *to determine baseline and to detect early deviations from baseline assessment.*
- Monitor for signs and symptoms of syndrome of inappropriate antidiuretic hormone (edema, weight gain, positive fluid balance, high urine specific gravity) *to facilitate early intervention and prevent increased ICP.*
- Turn and reposition the patient every 2 hours *to maintain skin integrity.*
- Encourage the patient to drink fluids or maintain I.V. fluids *to maintain hydration if the patient is unable to drink adequate amounts.*
- Administer oxygen *to prevent cerebral hypoxia.*
- Administer enteral nutrition or monitor total parenteral nutrition (TPN), as indicated, *to meet nutritional needs.*
- Limit environmental noise. *Auditory stimuli can contribute to increased ICP.*
- Encourage the patient to express feelings about changes in body image and a fear of dying *to decrease anxiety.*
- Maintain normothermia and control shivering. *Shivering causes isometric muscle contraction, which can increase ICP.*
- Provide rest periods. *Cerebral blood flow increases during rapid-eye-movement sleep.*
- Maintain seizure precautions and administer an anticonvulsant, as ordered. *Seizures increase intrathoracic pressure, decrease cerebral venous outflow, and increase cerebral blood volume, thereby increasing ICP.*
- Apply antiembolism stockings and a sequential compression device *to prevent thrombophlebitis.*

Teaching topics

- Recognizing decreased LOC
- Maintaining a safe, quiet environment
- Discussing quality-of-life decisions
- Arranging for hospice care, if appropriate

Cataract

A cataract occurs when the normally clear, transparent crystalline lens in the eye becomes opaque. With age, lens fibers become more densely packed, making the lens less transparent and giving the lens a yellowish hue. These changes result in vision loss.

A cataract usually develops first in one eye and then, in many cases, in the other eye.

CAUSES

- Aging
- Anterior uveitis
- Blunt or penetrating trauma
- Diabetes mellitus
- Hypoparathyroidism
- Long-term steroid treatment
- Radiation exposure
- Ultraviolet light exposure

DATA COLLECTION FINDINGS
- Dimmed or blurred vision
- Disabling glare
- Distorted images
- Poor night vision
- Yellow, gray, or white pupil

DIAGNOSTIC FINDINGS
- Ophthalmoscopy or slit-lamp examination confirms the diagnosis by revealing a dark area in the normally homogeneous red reflex.

NURSING DIAGNOSES
- Disturbed sensory perception (visual)
- Impaired physical mobility
- Risk for injury

TREATMENT
- Extracapsular cataract extraction and intracapsular lens implant

INTERVENTIONS AND RATIONALES
- Provide a safe environment for the patient. *Orienting the patient to his surroundings reduces the risk of injury.*
- Modify the environment to help the patient meet his self-care needs by placing items on the unaffected side *to discourage movement or positions that would apply pressure to the operative site or cause increased intraocular pressure.*
- Provide sensory stimulation (such as large print or tapes) *to help compensate for vision loss.*

Teaching topics
- Returning for a checkup the day after surgery
- Protecting the eye from injury by wearing an eye shield
- Correctly instilling eyedrops
- Notifying the doctor immediately if sharp eye pain occurs
- Maintaining activity restrictions, which include avoiding sleeping on the affected side, lifting more than 5 lb, straining with bowel movements, and bending the head lower than waist level.

Cerebral aneurysm

A cerebral aneurysm is an outpouching of a cerebral artery that results from weakness of the artery's middle layer. It usually results from a congenital weakness in the structure of the artery and remains asymptomatic until it ruptures.

Cerebral aneurysms are classified by size or shape, such as saccular, berry, and dissecting. Saccular aneurysms, the most common type, occur at the base of the brain at the juncture where the large arteries bifurcate.

CAUSES
- Atherosclerosis
- Congenital weakness
- Head trauma

DATA COLLECTION FINDINGS
- Asymptomatic until aneurysm ruptures
- Decreased LOC
- Diplopia, ptosis, blurred vision
- Nausea
- Vomiting
- Photophobia
- Fever
- Sudden headache (commonly described by the patient as the worst he's ever had)
- Hemiparesis
- Nuchal rigidity
- Seizure activity

DIAGNOSTIC FINDINGS
- Cerebral angiogram identifies the aneurysm.
- CT scan shows a shift of intracranial midline structures and blood in the subarachnoid space.
- LP (contraindicated with increased ICP) shows increased CSF pressure, protein level, and WBCs and grossly bloody and xanthochromic CSF.
- MRI may show a shift of intracranial midline structures and blood in the subarachnoid space. (See *On the lookout for subarachnoid hemorrhage complications.*)

NURSING DIAGNOSES
- Anxiety
- Ineffective tissue perfusion: Cerebral
- Decreased intracranial adaptive capacity

On the lookout for subarachnoid hemorrhage complications

Because the mortality rate is high for patients who experience subarachnoid hemorrhage as a result of cerebral aneurysm rupture, prompt recognition of changes and rapid treatment are essential. When caring for a patient at risk for subarachnoid hemorrhage, follow these guidelines:
- Perform neurologic assessment frequently. Monitor for subtle changes in level of consciousness or worsening headache, which may indicate further bleeding. If changes occur, notify the doctor immediately.
- Maintain the patient on bed rest with the head of the bed elevated per doctor's order.
- Avoid engaging the patient in any activities that can increase intracranial pressure.
- Keep the lights dim and minimize other stimuli.
- Space nursing care to avoid overstimulation.

TREATMENT

- Aneurysm and seizure precautions
- Aneurysm clipping
- Bed rest
- Elevating the head of bed per doctor's order
- I.V. therapy
- Oxygen therapy (intubation and mechanical ventilation, if decreased LOC
- Balloon embolization or microcoil thrombosis (before rupture occurs, if clipping is too risky)

Drug therapy

- Analgesic: codeine
- Anticonvulsant: phenytoin (Dilantin)
- Antihypertensives: hydralazine (Apresoline), nitroprusside (Nitropress), labetalol (Trandate), esmolol (Brevibloc)
- Calcium channel blocker: nimodipine (Nimotop) preferred to prevent cerebral vasospasm
- Diuretics: furosemide (Lasix), mannitol (Osmitrol)
- Glucocorticoid: dexamethasone (Decadron)
- H_2-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)
- Antiemetics: dolasetron (Anzemet), trimethobenzamide (Tigan), metoclopramide (Reglan)
- Vasopressors: dopamine (Intropin), phenylephrine (Neo-Synephrine) to maintain systolic blood pressure between 140 and 160 mm Hg
- Mucosal barrier fortifier: sucralfate (Carafate)
- Stool softener: docusate sodium (Colace)

INTERVENTIONS AND RATIONALES

- Monitor neurologic status *to screen for changes in the patient's condition.*
- Keep the environment and patient quiet, using sedatives and pain medication, *to reduce increased ICP.*
- Administer a diuretic *to prevent or treat increased ICP.*
- Maintain crystalloid solutions after aneurysm clipping *to induce hypervolemia and increase cerebral perfusion, thus decreasing the risk of vasospasm.*
- Administer oxygen (which may require intubation and mechanical ventilation) *to meet cerebral oxygen demands.*
- Keep the head of the bed elevated, per doctor's order, *to reduce increased ICP.*
- Monitor for Cushing's triad (bradycardia, systolic hypertension, and wide pulse pressure), *a sign of increased ICP.*
- Take vital signs every 1 or 2 hours initially and then every 4 hours when the patient becomes stable *to detect early signs of decreased cerebral perfusion pressure or increased ICP.*
- Allow a rest period between nursing activities *to reduce increased ICP.*
- Maintain seizure precautions and administer anticonvulsants, as ordered. *Seizures increase intrathoracic pressure, decrease cerebral venous outflow, and increase cerebral blood volume, thereby increasing ICP.*
- Provide skin care and turn the patient every 2 hours *to prevent pressure ulcers.*
- Maintain adequate nutrition *to facilitate tissue healing and meet metabolic needs.*
- Prevent constipation and straining at defecation *to prevent increased ICP.*
- Use an antiemetic or NG tube attached to suction *to prevent nausea and vomiting, which may increase ICP.*
- Apply antiembolism stockings and a sequential compression device *to prevent thromboembolism.*

Teaching topics

- Recognizing decreasing LOC
- Minimizing environmental stress
- Altering ADLs to compensate for neurologic deficits
- Preventing constipation

Conjunctivitis

Conjunctivitis is characterized by inflammation of the conjunctiva, the delicate membrane that lines the eyelids and covers the exposed surface of the eyeball. It may result from infection, allergy, or chemical reactions.

Conjunctivitis is common. Bacterial and viral conjunctivitis are highly contagious but are also self-limiting after a couple of weeks'

duration. Chronic conjunctivitis may result in degenerative changes to the eyelids.

CAUSES

The most common causative organisms are:
- bacterial: *Staphylococcus aureus, Streptococcus pneumoniae, Neisseria gonorrhoeae, N. meningitidis*
- chlamydial: *Chlamydia trachomatis* (inclusion conjunctivitis)
- viral: adenovirus types 3, 7, and 8; herpes simplex virus type 1.

Other causes

- Allergic reactions to pollen, grass, topical medications, air pollutants, and smoke
- Fungal infections (rare)
- Occupational irritants (acids and alkalies)
- Parasitic diseases caused by *Phthirus pubis* or *Schistosoma haematobium*
- Rickettsial diseases (Rocky Mountain spotted fever)

DATA COLLECTION FINDINGS

- Excessive tearing
- Hyperemia (engorgement) of the conjunctiva, sometimes accompanied by discharge and tearing
- Itching, burning
- Mucopurulent discharge

DIAGNOSTIC FINDINGS

- Culture and sensitivity tests identify the causative bacterial organism and indicate appropriate antibiotic therapy.

NURSING DIAGNOSES

- Risk for infection
- Disturbed sensory perception (visual)
- Disturbed body image

TREATMENT

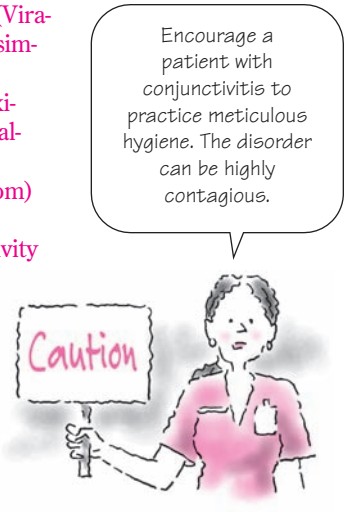
- Cold compresses to relieve itching for allergic conjunctivitis
- Warm compresses to treat bacterial or viral conjunctivitis

Drug therapy

- Antiviral agents: vidarabine ointment (Vira-A) or oral acyclovir (Zovirax), if herpes simplex is the cause
- Corticosteroids: dexamethasone (Maxidex), fluorometholone (Fluor-Op Ophthalmic), if the cause is nonviral
- Mast cell stabilizer: cromolyn (Opticrom) for allergic conjunctivitis
- Topical antibiotics according to sensitivity of infective organism (if bacterial)

INTERVENTIONS AND RATIONALES

- Teach proper hand-washing technique *because certain forms of conjunctivitis are highly contagious.*
- Stress the risk of spreading infection to family members by sharing washcloths, towels, and pillows. Warn against rubbing the infected eye, which can spread the infection to the other eye and to other persons. *These measures prevent the spread of infection.*
- Apply warm compresses and therapeutic ointment or drops. Don't irrigate the eye*; doing so will only spread infection.*
- Have the patient wash his hands before he uses the medication, and tell him to use clean washcloths or towels frequently *so he doesn't infect his other eye.*
- Teach the patient to instill eyedrops and ointments correctly—without touching the bottle tip to his eye or lashes—*to prevent the spread of infection.*
- Stress the importance of safety glasses for the patient who works near chemical irritants *to prevent further episodes of conjunctivitis.*
- Notify public health authorities if cultures show *N. gonorrhoeae. Public health authorities track sexually transmitted diseases.*



Teaching topics

- Knowing disease process and treatment options
- Using proper hand-washing technique
- Preventing the spread of infection
- Instilling eyedrops

Corneal abrasion

A corneal abrasion is a scratch on the surface epithelium of the cornea, the dome-shaped transparent structure in front of the eye.

CAUSES

- Improper use of contact lenses
- Trauma caused by a foreign body (such as a cinder or a piece of dust, dirt, or grit)

DATA COLLECTION FINDINGS

- Burning
- Change in visual acuity (depending on the size and location of injury)
- Increased tearing
- Pain disproportionate to size of injury
- Redness
- Sensation of foreign substance in the eye

DIAGNOSTIC FINDINGS

- Staining the cornea with fluorescein stain confirms the diagnosis: The injured area appears green when examined with a flashlight.
- Slit-lamp examination discloses the depth of the abrasion.

NURSING DIAGNOSES

- Acute pain
- Risk for infection
- Disturbed sensory perception (visual)

TREATMENT

- Irrigation with saline solution
- Pressure patch (a tightly applied eye patch)
- Removal of a deeply embedded foreign body with a foreign body spud, using a topical anesthetic

A pressure patch may be applied in corneal abrasion to prevent further corneal irritation when the patient blinks.

Drug therapy

- Antibiotic: sulfisoxazole (Gantrisin)
- Cycloplegic agent: tropicamide (Tropicacyl)

INTERVENTIONS AND RATIONALES

- Assist with examination of the eye. Check visual acuity before beginning treatment *to assess visual loss from injury.*
- If a foreign body is visible, carefully irrigate the eye with normal saline solution *to wash away the foreign body without damaging the eye.*
- Tell the patient with an eye patch to leave the patch in place for 6 to 8 hours *to protect the eye from further corneal irritation when the patient blinks.*
- Warn the patient with an eye patch that wearing a patch alters depth perception, so advise caution in everyday activities, such as climbing stairs or stepping off a curb, *to prevent injury.*
- Reassure the patient that the corneal epithelium usually heals in 24 to 48 hours *to allay anxiety.*
- Stress the importance of instilling prescribed antibiotic eyedrops *because an untreated corneal infection can lead to ulceration and permanent loss of vision.*
- Emphasize the importance of safety glasses *to protect a worker's eyes from flying fragments.*

Teaching topics

- Instilling eyedrops
- Using contacts properly

Encephalitis

Encephalitis is a severe inflammation and swelling of the brain, usually caused by a mosquito-borne or, in some areas, a tick-borne virus. Viruses that may cause the infection include the arboviruses, enteroviruses, herpes virus, mumps virus, human immunodeficiency virus (HIV), and adenoviruses. Transmission also may occur through ingestion of infected goat's milk and accidental injection or inhalation of the virus. Eastern equine encephalitis may produce permanent neurologic damage and is commonly fatal.

With encephalitis, intense lymphocytic infiltration of brain tissues and the leptomeninges causes cerebral edema, degeneration of the brain's ganglion cells, and diffuse nerve cell destruction.

CAUSES

- Exposure to virus or toxic substances such as infected goat's milk

DATA COLLECTION FINDINGS

- Agitation
- Headache

- Signs and symptoms of meningeal irritation (stiff neck and back) and neuronal damage (drowsiness, coma, paralysis, seizures, ataxia, organic psychoses)
- Sensory alterations
- Sudden onset of fever
- Vomiting
- Restlessness

DIAGNOSTIC FINDINGS

- Blood studies identify the virus and confirm the diagnosis.
- CSF analysis identifies the virus.
- LP discloses that CSF pressure is elevated and, despite inflammation, the fluid is commonly clear. WBC and protein levels in CSF are slightly elevated, but the glucose level remains normal.
- EEG reveals abnormalities such as generalized slowing of waveforms.
- CT scan may be ordered to rule out cerebral hematoma.

NURSING DIAGNOSES

- Disturbed thought processes
- Hyperthermia
- Impaired physical mobility

TREATMENT

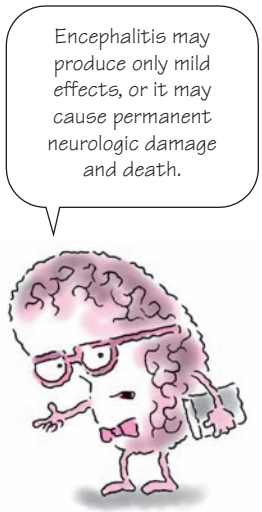
- ET intubation and mechanical ventilation
- I.V. fluids
- NG tube feedings or TPN (if unable to use the GI tract)

Drug therapy

- Anticonvulsants: phenytoin (Dilantin), phenobarbital (Luminal)
- Antiviral: acyclovir (Zovirax) (effective only against herpes encephalitis and only if administered before the onset of coma)
- Analgesics and antipyretics: aspirin, acetaminophen (Tylenol) to relieve headache and reduce fever
- Diuretics: furosemide (Lasix), mannitol (Osmitrol) to reduce cerebral swelling
- Corticosteroid: dexamethasone (Decadron) to reduce cerebral inflammation and edema
- Laxative: bisacodyl (Dulcolax)
- Sedative: lorazepam (Ativan) for restlessness
- Stool softener: docusate (Colace)

INTERVENTIONS AND RATIONALES

- Monitor neurologic function often. Observe the patient's mental status and cognitive abilities. *If the tissue within the brain becomes edematous, changes will occur in the patient's mental status and cognitive abilities.*
- Maintain adequate fluid intake *to prevent dehydration*, but avoid fluid overload, *which may increase cerebral edema*. Measure and record intake and output accurately *to assess fluid status*.
- Give acyclovir by slow I.V. infusion only. The patient must be well-hydrated and the infusion given over 1 hour *to avoid kidney damage*. Watch for adverse effects, such as nausea, diarrhea, pruritus, and rash, and adverse effects of other drugs *to prevent complications*. Check the infusion site often *to avoid infiltration and phlebitis.*
- Carefully position the patient *to prevent joint stiffness and neck pain*, and turn him often *to prevent skin breakdown.*
- Assist with range-of-motion (ROM) exercises *to maintain joint mobility.*
- Maintain adequate nutrition *to keep up with increased metabolic needs and promote healing*. It may be necessary to give the patient small, frequent meals or to supplement these meals with NG tube or parenteral feedings *to meet nutritional needs*.
- Give a stool softener or mild laxative *to prevent constipation and minimize the risk of increased ICP from straining during defecation.*
- Provide good mouth care *to prevent breakdown of oral mucous membrane*.
- Maintain a quiet environment *to promote comfort and decrease stimulation that can cause ICP to rise*. Darkening the room *may decrease photophobia and headache.*
- If the patient naps during the day and is restless at night, plan daytime activities *to minimize napping and promote sleep at night.*
- Provide emotional support and reassurance *because the patient is apt to be frightened by the illness and frequent diagnostic tests.*
- Reassure the patient and his family that behavioral changes caused by encephalitis usually disappear, *to decrease anxiety.*
- Apply antiembolism stockings and a sequential compression device *to prevent thromboembolism.*



Teaching topics
- Understanding the disease and its effects
- Understanding treatment and rehabilitation options

Glaucoma

With glaucoma, the patient experiences visual field loss due to damage to the optic nerve resulting from increased intraocular pressure. If left untreated, glaucoma can lead to blindness.

Glaucoma is either open-angle or angle-closure. With open-angle glaucoma, increased intraocular pressure is caused by overproduction or obstructed outflow of aqueous humor (a fluid in the front of the eye). With angle-closure glaucoma, an obstructed outflow of aqueous humor is due to anatomically narrow angles. This ocular emergency requires immediate treatment to lower intraocular pressure. If drugs don't lower intraocular pressure sufficiently, surgery follows.

CAUSES
- Diabetes mellitus
- Family history of glaucoma
- Long-term steroid treatment
- Previous eye trauma or surgery
- Race (blacks have higher incidence)
- Uveitis

DATA COLLECTION FINDINGS
Chronic open-angle glaucoma
- Initially asymptomatic
- Signs and symptoms of increased intraocular pressure
- Narrowed field of vision

Acute angle-closure glaucoma
- Acute ocular pain
- Blurred vision
- Dilated pupil
- Halo vision
- Signs and symptoms of increased intraocular pressure
- Nausea and vomiting

DIAGNOSTIC FINDINGS
- Gonioscopy reveals whether angle is open or closed.
- Ophthalmoscopy shows atrophy and cupping of optic nerve head.
- Perimetry shows decreased field of vision.
- Tonometry shows increased intraocular pressure.

NURSING DIAGNOSES
- Anxiety
- Risk for injury
- Disturbed sensory perception (visual)

TREATMENT
Chronic open-angle glaucoma
- Drug therapy (treatment of choice). If this fails, argon laser trabeculoplasty (argon laser beam is focused on the trabecular meshwork of an open angle, producing a thermal burn that changes the meshwork surface and increases aqueous humor outflow) or trabeculectomy.

Acute angle-closure glaucoma
- Laser iridectomy or surgical iridectomy, if intraocular pressure doesn't decrease with drug therapy

Drug therapy
Chronic open-angle glaucoma
- Alpha-adrenergic agonist: brimonidine (Alphagan)
- Beta-adrenergic antagonist: timolol (Timoptic)

Acute angle-closure glaucoma
- Cholinergic: pilocarpine (Pilopine HS)

INTERVENTIONS AND RATIONALES
- Monitor eye pain, and administer medication as prescribed. *Medication reduces pain and may control disease process.*
- Provide a safe environment. *Orienting the patient to surroundings reduces the risk of injury.*
- Modify the environment *to meet patient's self-care needs.*
- For an acute episode, limit activities that raise intraocular pressure. *Avoiding activities that increase intraocular pressure helps reduce complications.*

• Encourage the patient to express feelings about changes in body image *to aid acceptance of visual loss.*

Teaching topics

• Meticulous compliance with prescribed drug therapy to prevent an increase in intraocular pressure
• Monitoring eye for discharge, watering, blurred or cloudy vision, halos, flashes of light, and floaters

Guillain-Barré syndrome

Guillain-Barré syndrome is an acute, rapidly progressive, and potentially fatal form of polyneuritis (inflammation of several peripheral nerves at once) that causes muscle weakness and mild distal sensory loss.

Recovery is spontaneous and complete in about 95% of patients, although mild motor or reflex deficits in the feet and legs may persist. The prognosis is best when symptoms clear between 15 and 20 days after onset.

This disorder is also known as infectious polyneuritis, Landry-Guillain-Barré syndrome, and acute idiopathic polyneuritis.

CAUSES AND CONTRIBUTING FACTORS

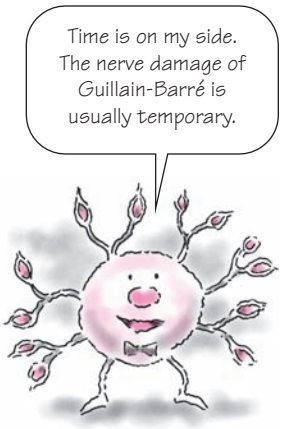
• Autoimmune attack on peripheral nerves in response to a viral infection or live vaccine
• Demyelination of the peripheral nerves

DATA COLLECTION FINDINGS

• Dysphagia (difficulty swallowing) or dysarthria (poor speech caused by impaired muscular control)
• Facial diplegia (paralysis affecting like parts on both sides of the face; possibly accompanied by ophthalmoplegia [ocular paralysis])
• Hypertonia (excessive muscle tone) and areflexia (absence of reflexes)
• Symmetrical muscle weakness (ascending from the legs to the arms)
• Paresthesia
• Stiffness and pain in the form of a severe "charley horse"
• Weakness of the muscles supplied by cranial nerve XI, the spinal accessory nerve, which affect shoulder movement and head rotation (a less common finding)

DIAGNOSTIC FINDINGS

• A history of preceding febrile illness (usually a respiratory tract infection) and typical clinical features suggest Guillain-Barré syndrome.
• CSF protein level begins to rise, peaking in 4 to 6 weeks. The WBC count in CSF remains normal, but in severe disease, CSF pressure may rise.
• Blood studies reveal a complete blood count that shows leukocytosis with the presence of immature forms early in the illness, but blood study results soon return to normal.
• EMG may show repeated firing of the same motor unit, instead of widespread sectional stimulation.
• Nerve conduction velocities are slowed soon after paralysis develops. Diagnosis must rule out similar diseases such as acute poliomyelitis.



NURSING DIAGNOSES

• Impaired physical mobility
• Ineffective breathing pattern
• Risk for injury

TREATMENT

• ET intubation or tracheotomy, if the patient has difficulty clearing secretions; possible mechanical ventilation
• NG tube feedings or parenteral nutrition (if unable to use the GI tract)
• I.V. fluid therapy
• Specialty bed or support surfaces
• Plasmapheresis
• Physical therapy

Drug therapy

• Corticosteroid: prednisone (Deltasone)
• Immunoglobulin therapy
• Anticoagulants: heparin, warfarin (Coumadin)

INTERVENTIONS AND RATIONALES

• Watch for ascending sensory loss, which precedes motor loss. Also, monitor vital signs and LOC *to detect disease progression.*

Potential complications of Guillain-Barré syndrome include respiratory failure, aspiration pneumonia, sepsis, joint contractures, and deep vein thrombosis.

• Monitor and treat respiratory dysfunction *to prevent respiratory arrest.*
• Auscultate for breath sounds *to detect early changes in respiratory function*, and encourage coughing and deep breathing *to mobilize secretions and prevent atelectasis.*
• Maintain respiratory support, if necessary.
• Give meticulous skin care *to prevent skin breakdown and contractures.*
• Establish a strict turning schedule; inspect the skin (especially the sacrum, heels, and ankles) for breakdown, and reposition the patient every 2 hours. *These measures prevent skin breakdown and pressure ulcer development.*
• After each position change, stimulate circulation by carefully massaging pressure points. Also, use foam, gel, or alternating-pressure pads at points of contact *to prevent skin breakdown.*
• Perform passive ROM exercises within the patient's pain limits. Remember that the proximal muscle groups of the thighs, shoulders, and trunk will be the most tender and cause the most pain on passive movement and turning. *Passive ROM exercises maintain joint function.*
• When the patient's condition stabilizes, change to gentle stretching and active assistance exercises *to strengthen muscles and maintain joint function.*
• Evaluate the patient for signs of dysphagia, such as coughing, choking, "wet"-sounding voice, rhonchi after feeding, drooling, delayed swallowing, and regurgitation of food. *These measures help prevent aspiration.*
• Elevate the head of the bed, position the patient upright and leaning forward when eating, provide semisolid food, and check the mouth for food pockets *to minimize the risk of aspiration.*
• Encourage the patient to eat slowly and remain upright for 15 to 20 minutes after eating *to prevent aspiration.*
• If aspiration can't be minimized by diet and position modification, expect to provide NG feeding *to prevent aspiration and ensure that nutritional needs are met.*
• As the patient regains strength and can tolerate a vertical position, monitor blood pressure and pulse rate during tilting periods *to detect postural hypotension.*
• Inspect the patient's legs regularly for signs of thrombophlebitis. *Thrombophlebitis is a common complication of Guillain-Barré syndrome.*
• Apply antiembolism stockings and sequential compression devices, and give prophylactic anticoagulants, as needed, *to prevent thrombophlebitis.*
• If the patient has facial paralysis, give eye and mouth care every 4 hours *to prevent corneal damage and breakdown of oral mucosa.*
• Protect the corneas with isotonic eyedrops and eye shields *to prevent corneal injury.*
• Encourage adequate fluid intake (2,000 ml/day), unless contraindicated, *to prevent dehydration, constipation, and renal calculi formation.*
• Measure and record intake and output every 8 hours and offer the bedpan every 3 or 4 hours *to monitor for urine retention.*
• Begin intermittent catheterization, as needed, *to relieve urine retention.* The patient may need manual pressure on the bladder (Credé's maneuver) before he can urinate *because the abdominal muscles are weak.* (See *Performing Credé's maneuver.*)
• Offer prune juice and a high-fiber diet *to prevent and relieve constipation.* If necessary, give daily or alternate-day suppositories (glycerin or bisacodyl) or Fleet enemas *to relieve constipation.*
• Refer the patient for physical therapy, occupational therapy, and speech therapy, as needed.

Teaching topics

• Transferring from bed to wheelchair and from wheelchair to toilet or tub and how to walk short distances with a walker or cane
• Caregiving strategies for the family, such as how to help the patient eat, compensate for facial weakness, and help avoid skin breakdown as well as the need for a regular bowel and bladder routine

Stepping up

Performing Credé's maneuver

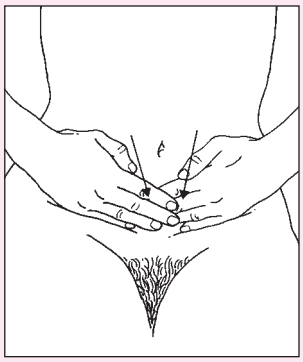
WHY YOU DO IT

When lower motor neuron damage impairs the voiding reflex, the bladder may become flaccid or areflexic. Because the bladder fails to contract properly, urine collects inside it, causing distention. Credé's maneuver—application of manual pressure over the lower abdomen—promotes complete emptying of the bladder. Even when performed properly, however, Credé's maneuver isn't always successful and doesn't always eliminate the need for catheterization.

After appropriate instruction, the patient can perform the maneuver, unless she can't reach her lower abdomen or lacks sufficient strength and dexterity. When a patient performs Credé's maneuver, close monitoring of urine output is necessary to help detect possible infection from accumulation of residual urine. Credé's maneuver can't be performed after abdominal surgery if the incision isn't completely healed.

HOW YOU DO IT

- Explain the procedure to the patient.
- Wash your hands.
- If the patient's condition permits, assist her onto the bedside commode. If not, place the patient in Fowler's position and position the bedpan or urinal.
- Place your hands flat on the patient's abdomen just below the umbilicus. (Ask the female patient to bend forward from the hips.) Firmly stroke downward toward the bladder about six times to stimulate the voiding reflex.
- Place one hand on top of the other above the pubic arch. Press firmly inward and downward to compress the bladder and to expel residual urine.



- Some facilities require a doctor's order for performing Credé's maneuver. This procedure shouldn't be performed on patients with normal bladder tone or bladder spasms.
- Record the date and time of the procedure, the amount of urine expelled, and the patient's tolerance of the procedure.

Huntington's disease

Huntington's disease is a hereditary disease in which degeneration in the cerebral cortex and basal ganglia causes chronic progressive chorea (involuntary and irregular movements) and cognitive deterioration, ending in dementia.

Huntington's disease usually strikes people between ages 25 and 55 (the average age is 35). Death usually results 10 to 15 years after onset from suicide, heart failure, or pneumonia. The disorder is also called Huntington's chorea, hereditary chorea, chronic progressive chorea, and adult chorea.

CAUSES

- Genetic transmission: autosomal dominant trait. (Either sex can transmit and inherit the disease.) Each child of a parent with this disease has a 50% chance of inheriting it; however, a child who doesn't inherit it can't pass it on to his own children.

DATA COLLECTION FINDINGS

- Choreic movements; rapid, often violent and purposeless; become progressively se-

vere; may include mild fidgeting, tongue smacking, dysarthria (indistinct speech), athetoid movements (slow, sinuous, writhing movements, especially of the hands), and torticollis (twisting of the neck)
• Dementia (can be mild at first but eventually disrupts the patient's personality)
• Gradual loss of musculoskeletal control, eventually leading to total dependence
• Personality changes, such as obstinacy, carelessness, untidiness, moodiness, apathy, loss of memory and, possibly, paranoia (in later stages of dementia)

DIAGNOSTIC FINDINGS
• PET scan detects the disease.
• Deoxyribonucleic acid analysis detects the disease.
• CT scan reveals brain atrophy.
• MRI demonstrates brain atrophy.
• Molecular genetics may detect the gene for Huntington's disease in people at risk while they're still asymptomatic.

NURSING DIAGNOSES
• Impaired physical mobility
• Ineffective health maintenance
• Risk for injury

TREATMENT
• Because Huntington's disease has no known cure, treatment is supportive, protective, and aimed at relieving symptoms.

Drug therapy
• Antipsychotics: chlorpromazine (Thorazine), haloperidol (Haldol) to help control choreic movements
• Antidepressant: imipramine (Tofranil) to alleviate depression

INTERVENTIONS AND RATIONALES
• Provide physical support by attending to the patient's basic needs, such as hygiene, skin care, bowel and bladder care, and nutrition. Increase this support as mental and physical deterioration makes him increasingly immobile. *These measures help prevent complications of immobility.*
• Assist in designing a behavioral plan that deals with the disruptive and aggressive behavior and impulse control problems. Reinforce positive behaviors, and maintain consistency with all caregiving. *These interventions consistently limit the patient's negative behaviors.*
• Offer emotional support to the patient and his family *to relieve anxiety and enhance coping*. Keep in mind the patient's dysarthria, and allow him extra time to express himself, *thereby decreasing frustration*.
• Stay alert for possible suicide attempts. Control the patient's environment to protect him from suicide or other self-inflicted injury. *The patient may be unable to cope with the devastating nature of the disease.*
• Pad the side rails of the bed but avoid restraints, *which may cause the patient to injure himself with violent, uncontrolled movements.*
• If the patient has difficulty walking, provide a walker *to help him maintain his balance.*
• Refer the patient and his family to appropriate community organizations, *which may provide information and support.*
• Apply antiembolism stockings and a sequential compression device while the patient is on bedrest *to prevent thromboembolism*.

Teaching topics
• Understanding the disease process
• Encouraging family participation in the patient's care
• Knowing the importance of genetic counseling (each child of a parent with this disease has a 50% chance of inheriting it)
• Contacting the Huntington's Disease Association

Ménière's disease

Ménière's disease is a dysfunction in the labyrinth (the part of the ear that produces balance) that produces severe vertigo, sensorineural hearing loss, and tinnitus. It usually affects adults, men slightly more often than women, between the ages of 30 and 60. After multiple attacks over several years, this disorder leads to residual tinnitus and hearing loss.

This disorder may also be called endolymphatic hydrops.

CAUSES

- Autonomic nervous system dysfunction that produces a temporary constriction of blood vessels supplying the inner ear
- Overproduction or decreased absorption of endolymph, which causes endolymphatic hydrops or endolymphatic hypertension, with consequent degeneration of the vestibular and cochlear hair cells

DATA COLLECTION FINDINGS

- Sensorineural hearing loss
- Severe vertigo
- Tinnitus
- Feeling of fullness or blockage in the ear
- Severe nausea
- Vomiting
- Sweating
- Giddiness
- Nystagmus

DIAGNOSTIC FINDINGS

- Electronystagmography, electrocochleography, a CT scan, MRI, and X-rays of the internal meatus may be necessary for differential diagnosis.
- Audiometric studies indicate a sensorineural hearing loss and loss of discrimination and recruitment.

NURSING DIAGNOSES

- Impaired physical mobility
- Risk for injury
- Disturbed sensory perception (auditory)

TREATMENT

- Restriction of sodium intake to less than 2 g/day
- Vestibular rehabilitation therapy
- Surgery to destroy the affected labyrinth (only if medical treatment fails; destruction of the labyrinth permanently relieves symptoms but at the expense of irreversible hearing loss)
- Chemical labyrinthectomy (injection of an aminoglycoside antibiotic, such as gentamicin, into the ear to destroy the vestibular tissue in the ear) when conservative measures fail

Drug therapy

- Anticholinergic: atropine (may stop an attack in 20 to 30 minutes)
- Diuretic: furosemide (Lasix)
- Antihistamines: diphenhydramine (Benadryl) (may be necessary in a severe attack), meclizine (Antivert), dimenhydrinate (Dramamine) (for milder attacks; may also be administered as part of prophylactic therapy)
- Antiemetics: dolasetron (Anzemet), trimethobenzamide (Tigan), metoclopramide (Reglan)

INTERVENTIONS AND RATIONALES

- Advise the patient against reading and exposure to glaring lights during an attack *to reduce dizziness.*
- Stress safety measures. Tell the patient not to get out of bed or walk during an attack without assistance *to prevent injury.*
- Instruct the patient to avoid sudden position changes and tasks that vertigo makes hazardous *because an attack can begin quite rapidly.*

Before surgery

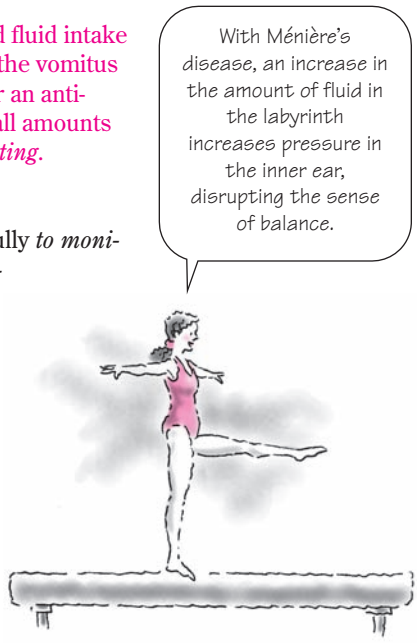
- If the patient is vomiting, record fluid intake and output and characteristics of the vomitus *to prevent dehydration.* Administer an antiemetic as necessary and give small amounts of fluid frequently *to prevent vomiting.*

After surgery

- Record intake and output carefully *to monitor fluid status and direct the treatment plan.*
- Tell the patient to expect dizziness and nausea for 1 or 2 days after surgery *to relieve anxiety.*

Teaching topics

- Knowing disease process and treatment options
- Performing measures to combat dizziness, such as rising slowly from a sitting or lying position



Meningitis

With meningitis, the brain and the spinal cord meninges become inflamed, usually as a result of bacterial infection. Such inflammation may involve all three meningeal membranes: the dura mater, arachnoid, and pia mater.

The prognosis is good and complications are rare, especially if the disease is recognized early and the infecting organism responds to antibiotics. The prognosis is poorer for neonates and elderly people. Mortality is high in untreated meningitis.

CAUSES

- Bacterial infection (may occur secondary to bacteremia [especially from pneumonia, empyema, osteomyelitis, and endocarditis], sinusitis, otitis media, encephalitis, myelitis, or brain abscess)
- Head trauma (may follow a skull fracture, a penetrating head wound, LP, or ventricular shunting procedure)
- Virus (usually mild and self-limiting)
- Fungal or protozoal infection (less common)

DATA COLLECTION FINDINGS

- Chills
- Coma
- Confusion
- Deep stupor
- Delirium
- Exaggerated deep tendon reflexes
- Fever
- Headache
- Irritability
- Malaise
- Opisthotonos (a spasm in which the back and extremities arch backward so that the body rests on the head and heels)
- Petechial, purpuric, or ecchymotic rash on the lower part of the body (meningococcal meningitis)
- Photophobia
- Positive Brudzinski's sign, in which the patient flexes his hips or knees when the nurse places her hands behind his neck and flexes it forward (a sign of meningeal inflammation and irritation)
- Positive Kernig's sign (pain or resistance when the patient's leg is flexed at the hip or knee while he's in a supine position)
- Seizures
- Signs and symptoms of increased ICP
- Stiff neck and back
- Twitching
- Visual alterations such as diplopia (two images of a single object)
- Vomiting

DIAGNOSTIC FINDINGS

- An LP shows elevated CSF pressure, cloudy or milky white CSF, high protein level, positive Gram stain and culture that usually identifies the infecting organism (unless it's a virus), and depressed CSF glucose concentration.
- Chest X-ray may reveal pneumonitis or lung abscess, tubercular lesions, or granulomas secondary to fungal infection.
- Sinus and skull X-rays may help identify the presence of cranial osteomyelitis, paranasal sinusitis, or skull fracture.
- WBC count reveals leukocytosis.
- CT scan can rule out cerebral hematoma, hemorrhage, or tumor.

NURSING DIAGNOSES

- Hyperthermia
- Risk for injury
- Decreased intracranial adaptive capacity

TREATMENT

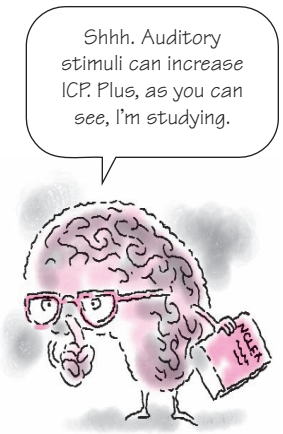
- Bed rest
- Hypothermia
- I.V. fluid administration
- Oxygen therapy, possibly with ET intubation and mechanical ventilation

Drug therapy

- Antibiotics: penicillin G (Pfizerpen), ampicillin (Omnipen), or nafcillin; tetracycline (Achromycin V) or chloramphenicol (Chloromycetin), if allergic to penicillin
- Diuretic: mannitol (Osmitrol)
- Anticonvulsants: phenytoin (Dilantin), phenobarbital (Luminal)
- Analgesics or antipyretics: acetaminophen (Tylenol), aspirin
- Laxative: bisacodyl (Dulcolax)
- Stool softener: docusate (Colace)

INTERVENTIONS AND RATIONALES

- Monitor neurologic function often *to detect early signs of increased intracranial pressure (ICP) and ensure prompt treatment.*
- Watch for deterioration in the patient's condition, *which may signal an impending crisis.*
- Monitor fluid balance. Maintain adequate fluid intake *to avoid dehydration without causing fluid overload, which may lead to cerebral edema.*
- Suction the patient only if necessary. Limit suctioning to 10 to 15 seconds per pass of the catheter. *Suctioning stimulates coughing and Valsalva's maneuver; Valsalva's maneuvers increase intrathoracic pressure, decrease cerebral venous drainage, and increase cerebral blood volume, resulting in increased ICP.*
- Hyperoxygenate the lungs with 100% oxygen for 1 minute before and after suctioning. *Hypercapnia results in cerebral vasodilation, increased blood volume, and increased ICP. Preoxygenation helps avoid hypoxemia and tissue ischemia.*
- Watch for adverse reactions to I.V. antibiotics and other drugs *to prevent complications such as anaphylaxis.*
- Position the patient carefully *to prevent joint stiffness and neck pain.*
- Turn the patient often, according to a planned positioning schedule, *to prevent skin breakdown.*
- Apply antiembolism stockings and a sequential compression device *to prevent thromboembolism.*
- Assist with ROM exercises *to prevent contractures.*
- Provide small, frequent meals or supplement meals with NG tube or parenteral feedings, as necessary, *to maintain adequate nutrition and elimination.*
- Give the patient a mild laxative or stool softener *to prevent constipation and minimize the risk of increased ICP resulting from straining during defecation.*
- Ensure the patient's comfort *to prevent increased ICP.*
- Provide mouth care regularly *to prevent breakdown of oral mucosa and promote patient comfort.*
- Maintain a quiet environment. *Auditory stimuli can increase ICP.*
- Darken the room *to decrease photophobia.*
- Relieve headache with a nonopioid analgesic, such as aspirin or acetaminophen, as needed. *Opioids interfere with accurate neurologic assessment.*
- Provide reassurance and support. The patient may be frightened by his illness and frequent LPs. *These measures decrease anxiety; emotional upsets may increase ICP.*
- Reassure the family that the delirium and behavior changes caused by meningitis usually disappear. *Doing so allays anxiety.*
- Follow strict aseptic technique when treating patients with head wounds or skull fractures *to prevent meningitis.*



Teaching topics

- Preventing meningitis (for example, teaching patients with chronic sinusitis or other chronic infections the importance of proper medical treatment)
- Recognizing signs of meningitis
- Identifying contagion risks; notifying anyone who came in close contact with the patient

Multiple sclerosis

Multiple sclerosis (MS) is a progressive disease that destroys myelin in the neurons of the brain and spinal cord. Degeneration of the myelin sheath results in patches of sclerotic tissue that impair the ability of the nervous system to conduct motor nerve impulses.

CAUSES

- Exact cause unknown

Possible causes

- Autoimmune response
- Environmental or genetic factors
- Slow-acting or latent viral infection

DATA COLLECTION FINDINGS

- Ataxia (incoordination and irregularity of voluntary, purposeful movements)
- Feelings of euphoria
- Heat intolerance
- Inability to sense or gauge body position
- Intention tremor

• Nystagmus, diplopia, blurred vision, optic neuritis
• Scanning speech
• Urinary incontinence or retention
• Weakness, paresthesia, impaired sensation, paralysis

DIAGNOSTIC FINDINGS

• CSF analysis shows increased immunoglobulin G, protein, and WBCs, or it may be normal.
• CT scan eliminates other diagnoses such as brain or spinal cord tumors.
• MRI may reveal plaques associated with multiple sclerosis.

NURSING DIAGNOSES

• Ineffective airway clearance
• Impaired physical mobility
• Imbalanced nutrition: Less than body requirements

TREATMENT

• High-calorie, high-vitamin, gluten-free, and low-fat diet
• Increased intake of fluids
• Physical therapy
• Plasmapheresis (for antibody removal)
• Speech therapy

Drug therapy

• Analgesic: carbamazepine (Tegretol)
• Cholinergic: bethanechol (Urecholine)
• Glucocorticoids: prednisone (Deltasone), dexamethasone (Decadron), corticotropin (ACTH)
• Immunosuppressants: interferon beta-1b (Betaseron), cyclophosphamide (Cytoxan), methotrexate (Folex), glatiramer (Copaxone)
• Skeletal muscle relaxants: dantrolene (Dantrium), baclofen (Lioresal)

INTERVENTIONS AND RATIONALES

• Monitor for changes in motor coordination, paralysis, or muscle weakness *to facilitate early intervention.*
• Evaluate respiratory status at least every 4 hours *to detect early signs of compromise.*
• Maintain the patient's diet *to decrease risk of constipation.*
• Encourage fluids *to decrease risk of urinary tract infection.*
• Administer medications, as prescribed, *to improve or maintain the patient's condition and functional status.*
• Encourage the patient to express feelings about changes in body image *to promote acceptance of muscular impairment.*
• Provide active and passive ROM exercises *to maintain mobility and prevent musculoskeletal degeneration.*
• Establish a bowel and bladder program *to decrease risk of constipation and urinary retention.*
• Maintain activity, as tolerated (alternating rest and activity), *to improve muscle tone and enhance self-esteem.*
• Protect the patient from falls *to prevent injury.*
• Monitor patient's neuromuscular status and voiding pattern *to facilitate early interventions for urinary retention.*

Teaching topics

• Reducing stress
• Recognizing the signs and symptoms of exacerbation
• Avoiding exposure to people with infections
• Alternating rest and activity
• Maintaining a safe, quiet environment
• Using devices to assist with ADLs
• Maintaining a sense of independence
• Avoiding temperature extremes, especially heat
• Contacting the National Multiple Sclerosis Society

Myasthenia gravis

Myasthenia gravis, a neuromuscular disorder, is marked by weakness of voluntary muscles. The patient experiences sporadic, progressive weakness and abnormal fatigue of voluntary skeletal muscles.

Myasthenia gravis is characterized by a disturbance in transmission of nerve impulses at neuromuscular junctions. This transmission defect results from a deficiency in release of acetylcholine or a deficient number of acetylcholine receptor sites.

CAUSES
- Autoimmune disease
- Excessive cholinesterase
- Insufficient acetylcholine

DATA COLLECTION FINDINGS
- Diplopia, ptosis, strabismus
- Dysarthria
- Dysphagia, drooling
- Impaired speech
- Masklike expression
- Muscle weakness and fatigue (typically, muscles are strongest in the morning but weaken throughout the day, especially after exercise)
- Profuse sweating
- Respiratory distress

DIAGNOSTIC FINDINGS
- EMG shows impaired impulse conduction in the muscles.
- Neostigmine (Prostigmin) or edrophonium (Tensilon) test relieves symptoms after medication administration (which is a positive indication of the disease).
- Thymus scan reveals hyperplasia or thymoma.

NURSING DIAGNOSES
- Impaired gas exchange
- Impaired physical mobility
- Impaired verbal communication

TREATMENT
- High-calorie diet with soft foods
- Plasmapheresis (in severe exacerbations)
- Thymectomy

Drug therapy
- Anticholinesterase inhibitors: neostigmine (Prostigmin), pyridostigmine (Mestinon)
- Glucocorticoids: prednisone (Deltasone), dexamethasone (Decadron), corticotropin (ACTH)
- Immunosuppressants: azathioprine (Imuran), cyclophosphamide (Cytoxan)

INTERVENTIONS AND RATIONALES
- Monitor neurologic and respiratory status. *Respiratory muscle weakness may be severe enough in myasthenic crisis to require an emergency airway and mechanical ventilation.*
- Evaluate swallow and gag reflexes *to prevent aspiration and determine extent of neurologic deficit.*
- Watch the patient for choking while eating *to prevent aspiration of food particles.*
- Monitor and record vital signs and intake and output *to prevent fluid overload or deficit and facilitate early intervention for deterioration of respiratory status.*
- Administer medications, as prescribed, *to relieve symptoms.*
- Maintain the patient's diet; encourage small, frequent meals *to conserve energy and meet nutritional needs.*
- Encourage the patient to express feelings about changes in body image and about difficulty in communicating verbally *to reduce the patient's tendency to suppress or repress feelings about neuromuscular loss.*
- Determine the patient's activity tolerance and assist in ADLs *to conserve energy and avoid fatigue.*
- Provide rest periods *to reduce the body's oxygen demands and prevent fatigue.*
- Provide oral hygiene *to promote comfort and enhance appetite.*
- Improve environmental safety *to protect the patient from falls.*
- Apply antiembolism stockings and a sequential compression device when the patient is on bed rest *to prevent thromboembolism.*
- Monitor for signs and symptoms of acute infection to detect complications.

Teaching topics
- Reducing stress
- Recognizing the signs and symptoms of respiratory distress
- Recognizing the signs and symptoms of myasthenic crisis
- Adhering to activity limitations
- Contacting the Myasthenia Gravis Foundation of America

Otosclerosis

Otosclerosis is an overgrowth of the ear's spongy bone around the oval window and stapes footplate. This overgrowth curtails movement of the stapes in the oval window, preventing sound from being transmitted to

the cochlea and resulting in conductive hearing loss.

CAUSES
- Familial tendency

DATA COLLECTION FINDINGS
- Progressive hearing loss
- Tinnitus

DIAGNOSTIC FINDINGS
- Audiometric testing confirms hearing loss.

NURSING DIAGNOSES
- Anxiety
- Impaired verbal communication
- Disturbed sensory perception (auditory)

TREATMENT
- Hearing aid
- Stapedectomy and insertion of a prosthesis to restore partial or total hearing

INTERVENTIONS AND RATIONALES
- Monitor vital signs and dressing postoperatively *to detect complications and bleeding.*
- Develop alternative means of communication *to decrease anxiety and communicate effectively with the patient.*

Teaching topics
- Using a hearing aid
- Avoiding loud noises and sudden pressure changes until healing is complete
- Avoiding (for at least 1 week) blowing the nose to prevent contaminated air and bacteria from entering the eustachian tube
- Protecting the ears against cold
- Avoiding activities that provoke dizziness
- Changing external ear dressings

Loud noises are bad for otosclerosis patients—and for NCLEX review. Find a quiet, calm place to study.

Parkinson's disease

Parkinson's disease is a progressive, degenerative disorder of the CNS associated with dopamine deficiency. This lack of dopamine impairs the area of the brain responsible for control of voluntary movement. As a result, most symptoms relate to problems with posture and movement.

CAUSES
- Exact cause unknown

Possible causes
- Cerebral vascular disease
- Dopamine deficiency
- Certain drugs
- Imbalance of dopamine and acetylcholine in basal ganglia
- Repeated head trauma
- Unknown

DATA COLLECTION FINDINGS
- Difficulty in initiating voluntary activity
- Dysphagia, drooling
- Fatigue
- Masklike facial expression
- "Pill-rolling" tremors, tremors at rest
- Shuffling gait, stiff joints, dyskinesia, "cogwheel" rigidity, stooped posture
- Small handwriting

DIAGNOSTIC FINDINGS
- CT scan is normal.
- EEG reveals minimal slowing of brain activity.

NURSING DIAGNOSES
- Activity intolerance
- Impaired physical mobility
- Imbalanced nutrition: Less than body requirements

TREATMENT
- A high-residue, high-calorie, high-protein diet composed primarily of soft foods
- Physical therapy
- Stereotactic neurosurgery: thalamotomy or pallidotomy

Drug therapy
- Anticholinergic: trihexyphenidyl (Artane)
- Antidepressant: amitriptyline (Elavil)
- Antiparkinsonian agents: levodopa (Larodopa), carbidopa-levodopa (Sinemet), benztropine (Cogentin)
- Antispasmodic: procyclidine (Kemadrin)
- Antiviral: amantadine (Symmetrel) (used early on to reduce tremors and rigidity)
- Dopamine receptor agonists: pergolide (Permax), bromocriptine (Parlodel)
- Enzyme inhibiting agent: selegiline (Eldepryl)

INTERVENTIONS AND RATIONALES

- Monitor neurologic and respiratory status *to detect change in status and possible need for change in treatment.*
- Monitor and record vital signs and intake and output *to detect complications.*
- Monitor the patient at mealtimes *to decrease risk of aspiration.*
- Position the patient *to prevent contractures and maintain skin integrity.*
- Administer medications, as prescribed, *to improve functioning.*
- Encourage the patient to express feelings about changes in body image *to reduce anxiety and depression.*
- Encourage daily ambulation *to promote independence.*
- Provide active and passive ROM exercises *to maintain mobility.*
- Maintain the patient's diet *to meet nutritional demands.*
- Provide skin care daily *to maintain skin integrity.*
- Provide oral hygiene *to promote self-care and improve nutritional intake.*
- Reinforce gait training *to improve mobility.*
- Reinforce independence in care *to maintain self-esteem.*

Teaching topics

- Recognizing early signs and symptoms of respiratory distress
- Alternating rest periods with activity
- Promoting a safe environment
- Preventing choking
- Eating soft foods cut into small pieces
- Increasing intake of fiber and fluids to prevent constipation

Retinal detachment

Retinal detachment is the separation of the retina (a thin, semitransparent layer of nerve tissue that lines the eye wall) from the choroid (the middle vascular coat of the eye between the retina and the sclera). It occurs when the retina develops a hole or tear and the vitreous humor seeps between the retina and choroid. If left untreated, retinal detachment can lead to vision loss.

CAUSES

- Aging
- Diabetic neovascularization
- Familial tendency
- Hemorrhage
- Inflammatory process
- Myopia
- Trauma
- Tumor

DATA COLLECTION FINDINGS

- Painless change in vision (floaters and flashes of light)
- Photopsia (recurrent flashes of light)
- With progression of detachment, painless vision loss possibly described as a "veil," "curtain," or "cobweb" that eliminates part of visual field

DIAGNOSTIC FINDINGS

- Indirect ophthalmoscopy shows retinal tear or detachment.
- Slit-lamp examination shows retinal tear or detachment.
- Ultrasound shows retinal tear or detachment in presence of a cataract.

NURSING DIAGNOSES

- Anxiety
- Risk for injury
- Disturbed sensory perception (visual)

TREATMENT

- Complete bed rest and restriction of eye movement to prevent further detachment
- Cryopexy, if there's a hole in the peripheral retina
- Laser therapy, if there's a hole in the posterior portion of the retina
- Scleral buckling to reattach the retina

INTERVENTIONS AND RATIONALES

- Evaluate visual status and functional vision in the unaffected eye *to determine self-care needs.*
- Postoperatively, instruct the patient to lie on his back or on his unoperated side *to reduce intraocular pressure on the affected side.*
- Discourage straining during defecation, bending down, and hard coughing, sneezing,

or vomiting *to avoid activities that can increase intraocular pressure.*
• Provide assistance with ADLs *to minimize frustration and strain.*
• Assist with ambulation, as needed, *to help the patient remain independent.*
• Approach the patient from the unaffected side *to avoid startling the patient.*
• Orient the patient to his environment *to reduce the risk of injury.*

Teaching topics
• Resting eyes frequently
• Keeping walkways free of clutter to prevent falls

Spinal cord injury

Spinal cord injuries usually result from traumatic force on the vertebral column, which, in turn, injures the spinal cord. Necrosis and scar tissue form in the area of the traumatized cord. Damage to the spinal cord results in sensory and motor deficits. The patient may experience partial or full loss of function of any or all extremities and bodily functions.

CAUSES
• Car accidents
• Congenital anomalies
• Diving into shallow water
• Falls
• Gunshot wounds
• Infections
• Sports injury
• Stab wounds
• Tumors

DATA COLLECTION FINDINGS
• Absence of reflexes below the level of the injury
• Flaccid muscles
• Loss of bowel and bladder control
• Neck pain
• Numbness and tingling
• Paralysis below the level of the injury
• Paresthesia below the level of the injury
• Respiratory distress

DIAGNOSTIC FINDINGS
• CT scan shows spinal cord edema, vertebral fracture, and spinal cord compression.
• MRI shows spinal cord edema, vertebral fracture, and spinal cord compression.
• Spinal X-rays reveal vertebral fracture.

NURSING DIAGNOSES
• Impaired physical mobility
• Posttrauma syndrome
• Powerlessness

TREATMENT
• Patient in flat position, with neck immobilized in a cervical collar
• Maintenance of vertebral alignment through Crutchfield tongs, Halo vest
• Specialized rotation bed
• Surgery for stabilization of the upper spine, such as insertion of Harrington rods

Drug therapy
• Antianxiety agent: lorazepam (Ativan)
• Glucocorticoid: methylprednisolone (Solu-Medrol) infusion immediately following injury (may improve neurologic recovery when administered within 8 hours of injury)
• H_2-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)
• Laxative: bisacodyl (Dulcolax)
• Mucosal barrier fortifier: sucralfate (Carafate)
• Muscle relaxant: dantrolene (Dantrium)

INTERVENTIONS AND RATIONALES
• Monitor neurologic and respiratory status *to determine baseline and to detect early complications.*
• Observe for signs and symptoms of spinal shock *to detect early changes in the patient's condition.*
• Monitor and record vital signs, intake and output, laboratory studies, and pulse oximetry values *to detect early changes in the patient's condition.*
• Check for autonomic dysreflexia (sudden extreme rise in blood pressure) *to prevent life-threatening complications.*
• Administer fluids *to maintain hydration.*
• Administer oxygen, as needed, *to maintain oxygenation to cells.*

• Provide suctioning, if necessary, and encourage coughing and deep breathing *to maintain a patent airway.*
• Administer medications, as prescribed, *to maintain or improve the patient's condition.*
• Encourage the patient to express feelings about changes in body image, sexual expression and function, and mobility *to reduce anxiety and depression.*
• Turn the patient every 2 hours using the logrolling technique (only if the patient is stabilized and not in a specialty bed) *to prevent pressure ulcers.*
• Keep a tool available to open the Halo vest in case of cardiac arrest *to maintain patient safety.*
• Maintain body alignment *to maintain joint function and prevent musculoskeletal degeneration.*
• Initiate bowel and bladder retraining *to avoid stimuli that could trigger autonomic dysreflexia.*
• Provide passive ROM exercises *to maintain ROM and joint mobility.*
• Provide skin care *to avoid discomfort and loss of skin integrity, which can become a permanent impairment. Maintaining skin integrity becomes a priority after the patient is stabilized.*
• Apply antiembolism stockings and a sequential compression device *to maintain venous circulation and prevent thromboembolism.*
• Provide sexual counseling *to encourage questions and avoid misunderstandings about sexual activity.*

Teaching topics

• Exercising regularly to strengthen muscles
• Recognizing the signs and symptoms of autonomic dysreflexia, urinary tract infection, and upper respiratory infection
• Continuing a bowel and bladder program
• Maintaining acidic urine with cranberry juice
• Consuming adequate fluids: 3,000 ml/day
• Using assistive devices with proper body mechanics for ADLs
• Maintaining skin integrity
• Using a wheelchair and proper transfer techniques, such as moving the strong part of the patient's body to the chair first
• Maintaining a sense of independence
• Contacting the National Spinal Cord Injury Association

Stroke

A stroke, also known as a cerebrovascular accident, results from a sudden impairment of cerebral circulation in one or more of the blood vessels supplying the brain. A stroke interrupts or diminishes oxygen supply and commonly causes serious damage or necrosis in brain tissues.

The sooner circulation returns to normal after the stroke, the better the patient's chances for a complete recovery. However, about half of those who survive a stroke remain permanently disabled and experience a recurrence within weeks, months, or years.

CAUSES

• Arrhythmia
• Cerebral arteriosclerosis
• Embolism
• Hemorrhage
• Hypertension
• Thrombosis
• Vasospasm

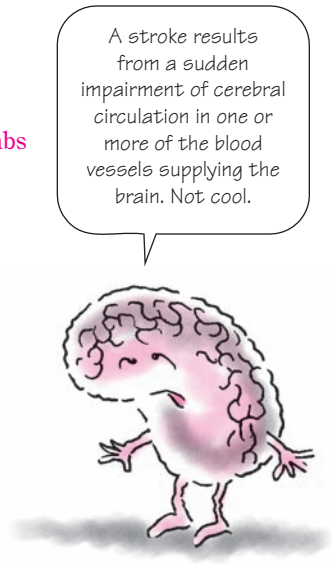
DATA COLLECTION FINDINGS

Stroke symptoms depend on the artery affected. (See *Location, location, location,* page 208.)

Symptoms are sudden and may include:
• garbled or impaired speech
• inability to move, or difficulty moving, limbs or one side of the body
• vision disturbances
• headache
• mental impairment
• seizures
• coma
• vomiting.

DIAGNOSTIC FINDINGS

• CT scan reveals intracranial bleeding, infarct (shows up 24 hours after the initial symptoms), or shift of midline structures.
• Digital subtraction angiography reveals occlusion or narrowing of vessels.



Location, location, location

Clinical features of stroke vary with the artery affected (and, consequently, the portion of the brain the artery supplies), the severity of damage, and the extent of collateral circulation that develops to help the brain compensate for decreased blood supply.

Typical arteries affected and their associated signs and symptoms are described here.

MIDDLE CEREBRAL ARTERY
Injury to this artery causes aphasia, dysphagia, visual field cuts, and hemiparesis on the affected side (more severe in the face and arm than in the leg).

CAROTID ARTERY
If the carotid artery is affected, the patient may develop weakness, paralysis, numbness, sensory changes, and visual disturbances on the affected side as well as altered level of consciousness, bruits, headaches, aphasia, and ptosis.

VERTEBROBASILAR ARTERY
A stroke affecting this artery may lead to weakness on the affected side, numbness around the lips and mouth, visual field cuts, diplopia, poor coordination, dysphagia, slurred speech, dizziness, amnesia, and ataxia.

ANTERIOR CEREBRAL ARTERY
If this artery becomes affected, the patient may develop confusion, weakness, and numbness (especially in the leg) on the affected side as well as incontinence, loss of coordination, impaired motor and sensory functions, and personality changes.

POSTERIOR CEREBRAL ARTERIES
If these arteries are affected, the patient may develop visual field cuts, sensory impairment, dyslexia, coma, and cortical blindness. Usually, paralysis is absent.

• EEG shows focal slowing in area of lesion.
• MRI shows intracranial bleeding, infarct, or shift of midline structures.

NURSING DIAGNOSES

• Ineffective tissue perfusion: Cerebral
• Risk for aspiration
• Risk for injury

TREATMENT

• Active and passive ROM and isometric exercises (see *Performing passive ROM exercises*)
• Bed rest until blood pressure stabilizes
• Low-sodium diet
• Physical therapy

Drug therapy

• Analgesics: codeine sulfate or codeine phosphate (if nothing-by-mouth status) to reduce headache
• Anticoagulants: heparin, warfarin (Coumadin)
• Anticonvulsant: phenytoin (Dilantin)
• Diuretics: mannitol (Osmitrol), furosemide (Lasix)
• Glucocorticoid: dexamethasone (Decadron)
• H_2-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)
• Thrombolytic therapy: tissue plasminogen activator given within the first 3 hours of an ischemic stroke to restore circulation to the affected brain tissue and limit the extent of brain injury
• Antiplatelet aggregation agent: ticlodipine (Ticlid)

INTERVENTIONS AND RATIONALES

• Take vital signs every 1 to 2 hours initially, then every 4 hours when the patient becomes stable, *to detect early signs of decreased cerebral perfusion pressure or increased ICP.*
• Elevate the head of the bed 30 degrees *to facilitate venous drainage and reduce cellular edema.*
• Maintain the patient's diet *to promote nutritional status and healing.*
• Maintain I.V. fluids and monitor intake and output *to prevent volume overload or deficit.*
• Conduct a neurologic assessment every 1 to 2 hours initially, then every 4 hours when the patient becomes stable, *to screen for changes in LOC and neurologic status.*

Stepping up

Performing passive ROM exercises

WHY YOU DO IT

Passive range-of-motion (ROM) exercises improve or maintain joint mobility and help prevent contractures. Performed by a nurse, a physical therapist, or a caregiver, these exercises are indicated for the patient with temporary or permanent loss of mobility, sensation, or consciousness. Passive ROM exercises require recognition of the patient's limits of motion and support of all joints during movement.

HOW YOU DO IT

- Determine the joints that need passive ROM exercises, and consult the doctor or physical therapist about limitations or precautions for specific exercises.
- Perform passive ROM at least once each shift, possibly while bathing or turning the patient or when the patient is in a convenient position. Repeat each exercise at least three times.
- Record which joints were exercised, the presence of edema or pressure areas, any pain resulting from the exercises, any limitation of ROM, and the patient's tolerance of the exercises.

Exercising the neck

- Support the patient's head with your hands and extend the neck, flex the chin to the chest, and tilt the head laterally toward each shoulder.
- Rotate the head from right to left.

Exercising the shoulders

- Support the patient's arm in an extended, neutral position; then extend the forearm and flex it back. Abduct the arm outward from the side of the body, and adduct it back to the side.
- Rotate the shoulder so that the arm crosses the midline, and bend the elbow so that the hand touches the opposite shoulder and then touches the mattress of the bed for complete internal rotation.
- Return the shoulder to a neutral position and, with elbow bent, push the arm backward so that the back of the hand touches the mattress for complete external rotation.

Exercising the elbow

- Place the patient's arm at his side with his palm facing up.
- Flex and extend the arm at the elbow.

Exercising the forearm

- Stabilize the patient's elbow; then twist the hand to bring the palm up (supination).
- Twist it back again to bring the palm down (pronation).

Exercising the wrist

- Stabilize the forearm, and flex and extend the wrist.
- Rock the hand sideways for lateral flexion, and rotate the hand in a circular motion.

Exercising the fingers and thumb

- Extend the patient's fingers, and then flex the hand into a fist.
- Repeat extension and flexion of each joint of each finger and thumb separately.
- Spread two adjoining fingers apart (abduction), and then bring them together (adduction).
- Oppose each fingertip to the thumb, and rotate the thumb and each finger in a circle.

Exercising the hip and knee

- Fully extend the patient's leg, and then bend the hip and knee toward the chest, allowing full joint flexion.
- Next, move the straight leg sideways, out and away from the other leg (abduction), and then back, over, and across it (adduction).
- Rotate the straight leg internally toward the midline and then externally away from the midline.

Exercising the ankle

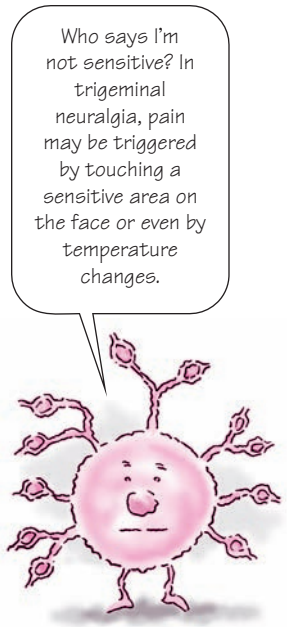
- Bend the patient's foot so that the toes push upward (dorsiflexion); then bend the foot so that the toes push downward (plantar flexion).
- Rotate the ankle in a circular motion.
- Invert the ankle so that the sole of the foot faces the midline, and evert the ankle so that the sole faces away from the midline.

Exercising the toes

- Flex the patient's toes toward the sole, and then extend them back toward the top of the foot.
- Spread two adjoining toes apart (abduction), and then bring them back together (adduction).

- Take the patient's temperature at least every 4 hours. *Hyperthermia causes increased ICP; hypothermia causes reduced cerebral perfusion pressure.*
- Monitor hemoglobin and hematocrit and report anomalies *to prevent tissue ischemia.*
- Evaluate respiratory status at least every 4 hours *for signs of aspiration or respiratory depression.*

• Make sure that suction equipment is available and suction as needed *to keep airway clear.*
• Administer oxygen *to promote cerebral tissue oxygenation.*
• Assist the patient with coughing and deep breathing *to mobilize secretions.*
• Maintain position, patency, and low suction of the NG tube. *Delayed gastric emptying and elevated intragastric pressure may cause regurgitation of stomach contents.*
• Administer enteral nutrition or monitor TPN, depending on the patient's condition, *to facilitate tissue healing and meet metabolic needs.*
• Apply antiembolism stockings and a sequential compression device *to promote venous return and prevent thromboembolism formation.*
• Maintain seizure precautions and administer an anticonvulsant, as ordered. *Seizures increase intrathoracic pressure, decrease cerebral venous outflow, and increase cerebral blood volume, thereby increasing ICP.*
• Provide passive ROM exercises *to prevent venous thrombosis and contractures.*
• Turn and position the patient every 2 hours *to prevent pressure ulcers.*
• Provide means of communication *to promote understanding and decrease anxiety.*
• Maintain routine bowel and bladder function and administer diuretics, as ordered, *to promote fluid mobilization.*
• Encourage the patient to express feelings about changes in body image and about difficulty in communicating verbally *to promote reduced anxiety and expression of feelings.*
• Maintain a quiet environment *to prevent increases in ICP.*
• Protect the patient from falls and injury, and provide a safe environment *to reduce the risk of injury.*



Teaching topics
• Monitoring blood pressure
• Recognizing signs and symptoms of stroke
• Minimizing environmental stress
• Communicating effectively (for an aphasic patient)
• Using devices to assist in ADLs
• Initiating lifestyle changes
• Contacting the American Heart Association and the National Stroke Association

Trigeminal neuralgia

Trigeminal neuralgia is a painful disorder of one or more branches of the fifth cranial (trigeminal) nerve that produces paroxysmal attacks of excruciating facial pain. Attacks are precipitated by stimulation of a trigger zone, a hypersensitive area of the face.

It occurs mostly in people over age 40, in women more often than men, and on the right side of the face more often than the left. Trigeminal neuralgia can subside spontaneously, with remissions lasting from several months to years. The disorder is also called tic douloureux.

CAUSES

Although the cause remains undetermined, trigeminal neuralgia may:
• reflect an afferent reflex phenomenon located centrally in the brain stem or more peripherally in the sensory root of the trigeminal nerve
• be related to compression of the nerve root by posterior fossa tumors, middle fossa tumors, or vascular lesions (subclinical aneurysm), although such lesions usually produce simultaneous loss of sensation
• occasionally be a manifestation of multiple sclerosis or herpes zoster.

DATA COLLECTION FINDINGS

• Searing pain in the facial area

Triggers
• Light touch to a sensitive area of the face (trigger zone)
• Exposure to hot or cold
• Eating, smiling, talking, or shaving
• Drinking hot or cold beverages

DIAGNOSTIC FINDINGS

• Observation during the examination shows the patient favoring (splinting) the affected area. To ward off a painful attack, the patient

often holds his face immobile when talking. He may also leave the affected side of his face unwashed and unshaven.
• Skull X-rays, tomography, and CT scan rule out sinus or tooth infections and tumors.

NURSING DIAGNOSES
• Acute pain
• Powerlessness
• Anxiety

TREATMENT
• Percutaneous radiofrequency procedure, which causes partial root destruction and relieves pain
• Microsurgery for vascular decompression
• Percutaneous electrocoagulation of nerve rootlets, under local anesthesia

Drug therapy
• Anticonvulsants: carbamazepine (Tegretol), phenytoin (Dilantin)
• Muscle relaxant: baclofen (Lioresol)

INTERVENTIONS AND RATIONALES
• Observe and record the characteristics of each attack, including the patient's protective mechanisms, *to gain information for developing the treatment plan.*
• Provide adequate nutrition in small, frequent meals at room temperature *to ensure that nutritional needs are met. Extremes of temperature may cause an attack.*
• Watch for adverse reactions to prescribed medication to detect complications.
• After resection of the first division of the trigeminal nerve, tell the patient to avoid rubbing his eyes and using aerosol spray. Advise him to wear glasses or goggles outdoors and to blink often *to prevent injury.*
• After surgery to sever the second or third division, tell the patient to avoid hot foods and drinks, *which could burn his mouth,* and to chew carefully *to avoid biting his mouth.*
• Advise the patient to place food in the unaffected side of his mouth when chewing, to brush his teeth often, and to see a dentist twice per year to detect cavities. *Cavities in the area of the severed nerve won't cause pain.*
• After surgical decompression of the root or partial nerve dissection, check neurologic and vital signs often *to detect early signs of postoperative complications.*
• Reinforce natural avoidance of stimulation (air, heat, cold) of trigger zones (lips, cheeks, gums) *to prevent further episodes.*

Teaching topics
• Knowing disease process and treatment options
• Avoiding things that can trigger an attack, such as temperature extremes

Offer the patient with trigeminal neuralgia small, frequent meals at room temperature. Extremes of temperature may cause an attack.

West Nile encephalitis

West Nile encephalitis is an infectious disease that primarily causes an inflammation of the brain. The etiology stems from the West Nile virus, a flavivirus commonly found in humans, birds, and other vertebrates in Africa, west Asia, and the Middle East. This disease is part of a family of vector-borne diseases that also includes malaria, yellow fever, and Lyme disease.

CAUSES
• Transferred to humans by the bite of a mosquito infected with the virus

DATA COLLECTION FINDINGS
Mild infections
• Fever
• Headache
• Body aches
• Skin rash
• Swollen lymph glands

Severe infections
• Headache
• High fever
• Neck stiffness
• Stupor
• Disorientation
• Coma
• Tremors
• Seizures
• Death

DIAGNOSTIC FINDINGS
• Patient history reveals recent mosquito bites.

• Enzyme-linked immunosorbent assay reveals West Nile virus.

NURSING DIAGNOSES

• Anxiety
• Hyperthermia
• Disturbed thought processes

TREATMENT

• Symptom control, such as I.V. fluids and respiratory support

Drug therapy

• Analgesics: codeine sulfate, ibuprofen (Motrin)
• Antipyretic: acetaminophen (Tylenol)
• Corticosteroid: dexamethasone (Decadron)

INTERVENTIONS AND RATIONALES

• Monitor respiratory status *to detect respiratory complications.*
• Administer supplemental oxygen, as prescribed, *to prevent hypoxemia.*
• Monitor pulse oximetry values, *to detect hypoxia.*
• Monitor neurologic status *to detect subtle changes and ensure prompt treatment intervention.*
• Administer medications, as prescribed, *to alleviate symptoms.*
• Monitor and record vital signs *to detect signs of compromise.*
• Provide frequent oral hygiene *to promote comfort.*
• Monitor and record intake and output *to prevent dehydration.*

Teaching topics

• Staying indoors at dawn and dusk and in the early evening
• Wearing long-sleeved shirts and long pants whenever the patient is outdoors
• Applying insect repellent sparingly when going outdoors

Pump up on practice questions

1. A nurse is caring for a client with a cerebral injury that impaired his speech and hearing. Most likely, the client has experienced damage to the:

1. frontal lobe.
2. parietal lobe.
3. occipital lobe.
4. temporal lobe.

Answer: 4. The portion of the cerebrum that controls speech and hearing is the temporal lobe. Injury to the frontal lobe causes personality changes, difficulty speaking, and disturbances in memory, reasoning, and concentration. Injury to the parietal lobe causes sensory alterations and problems with spatial relationships. Damage to the occipital lobe causes vision disturbances.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

2. Stimulation of the autonomic nervous system that produces a parasympathetic response would most likely cause:

1. increased heart rate.
2. increased metabolism.
3. increased gastric motility.
4. increased systemic vascular resistance.

Answer: 3. A parasympathetic response increases gastric motility but decreases heart rate, metabolism, and systemic vascular resistance.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

3. A client with a massive cerebral hemorrhage and loss of consciousness is scheduled for an EEG. A nurse is discussing the purpose of the test with the family. It would be most accurate for the nurse to tell family members that the test will measure:

1. extent of intracranial bleeding.
2. sites of brain injury.
3. electrical activity of the brain.
4. percentage of functional brain tissue.

Answer: 3. An EEG measures the electrical activity of the brain. The extent of intracranial bleeding and the injury site would be determined by CT scan or MRI. Percent of functional brain tissue would be determined by a series of tests.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

4. A nurse is teaching a client and his family about dietary practices related to Parkinson's disease. A priority for the nurse to address is risk of:

1. fluid overload and drooling.
2. aspiration and anorexia.
3. choking and diarrhea.
4. dysphagia and constipation.

Answer: 4. The problems associated with Parkinson's disease that affect eating include dysphagia, aspiration, constipation, and risk of choking. Fluid overload, anorexia, and diarrhea aren't problems specifically related to Parkinson's disease. Drooling occurs with Parkinson's disease but doesn't take priority.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

5. In some clients with MS, plasmapheresis diminishes symptoms. Plasmapheresis achieves this effect by removing:

1. catecholamines.
2. antibodies.
3. plasma proteins.
4. lymphocytes.

Answer: 2. In plasmapheresis, antibodies are removed from the client's plasma. Antibodies attack the myelin sheath of the neuron, causing the manifestations of MS. Plasmapheresis for MS isn't intended to remove catecholamines, plasma proteins, or lymphocytes.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

6. A client undergoes a surgical clipping of a cerebral aneurysm. To prevent vasospasm, postsurgical care focuses on maintaining an optimal cerebral perfusion pressure. This is best accomplished by administering:

1. a diuretic such as furosemide (Lasix).
2. blood products such as cryoprecipitate.
3. a calcium channel blocker such as nifedipine (Procardia).
4. volume expanders such as crystalloids.

Answer: 4. To prevent vasospasm following repair of a cerebral aneurysm, treatment focuses on increasing cerebral perfusion. This can be accomplished by giving volume expanders such as crystalloids. Diuretics would decrease cerebral perfusion by reducing volume. Cryoprecipitate isn't used as a volume expander. Nimodipine (Nimotop), not nifedipine (Procardia), is the calcium channel blocker indicated for use in cerebral vasospasm treatment and prevention.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

7. A client is diagnosed with a brain tumor. Palliative care is all that can be offered to the client. In addressing the client and family, it would be most therapeutic for the nurse to say:

1. "I'm sorry. I wish there were more we could do."
2. "Be optimistic. Others have survived equally as grave situations."
3. "I understand how this may be affecting you, and I want to help."
4. "Be thankful you and your family have each other for support during this time."

Answer: 3. Initially, the client and family may be in shock and disbelief. They need the nurse's understanding, support, and offer of help. The other responses communicate pity, false hope, and detachment.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

8. A nurse is teaching a client with a T4 spinal cord injury and paralysis of the lower extremities how to transfer from bed to a wheelchair independently. In transferring, it is important for the client to move:

1. his upper and lower body simultaneously into the wheelchair.
2. his upper body to the wheelchair first.
3. his feet to the wheelchair pedals and then his hands to the wheelchair arms.
4. his feet to the floor and then his buttocks to the wheelchair seat.

Answer: 2. The proper technique in transferring from a bed to a wheelchair when there's paralysis of the lower extremities is to move the strong part of the body to the chair first. The client should move his upper body to the wheelchair first and then move his legs from the bed to the wheelchair. Other techniques are less safe and can endanger the client.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

9. A client who recently underwent cranial surgery develops syndrome of inappropriate antidiuretic hormone (SIADH). A nurse should anticipate that the client will:

1. experience edema and weight gain.
2. produce excessive amounts of urine.
3. need vigorous fluid replacement therapy.
4. have a low urine specific gravity.

Answer: 1. SIADH is an abnormally high release of antidiuretic hormone causing water retention, which leads to edema and weight gain. Urine output is low, fluid is restricted rather than replaced, and the urine specific gravity is high.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

10. A nurse is providing care for a client following right cataract removal surgery. In which position should the nurse place the client?

1. Right side-lying
2. Prone
3. Supine
4. Trendelenburg's

Answer: 3. Positioning the client on his back (supine) or unoperative side prevents pressure on the operative eye. A right side-lying or prone position may put external pressure on the affected eye. Trendelenburg's position may increase intraocular pressure.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

7 Musculoskeletal system

In this chapter, you'll review:

- components of the musculoskeletal system and their functions
- tests used to diagnose musculoskeletal disorders
- common musculoskeletal disorders.

Brush up on key concepts

The musculoskeletal system has two main functions: to provide support and to produce movement. In addition, the musculoskeletal system protects internal tissues and organs, produces red blood cells (RBCs) in the bone marrow, and stores mineral salts such as calcium.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 216 to 218.

Mr. Bones

The **skeleton** consists of 206 bones, which work with the muscles to support and protect internal organs.

The skeleton also stores calcium, magnesium, and phosphorus. The bone marrow is the soft material found in the center of bones that's responsible for RBC production.

Body movin'

The **skeletal muscles**, which are attached to the bones by tendons, provide body movement and posture by tightening and shortening. The muscles begin contracting when stimulated by a motor neuron. They derive energy for contraction from hydrolysis of adenosine triphosphate to adenosine diphosphate and phosphate.

The skeletal muscles relax with the breakdown of acetylcholine by cholinesterase. Even then, however, they retain some contraction to maintain muscle tone.

Bones to bones and bones to muscles

Ligaments and **tendons** are tough bands of collagen fibers. Ligaments connect bones to bones and encircle joints to add strength and stability. Tendons connect muscles to bones.

Where bones meet

A **joint** is the articulation of two bone surfaces. Joints provide stabilization and permit locomotion. The degree of joint movement is called range of motion (ROM).

Friction reduction

The **synovium** is the membrane that lines a joint's inner surfaces. In conjunction with cartilage, the synovium reduces friction in joints through its production of synovial fluid.

Shock absorber

Cartilage is a specialized tissue that serves as a smooth surface for articulating bones. It absorbs shock to joints and serves as padding to reduce friction. Cartilage atrophies with limited ROM or in the absence of weight-bearing bursae (small sacs of synovial fluid).

Keep abreast of diagnostic tests

Here are some important tests used to diagnose musculoskeletal disorders, along with common nursing interventions associated with each test.

Muscle picture

Electromyography (EMG) uses electrodes to create a graphic recording of the muscle at rest and during contraction.

Nursing actions

• Explain that the patient will be asked to flex and relax his muscles during the procedure.

(Text continues on page 219.)

Cheat sheet

Musculoskeletal refresher

ARM AND LEG FRACTURES

Key signs and symptoms

- Loss of limb function
- Pain
- Deformity

Key test result

- Anteroposterior and lateral X-rays of the suspected fracture as well as X-rays of the joints above and below it confirm the diagnosis.

Key treatments

- Closed reduction (restoring displaced bone segments to their normal position)
- Immobilization with a splint, a cast, or traction
- Open reduction during surgery to reduce and immobilize the fracture with rods, plates, or screws when closed reduction is impossible, usually followed by application of a plaster cast
- Analgesics: morphine, acetaminophen (Tylenol), oxycodone (Percocet), hydrocodone (Vicodin)

Key interventions

- Monitor vital signs and be especially alert for a rapid pulse, decreased blood pressure, pallor, and cool, clammy skin.
- Maintain I.V. fluids as ordered.
- Ease pain with analgesics as ordered.
- Reposition the immobilized patient often. Assist with active range-of-motion (ROM) exercises to the unaffected extremities. Encourage deep breathing and coughing.
- Make sure that the immobilized patient receives adequate fluid intake. Watch for signs of renal calculi, such as flank pain, nausea, and vomiting.
- Provide cast care.
- Encourage the patient to start moving around as soon as possible. Assist with walking. (Remember, the patient who has been bedridden for some time may be dizzy at first.) Demonstrate how to use crutches properly.

CARPAL TUNNEL SYNDROME

Key signs and symptoms

- Numbness, burning, or tingling in arms
- Pain in arms and hands
- Weakness in arms and hands

Key test results

- A blood pressure cuff on the forearm inflated above systolic pressure for 1 to 2 minutes provokes pain and paresthesia along the distribution of the median nerve.
- Electromyography detects a median nerve motor conduction delay of more than 5 milliseconds.

Key treatments

- Resting the hands by splinting the wrist in neutral extension for 1 to 2 weeks
- Possibly changing occupations (if a definite link has been established between the patient's occupation and the development of carpal tunnel syndrome)
- Corticosteroid injections: betamethasone (Celestone), hydrocortisone (Hydrocortone)
- Nonsteroidal anti-inflammatory drugs (NSAIDs): indomethacin (Indocin), ibuprofen (Motrin), naproxen (Naprosyn)

Key interventions

- Administer NSAIDs as needed.
- Assist with eating and bathing if the patient's dominant hand has been impaired.
- Monitor vital signs and regularly check the color, sensation, and motion of the affected hand, if surgery is performed.

COMPARTMENT SYNDROME

Key signs and symptoms

- Severe or increased pain that occurs when the affected muscle is stretched or elevated and that is unrelieved by opioid analgesics
- Loss of distal pulse
- Tense, swollen muscle

Key test result

- Intracompartment pressure is elevated, as indicated by a blood pressure sphygmomanometer.

You can quickly bone up on musculoskeletal system disorders by studying this Cheat sheet.

Musculoskeletal refresher *(continued)*

COMPARTMENT SYNDROME *(continued)*

Key treatments

- Fasciotomy
- Positioning the affected extremity lower than the heart
- Removal of dressings or constrictive coverings of the area

Key interventions

- Monitor the affected extremity, and perform frequent neurovascular checks.
- Perform dressing changes after fasciotomy, and reinforce dressings frequently. (Expect a large amount of bloody drainage.)

GOUT

Key sign or symptom

- Inflamed, painful joints

Key test result

- Blood studies show a serum uric acid level that's above normal. The urine uric acid level is usually higher in secondary gout than in primary gout.

Key treatments

- Antigout drugs: colchicine (Colgout), allopurinol (Zyloprim)
- Uricosuric drugs: probenecid (Probalan), sulfinpyrazone (Anturane)
- Corticosteroids: betamethasone (Celestone), hydrocortisone (Hydrocortone)
- NSAIDs: ibuprofen (Motrin), naproxen (Naprosyn)

Key interventions

- Encourage bed rest, and use a bed cradle to reduce discomfort.
- Give analgesics, as needed, especially during acute attacks.
- Apply hot or cold packs to inflamed joints.
- Administer anti-inflammatory medication and other drugs.
- Urge the patient to drink plenty of fluids (up to 2 L/day).
- When encouraging fluids, record intake and output accurately.
- Alkalinize urine with sodium bicarbonate or another agent, as needed.
- Make sure the patient understands the importance of having serum uric acid levels checked periodically.

HERNIATED NUCLEUS PULPOSUS

Key signs and symptoms

In lumbosacral area

- Acute pain in the lower back that radiates across the buttock and down the leg
- Pain on ambulation
- Weakness, numbness, and tingling of the foot and leg

In cervical area

- Neck pain that radiates down the arm to the hand
- Neck stiffness
- Weakness of the affected upper extremities
- Weakness, numbness, and tingling of the hand

Key test results

- Myelogram shows compression of the spinal cord.
- X-ray shows narrowing of disk space.
- Magnetic resonance imaging identifies the herniated disk.

Key treatments

- Corticosteroid: cortisone (Cortone)
- NSAIDs: indomethacin (Indocin), ibuprofen (Motrin), sulindac (Clinoril), piroxicam (Feldene), flurbiprofen (Ansaid), diclofenac sodium (Voltaren), naproxen (Naprosyn), diflunisal (Dolobid)

Key interventions

- Monitor neurovascular status.
- Turn the patient every 2 hours using the logrolling technique.

HIP FRACTURE

Key signs and symptoms

- Shorter appearance and outward rotation of affected leg resulting in limited or abnormal ROM
- Edema and discoloration of surrounding tissue

Key test results

- Computed tomography scan (for complicated fractures) pinpoints abnormalities.
- X-ray reveals a break in the continuity of the bone.

Key treatments

- Surgical immobilization or joint replacement
- Abductor splint or trochanter roll between legs to prevent loss of alignment (postoperatively)
- Anticoagulant: warfarin (Coumadin) (postoperatively)

Key interventions

- Monitor neurovascular and respiratory status. Most important, check for compromised circulation, hemorrhage, and neurologic impairment in the affected extremity and pneumonia in the bedridden patient.
- Provide active and passive ROM and isometric exercises for unaffected limbs.
- Provide a trapeze.
- Maintain traction before surgery at all times, if using conservative treatment.

OSTEOARTHRITIS

Key signs and symptoms

- Crepitation

(continued)

Musculoskeletal refresher *(continued)*

OSTEOARTHRITIS *(continued)*

- Joint stiffness
- Pain relieved by resting the joints

Key test results

- Arthroscopy reveals bone spurs and narrowing of joint space.
- X-rays show joint deformity, narrowing of joint space, and bone spurs.

Key treatments

- Exercise
- Application of warm, moist heat
- NSAIDs: indomethacin (Indocin), ibuprofen (Motrin), naproxen (Naprosyn), diflunisal (Dolobid), celecoxib (Celebrex)

Key interventions

- Evaluate musculoskeletal status.
- Observe for increased bleeding or bruising tendency.

OSTEOMYELITIS

Key signs and symptoms

- Pain
- Tenderness
- Swelling

Key test results

- Blood cultures identify the causative organism.
- Erythrocyte sedimentation rate and C-reactive protein (CRP) are elevated. (CRP appears to be a better diagnostic tool.)

Key treatments

- Immobilization of the affected bone by plaster cast, traction, or bed rest
- Antibiotics: large doses of I.V. antibiotics, usually a penicillinase-resistant penicillin, such as nafcillin and oxacillin (Bactocill), or a cephalosporin, such as cefazolin (Ancef), after blood cultures are taken

Key interventions

- Use strict aseptic technique when changing dressings and irrigating wounds.
- Check vital signs and wound appearance daily, and monitor for new pain.
- Check circulation and drainage. If a wet spot appears on the cast, circle it with a marking pen and note the time of appearance (on the cast). Be aware of how much drainage is expected. Check the circled spot at least every 4 hours. Watch for any enlargement.

OSTEOPOROSIS

Key signs and symptoms

- Deformity
- Kyphosis
- Pain

Key test result

- X-rays show typical degeneration in the lower thoracic and lumbar vertebrae. The vertebral bodies may appear flattened and may look denser than normal. Loss of bone mineral becomes evident in later stages.

Key treatments

- Physical therapy consisting of weight-bearing exercise and activity
- Hormonal agents: conjugated estrogen (Premarin), calcitonin (Calcimar), teriparatide (Forteo)
- Vitamin D supplements
- Antiosteoporotics: alendronate (Fosamax), risedronate (Actonel), raloxifene (Evista)
- Calcium supplements

Key interventions

- Check the patient's skin daily for redness, warmth, and new sites of pain. Encourage activity; help the patient walk several times daily.
- Perform passive ROM exercises, or encourage the patient to perform active exercises. Encourage regular attendance at physical therapy sessions.
- Provide a balanced diet high in vitamin D, calcium, and protein.
- Administer analgesics and apply heat.

• Instruct the patient that the procedure may cause some minor discomfort but isn't painful.
• Administer analgesics, as prescribed, after the procedure.

Direct view of a joint

Arthroscopy is a relatively simple surgical procedure, performed under local anesthesia, that allows for direct visualization of a joint.

Nursing actions

Before the procedure
• Make sure that written, informed consent has been obtained.
• Administer prophylactic antibiotics as prescribed.
• Explain the procedure, skin preparation, and use of local anesthetics.
After the procedure
• Apply a pressure dressing to the injection site.
• Monitor neurovascular status.
• Apply ice to the affected joint.
• Limit weight bearing or joint use until allowed by the doctor.
• Administer analgesics as prescribed.

Fluid removal

With **arthrocentesis**, a doctor removes synovial fluid from a joint using a needle.

Nursing actions

Before the procedure
• Make sure that written, informed consent has been obtained.
• Administer prophylactic antibiotics as prescribed.
• Explain the procedure to the patient.
After the procedure
• Maintain a pressure dressing on the aspiration site.
• Monitor neurovascular status.
• Apply ice to the affected area.
• Limit weight bearing or joint use until allowed by the doctor.
• Administer analgesics as prescribed.

Bone image

A **bone scan** is used to reveal bone abnormalities. It involves the injection of a radioisotope, which (in conjunction with a scanner) allows a visual image of bone metabolism.

Nursing actions

• Determine the patient's ability to lie still during the scan.
• Make sure that written, informed consent has been obtained before the procedure.
• Advise the patient that a radioisotope will be injected I.V.
• Explain to the patient that he'll be required to drink several glasses of fluid during the waiting period to enhance excretion of any isotope that isn't absorbed by bone tissue.

Vertebrae visual

A **myelogram** involves the injection of radiopaque dye into the spine during a lumbar puncture. This dye allows fluoroscopic visualization of the subarachnoid space, spinal cord, and vertebral bodies.

Nursing actions

Before the procedure
• Make sure that written, informed consent has been obtained.
• Note the patient's allergies to iodine, seafood, and radiopaque dyes.
• Inform the patient about possible throat irritation and flushing of the face from the injection.
After the procedure
• Maintain bed rest. (Assist the patient to the bathroom, if necessary.)
• Inspect the insertion site for bleeding.
• Monitor neurologic status.
• Encourage fluids.

Solving for X

An **X-ray** is a noninvasive procedure that provides a radiographic image for examination of bones and joints.

Nursing actions

• Use caution when moving a patient with a suspected fracture.
• Explain the procedure to the patient.
• Make sure that the patient isn't pregnant (to prevent possible fetal damage from radiation exposure).

A myelogram—evaluation of the subarachnoid space—requires a lumbar puncture. Inspect the insertion site, and monitor neurologic status.

Magnetic view

Magnetic resonance imaging (MRI) uses magnetic and radio waves to create a detailed visualization of bones and their associated structures.

Nursing actions

- Make sure that written, informed consent has been obtained.
- Be aware that patients with pacemakers, surgical and orthopedic hardware, or shrapnel can't undergo MRI scanning
- Remove jewelry and metal objects from the patient.
- Determine the patient's ability to lie still for 45 to 60 minutes (or longer).
- Administer sedatives as prescribed.

Lab exam #1

A **blood chemistry test** analyzes a blood sample for potassium, sodium, calcium, phosphorus, glucose, bicarbonate, blood urea nitrogen, creatinine, protein, albumin, osmolality, creatine kinase, serum aspartate aminotransferase, aldolase, rheumatoid factor, complement fixation, lupus erythematosus cell preparation, antinuclear antibodies, anti-deoxyribonucleic acid, and C-reactive protein (CRP).

Nursing actions

- Withhold food and fluid before the procedure, if appropriate.
- Monitor the venipuncture site for bleeding after the procedure.

Lab exam #2

A **hematologic study** analyzes a blood sample for white blood cells (WBCs), RBCs, platelets, erythrocyte sedimentation rate (ESR), hemoglobin (Hb), and hematocrit (HCT).

Nursing actions

- Note current drug therapy to anticipate possible interference with test results.
- Assess the venipuncture site for bleeding after the procedure.

Memory jogger

When assessing for fractures, remember the **5 Ps:**

Pain

Pallor

Pulse loss

Paresthesia

Paralysis.

The last three occur distal to the fracture site.

Lab exam #3

A **coagulation study** analyzes a blood sample for prothrombin time, International Normalized Ratio, and partial thromboplastin time.

Nursing actions

- Note current drug therapy before the procedure.
- Check the venipuncture site for bleeding after the procedure.

Polish up on patient care

Major musculoskeletal disorders include arm and leg fractures, carpal tunnel syndrome, compartment syndrome, gout, herniated nucleus pulposus, hip fracture, osteoarthritis, osteomyelitis, and osteoporosis.

Arm and leg fractures

Fractures of the arms and legs usually result from trauma and commonly cause substantial muscle, nerve, and other soft-tissue damage. The prognosis varies with the extent of disability or deformity, the amount of tissue and vascular damage, the adequacy of reduction and immobilization, and the patient's age, health, and nutritional status.

Children's bones usually heal rapidly and without deformity. Bones of adults in poor health or with impaired circulation may never heal properly. Severe open fractures, especially of the femoral shaft, may cause substantial blood loss and life-threatening hypovolemic shock.

CAUSES

- Bone tumors
- Trauma
- Osteoporosis

DATA COLLECTION FINDINGS

- Discoloration
- Loss of limb function

- Acute pain
- Swelling
- Deformity
- Crepitus

DIAGNOSTIC FINDINGS

- Anteroposterior and lateral X-rays of the suspected fracture as well as X-rays of the joints above and below it confirm the diagnosis.

NURSING DIAGNOSES

- Acute pain
- Impaired physical mobility
- Risk for peripheral neurovascular dysfunction

TREATMENT

Emergency care

- Splinting the limb above and below the suspected fracture
- Cold pack application
- Elevating the extremity to reduce edema and pain
- Direct pressure to control bleeding in severe fractures that cause blood loss
- Rapid fluid replacement to prevent hypovolemic shock if blood loss has occurred as a result of the fracture

After confirming diagnosis

- Closed reduction (restoring displaced bone segments to their normal position)
- Immobilization with a splint, a cast, or traction
- Open reduction during surgery to reduce and immobilize the fracture, using rods, plates, or screws, when closed reduction is impossible, usually followed by application of a plaster cast
- Skin or skeletal traction (if splint or cast fails to maintain the reduction)

Open fractures

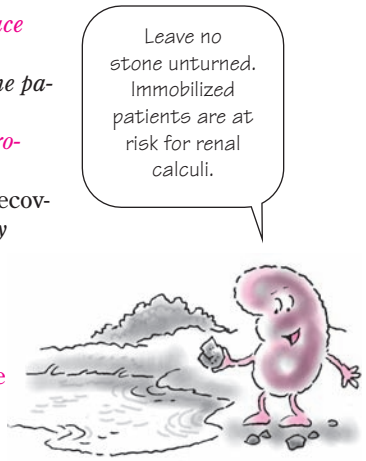
- Surgery to repair soft-tissue damage
- Thorough debridement of the wound

Drug therapy

- Analgesics: morphine, acetaminophen (Tylenol), oxycodone (Percocet), hydrocodone (Vicodin)
- Prophylactic antibiotics: cefazolin (Ancef), cefotetan disodium (Cefotan)
- Tetanus prophylaxis: tetanus toxoid

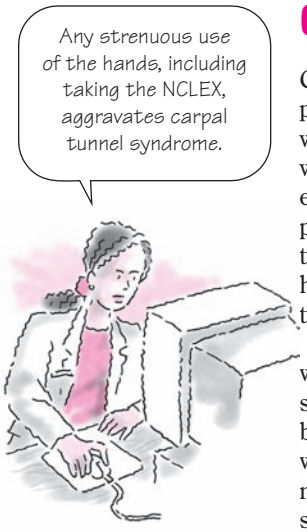
INTERVENTIONS AND RATIONALES

- Watch for signs of shock in the patient with a severe open fracture of a large bone such as the femur. *Open fractures can cause increased blood loss leading to hypovolemic shock.*
- Monitor vital signs and be especially alert for a rapid pulse, decreased blood pressure, pallor, and cool, clammy skin—*all of which may indicate that the patient is in shock.*
- Maintain I.V. fluids, as ordered, *to replace fluid loss.*
- Offer reassurance. *With any fracture, the patient is likely to be frightened and in pain.*
- Administer analgesics, as ordered, *to promote comfort.*
- Help the patient set realistic goals for recovery *to prevent frustration with the recovery process.*
- Reposition the immobilized patient often *to increase comfort and prevent pressure ulcers.*
- Assist with active ROM exercises of the unaffected extremities *to prevent muscle atrophy.*
- Encourage deep breathing and coughing *to avoid hypostatic pneumonia.*
- Make sure that the immobilized patient receives adequate fluid intake *to prevent urinary stasis and constipation.*
- Encourage the patient to start moving around as soon as possible *to prevent complications of immobility such as renal calculi.* Help the patient to walk. Demonstrate how to use crutches properly *to prevent injury.*
- Watch for signs of renal calculi, such as flank pain, nausea, and vomiting, *to ensure early recognition and treatment.*
- Provide cast care *to avoid skin breakdown.*



Teaching topics

- Caring for the cast
- Using assistive devices



Carpal tunnel syndrome

Carpal tunnel syndrome results from compression of the median nerve at the wrist, within the carpal tunnel. This nerve—along with blood vessels and flexor tendons—passes through to the fingers and thumb. Compression neuropathy causes sensory and motor changes in the median distribution of the hand. Carpal tunnel is the most common of the nerve entrapment syndromes.

Carpal tunnel syndrome usually occurs in women between ages 30 and 60 and poses a serious occupational health problem. Assembly-line workers, packers, typists, and persons who repeatedly use poorly designed tools are most likely to develop this disorder. Any strenuous use of the hands—sustained grasping, twisting, or flexing—aggravates this condition.

CAUSES

- Flexor tenosynovitis (commonly associated with rheumatic disease)
- Nerve compression
- Physical trauma
- Rheumatoid arthritis

DATA COLLECTION FINDINGS

- Atrophic nails
- Numbness, burning, or tingling in arms
- Pain in arms and hands
- Shiny, dry skin
- Weakness in arms and hands

DIAGNOSTIC FINDINGS

- Physical examination reveals decreased sensation to light touch or pinpricks in the affected fingers. Thenar muscle atrophy occurs in about half of all cases of carpal tunnel syndrome. The patient exhibits a positive Tinel's sign (tingling over the median nerve on light percussion). He also responds positively to Phalen's wrist-flexion test, in which holding the forearms vertically and allowing both hands to drop into complete flexion at the wrists for 1 minute reproduces symptoms of carpal tunnel syndrome.
- A blood pressure cuff on the forearm inflated above systolic pressure for 1 to 2 minutes provokes pain and paresthesia along the distribution of the median nerve.
- EMG reveals a median nerve motor conduction delay of more than 5 milliseconds.

NURSING DIAGNOSES

- Impaired physical mobility
- Chronic pain
- Risk for peripheral neurovascular dysfunction

TREATMENT

- Resting the hands by splinting the wrist in neutral extension for 1 to 2 weeks
- Possibly changing occupations (if a definite link has been established between the patient's occupation and the development of carpal tunnel syndrome)
- Correction of underlying disorder
- Surgical decompression of the nerve by resecting the entire transverse carpal tunnel ligament or by using endoscopic surgical techniques (neurolysis, or releasing of nerve fibers, may also be necessary)

Drug therapy

- Nonsteroidal anti-inflammatory drugs (NSAIDs): indomethacin (Indocin), ibuprofen (Motrin), naproxen (Naprosyn)
- Corticosteroid injections: betamethasone (Celestone), hydrocortisone (Hydrocortone)

INTERVENTIONS AND RATIONALES

- Administer NSAIDs as needed *to reduce inflammation and pain.*
- After surgery, you may have to help the patient with eating and bathing. *Mobility may be limited with carpal tunnel syndrome surgery.*
- Regularly evaluate the patient's degree of physical immobility *to evaluate the effectiveness of the current treatment plan.*
- After surgery, monitor the color, sensation, and motion of the affected hand *to detect signs of compromised circulation.*
- Advise the patient who's about to be discharged to exercise his hands. If his arm is in a sling, tell him to remove the sling several times each day to do exercises for his elbow and shoulder *to maintain ROM.*

Teaching topics

- Learning about the disease process and treatment options

• Applying the splint and removing it to perform gentle ROM exercises daily
• Taking NSAIDs with food or antacids to avoid stomach upset
• Reinforcing that maximum effects of drug therapy may not be seen for 2 to 4 weeks
• Contacting an occupational counselor

Compartment syndrome

Compartment syndrome occurs when increased pressure within a compartment impairs circulation, which can cause nerve and muscle damage. Tissue damage occurs after 30 minutes; after 4 hours, irreversible damage may occur.

If compartment syndrome is suspected, pressure within muscles is assessed by inserting a needle into a muscle. The needle is attached to an I.V. bag with tubing and a stopcock. Elevated pressure, as indicated by a blood pressure sphygmomanometer, indicates compartment syndrome.

CAUSES

• Application of a dressing or cast that's too tight
• Burns
• Closed fracture injury
• Crushing injuries
• Muscle swelling after exercise

DATA COLLECTION FINDINGS

• Severe or increased pain that occurs when the affected muscle is stretched or elevated and that's unrelieved by opioid analgesics.
• Decreased movement, strength, and sensation
• Loss of distal pulse
• Numbness and tingling distal to the involved muscle
• Paralysis
• Tense, swollen muscle

DIAGNOSTIC FINDINGS

• Intracompartment pressure is elevated, as indicated by a blood pressure sphygmomanometer.

NURSING DIAGNOSES

• Impaired physical mobility
• Acute pain
• Risk for peripheral neurovascular dysfunction

TREATMENT

• Fasciotomy
• Positioning the affected extremity lower than the heart
• Removal of dressings or constrictive coverings of the area (such as a cast)

Drug therapy

• Opioid analgesics: morphine, hydrocodone (Vicodin)

INTERVENTIONS AND RATIONALES

• Monitor vital signs *to detect early changes and prevent complications.*
• Monitor the affected extremity and perform neurovascular checks *to detect signs of impaired circulation.*
• Maintain the extremity in a position lower than the heart *to ensure adequate circulation and reduce pressure.*
• Evaluate the patient for pain and anxiety *because stress may lead to vasoconstriction.*
• Administer medications, as ordered, *to maintain or improve the patient's condition.*
• Perform dressing changes after fasciotomy and reinforce dressings frequently *to facilitate monitoring the extremity.* (Expect a large amount of bloody drainage.)

Teaching topics

• Recognizing and reporting signs and symptoms of compartment syndrome
• Preventing future injury

Numbers to know for compartment syndrome: Tissue damage after 30 minutes; permanent damage after 4 hours.

Gout

Gout is a metabolic disease marked by urate deposits in the joints, which cause painfully arthritic joints. It can strike any joint but favors those in the feet and legs. *Primary gout* (in which there's a metabolic cause that's genetic or inborn) usually occurs in men older than age 30 and in postmenopausal women. *Secondary gout* (which involves drug therapy or a metabolic cause that isn't genetic or inborn) occurs in older people.

Gout follows an intermittent course and may leave patients free from symptoms for years between attacks. Gout can lead to chronic disability or incapacitation and, rarely severe hypertension and progressive renal disease. The prognosis is good with treatment.

CAUSES

- Genetic predisposition
- Increased uric acid

DATA COLLECTION FINDINGS

- History of hypertension
- Back pain
- Inflamed, painful joints
- Tophi

DIAGNOSTIC FINDINGS

- Arthrocentesis reveals the presence of monosodium urate monohydrate crystals or needlelike intracellular crystals of sodium urate in synovial fluid taken from an inflamed joint or a tophus.
- Blood studies show a serum uric acid level that's above normal. The urine uric acid level is usually higher in secondary gout than in primary gout.
- X-rays are normal initially. With chronic gout, they show damage of the articular cartilage and subchondral bone as well as outward displacement of the overhanging margin from the bone contour.

NURSING DIAGNOSES

- Chronic pain
- Impaired physical mobility
- Risk for injury

TREATMENT

- Bed rest
- Immobilization and protection of the inflamed joints
- Local application of heat and cold
- Diet changes (with the goal of weight loss)

Drug therapy

- Antigout drugs: colchicine (Colgout), allopurinol (Zyloprim)
- Uricosuric drugs: probenecid (Probalan), sulfinpyrazone (Anturane)
- Alkalinizing drug: sodium bicarbonate
- Corticosteroids: betamethasone (Celestone), hydrocortisone (Hydrocortone)
- NSAIDs: ibuprofen (Motrin), naproxen (Naprosyn)

INTERVENTIONS AND RATIONALES

- Encourage bed rest and use a bed cradle *to keep bedcovers off extremely sensitive, inflamed joints.*
- Give analgesics as needed, especially during acute attacks, *to promote comfort.*
- Apply hot or cold packs to inflamed joints *to promote comfort.* (See *Applying cold therapy,* and *Applying heat therapy,* page 226.)
- Administer anti-inflammatory medication and other drugs *to decrease inflammation and increase excretion of uric acid.*
- Be alert for GI disturbances with colchicine administration *to prevent complications.*
- Urge the patient to drink plenty of fluids (up to 2 L/day) *to prevent formation of renal calculi.*
- When encouraging fluids, record intake and output accurately *to detect fluid volume excess.*
- Alkalinize urine with sodium bicarbonate or another agent, as needed, *to prevent formation of renal calculi.*
- Make sure the patient understands the importance of having serum uric acid levels checked periodically *to help ensure compliance.*
- Advise the patient receiving allopurinol, probenecid, and other drugs to immediately report adverse effects, such as drowsiness, dizziness, nausea, vomiting, urinary frequency, and dermatitis, *to prevent complications.*
- Warn the patient taking probenecid or sulfinpyrazone to avoid aspirin and other salicylates. *Their combined effect causes urate retention.*
- Inform the patient that long-term colchicine therapy is essential during the first 3 to 6 months of treatment with uricosuric drugs or allopurinol *to prevent further acute attacks.*

Teaching topics

- Avoiding alcohol, especially beer and wine
- Minimizing intake of purine-rich foods, such as anchovies, liver, sardines, kidneys, sweet-breads, and lentils
- Losing weight, if obese

Stepping up

Applying cold therapy

WHY YOU DO IT

The application of cold constricts blood vessels; inhibits local circulation, suppuration, and tissue metabolism; relieves vascular congestion; slows bacterial activity in infections; reduces body temperature; and may act as a temporary anesthetic during brief, painful procedures. Because treatment with cold also relieves inflammation, reduces edema, and slows bleeding, it may provide effective initial treatment after eye injuries, strains, sprains, bruises, muscle spasms, and burns. Cold doesn't reduce existing edema, however, because it inhibits reabsorption of excess fluid.

Cold may be applied in dry or moist forms, but ice shouldn't be placed directly on a patient's skin because it may further damage tissue. Moist forms are more penetrating than dry because moisture facilitates conduction. Devices for applying dry cold include an ice bag or collar, K pad (which can produce cold or heat), and chemical cold packs and ice packs. Devices for applying moist cold include cold compresses for small body areas and cold packs for large areas.

Apply cold treatments cautiously on patients with impaired circulation, on children, and on elderly or arthritic patients because of the risk of ischemic tissue damage.

Apply cold immediately after an injury to minimize edema. Although colder temperatures can be tolerated for a longer time when the treatment site is small, you should remove the application after 1 hour to avoid reflex vasodilation. Applying temperatures below 59° F (15° C) also causes local reflex vasodilation.

HOW YOU DO IT

- Check the doctor's order and evaluate the patient's condition.
- Explain the procedure to the patient, provide privacy, and make sure the room is warm and free from drafts. Wash your hands thoroughly.
- Record the patient's temperature, pulse, and respirations to serve as a baseline.
- Expose only the treatment site to avoid chilling the patient.
- Make sure to time all cold therapies and apply them for the ordered amount of time.
- Because tissue damage may result from direct cold application, monitor the temperature of the cold device carefully. Frequently evaluate the condition of the patient's skin under the cold application device.

Applying dry cold

- Place the covered cold device on the treatment site.
- Refill or replace the cold device as necessary to maintain the correct temperature. Change the protective cover if it becomes wet.

Applying moist cold

- Place a linen-saver pad under the treatment site.
- Remove the compress or pack from the water, and wring it out to prevent dripping. Apply it to the treatment site.
- Cover the compress or pack with a waterproof covering to provide insulation and to keep the surrounding area dry. Secure the covering with tape or roller gauze to prevent it from slipping.
- Check the application site frequently for signs of tissue intolerance, and note complaints of burning or numbness. If these symptoms develop, discontinue treatment and notify the doctor.
- Change the compress or pack as needed to maintain the correct temperature. Remove it after the prescribed treatment period (usually 20 minutes).
- Record the time, date, and duration of cold application; type of device used (ice bag or collar, K pad, or chemical cold pack); site of application; temperature or temperature setting; patient's temperature, pulse, and respirations before and after application; skin appearance before, during, and after application; signs of complications; and the patient's tolerance of the treatment.

Stepping up

Applying heat therapy

WHY YOU DO IT

Heat applied directly to the patient's body raises tissue temperature and enhances the inflammatory process by causing vasodilation and increasing local circulation. This promotes leukocytosis (an increase in leukocytes), suppuration, drainage, and healing. Heat also increases tissue metabolism, reduces pain caused by muscle spasm, and decreases congestion in deep visceral organs.

Direct heat may be dry or moist. Dry heat can be delivered at a higher temperature and for a longer time than moist heat. Devices for applying dry heat include the hot-water bottle, electric heating pad, K pad, and chemical hot pack.

Moist heat softens crusts and exudates, penetrates deeper than dry heat, is less drying to the skin, produces less perspiration, and is usually more comfortable for the patient. Devices for applying moist heat include warm compresses for small body areas and warm packs for large areas.

Direct heat treatment can't be used on a patient at risk for hemorrhage. It's also contraindicated if the patient has a sprained limb in the acute stage (because vasodilation increases pain and swelling) or if he has a condition associated with acute inflammation, such as appendicitis. Direct heat should be applied cautiously to pediatric and elderly patients and to patients with impaired renal, cardiac, or respiratory function; arteriosclerosis; atherosclerosis; or impaired sensation. It should be applied with extreme caution to heat-sensitive areas, such as scar tissue and stomas.

HOW YOU DO IT

- Check the doctor's order and evaluate the patient's condition.
- Position the patient comfortably in the bed.
- Explain the procedure to the patient, and tell him not to lean or lie directly on the heating device because this reduces air space and increases the risk of burns. Warn him against adjusting the temperature of the heating device or adding hot water to a hot-water bottle. Advise him to report pain immediately and to remove the device if necessary.
- Record the patient's temperature, pulse, and respirations to serve as a baseline. If heat treatment is being applied to raise the patient's body temperature, monitor temperature, pulse, and respirations throughout the application.
- Expose only the treatment area because vasodilation will make the patient feel chilly.
- Make sure to time heat therapies and apply them for the ordered amount of time.
- Because tissue damage may result from direct heat application, monitor the temperature of the heating device carefully. Frequently evaluate the condition of the patient's skin under the heat application device.

Applying dry heat

- Before applying the heating device, press it against your inner forearm to test its temperature and heat distribution. If it heats unevenly, obtain a new device.
- Apply the device to the treatment area and, if necessary, secure it with tape or roller gauze.
- Check the patient for tolerance and skin reaction.

Applying moist heat

- Place a linen-saver pad under the treatment site.
- Remove the warm compress or pack from the bowl or basin. (Use sterile forceps throughout the procedure, if needed.)
- Wring excess solution from the compress or pack. Excess moisture increases the risk of burns.
- Apply the compress gently to the affected site. After ten seconds, check for tolerance and skin reaction.
- Apply a waterproof covering (sterile, if necessary) to the compress. Secure it with tape or roller gauze to prevent it from slipping.
- Place a hot-water bottle, K pad, or chemical hot pack over the compress and waterproof covering to maintain the correct temperature.
- Record the date and time; the duration of heat application; the device used; the temperature of the heat setting, the site of application; the patient's temperature, pulse, respirations, and skin condition before, during, and after treatment; signs of complications; and the patient's tolerance of the treatment.

Herniated nucleus pulposus

In herniated nucleus pulposus, the intervertebral disk ruptures, causing a protrusion of the nucleus pulposus (the soft, central portion of a spinal disk) into the spinal canal. This compresses the spinal cord or nerve roots, causing pain, numbness, and loss of motor function. Commonly known as a herniated disk, herniated nucleus pulposus can be further described as lumbosacral (affecting the lumbar vertebrae L4 and L5 and the sacral vertebra S1) or cervical (affecting the cervical vertebrae C5, C6, and C7).

CAUSES

- Back or neck strain
- Congenital bone deformity
- Degeneration of disk
- Heavy lifting
- Trauma
- Weakness of ligaments

DATA COLLECTION FINDINGS

In lumbosacral area

- Acute pain in the lower back that radiates across the buttock and down the leg
- Pain on ambulation
- Weakness, numbness, and tingling of the foot and leg

In cervical area

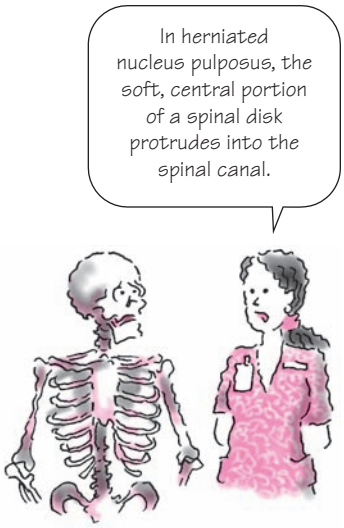
- Atrophy of biceps and triceps
- Neck pain that radiates down the arm to the hand
- Neck stiffness
- Straightening of normal lumbar curve with scoliosis away from the affected side
- Weakness of the affected upper extremities
- Weakness, numbness, and tingling of the hand

DIAGNOSTIC FINDINGS

- Deep tendon reflexes are depressed or absent in the upper extremities or Achilles tendon.
- EMG shows spinal nerve involvement.
- Lasègue's sign is positive (back pain occurs when the patient assumes a supine position with his legs extended fully and the examiner raises the patient's legs).
- Myelogram shows compression of the spinal cord.
- X-ray shows narrowing of disk space.
- MRI identifies the herniated disk.

NURSING DIAGNOSES

- Impaired physical mobility
- Posttrauma syndrome
- Acute pain



TREATMENT

- Bed rest with active and passive ROM and isometric exercises
- Diet that includes increased fiber and fluids
- Heating pad and moist, hot compresses
- Laminectomy
- Orthopedic devices, including back brace and cervical collar
- Transcutaneous electrical nerve stimulation

Drug therapy

- Analgesic: oxycodone (OxyContin)
- Corticosteroid: cortisone (Cortone)
- Muscle relaxants: diazepam (Valium), cyclobenzaprine (Flexeril)
- NSAIDs: indomethacin (Indocin), ibuprofen (Motrin), sulindac (Clinoril), piroxicam (Feldene), flurbiprofen (Ansaid), diclofenac sodium (Voltaren), naproxen (Naprosyn), diflunisal (Dolobid)
- Stool softener: docusate sodium (Colace)

INTERVENTIONS AND RATIONALES

- Monitor neurovascular status *to determine baseline and detect early changes.*
- Monitor and record vital signs, intake and output, and results of laboratory studies *to detect changes in the patient's condition.*
- Maintain the patient's diet; increase fluid intake *to maintain hydration.*
- Keep the patient in semi-Fowler's position with moderate hip and knee flexion *to promote comfort.*
- Administer medications, as prescribed, *to maintain or improve the patient's condition.*
- Encourage the patient to express feelings about changes in body image and about fears of disability *to help him resolve his feelings.*

Treatment for herniated nucleus pulposus ranges from bed rest to surgery. Provide emotional support and reinforcement during the treatment and recovery period.

• Provide skin and back care *to promote comfort and prevent skin breakdown.*
• Turn the patient every 2 hours, using the logrolling technique, *to prevent injury.*
• Maintain bed rest and body alignment *to maintain joint function and prevent neuromuscular deformity.*
• Maintain traction, braces, and cervical collar *to prevent further injury and to promote healing.*
• Promote independence in activities of daily living (ADLs) *to maintain self-esteem.*

Teaching topics

• Exercising regularly, with special attention to exercises that strengthen and stretch the muscles
• Avoiding lifting, sleeping prone, climbing stairs, and riding in a car
• Avoiding flexion, extension, or rotation of the neck, if cervical
• Using one pillow for support while sleeping
• Using a back brace or cervical collar

Hip fracture

A hip fracture occurs when too much stress is placed on the bone. See what happens when you go out on a limb?

A fracture occurs when too much stress is placed on the bone. As a result, the bone breaks and local tissue becomes injured, causing muscle spasm, edema, hemorrhage, compressed nerves, and ecchymosis.

Sites of hip fractures include intracapsular (within the capsule of the femur), extracapsular (outside the capsule of the femur), intertrochanteric (within the trochanter), or subtrochanteric (below the trochanter).

CAUSES

• Aging
• Bone tumors
• Cushing's syndrome
• Immobility
• Malnutrition
• Multiple myeloma
• Osteomyelitis
• Osteoporosis
• Steroid therapy
• Trauma

DATA COLLECTION FINDINGS

• Shorter appearance and outward rotation of affected leg, resulting in limited or abnormal ROM
• Edema and discoloration of surrounding tissue
• History of a fall or other trauma to the bones
• Pain in the affected hip and leg, exacerbated by any movement

DIAGNOSTIC FINDINGS

• Computed tomography scan (for complicated fractures) pinpoints abnormalities.
• Hematology shows decreased Hb and HCT.
• X-ray reveals a break in the continuity of the bone.

NURSING DIAGNOSES

• Impaired physical mobility
• Risk for impaired skin integrity
• Ineffective role performance

TREATMENT

• Isometric exercises, such as tensing and relaxing the muscles of the leg
• Physical therapy to teach the patient nonweight-bearing transfers and to work with changes in weight-bearing status
• Skin traction: Buck's or Russell
• Surgical immobilization or joint replacement
• Abductor splint or trochanter roll between legs to prevent loss of alignment (postoperatively)

Drug therapy

• Analgesics: morphine, ketorolac (Toradol), oxycodone (Oxycontin), hydrocodone (Percocet)
• Anticoagulant: warfarin (Coumadin) (postoperatively)

INTERVENTIONS AND RATIONALES

• Monitor neurovascular and respiratory status. Most important, check for compromised circulation, hemorrhage, and neurologic impairment in the affected extremity and pneumonia in the bedridden patient *to detect changes and prevent complications.*

• Monitor and record vital signs, intake and output, and results of laboratory studies *to detect early changes in the patient's condition.*
• Maintain the patient's diet; increase fluid intake *to maintain hydration.*
• Keep the patient who's in traction in a flat position with the foot of the bed elevated 25 degrees *to prevent further injury.*
• Keep the legs abducted using an abductor splint *to prevent dislocation of the hip joint.*
• Administer medications, as prescribed, *to improve or maintain the patient's condition.*
• Provide skin care and logroll the patient every 2 hours *to maintain skin integrity and prevent pressure ulcers.*
• Assist with coughing, deep breathing, and incentive spirometry *to maintain a patent airway.*
• Keep the hip extended *to prevent further injury and maintain circulation.*
• Promote independence in ADLs *to promote self-esteem.*
• Provide active and passive ROM and isometric exercises for unaffected limbs *to maintain joint mobility.*
• Provide a trapeze *to promote independence in self-care.*
• Maintain traction before surgery at all times, if using conservative treatment, *to ensure proper body alignment and promote healing.*
• Keep side rails up *to prevent injury.*
• Provide appropriate sensory stimulation with frequent reorientation *to reduce anxiety.*
• Encourage increased fiber and fluid intake, activity as allowed, and medication as needed *to prevent constipation.*
• Provide diversional activities *to promote self-esteem.*
• Apply antiembolism stockings and a sequential compression device *to promote venous circulation and prevent thromboembolism formation.*

Teaching topics

• Attending physical therapy sessions
• Avoiding putting weight on the affected limb
• Performing skin and foot care daily
• Avoiding crossing legs
• Using assistive devices

Osteoarthritis

Also known as degenerative joint disease, osteoarthritis is characterized by degeneration of cartilage in weight-bearing joints, such as the spine, knees, and hips. It occurs when cartilage softens with age, narrowing the joint space. This allows bones to rub together, causing pain and limiting joint movement.

Osteoarthritis can be primary or secondary. Primary osteoarthritis, a normal part of aging, results from metabolic, genetic, chemical, and mechanical factors. Secondary osteoarthritis usually follows an identifiable cause, such as obesity or congenital deformity, and leads to degenerative changes.

CAUSES

• Aging
• Congenital abnormalities
• Joint trauma
• Obesity

DATA COLLECTION FINDINGS

• Crepitation
• Enlarged, edematous joints
• Heberden's nodes
• Increased pain in damp, cold weather
• Joint stiffness
• Limited ROM
• Pain relieved by resting joints
• Smooth, taut, shiny skin

DIAGNOSTIC FINDINGS

• Arthroscopy reveals bone spurs and narrowing of joint space.
• Hematology studies show increased ESR.
• X-rays show joint deformity, narrowing of joint space, and bone spurs.

NURSING DIAGNOSES

• Activity intolerance
• Impaired physical mobility
• Chronic pain

TREATMENT

• Cane or walker
• Low-calorie diet, if the patient isn't at optimal weight
• Exercise
• Scheduled rest periods
• Application of warm, moist heat

Drug therapy

- Analgesics: aspirin, acetaminophen (Tylenol)
- NSAIDs: indomethacin (Indocin), ibuprofen (Motrin), naproxen (Naprosyn), diflunisal (Dolobid), celecoxib (Celebrex)

INTERVENTIONS AND RATIONALES

- Evaluate musculoskeletal status *to determine baseline and detect changes.*
- Monitor and record vital signs and intake and output *to evaluate hydration.*
- Evaluate pain. *Correlating the patient's pain with time of day and visits may be useful in modifying tasks.*
- Check the degree of joint mobility *to determine baseline and detect changes.*
- Maintain the patient's diet *to promote nutrition and healing.*
- Keep joints extended *to prevent contractures and maintain joint mobility.*
- Administer medications, as prescribed, *to relieve pain and encourage mobility.*
- Observe for increased bleeding or bruising tendency *to facilitate early intervention for drug adverse effects.*
- Urge the patient to express feelings about changes in body image *to encourage acceptance of changes.*
- Provide skin care *to promote skin integrity.*
- Provide rest periods *to conserve energy.*
- Maintain calorie count *to promote nutrition and healing.*
- Provide moist compresses, as prescribed, *to promote comfort.*
- Teach proper body mechanics *to prevent injury.*
- Provide passive ROM exercises *to maintain joint mobility.*

Teaching topics

- Avoiding certain exercises (jumping, lifting)
- Identifying ways to reduce physical stress (weight loss, exercise)
- Performing complete skin and foot care daily
- Contacting the Arthritis Foundation

Osteomyelitis

Osteomyelitis is a pyogenic (pus-producing) bone infection. It may be chronic or acute and commonly results from a combination of local trauma—usually quite trivial but resulting in hematoma formation—and an acute infection originating elsewhere in the body. Although osteomyelitis commonly remains localized, it can spread through the bone to the marrow, cortex, and periosteum (the membrane that covers the bone).

Acute osteomyelitis is usually a blood-borne disease that most commonly affects rapidly growing children. Chronic osteomyelitis (rare) is characterized by multiple draining sinus tracts and metastatic lesions.

Osteomyelitis occurs more commonly in children—particularly in boys—than adults usually as a complication of an acute, localized infection. The most common sites in children are the lower end of the femur and the upper end of the tibia, humerus, and radius. In adults, the most common sites are the pelvis and vertebrae, generally the result of contamination associated with surgery or trauma.

CAUSES

- Exposure to disease-causing organisms

DATA COLLECTION FINDINGS

- Pain
- Tenderness
- Swelling

DIAGNOSTIC FINDINGS

- Blood culture results identify the causative organism.
- Bone scan identifies the area of infection.
- ESR and CRP are elevated. (CRP appears to be a better diagnostic tool.)
- WBC count shows leukocytosis.

NURSING DIAGNOSES

- Impaired tissue integrity
- Impaired physical mobility
- Acute pain

TREATMENT

- Early surgical drainage to relieve pressure buildup and sequestrum formation (sequestrum is dead bone that has separated from sound bone)
- High-protein diet with extra vitamin C
- Immobilization of the affected bone by plaster cast, traction, or bed rest
- I.V. fluids

Drug therapy

- Antibiotics: large doses of I.V. antibiotics, usually a penicillinase-resistant penicillin, such as nafcillin and oxacillin (Bactocill), or a cephalosporin, such as cefazolin (Ancef), after blood cultures are taken
- Analgesics: ibuprofen (Motrin), acetaminophen (Tylenol), oxycodone (Percocet), hydrocodone (Vicodin)

INTERVENTIONS AND RATIONALES

- Use strict aseptic technique when changing dressings and irrigating wounds *to prevent infection.*
- If the patient is in skeletal traction for compound fractures, provide pin care and then cover insertion points of pin tracks with small, dry dressings. Tell the patient not to touch the skin around the pins and wires *to prevent infection.*
- Monitor I.V. fluids *to maintain adequate hydration as necessary.*
- Provide a diet high in protein and vitamin C *to promote healing.*
- Check vital signs and wound appearance daily and monitor daily for new pain, *which may indicate secondary infection.*
- Support the affected limb with firm pillows. Keep the limb level with the body; don't let it sag *to prevent injury.*
- Provide good skin care. Turn the patient gently every 2 hours *to prevent skin breakdown,* and watch for signs of developing pressure ulcers *to ensure early intervention and treatment.*
- Provide good cast care. Support the cast with firm pillows and "petal" the edges with pieces of adhesive tape or moleskin to smooth rough edges *to prevent skin breakdown, which may lead to infection.*
- Check circulation and drainage: If a wet spot appears on the cast, circle it with a marking pen and note the time of appearance (on the cast). Be aware of how much drainage is expected. Check the circled spot at least every 4 hours. Watch for any enlargement. *These measures help detect early signs of hemorrhage.*
- Protect the patient from mishaps, such as jerky movements and falls, which may threaten bone integrity, *to prevent injury.*
- Be alert for sudden pain, crepitus, or deformity. Watch for sudden malposition of the limb *to detect fracture.*
- Provide emotional support and appropriate diversions *to reduce anxiety.*

Teaching topics

- Cleaning the wound
- Recognizing signs of infection
- Following up with the doctor as recommended
- Seeking prompt treatment for possible sources of recurrence—blisters, boils, styes, and impetigo

Antibiotic treatment for osteomyelitis usually includes large doses of a penicillinase-resistant penicillin and may begin even before the diagnosis is confirmed.

Osteoporosis

With osteoporosis, a metabolic bone disorder, the rate of bone resorption accelerates while the rate of bone formation slows down, causing a loss of bone mass. Bones affected by this disease lose calcium and phosphate salts and, thus, become porous, brittle, and abnormally vulnerable to fracture.

Osteoporosis may be primary or secondary to an underlying disease. Primary osteoporosis is often called senile or postmenopausal osteoporosis because it most commonly develops in elderly, postmenopausal women.

CAUSES

- Decreased hormonal function
- Negative calcium balance

DATA COLLECTION FINDINGS

- Aged appearance
- Deformity
- Kyphosis
- Pain

DIAGNOSTIC FINDINGS

- Bone biopsy shows thin and porous but otherwise normal-looking bone.
- Dual or single photon absorptiometry allows measurement of bone mass, which helps to assess the extremities, hips, and spine.
- Serum calcium, phosphorus, and alkaline phosphatase are all within normal limits, but parathyroid hormone may be elevated.
- X-rays show typical degeneration in the lower thoracic and lumbar vertebrae. The vertebral bodies may appear flattened and may look denser than normal. Loss of bone mineral becomes evident in later stages.

NURSING DIAGNOSES

- Impaired physical mobility
- Risk for injury
- Chronic pain

TREATMENT

- Physical therapy consisting of weight-bearing exercise and activity
- Supportive devices for weakened vertebrae
- Balanced diet high in vitamin D, calcium, and protein

Drug treatment

- Analgesics: aspirin, indomethacin (Indocin)
- Hormonal agents: conjugated estrogen (Premarin), calcitonin (Calcimar), teriparatide (Forteo)
- Vitamin D supplements
- Antiosteoporotics: alendronate (Fosamax), risedronate (Actonel), raloxifene (Evista)
- Calcium supplements

INTERVENTIONS AND RATIONALES

- Focus on the patient's fragility, stressing careful positioning, ambulation, and prescribed exercises, *to prevent injury.*
- Check the patient's skin daily for redness, warmth, and new sites of pain, *which may indicate new fractures.* Encourage activity; help the patient walk several times daily *to slow progress of the disease.*
- Perform passive ROM exercises, or encourage the patient to perform active exercises. Make sure she regularly attends scheduled physical therapy sessions. *These measures help slow disease progression.*
- Provide a balanced diet high in vitamin D, calcium, and protein *to support skeletal metabolism.*
- Administer analgesics and apply heat *to relieve pain.*
- Advise the patient to sleep on a firm mattress *to promote comfort* and avoid excessive bed rest *to slow disease progression.*
- Make sure the patient knows how to wear her back brace *to prevent back injury.*

Teaching topics

- Consuming foods high in calcium
- Using good body mechanics while lifting
- Importance of regular weight-bearing exercise
- Understanding the prescribed drug regimen and reporting adverse reactions immediately
- Reporting any new pain sites immediately, especially after trauma, no matter how slight
- Using proper technique for self-examination of the breasts, if receiving estrogen therapy
- Understanding the need for regular gynecologic examinations and reporting abnormal bleeding promptly while receiving estrogen therapy
- Contacting the National Osteoporosis Foundation

Pump up on practice questions

1. A client with a sports injury undergoes a diagnostic arthroscopy of his left knee. After the procedure, the nurse assesses the client's leg. What are the priority data collection factors?

1. Wound and skin
2. Mobility and sensation
3. Vascular and integumentary
4. Circulatory and neurologic

Answer: 4. Following a procedure on an extremity, data collection should focus on neurovascular status of the extremity. Swelling of the extremity can impair both neurologic and circulatory function of the leg. After the neurovascular stability of the extremity has been established, the nurse can address the other concerns.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

2. A client undergoes a lumbar puncture for a myelogram. Shortly after the procedure, he reports a severe headache. What should the nurse do?

1. Increase the client's fluid intake.
2. Administer prescribed antihypertensives.
3. Offer roll lenses to the client.
4. Place cooling packs over the lumbar puncture site.

Answer: 1. Headache following a lumbar puncture is usually caused by cerebrospinal fluid (CSF) leakage. Increased fluid intake will help restore CSF volume. Antihypertensives don't address the problem. Roll lenses reduce light irritation to the eyes and cooling packs may reduce site pain, but neither intervention addresses the problem of reduced CSF volume, which caused the headache.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

3. A nurse is caring for a client with osteoarthritis of the knees. The nurse would most likely detect crepitation during:

1. palpation.
2. percussion.
3. auscultation.
4. inspection.

Answer: 1. Crepitus is a grating sensation associated with degenerative joint disease and can be felt and heard. It's best detected by palpation of the affected joint.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

4. A client with osteoarthritis develops coagulopathy secondary to long-term NSAID use. The coagulopathy is most likely the result of:

1. impaired vitamin K synthesis.
2. blocked prothrombin conversion.
3. decreased platelet adhesiveness.
4. factor VIII destruction.

Answer: 3. NSAIDs reduce platelet adhesiveness and can impair coagulation. They don't impair vitamin K synthesis, block prothrombin conversion, or destroy factor VIII.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

5. A nurse is teaching a client with osteoarthritis about lifestyle changes. Which lifestyle change will most likely reduce the signs and symptoms associated with osteoarthritis?

1. Avoiding exercise
2. Restricting caffeine
3. Abstaining from alcohol
4. Reducing weight

Answer: 4. Osteoarthritis (degenerative joint disease) is a disorder caused by wear and tear on the joints. Excess body weight is a risk factor associated with development and progression of osteoarthritis. Weight reduction can reduce the manifestations of osteoarthritis. Certain aggravating exercises may need to be avoided, but exercise can be beneficial. Caffeine isn't associated with clinical manifestations of osteoarthritis. Alcohol intake isn't prohibited.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

6. A client develops L5-S1 herniated nucleus pulposus, which impinges on the left nerve root. Most likely, the client would experience pain that radiates:

1. up the spinal column.
2. to the lower abdomen.
3. down the left leg.
4. across to the right pelvis.

Answer: 3. The pain associated with herniated nucleus pulposus of L5-S1 primarily affects the lower back, with radiation down one leg.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

7. A nurse is walking in a local park and witnesses an elderly woman fall. The woman reports severe pain, has difficulty moving her left leg, and is unable to bear weight on the affected leg. The nurse notices her left leg appears shorter than her right. The nurse suspects a femoral fracture. The greatest risk to the client is:

1. infection.
2. fat embolus.
3. neurogenic shock.
4. hypovolemia.

Answer: 4. The greatest risk to the client with a femoral fracture is hypovolemia from hemorrhage, which may be covert and can be fatal if not detected. Infection and fat emboli are potential complications less commonly seen in femoral fracture. Neurogenic shock isn't directly associated with femoral fracture.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

8. A client is undergoing rehabilitation following a fracture. As part of his regimen, the client performs isometric exercises. Which of the following provides the best evidence that the client understands the proper technique?

1. Exercising of bilateral extremities simultaneously
2. Periodic monitoring of his heart rate
3. Forced resistance against stable objects
4. Swinging of limbs through full ROM

Answer: 3. Isometric exercises involve applying pressure against a stable object, such as pressing the hands together or pushing an arm against a wall. Exercising extremities simultaneously isn't a characteristic of isometrics. Heart rate monitoring is associated with aerobic exercising. Limb swinging isn't isometric.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

9. A client in balanced suspension traction for a fractured femur needs to be repositioned toward the head of the bed. During repositioning, the nurse should:

1. place slight additional tension on the traction cords.
2. release the weights and replace them immediately after positioning.
3. lift the traction and the client during repositioning.
4. maintain the same degree of traction tension.

Answer: 4. Traction is used to reduce the fracture and must be maintained at all times, including during repositioning. It isn't appropriate to increase traction tension or release or lift the traction during repositioning.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

10. A client undergoes cast placement for a fractured left radius. The nurse should suspect compartment syndrome if the client experiences pain that:

1. intensifies with elevation of the left arm.
2. disappears with left arm flexion.
3. increases with the arm in a dependent position.
4. radiates up the arm to the left scapula.

Answer: 1. Pain is the most common symptom of compartment syndrome. Because the pain is the result of ischemia, elevating the limb reduces circulation, worsens the ischemia, and intensifies the pain.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

8 Gastrointestinal system

In this chapter, you'll review:

- components of the GI system and their function
- tests used to diagnose GI disorders
- common GI disorders.

Brush up on key concepts

The GI system is the body's food processing complex. The GI tract is basically a hollow, muscular tube through which food is digested. In addition, accessory organs, such as the liver, gallbladder, and pancreas, play an important role in digestion.

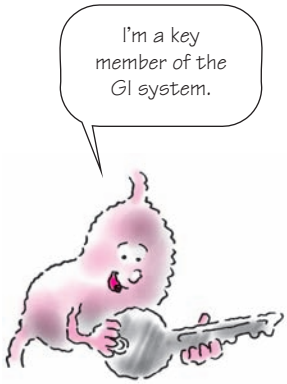
At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 238 to 243.

The breakdown begins

The digestive process begins in the **mouth,** where a mechanical (tongue and teeth) and chemical (saliva) combination starts to break down food.

Straight to the stomach

The **esophagus** transfers food from the oropharynx (area between the soft palate in the mouth and the upper portion of the throat) to the stomach. The esophagus contains two structures, the epiglottis and the cardiac sphincter. The epiglottis closes to prevent food from entering the trachea, while the cardiac sphincter closes to prevent reflux of gastric contents.



Chyme time

The **stomach** is a hollow muscular pouch that secretes pepsin, mucus, and hydrochloric acid for digestion. In the stomach, food mixes with these gastric juices to create chyme, which the stomach stores before parceling it into the small intestine. The stomach also secretes the intrinsic factor necessary for absorption of vitamin B_{12}.

Digestion central

The **small intestine** consists of the duodenum, jejunum, and ileum (proximal, central, and distal portions). Nearly all digestion takes place in the small intestine, which contains digestive agents, such as bile and pancreatic secretions. The small intestine is also lined with villi, which contain capillaries and lymphatics that transport nutrients from the small intestine to the body.

Absorb, synthesize, and store

The **large intestine** consists of the ascending colon, transverse colon, descending colon, sigmoid colon, and rectum. It absorbs fluid and electrolytes, synthesizes vitamin K, and stores fecal material.

Not just bile

The **liver** is the largest organ in the body. Its many functions include:

- producing and conveying bile
- metabolizing carbohydrates, fats, and proteins
- synthesizing coagulation factors VII, IX, and X, and prothrombin
- storing copper, iron, and vitamins A, D, E, K, and B_{12}
- detoxifying chemicals, excreting bilirubin, and producing and storing glycogen.

Pear-shaped storage

The **gallbladder** is a hollow, pear-shaped organ that stores bile that isn't immediately needed for digestion and concentrates it. When the bile is needed, the gallbladder contracts and expels bile into its duct, known as the cystic duct. From the cystic duct, bile flows into the common bile duct. Bile then enters the duodenum.

(Text continues on page 244.)

Cheat sheet

Gastrointestinal refresher

APPENDICITIS

Key signs and symptoms

- Anorexia
- Generalized abdominal pain that localizes in the right lower abdomen (McBurney's point)
- Nausea and vomiting
- Sudden cessation of pain (indicates rupture)

Key test result

- Hematology shows moderately elevated white blood cell count.

Key treatment

- Appendectomy

Key interventions

- Monitor GI status and pain.
- Maintain nothing-by-mouth status until bowel sounds return postoperatively and then advance diet as tolerated.
- Monitor dressings for drainage and the incision for infection postoperatively.

CHOLECYSTITIS

Key signs and symptoms

- Episodic colicky pain in epigastric area, which radiates to back and shoulder
- Indigestion or chest pain after eating fatty or fried foods
- Nausea, vomiting, and flatulence

Key test results

- Blood chemistry reveals increased alkaline phosphatase, bilirubin, direct bilirubin transaminase, amylase, lipase, aspartate aminotransferase (AST), and lactate dehydrogenase (LD) levels.
- Cholangiogram shows stones in the biliary tree.

Key treatments

- Laparoscopic cholecystectomy or open cholecystectomy
- Analgesic: morphine

Key interventions

- Monitor abdominal status and pain.
- Provide postoperative care (monitor dressings for drainage; if open cholecystectomy, monitor and record T-tube drainage, monitor the incision for signs of infection, get the patient out of bed as soon as possible, and encourage the use of patient-controlled analgesia).
- Maintain the position, patency, and low suction of the nasogastric (NG) tube.

CIRRHOSIS

Key signs and symptoms

- Abdominal pain (possibly because of an enlarged liver)
- Anorexia
- Ascites
- Fatigue
- Jaundice
- Nausea
- Vomiting

Key test results

- Liver biopsy, the definitive test for cirrhosis, detects destruction and fibrosis of hepatic tissue.
- Computed tomography scan with I.V. contrast reveals enlarged liver, identifies liver masses, and visualizes hepatic blood flow and obstruction, if present.

Key treatments

- Blood transfusions, as indicated
- Gastric intubation and esophageal balloon tamponade for bleeding esophageal varices
- I.V. therapy using colloid volume expanders or crystalloids
- Hemostatic: vasopressin (Pitressin) for esophageal varices
- Diuretics: furosemide (Lasix), spironolactone (Aldactone) for edema (diuretics require careful monitoring; fluid and electrolyte imbalance may precipitate hepatic encephalopathy)
- Vitamin K: phytonadione (AquaMEPHYTON) for bleeding tendencies due to hypoprothrombinemia

Key interventions

- Check respiratory status frequently. Position the patient.
- Check skin, gums, stool, and emesis regularly for bleeding.

Have time for just a 5-minute review? I think I see a Cheat sheet in your future.

Gastrointestinal refresher *(continued)*

CIRRHOSIS *(continued)*

- Observe the patient closely for signs of behavioral or personality changes—especially increased stupor, lethargy, hallucinations, and neuromuscular dysfunction.
- Monitor level of consciousness.
- Monitor ammonia levels.
- Carefully evaluate before, during, and after paracentesis.

COLORECTAL CANCER

Key signs and symptoms

- Abdominal cramping
- Change in bowel habits and shape of stools
- Diarrhea and constipation
- Weight loss

Key test results

- Colonoscopy identifies and locates the mass.
- Digital rectal examination reveals the mass.
- Fecal occult blood test is positive.

Key treatments

- Radiation therapy to reduce tumor size
- Surgery depending on tumor location
- Antineoplastics: doxorubicin (Adriamycin), 5-fluorouracil (Adrucil)

Key intervention

- Provide postoperative care if indicated (monitor vital signs and intake and output; make sure the NG tube is kept patent; monitor dressings for drainage; apply a sequential compression device and maintain while on bedrest; evaluate the wound for infection; assist with turning, coughing, deep breathing, and incentive spirometry; and medicate for pain as necessary or guide the patient in use of patient-controlled analgesia).

CROHN'S DISEASE

Key signs and symptoms

- Abdominal cramps and spasms after meals
- Chronic diarrhea with blood
- Pain in lower right quadrant

Key test result

- Upper GI series shows classic string sign: segments of stricture separated by normal bowel.

Key treatments

- Colectomy with ileostomy in many patients with extensive disease of the large intestine and rectum
- Antibiotics: sulfasalazine (Azulfidine), metronidazole (Flagyl)
- Anticholinergics: propantheline (Pro-Banthine), dicyclomine (Bentyl)
- Antidiarrheal: diphenoxylate (Lomotil)
- Corticosteroid: prednisone (Deltasone)
- Immunosuppressants: mercaptopurine (Purinethol), azathioprine (Imuran)

Key interventions

- Monitor GI status (note excessive abdominal distention) and fluid balance.
- Minimize stress and encourage verbalization of feelings.
- Provide postoperative care if indicated (monitor vital signs; monitor dressings for drainage; apply a sequential compression device; monitor ileostomy drainage and perform ileostomy care as needed; evaluate the incision for signs of infection; assist with turning, coughing, deep breathing, and incentive spirometry; and get the patient out of bed on the first postoperative day if stable).

DIVERTICULAR DISEASE

Key signs and symptoms

- Anorexia
- Change in bowel habits
- Flatulence
- Left lower quadrant pain or midabdominal pain that radiates to the back
- Nausea

Key test result

- Sigmoidoscopy shows a thickened wall in the diverticula.

Key treatments

- Colon resection (for diverticulitis refractory to medical treatment)
- Liquid diet for mild diverticulitis or diverticulosis before pain subsides; high-fiber, low-fat diet after pain subsides
- Temporary colostomy possible for perforation, peritonitis, obstruction, or fistula that accompanies diverticulitis
- Analgesic: morphine
- Antibiotics: metronidazole (Flagyl), ciprofloxacin (Cipro), cotrimoxazole (Bactrim) for mild diverticulitis
- Anticholinergic: propantheline (Pro-Banthine)
- Stool softener: docusate sodium (Colace) for diverticulosis or mild diverticulitis

Key interventions

- Monitor abdominal distention and bowel sounds.
- Prepare the patient for surgery, if necessary (administer cleansing enemas, osmotic purgative, oral and parenteral antibiotics).
- Provide postoperative care (watch for signs of infection; perform meticulous wound care; watch for signs of postoperative

(continued)

Gastrointestinal refresher *(continued)*

DIVERTICULAR DISEASE *(continued)*

bleeding; assist with turning, coughing, and deep breathing; and teach ostomy self-care).

ESOPHAGEAL CANCER

Key signs and symptoms

- Dysphagia
- Substernal pain
- Weight loss

Key test result

- Endoscopic examination of the esophagus, punch and brush biopsies, and an exfoliative cytologic test confirm esophageal tumors.

Key treatments

- Gastrostomy or jejunostomy to help provide adequate nutrition
- Radiation therapy
- Radical surgery to excise the tumor and resect either the esophagus alone or the stomach and the esophagus
- Antineoplastics: fluorouracil (5-FU), cisplatin (Platinol)

Key interventions

- Before surgery, answer the patient's questions and let him know what to expect after surgery (gastrostomy tubes, closed chest drainage, and NG suctioning).
- After surgery, monitor vital signs and watch for unexpected changes. If surgery included an esophageal anastomosis, keep the patient flat on his back.
- Promote adequate nutrition, and evaluate the patient's nutritional and hydration status.
- Place the patient in Fowler's position for meals and allow plenty of time to eat.
- Provide high-calorie, high-protein, pureed food as needed.
- If the patient has a gastrostomy tube, give food slowly, using gravity to adjust the flow rate. Offer him something to chew before each feeding.
- Provide emotional support for the patient and his family.

GASTRIC CANCER

Key signs and symptoms

- Anorexia
- Epigastric fullness and pain
- Nausea and vomiting
- Pain after eating that isn't relieved by antacids
- Weight loss

Key test results

- Gastric analysis shows positive cancer cells and achlorhydria.
- Gastroscopy biopsy is positive for cancer cells.

Key treatments

- Gastric surgery: gastroduodenostomy, gastrojejunostomy, partial gastric resection, total gastrectomy
- Antineoplastics: carmustine (BiCNU), 5-fluorouracil (Adrucil)
- Vitamin supplements: folic acid (Folvite), cyanocobalamin (vitamin B_{12}) for patients who have undergone total gastrectomy

Key interventions

- Monitor GI status postoperatively.
- Maintain the position, patency, and low suction of NG tube (without irrigating or repositioning the NG tube because it may put pressure on the suture line).

GASTRITIS

Key signs and symptoms

- Abdominal cramping
- Epigastric discomfort
- Hematemesis
- Indigestion

Key test result

- Upper GI endoscopy with biopsy confirms the diagnosis when performed within 24 hours of bleeding.

Key treatments

- I.V. fluid therapy
- NG lavage to control bleeding
- Histamine$_2$-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)

Key interventions

- If the patient is vomiting, give antiemetics and I.V. fluids.
- Monitor fluid intake and output and electrolyte levels.
- Provide a bland diet. Monitor the patient for recurrent symptoms as food is reintroduced.
- Offer small, frequent meals. Eliminate foods that cause gastric upset.
- If surgery is necessary, prepare the patient preoperatively and provide appropriate postoperative care.
- Administer antacids and other prescribed medications.
- Provide emotional support to the patient.

GASTROENTERITIS

Key signs and symptoms

- Abdominal discomfort
- Diarrhea
- Nausea and vomiting

Gastrointestinal refresher *(continued)*

GASTROENTERITIS *(continued)*

Key test result

- Stool culture identifies the causative bacteria, parasites, or amoebae.

Key treatments

- I.V. fluid and electrolyte replacement
- Antidiarrheals: camphorated opium tincture (Paregoric), diphenoxylate with atropine (Lomotil), loperamide (Imodium)

Key interventions

- Administer medications; correlate dosages, routes, and times appropriately with the patient's meals and activities; for example, give antiemetics 30 to 60 minutes before meals.
- If the patient is unable to tolerate food, replace lost fluids and electrolytes with clear liquids and sports drinks.
- Record strict intake and output. Watch for signs of dehydration, such as dry skin and mucous membranes, fever, and sunken eyes.
- Wash your hands thoroughly after giving care.

GASTROESOPHAGEAL REFLUX DISEASE

Key signs and symptoms

- Dysphagia
- Heartburn (burning sensation in the upper abdomen)

Key test results

- Barium swallow fluoroscopy indicates reflux.
- Esophagoscopy shows reflux.
- Endoscopy allows visualization and confirmation of pathologic changes in the mucosa.

Key treatments

- Positional therapy to help relieve symptoms by decreasing intra-abdominal pressure
- GI stimulants: metoclopramide (Reglan), bethanechol (Urecholine)

Key interventions

- Develop a diet for the patient that takes his food preferences into account.
- Have the patient sleep in reverse Trendelenburg's position (with the head of the bed elevated 6″ to 12″ [15 to 30 cm]).

After surgery

- If needed, perform chest physiotherapy and give oxygen.
- Place the patient with an NG tube in semi-Fowler's position.

HEPATITIS

Key signs and symptoms

During preicteric phase (usually 1 to 5 days)

- Clay-colored stools
- Fatigue
- Right upper quadrant pain
- Weight loss

During icteric phase (usually 1 to 2 weeks)

- Clay-colored stools
- Fatigue
- Jaundice
- Pruritus
- Weight loss

During posticteric or recovery phase (usually 2 to 12 weeks, sometimes longer in patients with hepatitis B, C, or E)

- Decreased hepatomegaly
- Decreased jaundice
- Fatigue

Key test results

- Blood chemistry shows increased alanine aminotransferase, AST, alkaline phosphatase, LD, bilirubin, and erythrocyte sedimentation rate.
- Serologic tests identify hepatitis A virus, hepatitis B virus, hepatitis C virus, and delta antigen, if present.

Key treatment

- Vitamins and minerals: vitamin K (AquaMEPHYTON), vitamin C (ascorbic acid), vitamin B-complex (mega-B)

Key interventions

- Monitor GI status and watch for bleeding and fulminant hepatitis.
- Maintain standard precautions.

HIATAL HERNIA

Key signs and symptoms

- Dysphagia
- Regurgitation
- Sternal pain after eating

Key test results

- Barium swallow reveals protrusion of the hernia.
- Chest X-ray shows protrusion of abdominal organs into the thorax.
- Esophagoscopy shows incompetent cardiac sphincter.

Key treatments

- Bland diet in small, frequent meals with decreased intake of caffeine and spicy foods
- Anticholinergic: propantheline (Pro-Banthine)
- Histamine$_2$-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid)

(continued)

Gastrointestinal refresher *(continued)*

HIATAL HERNIA *(continued)*

Key interventions

- Monitor respiratory status.
- Avoid flexion at the waist when positioning the patient.

INTESTINAL OBSTRUCTION

Key signs and symptoms

- Abdominal distention
- Cramping pain
- Diminished or absent bowel sounds

Key test results

- Abdominal X-ray shows increased amount of gas in bowel.
- Barium enema stops at obstruction.

Key treatments

- Bowel resection with or without anastomosis if other treatment fails
- GI decompression using NG, Miller-Abbott, or Cantor tube
- Fluid and electrolyte replacement

Key interventions

- Monitor GI status. Assess and record bowel sounds once per shift.
- Measure and record the patient's abdominal girth.
- Maintain the position, patency, and low intermittent suction of NG and Miller-Abbott tubes.
- Provide postoperative care if indicated (monitor vital signs and intake and output; make sure the NG tube is kept patent; monitor dressings for drainage; evaluate the wound for infection; assist with turning, coughing, deep breathing, and incentive spirometry; apply a sequential compression device while the patient is on bedrest; and medicate for pain as necessary or guide the patient in use of postoperative patient-controlled analgesia).

IRRITABLE BOWEL SYNDROME

Key signs and symptoms

- Abdominal bloating
- Constipation, diarrhea, or both
- Lower abdominal pain
- Passage of mucus
- Pasty, pencil-like stools

Key test result

- Sigmoidoscopy may disclose spastic contractions.

Key treatments

- Elimination diet to determine if symptoms result from food intolerance (in this type of diet, certain foods, such as citrus fruits, coffee, corn, dairy products, tea, and wheat, are sequentially eliminated; then each food is gradually reintroduced to identify which foods, if any, trigger the patient's symptoms)
- Avoiding high-fat foods
- Diet containing 15 to 20 g daily of bulky foods, such as wheat bran, oatmeal, oat bran, rye cereals, prunes, dried apricots, and figs (if the patient has constipation and abdominal pain)
- Stress management
- Antispasmodic: propantheline (Pro-Banthine)
- Antidiarrheal: diphenoxylate with atropine (Lomotil)

Key intervention

- Help the patient deal with stress, and warn against dependence on sedatives or antispasmodics.

PANCREATITIS

Key signs and symptoms

- Abdominal tenderness and distention
- Abrupt onset of pain in the epigastric area that radiates to the shoulder, substernal area, back, and flank
- Aching, burning, stabbing, pressing abdominal pain
- Nausea and vomiting
- Tachycardia

Key test results

- Blood chemistry shows increased amylase, lipase, LD, glucose, AST, and lipid levels and decreased calcium and potassium levels.
- Cullen's sign is positive.
- Grey Turner's sign is positive.
- Ultrasonography reveals cysts, bile duct inflammation, and dilation.

Key treatments

- Bed rest
- I.V. fluids (vigorous replacement of fluids and electrolytes)
- Transfusion therapy with packed red blood cells
- Analgesic: morphine
- Antidiabetic: insulin
- Corticosteroid: hydrocortisone (Solu-Cortef)
- Potassium supplement: I.V. potassium chloride

Key interventions

- Monitor abdominal, cardiac, and respiratory status (as the disease progresses, watch for respiratory failure, tachycardia, and worsening GI status).
- Evaluate fluid balance.
- Perform bedside glucose monitoring.
- Monitor I.V. fluids.
- Turn the patient every 2 hours, or use a specialty rotation bed.

Gastrointestinal refresher *(continued)*

PEPTIC ULCER DISEASE

Key signs and symptoms

- Anorexia
- Hematemesis
- Left epigastric pain 1 to 2 hours after eating
- Relief of pain after administration of antacids

Key test results

- Barium swallow shows ulceration of the gastric mucosa.
- Upper GI endoscopy shows the location of the ulcer.

Key treatments

- If GI hemorrhage: Gastric surgery that may include gastroduodenostomy, gastrojejunostomy, partial gastric resection, and total gastrectomy
- Saline lavage by NG tube until return is clear (if bleeding is present)
- Antibiotic if *Helicobacter pylori* is present
- Histamine$_2$-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), nizatidine (Axid), famotidine (Pepcid)
- Mucosal barrier fortifier: sucralfate (Carafate)

Key interventions

- Monitor GI and cardiovascular status.
- Maintain the position, patency, and low suction of NG tube if gastric decompression is ordered.
- Provide postoperative care if necessary (don't reposition the NG tube; irrigate it gently if ordered; medicate for pain as needed and ordered; monitor dressings for drainage; evaluate bowel sounds; assist with incentive spirometry; apply a sequential compression device while the patient is on bedrest; and get the patient out of bed as tolerated).

PERITONITIS

Key signs and symptoms

- Abdominal resonance and tympany on percussion
- Abdominal rigidity and distention
- Constant, diffuse, and intense abdominal pain
- Decreased or absent bowel sounds
- Decreased urine output
- Fever
- Rebound tenderness
- Shallow respirations
- Weak, rapid pulse

Key test result

- Abdominal X-ray shows free air in the abdomen under the diaphragm.

Key treatment

- Surgical intervention when the patient's condition is stabilized (surgery is chosen to treat the cause [for example, if the patient has a perforated appendix, then an appendectomy is indicated]; drains will also be placed for drainage of infected material)

Key interventions

- Monitor abdominal and respiratory status and fluid balance.
- Monitor and record vital signs, intake and output, laboratory studies, daily weight, and urine specific gravity.
- Provide postoperative care (monitor vital signs and intake and output, including drainage from drains; assist with turning, incentive spirometry, coughing, and deep breathing; apply a sequential compression device while the patient is on bedrest; and get the patient out of bed on the 1st postoperative day if his condition allows).

ULCERATIVE COLITIS

Key signs and symptoms

- Abdominal cramping
- Bloody, purulent, mucoid, watery stools (15 to 20 per day)
- Hyperactive bowel sounds
- Weight loss

Key test results

- Barium enema shows ulcerations.
- Sigmoidoscopy shows ulceration and hyperemia.

Key treatments

- Colectomy or pouch ileostomy
- Total parenteral nutrition (TPN) if necessary to rest the GI tract
- Antibiotic: sulfasalazine (Azulfidine)
- Anticholinergics: propantheline (Pro-Banthine), dicyclomine (Bentyl)
- Antidiarrheals: diphenoxylate (Lomotil), loperamide (Imodium)
- Antiemetic: prochlorperazine (Compazine)
- Corticosteroid: hydrocortisone (Solu-Cortef)
- Immunosuppressants: azathioprine (Imuran), cyclophosphamide (Cytoxan)

Key interventions

- Montor GI status and fluid balance.
- Monitor the number, amount, and character of stools.
- Maintain I.V. fluids and TPN.
- Maintain the position, patency, and low suction of NG tube.

Enzymes and hormones

The **pancreas** secretes three digestive enzymes: amylase, lipase, and trypsin into the duodenum. It also secretes the hormones insulin, glucagon, and somatostatin from the islets of Langerhans into the blood. In addition, the pancreas secretes large amounts of sodium bicarbonate, which is used to neutralize the acid in chyme.

Keep abreast of diagnostic tests

Here are some important tests used to diagnose GI disorders, along with common nursing interventions associated with each test.

Visualize. Imagine that you're caring for a real-life patient and performing each nursing action. It will make information more meaningful and help you remember.

Barium above

A **barium swallow test** involves fluoroscopic examination of the pharynx and esophagus.

Nursing actions

- Before the procedure, withhold food and fluids for at least 8 hours and evaluate the patient's ability to swallow.
- After the procedure, force fluids unless contraindicated and administer laxatives, as prescribed.

Barium between

An **upper GI series** uses an X-ray to examine the esophagus, stomach, duodenum, and other portions of the small bowel after the patient swallows barium.

Nursing actions

Before the procedure

- Withhold food and fluids for at least 8 hours.
- Maintain I.V. fluids and administer cathartics and enemas, as prescribed.

After the procedure

- Inform the patient that stool will be light-colored for several days.
- Administer cathartics, fluids, and enemas, as prescribed.

Barium below

A **lower GI series,** also known as a barium enema, uses an X-ray to examine the large intestine after the instillation of barium.

Nursing actions

Before the procedure

- Withhold food and fluids for at least 8 hours.
- Administer bowel preparation (laxatives and enemas), as prescribed.

After the procedure

- Force fluids unless contraindicated.
- Administer enemas and laxatives, as prescribed.
- Monitor color and consistency of stool.

Stomach cam

Endoscopy uses an endoscope to view the esophagus and stomach.

Nursing actions

Before the procedure

- Withhold food and fluids for at least 8 hours.
- Make sure that written, informed consent has been obtained.
- Obtain baseline vital signs.
- Administer sedatives, as prescribed.

After the procedure

- Monitor gag and cough reflexes.
- Monitor vital signs.
- Evaluate vasovagal response.
- Withhold food and fluids until the gag reflex returns.

Blood search

A **fecal occult blood test** analyzes stools for the presence of blood.

Nursing actions

- Instruct the patient to avoid red meat for 3 days before the test.
- Document administration of aspirin, anticoagulants, vitamin C, and anti-inflammatory drugs. (See *Testing for occult blood.*)

Fat search

A **fecal fat test** analyzes stool for the presence of fat.

Stepping up

Testing for occult blood

WHY YOU DO IT

A minute quantity of fecal occult blood can be detected by microscopic analysis or chemical test for hemoglobin, such as the guaiac or orthotolidine tests. Small amounts of blood (2 to 2.5 ml/day) normally appear in the feces; these tests are designed to detect greater-than-normal quantities. They're used to detect GI bleeding and to aid early diagnosis of colorectal cancer.

HOW YOU DO IT

- Explain the purpose of the test to the patient. Instruct him to avoid contaminating the stool specimen with toilet tissue or urine.
- Obtain a small specimen from two different areas of the stool to allow for any variation in the distribution of blood.
- Use a commercially prepared Hemoccult card and developer as instructed. Apply two drops of the chemical developer to the paper covering the sample. Note the color after 1 minute.
- A normal result is indicated by a green reaction (less than 2 ml of blood are present); an abnormal result (positive for fecal occult blood) is indicated by a blue reaction that occurs within 30 to 60 seconds. If the blue color appears within this period, consider it strongly positive. A faint blue reaction is weakly positive and not necessarily abnormal.
- Document the appearance of the stool and test results.

Nursing actions

- Instruct the patient to abstain from alcohol and to maintain a high-fat diet (100 g/day) for 3 days before and during the 72-hour stool collection.
- Refrigerate the specimen.
- Document current medications.

From colon to canal

Proctosigmoidoscopy uses a lighted scope to view the sigmoid colon, rectum, and anal canal.

Nursing actions

Before the procedure

- Administer bowel preparation, as prescribed.
- Make sure that written, informed consent has been obtained.

After the procedure

- Document iron intake.
- Check the patient for bleeding.
- Monitor the patient's vital signs.
- Monitor the patient for complications such as perforated bowel (abdominal tenderness, rigidity, and distention).

A biliary duct to dye for

Cholangiography uses dye injection to produce a radiographic picture of the biliary duct system.

Nursing actions

Before the procedure

- Encourage a low-residue, high-fat diet 1 day before the examination.
- Make sure that written, informed consent has been obtained.
- Withhold food and fluids after midnight.
- Note the patient's allergies to iodine, seafood, and radiopaque dyes.
- Inform the patient about possible throat irritation and flushing of the face.

After the procedure

- Check the injection site for bleeding.
- Monitor the patient's vital signs.
- Administer fluids to flush the dye out through the kidneys.

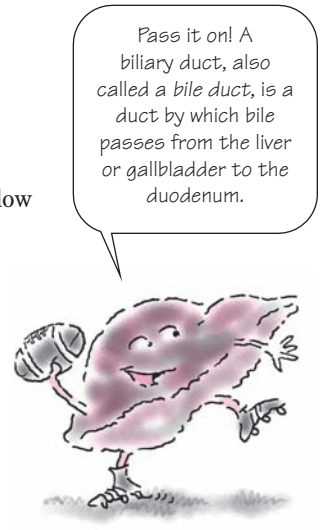
Flow glow

A **liver scan** produces an image of blood flow in the liver using an injection of a radioisotope.

Nursing actions

Before the procedure

- Determine the patient's ability to lie still during the procedure.
- Check the patient for possible allergies.
- Make sure that written, informed consent has been obtained.



After the procedure
• Monitor the patient for signs and symptoms of delayed allergic reaction to the radioisotope, such as itching and hives.

Acid basics

A **gastric analysis** is performed after the patient has fasted. Results indicate the acidity of gastric secretions aspirated through a nasogastric (NG) tube.

Nursing actions

Before the procedure
• Withhold food and fluids after midnight.
• Instruct the patient not to smoke for 8 to 12 hours before the test.
• Withhold medications that can affect gastric secretions for 24 hours before the procedure.
After the procedure
• Obtain vital signs.
• Note reactions to gastric acid stimulant, if used.

Liver biopsy involves percutaneous removal of liver tissue with a needle. Afterward, watch for signs of shock and pneumothorax.

Organ organ echo echo

Ultrasonography uses echoes from sound waves to visualize body organs.

Nursing actions

• Evaluate the patient's ability to lie still during the procedure.
• Explain the procedure to the patient.

Blood study 1

Blood chemistry tests are used to analyze the patient's blood. Samples may be obtained to analyze potassium, sodium, calcium, phosphorus, glucose, bicarbonate, blood urea nitrogen, creatinine, protein, albumin, osmolality, amylase, lipase, alkaline phosphatase, ammonia, bilirubin, lactate dehydrogenase (LD), aspartate aminotransferase (AST), serum alanine aminotransferase (ALT), hepatitis-associated antigens, and carcinoembryonic antigen (CEA).

Nursing actions

• Note current drug therapy.
• Check the venipuncture site for bleeding.

Blood study 2

A **hematologic study** is used to analyze a blood sample for red blood cells (RBCs), white blood cells (WBCs), platelets, hemoglobin (Hb level), hematocrit (HCT), and erythrocyte sedimentation rate (ESR).

Nursing actions

• Note current drug therapy.
• Check the venipuncture site for bleeding.

Blood study 3

A **coagulation study** is a laboratory test of a blood sample that analyzes prothrombin time (PT), international normalized ratio (INR), and partial thromboplastin time (PTT).

Nursing actions

• Note current drug therapy.
• Check the venipuncture site for bleeding.

Tissue bye-bi

A **liver biopsy**, which is used to diagnose disorders such as cirrhosis and cancer, involves percutaneous removal of liver tissue with a needle.

Nursing actions

Before the procedure
• Withhold food and fluids after midnight.
• Make sure that written, informed consent has been obtained.
• Obtain baseline clotting studies and vital signs.
• Instruct the patient to exhale and hold his breath during insertion of the needle.
After the procedure
• Check the insertion site for bleeding.
• Monitor the patient's vital signs.
• Observe the patient for signs of shock (hypotension, tachycardia, oliguria) and pneumothorax (decreased breath sounds on the affected side, tachypnea, shortness of breath).
• Position the patient on his right lateral side for hemostasis.

Lighting the large intestine

Colonoscopy uses a lighted scope to directly visualize the large intestine.

Nursing actions

Before the procedure

- Make sure that written, informed consent has been obtained.
- Provide a clear liquid diet 48 hours before the test.
- Administer a bowel preparation the day before the test.
- Explain that the patient will feel cramping and the sensation of needing to have a bowel movement.
- Explain the use of air to distend the bowel lumen.

After the procedure

- Monitor for gross bleeding.
- Monitor for signs and symptoms of colon perforation (abdominal distention, pain, and rigidity).
- Withhold food and fluids for 2 hours.
- Check for blood in stool if polyps were removed.
- Monitor the patient's vital signs.

Duct tapes

Endoscopic retrograde cholangiopancreatography (ERCP) is radiographic examination of the hepatobiliary tree and pancreatic ducts using a contrast medium and a lighted scope.

Nursing actions

Before the procedure

- Make sure that written, informed consent has been obtained.
- Withhold food and fluids after midnight.
- Check for allergies to iodine or seafood.

After the procedure

- Check for respiratory depression.
- Check for urine retention.
- Monitor gag reflex and withhold food until gag reflex returns.
- Watch for signs and symptoms of procedure-induced pancreatitis (abdominal pain, nausea, and vomiting).

Croco-bile hunter

Percutaneous transhepatic cholangiography is fluoroscopic examination of the biliary ducts. It involves injection of a contrast medium.

Nursing actions

Before the procedure

- Inform the patient that the X-ray table will be tilted and rotated during the procedure.
- Make sure that written, informed consent has been obtained.
- Check for allergies to iodine or seafood.
- Check PT, INR, and PTT before the procedure.
- Type and cross-match the patient's blood.
- Withhold food and fluids after midnight.

After the procedure

- Require the patient to rest on his side for at least 6 hours.
- Check for bleeding at the injection site.
- Monitor vital signs.
- Withhold food and fluids for 2 hours.

Polish up on patient care

Major GI disorders include appendicitis, cholecystitis, cirrhosis, colorectal cancer, Crohn's disease, diverticular disease, esophageal cancer, gastric cancer, gastritis, gastroenteritis, gastroesophageal reflux disease (GERD), hepatitis, hiatal hernia, intestinal obstruction, irritable bowel syndrome, pancreatitis, peptic ulcer disease, peritonitis, and ulcerative colitis.

Appendicitis

Appendicitis is an inflammation of the appendix. Although the appendix has no known function, it regularly fills with and empties itself of food. Appendicitis occurs when the appendix becomes inflamed from ulceration of the mucosa or from obstruction of the lumen.

CAUSES

- Barium ingestion
- Fecal mass
- Stricture
- Viral infection

Stepping up

Using an incentive spirometer

WHY YOU DO IT

The purpose of incentive spirometry is for the patient to achieve maximum ventilation. Maximum ventilation is necessary to help prevent and reverse alveolar collapse, which can cause atelectasis and pneumonitis.

HOW YOU DO IT

- Evaluate the patient's condition.
- Explain the procedure and the importance of regularly performing incentive spirometry to maintain alveolar inflation.
- Place the patient in a comfortable sitting or semi-Fowler position to promote optimal lung expansion.
- Instruct the patient to insert the mouthpiece and to close his lips tightly around it to create a seal.
- Tell the patient to exhale normally and then inhale as slowly and as deeply as possible; instruct him to retain the entire volume of air inhaled for 3 seconds or, if he's using a device with a light indicator, until the light turns off.
- Tell the patient to remove the mouthpiece and exhale normally. Repeat this sequence 5 to 10 times during every waking hour.
- Document the patient's response and tidal volumes.

DATA COLLECTION FINDINGS

- Anorexia
- Constipation
- Generalized abdominal pain that becomes localized in the right lower abdomen (McBurney's point)
- Lies in bent-knee position
- Low-grade fever
- Malaise
- Nausea and vomiting
- Psoas sign (abdominal pain on hip hyperextension)
- Rovsing's sign (right lower quadrant pain resulting from palpation of left lower quadrant)
- Sudden cessation of pain (indicates rupture)

DIAGNOSTIC FINDINGS

- Hematology shows moderately elevated WBC count.
- An abdominal X-ray with radiographic contrast agent reveals failure of the appendix to fill with contrast.
- An abdominal CT scan shows inflammation or rupture of the appendix.
- An abdominal ultrasound shows inflammation of the appendix.

NURSING DIAGNOSES

- Imbalanced nutrition: Less than body requirements
- Acute pain
- Risk for infection

TREATMENT

- Appendectomy
- I.V. fluids to prevent dehydration
- Nothing by mouth

Drug therapy

- Analgesics: morphine (administered only when diagnosis is confirmed)
- Antbiotics: cefoxitin (Mefoxin)
- Antipyretics: acetaminophen (Tylenol)

INTERVENTIONS AND RATIONALES

- Monitor GI status and pain. *Sudden cessation of pain preoperatively may indicate appendix rupture.*
- Monitor and record vital signs and intake and output *to determine fluid volume.*
- Administer medications as ordered *to maintain or improve the patient's condition.*
- Maintain nothing-by-mouth status until bowel sounds return postoperatively; then ad-

vance diet as tolerated *to promote healing and meet metabolic needs.*
• Assist patient with incentive spirometry, turning, coughing, and deep breathing *to mobilize secretions and promote lung expansion.* (See *Using an incentive spirometer.*)
• Monitor dressings for drainage and incision for infection postoperatively *to detect early signs of infection and prevent complications.*

Teaching topics
• Completing follow-up medical care
• Following activity restrictions
• Recognizing the signs and symptoms of infection

Cholecystitis

Cholecystitis is acute or chronic inflammation of the gallbladder most commonly associated with cholelithiasis (presence of gallstones). It occurs when an obstruction, such as calculi or edema, prevents the gallbladder from contracting when fatty foods enter the duodenum.

CAUSES
• Cholelithiasis
• Estrogen therapy
• High-fat diet
• Infection of the gallbladder
• Major surgery
• Obesity
• Trauma

DATA COLLECTION FINDINGS
• Belching
• Clay-colored stools
• Dark amber urine
• Ecchymosis
• Episodic colicky pain in the epigastric area that radiates to the back and shoulder
• Fever
• Flatulence
• Indigestion or chest pain after eating fatty or fried foods
• Jaundice
• Nausea and vomiting
• Pruritus
• Steatorrhea

DIAGNOSTIC FINDINGS
• Blood chemistry reveals increased alkaline phosphatase, bilirubin, direct bilirubin transaminase, amylase, lipase, AST, and LD levels.
• Cholangiogram shows stones in the biliary tree.
• Gallbladder series shows stones in the biliary tree.
• Hematology shows increased WBC count.
• Liver scan shows obstruction of the biliary tree.
• Ultrasound shows bile duct distention and calculi.
• ERCP reveals the presence of ductal stones.

NURSING DIAGNOSES
• Deficient fluid volume
• Acute pain
• Risk for infection

TREATMENT
• Small, frequent meals of a low-fat, low-calorie diet high in carbohydrates, protein, and fiber with restricted intake of gas-forming foods or no foods or fluids, as directed
• Extracorporeal shock wave lithotripsy
• Incentive spirometry (postoperatively)
• Laparoscopic cholecystectomy or open cholecystectomy

Drug therapy
• Analgesic: morphine
• Antibiotics: ceftazidime (Fortaz), clindamycin (Cleocin), gentamicin (Gentak)
• Anticholinergics: propantheline (Pro-Banthine), dicyclomine (Bentyl)
• Antiemetic: prochlorperazine (Compazine)
• Antipruritic: diphenhydramine (Benadryl)

INTERVENTIONS AND RATIONALES
• Monitor abdominal status and pain *to determine baseline and detect changes in the patient's condition.*
• Monitor and record vital signs, intake and output, laboratory studies, and urine specific gravity *to evaluate fluid and electrolyte balance.*
• Maintain the patient's diet; withhold food and fluids *to rest the GI tract and prevent recurrence of the condition.*

Memory jogger

Cholecystitis occurs most often in overweight women over age 40 who haven't gone through menopause. To remember risk factors associated with cholecystitis, think of the four **F**s:

Female

Fertile

Forty

Fat.

Stepping up

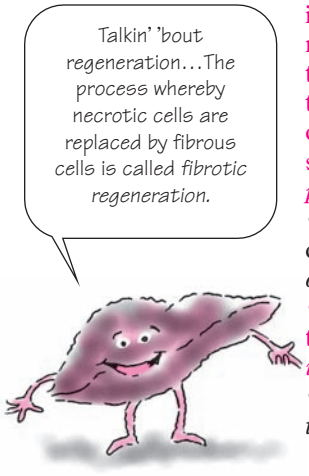
Performing nasogastric tube care

WHY YOU DO IT

Providing effective nasogastric (NG) tube care requires meticulous monitoring of the patient and the equipment. Monitoring the patient involves checking drainage from the NG tube and assessing GI function. Monitoring the equipment involves verifying correct tube placement and irrigating the tube to ensure patency and to prevent mucosal damage.

HOW YOU DO IT

- Explain the procedure to the patient and provide privacy.
- Wash your hands and put on gloves.
- Aspirate stomach contents and check the pH of the aspirate to check correct positioning in the stomach. The color of the aspirate should be green or brown with mucous and the pH should be less than or equal to 5.
- To irrigate the tube, draw up irrigant in a bulb syringe or 60-ml catheter tip syringe (usually 30 ml of normal saline solution). Be sure to accurately measure the amount of irrigant to maintain an accurate intake and output record.
- When suction is applied to a Salem sump tube or a Levin tube, unclamp and disconnect the tube from the suction equipment while holding it over a linen-saver pad or an emesis basin to collect any drainage.
- Slowly instill the irrigant into the NG tube. When irrigating a Salem sump tube, you may instill small amounts of solution into the vent lumen without interrupting suction; instill greater amounts into the larger, primary lumen.
- Gently aspirate the solution with the bulb syringe or a 60-ml catheter-tip syringe or connect the tube to the suction equipment as ordered. Gentle aspiration prevents excessive pressure on the suture line and the delicate gastric mucosa. Report any bleeding.
- Reconnect the tube to suction after completing the irrigation.
- Document tube placement confirmation (usually every 4 to 8 hours). Keep a precise record of fluid intake and output, including the instilled irrigant in fluid intake. Track the irrigation schedule and note the actual time of each irrigation. Describe drainage color, consistency, odor, and amount. Also, note tape change times and the condition of the nares.



- Maintain I.V. fluids *to provide the patient with necessary fluids and electrolytes.*
- Administer medications as prescribed *to treat infection, decrease pain, and promote comfort.*
- Provide postoperative care (monitor dressings for drainage; if open cholecystectomy, monitor and record T-tube drainage, monitor the incision for signs of infection, get the patient out of bed as soon as possible, and encourage the use of patient-controlled analgesia) *to maintain the patient's condition and prevent postoperative complications.*
- Assist with turning, incentive spirometry, coughing, and deep breathing *to mobilize secretions and promote lung expansion.*
- Maintain the position, patency, and low suction of NG tube *to prevent nausea and vomiting.* (See *Performing nasogastric tube care.*)
- Place the patient in semi-Fowler's position *to promote comfort and facilitate GI emptying.*
- Provide skin, nares, and mouth care *to promote patient comfort and prevent tissue breakdown.*
- Maintain a quiet environment *to promote rest.*
- Apply a sequential compression device *to prevent thrombosis formation.*

Teaching topics

- Using patient-controlled analgesia
- Using incentive spirometry
- Completing skin care daily
- Recognizing the signs and symptoms of infection
- Importance of early ambulation postoperatively to prevent complications of immobility

Cirrhosis

Cirrhosis is a chronic hepatic disease characterized by diffuse destruction of hepatic cells, which are replaced by fibrous cells. Necrotic

tissue yields to fibrosis. Cirrhosis alters liver structure and normal vasculature, impairs blood and lymph flow, and eventually causes hepatic insufficiency. Cirrhosis is irreversible.

CAUSES

- Alcoholism and resulting malnutrition
- Autoimmune disease such as sarcoidosis or chronic inflammatory bowel disease
- Exposure to hepatitis (types A, B, C, D, and E viral hepatitis) or toxic substances

DATA COLLECTION FINDINGS

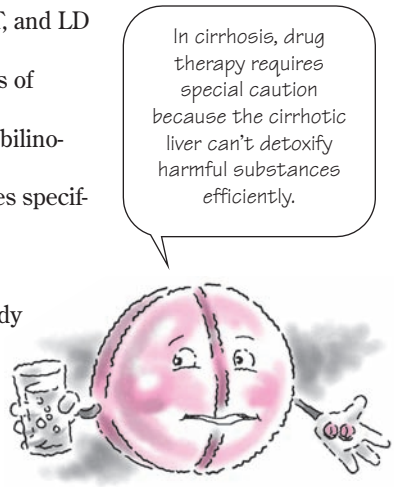
- Abdominal pain (possibly because of an enlarged liver)
- Anorexia
- Ascites
- Clay-colored stools
- Constipation
- Diarrhea
- Fatigue
- Headache
- Hepatomegaly
- Indigestion
- Jaundice
- Muscle cramps
- Nausea
- Pruritus
- Spider telangiectases
- Vomiting

DIAGNOSTIC FINDINGS

- Liver biopsy, the definitive test for cirrhosis, shows hepatic tissue destruction and fibrosis.
- Computed tomography (CT) scan with I.V. contrast medium reveals enlarged liver, identifies liver masses, and visualizes hepatic blood flow and obstruction, if present.
- Magnetic resonance imaging is used to further assess hepatic nodules.
- Esophagogastroduodenoscopy reveals bleeding esophageal varices, stomach irritation or ulceration, or duodenal bleeding and irritation.
- Blood studies reveal elevated WBC count, decreased platelets and HCT, and decreased levels of Hb, albumin, serum electrolytes (sodium, potassium, chloride, magnesium), and folate. Prolonged PT.
- Blood studies reveal elevated levels of globulin, ammonia, total bilirubin, total cholesterol, alkaline phosphatase, AST, ALT, and LD and increased thymol turbidity.
- Urine studies show increased levels of bilirubin and urobilinogen.
- Stool studies reveal decreasing urobilinogen levels.
- Hepatitis profile identifies antibodies specific to the causative virus.

NURSING DIAGNOSES

- Imbalanced nutrition: Less than body requirements
- Risk for injury
- Ineffective breathing pattern

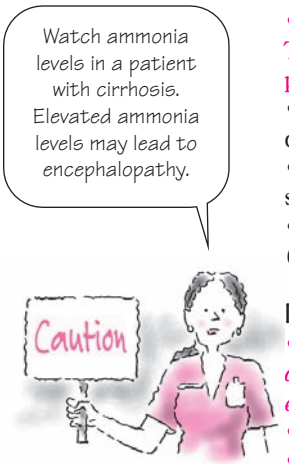


TREATMENT

- Blood transfusions, as indicated
- Fluid restriction (usually to 1,500 ml/day)
- Gastric intubation and esophageal balloon tamponade for bleeding esophageal varices (Sengstaken-Blakemore method, esophagogastric tube method, Minnesota tube method)
- I.V. therapy using colloid volume expanders or crystalloids
- Oxygen therapy (may require endotracheal (ET) intubation and mechanical ventilation)
- Paracentesis to reduce abdominal pressure from ascites
- Transjugular intrahepatic portal-systemic shunting performed by a radiologist as a last resort for patients with bleeding esophageal varices and portal hypertension (may help until liver transplantation is possible)
- Sclerotherapy, if the patient continues to experience repeated hemorrhagic episodes despite conservative treatment
- Sodium restriction (usually 500 mg/day)
- Low-protein diet
- Liver transplantation
- Total parenteral nutrition (TPN) may be necessary during the acute stages

Drug therapy

- Antiemetic: ondansetron (Zofran)
- Somastatin analog: octreotide (Sandostatin)
- Hemostatic: vasopressin (Pitressin) for esophageal varices
- Diuretics: furosemide (Lasix), spironolactone (Aldactone) for edema (diuretics require careful monitoring; fluid and electrolyte imbalance may precipitate hepatic encephalopathy)



• Vitamin K: phytonadione (AquaMEPHYTON) for bleeding tendencies due to hypoprothrombinemia
• Beta-adrenergic blocker: propranolol (Inderal) to decrease pressure from varices
• Laxative: lactulose (Cephulac) to reduce serum ammonia levels
• Bile acid sequestrant: cholestyramine (Questran) controls itching

INTERVENTIONS AND RATIONALES

• Check respiratory status frequently *because abdominal distention may interfere with lung expansion.*
• Position the patient *to facilitate breathing.*
• Check skin, gums, stool, and emesis regularly for bleeding *to recognize early signs of bleeding and prevent hemorrhage.*
• Warn the patient against taking aspirin, straining during defecation, and blowing his nose or sneezing too vigorously *to avoid bleeding.*
• Suggest using an electric razor and soft toothbrush. *These measures also prevent bleeding.*
• Observe the patient closely for signs of behavioral or personality changes—especially increased stupor, lethargy, hallucinations, and neuromuscular dysfunction. *Behavioral or personality changes may indicate increased ammonia levels.*
• Monitor ammonia levels. *Elevated levels may lead to encephalopathy.*
• Monitor for signs and symptoms of alcohol withdrawl *to ensure prompt treatment.*
• Monitor level of consciousness.
• Watch for asterixis, *a sign of developing hepatic encephalopathy.*
• Weigh the patient and measure his abdominal girth daily (at the level of the umbilicus), inspect the ankles and sacrum for dependent edema, and accurately record intake and output *to evaluate fluid retention.*
• Carefully evaluate the patient before, during, and after paracentesis *because this drastic loss of fluid may induce shock.*
• Avoid using soap when bathing the patient; instead, use lubricating lotion or moisturizing agents *to prevent skin breakdown associated with edema and pruritus.*
• Handle the patient gently, and turn and reposition often *to keep skin intact.*
• Encourage rest and good nutrition *to help the patient conserve energy and decrease metabolic demands on the liver.*
• Encourage frequent, small meals *to ensure nutritional needs are met.*

Teaching topics

• Avoiding infections and abstaining from alcohol
• Contacting Alcoholics Anonymous if appropriate
• Avoiding activities that increase intra-abdominal pressure, such as heavy lifting, vigorous coughing, and straining during a bowel movement

Colorectal cancer

Colorectal cancer is a malignant tumor of the colon or rectum. It may be primary or metastatic. It begins when unregulated cell growth and uncontrolled cell division develop into a neoplasm. Adenocarcinomas then infiltrate and cause obstruction, ulcerations, and hemorrhage.

CAUSES

• Aging
• Chronic constipation
• Chronic ulcerative colitis
• Diverticulosis
• Familial polyposis
• Low-fiber, high-fat diet

DATA COLLECTION FINDINGS

• Abdominal cramping
• Abdominal distention
• Anorexia
• Change in bowel habits and shape of stools
• Diarrhea and constipation
• Fecal oozing
• Melena
• Pallor
• Palpable mass
• Rectal bleeding
• Vomiting
• Weakness
• Weight loss

The lowdown on location

Surgery for colorectal cancer depends on the tumor location:

- **Cecum and ascending colon:** Surgery is a right hemicolectomy. This surgery may include resection of the terminal segment of the ileum, cecum, ascending colon, and right half of the transverse colon with corresponding mesentery.
- **Proximal and middle transverse colon:** Surgery is a right colectomy that includes the transverse colon and mesentery, or segmental resection of the transverse colon and associated midcolic vessels.
- **Sigmoid colon:** Surgery is limited to the sigmoid colon and mesentery.
- **Upper rectum:** Surgery is an anterior or low anterior resection.
- **Lower rectum:** Surgery is an abdominoperineal resection and permanent sigmoid colostomy.

DIAGNOSTIC FINDINGS

- Barium enema is used to locate the mass.
- Biopsy is positive for cancer cells.
- CEA test is positive.
- Colonoscopy is used to identify and locate the mass.
- Digital rectal examination reveals the mass.
- Fecal occult blood test is positive.
- Lower GI series shows mass location.
- Hematology shows decreased Hb level and HCT.
- Sigmoidoscopy is used to identify and locate the mass.

NURSING DIAGNOSES

- Anxiety
- Deficient fluid volume
- Acute pain

TREATMENT

- Radiation therapy to reduce tumor size
- Surgery depending on tumor location (see *The lowdown on location*)

Drug therapy

- Antiemetics: prochlorperazine (Compazine), ondansetron (Zofran)
- Antineoplastics: doxorubicin (Adriamycin), 5-fluorouracil (Adrucil)
- Folic acid derivative: leucovorin (Wellcovorin)
- Immunomodulator: levamisole (Ergamisol)

INTERVENTIONS AND RATIONALES

- Monitor GI status *to determine baseline and detect changes in patient's condition.*
- Monitor and record vital signs, intake and output, laboratory studies, and daily weight *to assess fluid and electrolyte status.*
- Monitor and record the color, consistency, amount, and frequency of stools *to detect early changes and bleeding.*
- Monitor for bleeding, infection, and electrolyte imbalance *to detect early changes and prevent complications.*
- Maintain the patient's diet *to meet metabolic needs and promote healing.*
- Keep the patient in semi-Fowler's position *to promote emptying of the GI tract.*
- Maintain TPN *to improve nutritional status when the patient is unable to consume adequate calories through the GI tract.*
- Administer postoperative care if indicated (monitor vital signs and intake and output; make sure the NG tube is kept patent; monitor dressings for drainage; apply a sequential compression device and maintain while on bedrest; evaluate wound for infection; assist with turning, coughing, deep breathing, and incentive spirometry; medicate for pain as necessary or guide the patient in use of patient-controlled analgesia) *to prevent complications and promote healing.*
- Encourage the patient to express feelings about changes in body image and a fear of dying and support coping mechanisms *to increase potential for further adaptive behavior.*
- Provide skin and mouth care *to maintain tissue integrity.*
- Provide rest periods *to promote healing and conserve energy.*

- Provide postchemotherapeutic and postradiation nursing care *to promote healing and prevent complications.*
- Monitor dietary intake *to determine nutritional adequacy.*
- Administer antiemetics and antidiarrheals, as prescribed, *to prevent further fluid loss.*

Teaching topics

- Performing ostomy self-care if indicated
- Monitoring changes in bowel elimination
- Self-monitoring for infection
- Alternating rest periods with activity
- Contacting the United Ostomy Association and the American Cancer Society
- Importance of follow-up care and future screening

Crohn's disease is a chronic disorder. Patient care involves long-term concerns such as reducing stress.

Crohn's disease

Crohn's disease is a chronic inflammatory disease of the small intestine, usually affecting the terminal ileum. It also sometimes affects the large intestine, usually in the ascending colon. It's slowly progressive with exacerbations and remissions.

CAUSES

- Emotional upsets
- Family history
- Immune factors
- Unknown

DATA COLLECTION FINDINGS

- Abdominal cramps and spasms after meals
- Chronic diarrhea with blood
- Fever
- Flatulence
- Nausea
- Pain in lower right quadrant
- Steatorrhea
- Weight loss

DIAGNOSTIC FINDINGS

- Abdominal X-ray shows congested, thickened, fibrosed, narrowed intestinal wall.
- Barium enema shows lesions in terminal ileum.
- Fecal fat test shows increased fat.
- Fecal occult blood test is positive.
- Proctosigmoidoscopy shows ulceration.
- Upper GI series shows classic string sign: segments of stricture separated by normal bowel.

NURSING DIAGNOSES

- Anxiety
- Diarrhea
- Imbalanced nutrition: Less than body requirements

TREATMENT

- Colectomy with ileostomy in many patients with extensive disease of the large intestine and rectum
- Small, frequent meals of a diet high in protein, calories, and carbohydrates and low in fat, fiber, and residue with bland foods and restricted intake of milk and gas-forming foods or no food or fluids
- TPN to rest the bowel

Drug therapy

- Analgesics: morphine, hydromorphone (Dilaudid)
- Antianemics: ferrous sulfate (Feosol), ferrous gluconate (Fergon)
- Antibiotics: sulfasalazine (Azulfidine), metronidazole (Flagyl)
- Anticholinergics: propantheline (ProBanthine), dicyclomine (Bentyl)
- Antidiarrheal: diphenoxylate (Lomotil)
- Antiemetic: prochlorperazine (Compazine)
- Anti-inflammatory: olsalazine (Dipentum)
- Corticosteroid: prednisone (Deltasone)
- Immunosuppressants: mercaptopurine (Purinethol), azathioprine (Imuran)
- Potassium supplements: potassium chloride (K-Lor) administered with food, potassium gluconate (Kaon)

INTERVENTIONS AND RATIONALES

- Monitor GI status (note excessive abdominal distention) and fluid balance *to determine baseline and detect changes in patient's condition.*
- Monitor and record vital signs and intake and output, daily weight, urine specific gravity, and fecal occult blood *to detect bleeding and dehydration.*
- Monitor the number, amount, and character of stools *to detect deterioration in GI status.*

• Maintain TPN *to rest the bowel and promote nutritional status.*
• Administer medications, as prescribed, *to maintain or improve patient's condition.*
• Maintain the patient's diet; withhold food and fluids as necessary *to minimize GI discomfort.*
• Minimize stress and encourage verbalization of feelings *to allay the patient's anxiety.*
• Provide skin and perianal care *to prevent skin breakdown.*
• If surgery is necessary, provide postoperative care (monitor vital signs; monitor dressings for drainage; apply a sequential compression device *to prevent blood clot formation* while on bed rest; monitor ileostomy drainage and perform ileostomy care as needed; evaluate the incision for signs of infection; assist with turning, coughing, deep breathing, and incentive spirometry; get the patient out of bed on the first postoperative day if stable) *to promote healing and prevent complications.*

Teaching topics
• Performing ileostomy self-care
• Avoiding laxatives and aspirin
• Performing perianal care daily
• Reducing stress
• Recognizing the signs and symptoms of rectal hemorrhage and intestinal obstruction

Diverticular disease

Diverticular disease has two clinical forms: diverticulosis and diverticulitis. Diverticulosis occurs when the intestinal mucosa protrudes through the muscular wall. The common sites for diverticula are in the descending and sigmoid colon, but they may develop anywhere from the proximal end of the pharynx to the anus.

Diverticulitis is an inflammation of the diverticula that may lead to infection, hemorrhage, or obstruction.

CAUSES
• Age (most common in people over age 40)
• Chronic constipation
• Congenital weakening of the intestinal wall
• Low intake of roughage and fiber
• Straining during defecation

DATA COLLECTION FINDINGS
• Anorexia
• Bloody stools
• Change in bowel habits
• Constipation and diarrhea
• Fever
• Flatulence
• Left lower quadrant pain or midabdominal pain that radiates to the back
• Nausea
• Rectal bleeding

DIAGNOSTIC FINDINGS
• Barium enema (contraindicated in acute diverticulitis) shows inflammation, narrow lumen of the bowel, and diverticula.
• Hematologic study shows increased WBC count and ESR.
• Sigmoidoscopy shows a thickened wall in the diverticula.

NURSING DIAGNOSES
• Constipation
• Diarrhea
• Acute pain

TREATMENT
• Generally no treatment for diverticulosis that produces no symptoms
• Colon resection (for diverticulitis refractory to medical treatment)
• Bland diet, stool softeners, and occasional doses of mineral oil for diverticulosis with pain, mild GI distress, constipation, or difficult defecation
• Diet: high fiber, low fat for diverticulosis after pain subsides, liquid for mild diverticulitis or diverticulosis before pain subsides
• Temporary colostomy possible for perforation, peritonitis, obstruction, or fistula that accompanies diverticulitis

Drug therapy
• Analgesic: morphine
• Antibiotics: metronidazole (Flagyl), ciprofloxacin (Cipro), co-trimoxazole (Bactrim) for mild diverticulitis
• Anticholinergic: propantheline (Pro-Banthine)
• Laxative: L psyllium (Metamucil)
• Stool softener: docusate sodium (Colace) for diverticulosis or mild diverticulitis

Stepping up

Caring for surgical wounds

WHY YOU DO IT

Proper care of surgical wounds helps prevent infection, protects the skin from maceration and excoriation, allows removal and measurement of wound drainage, and promotes comfort. When a surgical incision is closed, the incision is covered with a sterile dressing for 24 to 48 hours. After 48 hours, the incision can be covered by a dressing or left open to air.

HOW YOU DO IT

- Because many doctors prefer to change the first postoperative dressing, avoid changing it unless ordered. If you have no such order and drainage is seeping through the dressing, reinforce the dressing with fresh sterile gauze. To prevent bacterial growth, don't allow a reinforced dressing to remain in place longer than 24 hours. Replace any dressing that becomes wet from the outside as soon as possible.
- Check the doctor's order for wound care instructions.
- Explain the procedure to the patient.
- Position the patient as comfortably as possible, with the wound site exposed.
- Wash your hands.
- Put on a gown, if necessary, and gloves (clean gloves to remove the soiled dressings; sterile gloves to redress the incision).
- When the procedure is complete, document the appearance of the wound site and the color, consistency, amount, and odor of any drainage.

Removing the old dressing

- Hold the skin and pull the tape or dressing toward the wound. Remove the soiled dressing. If needed, loosen gauze with sterile normal saline solution.
- Check the dressing for the amount, type, color, and odor of drainage. Discard the dressing and gloves in a waterproof trash bag.

Caring for the wound or incision

- Establish a sterile field for equipment and supplies. If ointment is prescribed, squeeze the needed amount onto the sterile field. Put on sterile gloves.
- If you aren't using prepackaged swabs, saturate sterile gauze pads with the prescribed cleaning agent.
- Squeeze excess solution from the pad or swab. Wipe once from the top to the bottom of the incision and then discard the pad or swab. With a second pad, wipe from top to bottom in a vertical path next to the incision and then discard the pad.
- Continue to work outward from the incision in lines running parallel to it. Always wipe from the clean area toward the less-clean area. Use each pad or swab for only one stroke. Use sterile cotton-tipped applicators to clean tight-fitting wire sutures, deep wounds, or wounds with pockets.
- If the patient has a surgical drain, clean the drain's surface last. Clean the surrounding skin by wiping in half or full circles from the drain site outward.
- Clean at least 1″ (2.5 cm) beyond the new dressing or 2″ (5 cm) beyond the incision.
- Check for signs of infection, dehiscence, or evisceration. If you observe such signs or the patient reports pain, notify the doctor.
- Wash the surrounding skin with soap and water, and pat it dry. Apply prescribed topical medication and a skin protectant, if warranted.
- Pack open wounds with sterile moist gauze using the wet-to-damp method. Avoid using cotton-lined gauze pads.

Applying a fresh gauze dressing

- Place a sterile 4″ × 4″ gauze pad at the wound center, and move the pad outward to the edges of the wound site. Extend the gauze at least 1″ beyond the incision in each direction. Use enough sterile dressings to absorb all drainage until the next dressing change.
- Secure the dressing with strips of tape or Montgomery straps.

Dressing a wound with a drain

- Use a precut sterile 4″ × 4″ gauze pad.
- Place the pad close to the skin around the drain so that the tubing fits into the slit. Press a second pad around the drain from the opposite direction to encircle the tubing.
- Layer as many uncut sterile pads around the tubing as needed to absorb drainage. Secure the dressing with tape or Montgomery straps.

Pouching a wound

- To create a pouch, measure the wound and then cut an opening in the collection pouch facing that's ⅛″ (0.3 cm) larger than the wound.
- Make sure the surrounding skin is clean and dry, and then apply a skin protectant.
- Make sure the drainage port at the bottom of the pouch is closed. Then press the contoured pouch opening around the wound, beginning at its lower edge.
- To empty the pouch, put on gloves, insert bottom half of the pouch into a graduated container, and open the drainage port.
- Wipe the bottom of the pouch and the drainage port with a sterile gauze pad; then reseal the port. Change the pouch if it leaks or becomes loose.

INTERVENTIONS AND RATIONALES

- Monitor abdominal distention and bowel sounds *to determine baseline and detect changes in the patient's condition.*
- Monitor and record vital signs, intake and output, and laboratory studies *to evaluate fluid status.*
- Monitor stools for occult blood *to detect bleeding.*
- Maintain the patient's diet *to improve nutritional status and promote healing.*
- Maintain position, patency, and low suction of NG tube *to prevent nausea and vomiting.*
- Place the patient in semi-Fowler's position *to promote comfort and GI emptying.*
- Prepare the patient for surgery, if necessary (administer cleansing enemas, osmotic purgative, and oral and parenteral antibiotics), *to avoid wound contamination from bowel contents during surgery.*
- Provide postoperative care (watch for signs of infection; perform meticulous wound care; watch for signs of postoperative bleeding; apply sequential compression device while the patient is on bedrest; assist with turning, coughing, deep breathing, and incentive spirometry; teach ostomy self-care) to promote healing and prevent complications. (See *Caring for surgical wounds.*)
- Maintain TPN *to improve nutritional status when the patient is unable to receive nutrition through the GI tract.*
- Administer medications as prescribed *to maintain or improve the patient's condition.*

Teaching topics

- Decreasing constipation
- Following dietary recommendations and restrictions
- Monitoring stools for bleeding

Esophageal cancer

Esophageal cancer attacks the esophagus, the muscular tube that runs from the back of the throat to the stomach. Cells in the lining of the esophagus start to multiply rapidly and form a tumor that may spread to other parts of the body.

Nearly always fatal, esophageal cancer usually develops in men over age 60. This disease occurs worldwide, but incidence varies geographically. It's most common in Japan, China, the Middle East, and parts of South Africa.

CONTRIBUTING FACTORS

- Excessive use of alcohol
- Nutritional deficiency
- Reflux esophagitis
- Smoking

DATA COLLECTION FINDINGS

- Dysphagia
- Substernal pain
- Weight loss

DIAGNOSTIC FINDINGS

- Endoscopic examination of the esophagus, punch and brush biopsies, and an exfoliative cytologic test confirm esophageal tumors.
- X-rays of the esophagus, with barium swallow and motility studies, reveal structural and filling defects and reduced peristalsis.

NURSING DIAGNOSES

- Imbalanced nutrition: Less than body requirements
- Impaired swallowing
- Risk for aspiration

TREATMENT

- Endoscopic laser treatment and bipolar electrocoagulation can help restore swallowing by vaporizing cancerous tissue
- Esophageal dilation
- Gastrostomy or jejunostomy to help provide adequate nutrition
- Radiation therapy
- Radical surgery to excise the tumor and resect either the esophagus alone or the stomach and the esophagus

Drug therapy

- Antineoplastics: fluorouracil (5-FU), cisplatin (Platinol)
- Analgesics: morphine (MS Contin), fentanyl (Duragesic-25)

INTERVENTIONS AND RATIONALES

- Before surgery, answer the patient's questions and let him know what to expect after surgery (gastrostomy tubes, closed chest drainage, NG suctioning) *to allay anxiety.*

Stepping up

Delivering a gastric feeding

WHY YOU DO IT

Gastric tube feedings involve delivery of a liquid feeding formula directly to the stomach (known as *gastric gavage*). Tube feedings may also be delivered to the duodenum or jejunum. Gastric gavage is typically indicated for a patient who can't eat normally due to dysphagia or oral or esophageal obstruction or injury. Gastric feedings may also be given to an unconscious or intubated patient or to a patient recovering from GI tract surgery who can't ingest food orally.

HOW YOU DO IT

- Explain the procedure to the patient.
- Place the patient in semi-Fowler's or high Fowler's position (if possible).
- If the patient has a nasal or oral tube, cover his chest with a towel or linen-saver pad to protect him and the bed linens from spills.
- Check the patient's abdomen for bowel sounds and distention.
- Check placement of the feeding tube to ensure that it hasn't slipped out since the last feeding. *Never give a tube feeding until you're certain the tube is properly positioned in the patient's stomach.*
- To check tube patency and position, remove the cap or plug from the feeding tube and use a bulb or piston syringe to aspirate stomach contents and check the pH. The pH of stomach contents should be less than or equal to 5. The color of the aspirate should be green or brown with mucous.
- To check gastric emptying, aspirate and measure residual gastric contents. Hold feedings if residual volume is greater then the amount specified in the doctor's order (usually 50 to 100 ml). Reinstill any aspirate obtained.
- Connect the gavage bag tubing to the feeding tube.
- If you're using a bulb or piston syringe, remove the bulb or plunger and attach the syringe to the pinched-off feeding tube to prevent excess air from entering the patient's stomach, which causes distention. If you're using an infusion pump, thread the tube from the formula container through the infusion pump, according to the manufacturer's directions. Purge the tubing of air, and attach it to the feeding tube.
- Open the flow regulator clamp on the gavage bag tubing, and adjust the flow rate as appropriate. When using a bulb syringe, fill the syringe with formula and release the feeding tube to allow formula to flow through it. The height at which you hold the syringe determines the flow rate. When the syringe is three-quarters empty, pour more formula into it.
- To prevent air from entering the tube and the patient's stomach, never allow the syringe to empty completely. If you're using an infusion pump, set the flow rate according to the manufacturer's directions. Always administer a tube feeding slowly—typically 200 to 350 ml over 15 to 30 minutes, depending on the patient's tolerance and the doctor's order—to prevent sudden stomach distention, which can cause nausea, vomiting, cramps, and diarrhea.
- After administering the appropriate amount of formula, flush the tubing by adding about 60 ml of water to the gavage bag or bulb syringe, or manually flush it using a barrel syringe. This maintains the tube's patency by removing excess formula, which could occlude the tube.
- If you're administering a continuous feeding, flush the feeding tube every 4 hours to help prevent tube occlusion. Monitor gastric emptying every 4 hours.
- To discontinue gastric feeding (depending on the equipment you're using), close the regulator clamp on the gavage bag tubing, disconnect the syringe from the feeding tube, or turn off the infusion pump.
- Cover the end of the feeding tube with its plug or cap to prevent leakage and contamination.
- Leave the patient in semi-Fowler's or high Fowler's position for at least 30 minutes.
- On the intake and output sheet, record the date, volume of formula, and volume of water. In your notes, document abdominal assessment findings (including tube exit site, if appropriate); amount of residual gastric contents; verification of tube placement; amount, type, and time of feeding; and tube patency. Discuss the patient's tolerance of the feeding, including nausea, vomiting, cramping, diarrhea, and distention.

- After surgery, monitor vital signs and watch for unexpected changes *to detect early signs of complications and avoid treatment delay.*
- If surgery included an esophageal anastomosis, keep the patient flat on his back *to avoid tension on the suture line.*
- Promote adequate nutrition, and evaluate the patient's nutritional and hydration status *to determine the need for supplementary parenteral feedings.*
- Place the patient in Fowler's position for meals and allow plenty of time to eat *to avoid aspiration of food.*
- Assist with incentive spirometry hourly during the waking hours *to prevent atelectasis.*
- Apply a sequential compression device while patient is on bedrest *to prevent thrombus formation.*
- Provide high-calorie, high-protein, pureed food as needed *to meet increased metabolic demands and prevent aspiration.*
- If the patient has a gastrostomy tube, give food slowly, using gravity to adjust the flow rate *to prevent abdominal discomfort.*
- Offer him something to chew before each feeding *to promote gastric secretions and a semblance of normal eating.* (See *Delivering a gastric feeding.*)
- Instruct the family in gastrostomy tube care (checking tube patency before each feeding, providing skin care around the tube, and keeping the patient upright during and after feedings) *to avoid complications.*
- Provide emotional support for the patient and his family *to help them cope with terminal illness.*

Teaching topics

- Caring for the gastrostomy tube
- Contacting the American Cancer Society

Gastric cancer

Gastric cancer involves a malignant stomach tumor. It may be primary or metastatic. Its precise cause is unknown, but it's commonly associated with gastritis, gastric atrophy, and other conditions. About one-half of gastric cancers occur in the pyloric area of the stomach.

CONTRIBUTING FACTORS

- Achlorhydria
- Chronic gastritis
- *Helicobacter pylori* infection
- High intake of salted and smoked foods
- Low intake of vegetables and fruits
- Peptic ulcer
- Pernicious anemia

DATA COLLECTION FINDINGS

- Anorexia
- Epigastric fullness and pain
- Fatigue
- Hematemesis
- Indigestion
- Malaise
- Melena
- Nausea and vomiting
- Pain after eating that isn't relieved by antacids
- Regurgitation
- Rigid abdomen
- Shortness of breath
- Syncope
- Weakness
- Weight loss

DIAGNOSTIC FINDINGS

- CEA test is positive.
- Fecal occult blood test is positive.
- Gastric analysis shows positive cancer cells and achlorhydria.
- Gastroscopy biopsy is positive for cancer cells.
- Upper GI series reveals a gastric mass.
- Hematology shows decreased Hb level and HCT.
- Gastric hydrochloric acid level is decreased.

NURSING DIAGNOSES

- Anxiety
- Imbalanced nutrition: less than body requirements
- Risk for deficient fluid volume

TREATMENT

- Gastric surgery: gastroduodenostomy, gastrojejunostomy, partial gastric resection, total gastrectomy
- TPN
- High-calorie diet
- Radiation therapy

Drug therapy

- Analgesics: morphine, hydromorphone (Dilaudid)
- Antiemetics: prochlorperazine (Compazine), metoclopramide (Reglan)
- Antineoplastics: carmustine (BiCNU), 5-fluorouracil (Adrucil)
- Vitamin supplements: folic acid (Folvite), cyanocobalamin (vitamin B_{12}) for patients who have undergone total gastrectomy

INTERVENTIONS AND RATIONALES

- Monitor GI status postoperatively *to monitor the patient for dumping syndrome (weakness, nausea, flatulence, and palpitations 30 minutes after a meal).*
- Monitor and record vital signs, intake and output, laboratory studies, and daily weight *to determine baseline and early changes in condition.*
- Monitor the consistency, amount, and frequency of stools *to detect GI compromise.*
- Monitor the color of stools *to detect bleeding and prevent hemorrhage.*
- Maintain the patient's diet *to promote nutritional balance.*
- Maintain the position, patency, and low suction of NG tube (without irrigating or repositioning the NG tube because it may put pressure on the suture line) *to prevent complications, nausea, and vomiting.*
- Maintain TPN for 1 week or longer if gastric surgery is extensive *to meet metabolic needs and promote wound healing.*
- Administer medications, as prescribed, *to maintain or improve the patient's condition.*
- Support patient coping mechanisms *to increase the potential for adaptive behavior.*
- Provide skin and mouth care *to prevent skin breakdown and damage to the oral mucosa and to improve nutritional intake.*
- Provide rest periods *to conserve energy.*

Teaching topics

- Avoiding exposure to people with infections
- Alternating rest periods with activity
- Monitoring temperature
- Recognizing the signs and symptoms of wound infection
- Recognizing the signs and symptoms of ulceration
- Completing skin care daily
- Contacting the American Cancer Society

Gastritis

Gastritis is an inflammation of the gastric mucosa (the stomach lining). It may be acute or chronic:

- Acute gastritis produces mucosal reddening, edema, hemorrhage, and erosion.
- Chronic gastritis is common among elderly people and people with pernicious anemia. In chronic atrophic gastritis, all stomach mucosal layers are inflamed.

CAUSES

Acute gastritis

- Chronic ingestion of irritating foods, spicy foods, or alcohol
- Drugs, such as aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDs) (in large doses), cytotoxic agents, caffeine, corticosteroids, antimetabolites, phenylbutazone, and indomethacin
- Endotoxins released from infecting bacteria, such as staphylococci, *Escherichia coli,* and *Salmonella*
- *Helicobacter pylori* infection
- Ingestion of poisons, especially DDT, ammonia, mercury, carbon tetrachloride, and corrosive substances

Chronic gastritis

- Alcohol ingestion
- Cigarette smoke
- Environmental irritants
- Peptic ulcer disease

DATA COLLECTION FINDINGS

- Abdominal cramping
- Epigastric discomfort

• Hematemesis
• Indigestion

DIAGNOSTIC FINDINGS

• Occult blood test shows occult blood in vomitus and stools if the patient has gastric bleeding.
• Blood studies show low Hb level and HCT when significant bleeding has occurred.
• Upper GI endoscopy with biopsy results confirm the diagnosis when performed within 24 hours of bleeding.
• Upper GI series may be performed to exclude serious lesions.

NURSING DIAGNOSES

• Risk for deficient fluid volume
• Imbalanced nutrition: Less than body requirements
• Acute or chronic pain (depending on the type of gastritis)

TREATMENT

• Angiography with vasopressin infused in normal saline solution (when gastritis causes massive bleeding)
• Blood transfusion, if indicated
• I.V. fluid therapy
• NG lavage to control bleeding
• Oxygen therapy, if necessary
• Partial or total gastrectomy (rare)
• Vagotomy and pyloroplasty (limited success when conservative treatments have failed)

Drug therapy

• Antacids: calcium carbonate (Maalox), aluminum hydroxide (AlternaGEL)
• Antibiotics according to sensitivity of infecting organism (if the cause is bacterial)
• Antidote according to the ingested poison (if the cause is poisoning)
• Antiemetics: prochlorperazine (Compazine), ondansetron (Zofran)
• Histamine$_2$-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)

INTERVENTIONS AND RATIONALES

• If the patient is vomiting, give an antiemetic and I.V. fluid *to prevent dehydration and electrolyte imbalance.*
• Monitor fluid intake and output and electrolyte levels *to detect early signs of dehydration and electrolyte loss.*
• Provide a bland diet *to prevent recurrence.*
• Monitor the patient for recurrent symptoms as food is reintroduced *to detect early signs of intolerance.*
• Offer smaller, more frequent meals *to reduce irritating gastric secretions.*
• Eliminate foods that cause gastric upset *to prevent gastric irritation.*
• If surgery is necessary, prepare the patient preoperatively and provide appropriate postoperative care *to decrease preoperative anxiety and prevent intraoperative and postoperative complications.*
• Administer antacids and other prescribed medications *to promote gastric healing.*
• Urge the patient to seek immediate attention for recurring symptoms, such as hematemesis, nausea, and vomiting *to prevent complications such as GI hemorrhage.*
• Urge the patient to take prophylactic medications as prescribed *to prevent recurring symptoms.*
• Provide emotional support to the patient *to help him manage his symptoms.*

Teaching topics

• Taking an antacid between meals and at bedtime and avoiding aspirin-containing compounds
• Taking steroid medication with milk, food, or an antacid
• Counseling for smoking cessation
• Avoiding spicy foods and foods and beverages containing caffeine

Gastroenteritis

Gastroenteritis is an irritation and inflammation of the digestive tract characterized by diarrhea, nausea, vomiting, and abdominal cramping. It occurs in all age-groups and is usually self-limiting in adults.

It can be life-threatening in young children, elderly, and debilitated persons. It's a major cause of morbidity and mortality in developing nations.

This disorder is also called *intestinal flu, traveler's diarrhea, viral enteritis,* and *food poisoning.*

CAUSES

- Amoebae, especially *Entamoeba histolytica*
- Bacteria (responsible for acute food poisoning): *Staphylococcus aureus, Salmonella, Shigella, Clostridium botulinum, Escherichia coli, Clostridium perfringens*
- Drug reactions (especially antibiotics)
- Enzyme deficiencies
- Food allergens
- Ingestion of toxins: plants or toadstools (mushrooms)
- Parasites: *Ascaris, Enterobius*, *Trichinella spiralis*
- Viruses (may be responsible for traveler's diarrhea): adenovirus, echovirus, or coxsackievirus

DATA COLLECTION FINDINGS

- Abdominal discomfort
- Diarrhea
- Nausea and vomiting

DIAGNOSTIC FINDINGS

- Stool culture identifies causative bacteria, parasites, or amoebae.
- Blood culture identifies causative organism.

NURSING DIAGNOSES

- Diarrhea
- Risk for deficient fluid volume
- Acute pain

TREATMENT

- Increased fluid intake
- I.V. fluid and electrolyte replacement
- Nutritional support

Drug therapy

- Antibiotic therapy according to the sensitivity of the causative organism
- Antidiarrheals: camphorated opium tincture (Paregoric), diphenoxylate with atropine (Lomotil), loperamide (Imodium)
- Antiemetics: prochlorperazine (Compazine), trimethobenzamide (Tigan) (These medications should be avoided in patients with viral or bacterial gastroenteritis.)

INTERVENTIONS AND RATIONALES

- Administer medications; correlate dosages, routes, and times appropriately with the patient's meals and activities; for example, give antiemetics 30 to 60 minutes before meals *to prevent the onset of symptoms.*
- If the patient is unable to tolerate food, replace lost fluids and electrolytes with clear liquids and sport drinks *to prevent dehydration.*
- Vary the patient's diet *to make it more enjoyable and allow some choice of foods.*
- Instruct the patient to avoid milk and milk products, *which may exacerbate the condition.*
- Record strict intake and output. Watch for signs of dehydration, such as dry skin and mucous membranes, fever, and sunken eyes, *to prevent complications of dehydration.*
- Wash your hands thoroughly after giving care *to avoid spread of infection.*
- Instruct the patient to perform warm sitz baths three times per day *to relieve anal irritation.*
- Maintain contact precautions as indicated *to prevent the spread of infection.*

Teaching topics

- Cleaning utensils thoroughly; avoiding drinking water or eating raw fruit or vegetables when visiting a foreign country; eliminating flies and roaches in the home
- Thoroughly cooking foods, especially pork; refrigerating perishable foods
- Washing hands with warm water and soap before handling food, especially after using the bathroom

Gastroesophageal reflux disease

GERD refers to the esophageal irritation caused by backflow, or reflux, of gastric and duodenal contents past the lower esophageal sphincter and into the esophagus. Reflux may or may not cause symptoms or pathologic changes. The prognosis varies with the underlying cause.

CAUSES AND CONTRIBUTING FACTORS

- Any action that decreases lower esophageal sphincter pressure, such as smoking ciga-

rettes and ingesting food, alcohol, anticholinergics (atropine, belladonna, propantheline), and other drugs (morphine, diazepam, meperidine)
• Any condition or position that increases intra-abdominal pressure
• Hiatal hernia (especially in children)
• Long-term NG intubation (more than 5 days)
• Pressure within the stomach that exceeds lower esophageal sphincter pressure
• Pyloric surgery (alteration or removal of the pylorus), which allows reflux of bile or pancreatic juice

DATA COLLECTION FINDINGS
• Dysphagia
• Heartburn (burning sensation in the upper abdomen)

Atypical symptoms
• Asthma
• Atypical chest pain
• Chronic cough
• Laryngitis
• Sore throat

DIAGNOSTIC FINDINGS
• Barium swallow fluoroscopy indicates reflux.
• Esophageal pH probe reveals a low pH, which indicates reflux.
• Esophagoscopy shows reflux.
• Acid perfusion (Bernstein) test shows that reflux is the cause of symptoms.
• Endoscopy allows visualization and confirmation of pathologic changes in the mucosa.
• Biopsy allows visualization and confirmation of pathologic changes in the mucosa.

NURSING DIAGNOSES
• Risk for aspiration
• Chronic pain
• Deficient knowledge (disease process and treatment plan)

TREATMENT
• Diet: low fat, high fiber with no caffeine or carbonated beverages
• Oxygen therapy
• Positional therapy to help relieve symptoms by decreasing intra-abdominal pressure
• Surgery: fundoplication (the fundus of the stomach is sutured in place around the lower esophagus)

Drug therapy
• Antacid: aluminum hydroxide, magnesium hydroxide (Mylanta)
• GI stimulants: metoclopramide (Reglan), bethanechol (Urecholine)
• Histamine$_2$-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)
• Proton pump inhibitors: esomeprazole (Nexium), lansoprazole (Prevacid)

INTERVENTIONS AND RATIONALES
• Develop a diet that takes food preferences into account while helping to minimize reflux symptoms *to ensure compliance.*
• Have the patient sleep in reverse Trendelenburg's position (with the head of the bed elevated 6″ to 12″ [15 to 30 cm]) *to reduce intra-abdominal pressure.*
• After surgery, evaluate the incisions for signs of drainage, assist with turning, coughing, deep breathing, and incentive spirometry. Apply a sequential compression device *to prevent thrombus formation while on bedrest.*
• If needed, perform chest physiotherapy and administer oxygen *to mobilize secretions and prevent hypoxemia.*
• Place the patient with an NG tube in semi-Fowler's position *to help prevent reflux.*
• Offer reassurance and emotional support *to help the patient cope with pain and discomfort.*

Teaching topics
• Avoiding reflux through diet and lifestyle changes

Hepatitis

Hepatitis is an inflammation of liver tissue that causes inflammation of hepatic cells, hypertrophy and proliferation of Kupffer's cells, and bile stasis. Hepatitis is typically caused by one of five viruses: hepatitis A, B, C, D, or E.

CAUSES
• Hepatitis A: contaminated food, milk, water, feces (most commonly foodborne)

Recognizing fulminant hepatitis

A rare but severe form of hepatitis, fulminant hepatitis rapidly causes massive liver necrosis. It usually occurs in patients with hepatitis B, D, or E. Although mortality is extremely high (more than 80% of patients lapse into deep coma), patients who survive may recover completely.

DATA COLLECTION

In a patient with viral hepatitis, suspect fulminant hepatitis if you detect:

- confusion
- somnolence
- ascites
- edema
- rapidly increasing bilirubin level
- markedly prolonged prothrombin time
- elevated ammonia level

As the disease progresses quickly to the terminal phase, the patient may experience cerebral edema, brain stem compression, GI bleeding, sepsis, respiratory failure, cardiovascular collapse, and renal failure.

EMERGENCY ACTIONS

If you suspect fulminant hepatitis, you should:

- notify the physician immediately
- provide supportive care, such as maintaining fluid volume, supporting ventilation through mechanical means, controlling bleeding, and correcting hypoglycemia
- restrict protein intake
- expect to administer oral lactulose or neomycin and, possibly, massive doses of glucocorticoids
- prepare the patient for a liver transplant if necessary and if the patient meets the criteria.

- Hepatitis B: parenteral (needle sticks), blood, sexual contact, secretions
- Hepatitis C: blood or serum (blood transfusion, exposure to contaminated blood), sexual contact, body piercing, tatoos
- Hepatitis D: similar to causes of type B virus
- Hepatitis E: fecal-oral route

DATA COLLECTION FINDINGS

Findings are consistent for the different types of hepatitis, but signs and symptoms progress over several stages.

During preicteric phase (usually 1 to 5 days)

- Anorexia
- Arthralgia
- Clay-colored stool (at end of preicteric phase)
- Constipation and diarrhea
- Fatigue
- Fever
- Headache
- Hepatomegaly
- Malaise
- Nasal discharge
- Nausea and vomiting
- Pharyngitis
- Pruritus
- Right upper quadrant pain
- Splenomegaly
- Weight loss

During icteric phase (usually 1 to 2 weeks)

- Clay-colored stools
- Dark urine
- Fatigue
- Hepatomegaly
- Jaundice
- Pruritus
- Splenomegaly
- Weight loss

During posticteric or recovery phase (usually 2 to 12 weeks, sometimes longer in patients with hepatitis B, C, or E)

- Decreased hepatomegaly
- Decreased jaundice
- Fatigue
- Improved appetite

DIAGNOSTIC FINDINGS

- Blood chemistry shows increased ALT, AST, alkaline phosphatase, LD, bilirubin, and ESR.
- Serologic tests identify hepatitis A virus (HAV), HBV, HCV, and delta antigen, if present.
- Coagulation studies show increased PT.
- Stool specimen reveals HAV (in hepatitis A cases).
- Urine chemistry shows increased urobilinogen.

NURSING DIAGNOSES
- Deficient fluid volume
- Chronic pain
- Imbalanced nutrition: Less than body requirements

TREATMENT
- High-calorie, high-carbohydrate, moderate-protein, low-fat diet in small, frequent meals

Drug therapy
- Antiemetic: prochlorperazine (Compazine)
- Vitamins and minerals: vitamin K (AquaMEPHYTON), vitamin C (ascorbic acid), vitamin B complex (mega-B)
- Antipyretics: ibuprofen (Motrin)
- Interferon: alfacon-1 (Infergen) (for hepatitis C)

INTERVENTIONS AND RATIONALES
- Monitor GI status and watch for bleeding and fulminant hepatitis *to detect early complications.* (See *Recognizing fulminant hepatitis.*)
- Maintain the patient's diet *to meet his metabolic needs.*
- Monitor and record vital signs, intake and output, and laboratory studies *to detect early signs of fluid volume deficit.*
- Administer medications, as prescribed, *to maintain or improve the patient's condition.*
- Maintain standard precautions *to prevent the spread of pathogens to others.* (See *Standard precautions.*)
- Provide rest periods *to conserve patient energy and reduce metabolic demands.*
- Encourage small, frequent meals *to improve the patient's nutritional status.*
- Change the patient's position every 2 hours *to reduce the risk of skin breakdown.*
- Monitor for signs of bleeding *to prevent hemorrhage.*

Teaching topics
- Avoiding exposure to people with infections
- Avoiding alcohol
- Maintaining good personal hygiene
- Refraining from donating blood
- Increasing fluid intake to 3,000 ml/day (approximately 12 8-oz glasses)
- Abstaining from sexual intercourse until serum liver studies are within normal limits

Hiatal hernia

A hiatal hernia is a defect in the diaphragm that permits a portion of the stomach to pass through the diaphragmatic opening into the chest.

Standard precautions

Standard precautions apply to blood; all body fluids, secretions, and excretions except sweat, regardless of whether they contain visible blood; nonintact skin; and mucous membranes.

HAND WASHING
Wash hands after touching blood, body fluids, secretions, excretions, and contaminated items, whether or not gloves are worn. Wash hands immediately after gloves are removed, between patient contacts, and when otherwise indicated to avoid transfer of microorganisms to other patients or environments. It may be necessary to wash hands between tasks and procedures on the same patient to prevent cross-contamination to different body sites.

GLOVES
Wear gloves when in contact with blood, body fluids, secretions, excretions, or contaminated items. Put on clean gloves just before touching mucous membranes and nonintact skin. Remove gloves promptly after use and wash hands.

MASK, EYE PROTECTION, AND FACE SHIELD
Wear a mask, eye protection, and a face shield to protect the mucous membranes of your eyes, nose, and mouth during procedures and patient care activities that are likely to generate splashes of blood, body fluids, secretions, or excretions.

GOWN
Wear a gown to protect skin and prevent soiling of clothing during procedures and patient care activities that are likely to generate splashes of blood, body fluids, secretions, or excretions.

CAUSES
- Aging
- Congenital weakness
- Increased abdominal pressure
- Obesity
- Pregnancy
- Trauma
- Unknown

DATA COLLECTION FINDINGS
- Cough
- Dysphagia
- Dyspnea
- Feeling of fullness
- Pyrosis
- Regurgitation
- Sternal pain after eating
- Tachycardia
- Vomiting

DIAGNOSTIC FINDINGS
- Barium swallow reveals protrusion of the hernia.
- Chest X-ray shows protrusion of abdominal organs into the thorax.
- Esophagoscopy shows incompetent cardiac sphincter.

NURSING DIAGNOSES
- Anxiety
- Imbalanced nutrition: Less than body requirements
- Chronic pain

TREATMENT
- Antireflux surgical repair, if complications develop
- Bland diet in small, frequent meals, with decreased intake of caffeine and spicy foods
- Weight loss, if necessary

Drug therapy
- Anticholinergic: propantheline (Pro-Banthine)
- Histamine$_2$-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid)
- GI stimulant: metoclopramide (Reglan)

INTERVENTIONS AND RATIONALES
- Monitor respiratory status *to detect early signs of respiratory distress.*
- Monitor and record vital signs, intake and output, and daily weight *to determine baseline and detect early signs of nutritional deficit.*
- Administer oxygen *to help relieve respiratory distress.*
- Avoid flexion at the waist in positioning the patient *to promote comfort.*
- Maintain the patient's diet *to maintain and improve nutritional status.*
- Maintain position, patency, and low suction of NG tube *to prevent nausea and vomiting.*
- Place the patient in semi-Fowler's position *to promote comfort.*
- Administer medications, as prescribed, *to improve GI function.*

Teaching topics
- Eating small, frequent meals slowly
- Avoiding carbonated beverages and alcohol
- Remaining upright for 2 hours after eating
- Avoiding constrictive clothing
- Avoiding lifting, bending, straining, and coughing
- Sleeping with upper body elevated to reduce gastric reflux

Intestinal obstruction

An intestinal obstruction occurs when the intestinal lumen becomes blocked, causing gas, fluid, and digested substances to accumulate near the obstruction and increasing peristalsis in the area of the obstruction. Water and electrolytes are then secreted into the blocked bowel, causing inflammation and inhibiting absorption.

CAUSES
- Adhesions
- Diverticulitis
- Fecal impaction
- Hernias
- Inflammation (Crohn's disease)
- Intussusception
- Mesenteric thrombosis
- Paralytic ileus
- Tumors
- Volvulus

DATA COLLECTION FINDINGS
- Abdominal distention
- Constipation
- Cramping pain
- Diminished or absent bowel sounds
- Fever
- Nausea
- Vomiting fecal material
- Weight loss

DIAGNOSTIC FINDINGS
- Abdominal ultrasound shows distended bowel.
- Abdominal X-ray shows increased amount of gas in bowel.
- Barium enema stops at obstruction.
- Blood chemistry shows decreased sodium and potassium levels.
- Hematologic study shows increased WBC count.

NURSING DIAGNOSES
- Ineffective tissue perfusion: GI
- Imbalanced nutrition: Less than body requirements
- Acute pain

TREATMENT
- Bowel resection with or without anastomosis if other treatment fails
- GI decompression using NG tube, Miller-Abbott tube, or Cantor tube
- Withholding food and fluids
- Fluid and electrolyte replacement

Drug therapy
- Analgesic: morphine
- Antibiotic: gentamicin (Garamycin)

INTERVENTIONS AND RATIONALES
- Monitor GI status and record bowel sounds once per shift *to determine GI status.*
- Monitor and record vital signs, intake and output, and laboratory studies *to detect early signs of fluid volume deficit.*
- Withhold food and fluids *to prevent nausea and vomiting.*
- Monitor and record the frequency, color, and amount of stools *to determine nutritional status.*
- Measure and record the patient's abdominal girth *to determine the presence of distention.*
- Maintain I.V. fluids *to maintain hydration.*
- Maintain position, patency, and low intermittent suction of NG tube and Miller-Abbott tube *to prevent nausea and vomiting and resolve the obstruction if possible.*
- Place the patient in semi-Fowler's position *to promote comfort.*
- Administer postoperative care if indicated (monitor vital signs and intake and output; make sure NG tube is kept patent; monitor dressings for drainage; evaluate wound for infection; assist with turning, coughing, deep breathing, and incentive spirometry; apply a sequential compression device while the patient is on bedrest *to prevent blood clot formation.*
- Medicate for pain as necessary or guide the patient with use of postoperative patient-controlled analgesia) *to promote healing and detect early postoperative complications.*
- Administer medications as prescribed *to maintain or improve the patient's condition.*

Withhold food and fluids from the patient with intestinal obstruction.

Teaching topics
- Avoiding constipation-causing foods
- Monitoring the frequency and color of stools
- Recognizing the signs and symptoms of diverticulitis
- Contacting the American Ostomy Association, if appropriate

One good reason not to get stressed out about the NCLEX: Stress contributes to the development of irritable bowel syndrome.

Irritable bowel syndrome

Irritable bowel syndrome is marked by chronic signs and symptoms of abdominal pain, alternating constipation and diarrhea, and abdominal distention. This disorder is common; a substantial portion of patients, however, never seek medical attention.

This disorder may also be referred to as *spastic colon* or *spastic colitis.*

CAUSES AND CONTRIBUTING FACTORS
- Diverticular disease
- Family history
- Irritants (caffeine, alcohol)
- Smoking
- Stress

DATA COLLECTION FINDINGS
- Abdominal bloating
- Constipation, diarrhea, or both
- Dyspepsia
- Faintness
- Heartburn
- Lower abdominal pain
- Passage of mucus
- Pasty, pencil-like stools
- Weakness

DIAGNOSTIC FINDINGS
- Barium enema may reveal colonic spasm and tubular appearance of the descending colon. It also rules out certain other disorders, such as diverticula, tumors, and polyps.
- Manometry reveals changes in interluminal pressure.
- Sigmoidoscopy may disclose spastic contractions.
- Stool examination for occult blood, parasites, and pathogenic bacteria is negative.

NURSING DIAGNOSES
- Constipation
- Diarrhea
- Chronic pain

TREATMENT
- Elimination diet to determine if symptoms result from food intolerance (In this type of diet, certain foods, such as citrus fruits, coffee, corn, dairy products, tea, and wheat, are sequentially eliminated, and then each food is gradually reintroduced to identify which foods, if any, trigger the patient's symptoms.)
- Diet containing 15 to 20 g daily of bulky foods, such as wheat bran, oatmeal, oat bran, rye cereals, prunes, dried apricots, and figs (if the patient has constipation and abdominal pain); avoiding high-fat foods
- Increasing fluid intake to at least eight 8-oz glasses per day
- Stress management

Drug therapy
- Sedatives: alprazolam (Xanax), lorazepam (Ativan)
- Antiflatulent: simethicone (Mylicon)
- Antispasmodic: propantheline (Pro-Banthine)
- Antidiarrheal: diphenoxylate with atropine (Lomotil)
- Corticosteroid: hydrocortisone (Solu-Cortef)

INTERVENTIONS AND RATIONALES
- Help the patient deal with stress, and warn against dependence on sedatives or antispasmodics *because stress may be the underlying cause of irritable bowel syndrome.*
- Encourage regular checkups. For patients over age 40, emphasize the need for a yearly flexible sigmoidoscopy and rectal examination. *Irritable bowel syndrome is associated with a higher-than-normal incidence of diverticulitis and colon cancer.*

Teaching topics
- Avoiding alcohol
- Avoiding irritating foods
- Managing stress
- Smoking cessation (smoking can increase GI motility)
- Planning diet and increasing water intake

Pancreatitis

Pancreatitis is the inflammation of the pancreas. With acute pancreatitis, pancreatic enzymes are activated in the pancreas rather than the duodenum, resulting in tissue damage and autodigestion of the pancreas.

With chronic pancreatitis, chronic inflammation results in fibrosis and calcification of the pancreas, obstruction of the ducts, and destruction of the secreting acinar cells.

CAUSES
- Alcoholism
- Bacterial or viral infection
- Biliary tract disease
- Blunt trauma to pancreas or abdomen
- Drug induced: steroids, thiazide diuretics, oral contraceptives
- Duodenal ulcer
- Hyperlipidemia
- Hyperparathyroidism

DATA COLLECTION FINDINGS
- Abdominal tenderness and distention

- Abrupt onset of pain in epigastric area that radiates to the shoulder, substernal area, back, and flank
- Aching, burning, stabbing, pressing abdominal pain
- Decreased or absent bowel sounds
- Dyspnea
- Fever
- Hypotension
- Jaundice
- Knee-chest position, fetal position, or leaning forward for comfort
- Nausea and vomiting
- Pain upon eating
- Steatorrhea
- Tachycardia
- Weight loss

DIAGNOSTIC FINDINGS

- Arteriography reveals fibrous tissue and calcification of pancreas.
- Blood chemistry shows increased amylase, lipase, LD, glucose, AST, and lipid levels and decreased calcium and potassium levels.
- CT scan shows enlarged pancreas.
- Cullen's sign is positive.
- ERCP reveals biliary obstruction.
- Fecal fat test is positive.
- Glucose tolerance test shows decreased tolerance.
- Grey Turner's sign is positive.
- Hematology shows increased WBC count and decreased Hb level and HCT.
- Ultrasonography reveals cysts, bile duct inflammation, and dilation.
- Urine chemistry shows increased amylase.

NURSING DIAGNOSES

- Deficient fluid volume
- Imbalanced nutrition: Less than body requirements
- Acute or chronic pain

TREATMENT

- Bland, low-fat, high-protein diet of small, frequent meals with restricted intake of caffeine, alcohol, and gas-forming foods; as disorder progresses, nothing by mouth
- Bed rest
- I.V. fluids (vigorous replacement of fluids and electrolytes)
- Nasogastric suction to relieve nausea and vomiting and to provide decompression
- Sequential compression device to prevent deep vein thrombosis
- Surgical intervention to treat underlying cause, if appropriate
- Transfusion therapy with packed RBCs, as indicated

Drug therapy

- Analgesic: morphine
- Anticholinergics: propantheline (Pro-Banthine), dicyclomine (Bentyl)
- Antidiabetic: insulin
- Antiemetics: prochlorperazine (Compazine), metoclopromide (Reglan)
- Calcium supplement: calcium gluconate
- Corticosteroid: hydrocortisone (Solu-Cortef)
- Digestant: pancrelipase (Pancrease)
- Histamine$_2$-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)
- Mucosal barrier fortifier: sucralfate (Carafate)
- Potassium supplement: I.V. potassium chloride
- Tranquilizers: lorazepam (Ativan), alprazolam (Xanax)

INTERVENTIONS AND RATIONALES

- Monitor abdominal, cardiac, and respiratory status (as the disease progresses, watch for respiratory failure, tachycardia, and worsening GI status) *to determine baseline and detect early changes and signs of complications.*
- Evaluate fluid balance *to detect fluid volume deficit or excess.*
- Monitor and record vital signs, intake and output, laboratory studies, daily weight, and urine specific gravity *to detect signs of fluid volume deficit.*
- Monitor urine and stool for color, character, and amount *to detect bleeding.*
- Maintain the patient's diet; withhold food and fluids as necessary *to rest the pancreas and prevent nausea and vomiting.*
- Perform bedside glucose monitoring *to check for hyperglycemia.*
- Administer oxygen and maintain ET and mechanical ventilation if necessary *to improve*

oxygenation and provide suctioning as needed *to stabilize secretions.*
• Monitor I.V. fluids *to treat or prevent hypovolemic shock and restore electrolyte balance.*
• Maintain position, patency, and low suction of NG tube *to prevent nausea and vomiting.*
• Place the patient in semi-Fowler's position if the patient's blood pressure allows *to promote comfort and lung expansion.*
• Maintain TPN. *In severe cases, reintroduction of food may be associated with pancreatic abscess. TPN is necessary to meet the patient's metabolic needs.*
• Place the patient in bed and turn every 2 hours, or utilize a specialty rotation bed *to prevent pressure ulcers.*
• Maintain medications, as prescribed, *to improve or maintain the patient's condition.*
• Provide skin, nares, and mouth care *to prevent tissue damage.*
• Provide a quiet, restful environment *to conserve energy and decrease metabolic demands.*
• Assist with incentive spirometry hourly during waking hours *to prevent atelectasis.*

Teaching topics
• Avoiding alcohol
• Monitoring blood glucose levels frequently
• Monitoring stools for steatorrhea
• Monitoring self for infection
• Recognizing the signs and symptoms of increased blood glucose levels
• Adhering to activity limitations
• Modifying risk factors
• Avoiding caffeine

Peptic ulcer disease

Peptic ulcer disease (PUD) is a break in the continuity of gastric, or duodenal mucosa. This occurs when normal defense mechanisms are overwhelmed or impaired by acid or pepsin. Ulcers are circumscribed lesions that extend through the mucosa. Ulcers occur in the duodenum 5 times more often than in the stomach.

CAUSES
• Drug-induced: salicylates, steroids, NSAIDs, reserpine
• Gastritis
• *Helicobacter pylori* infection
• Smoking
• Zollinger-Ellison syndrome

DATA COLLECTION FINDINGS
• Anorexia
• Hematemesis
• Left epigastric pain 1 to 2 hours after eating
• Melena
• Nausea and vomiting
• Relief of pain after administration of antacids
• Weight loss

DIAGNOSTIC FINDINGS
• Barium swallow shows ulceration of the gastric mucosa.
• Fecal occult blood test is positive.
• *H. pylori* test is positive.
• Hematologic study shows decreased Hb level and HCT (if bleeding is present).
• Serum gastrin level is normal or increased.
• Upper GI endoscopy shows the location of the ulcer.

NURSING DIAGNOSES
• Anxiety
• Imbalanced nutrition: Less than body requirements
• Acute pain

TREATMENT
• Endoscopic laser therapy to control bleeding
• If GI hemorrhage, gastric surgery that may include gastroduodenostomy, gastrojejunostomy, partial gastric resection, and total gastrectomy
• Diet that avoids extremes in temperature, caffeine, and foods that cause pain
• Photocoagulation to control bleeding
• Saline lavage by NG tube until return is clear (if bleeding is present)
• Transfusion therapy with packed RBCs (if bleeding is present and Hb level and HCT are low)
• Vagotomy to decrease gastric acid production

Drug therapy

- Antacids: magnesium and aluminum hydroxide (Maalox), aluminum hydroxide gel (AlternaGEL)
- Antibiotic if *H. pylori* is present
- Histamine$_2$-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), nizatidine (Axid), famotidine (Pepcid)
- Pituitary hormone: vasopressin (Pitressin) to manage bleeding
- Proton-pump inhibitor: lansoprazole (Prevacid)
- Mucosal barrier fortifier: sucralfate (Carafate)
- Prostaglandin: misoprostol (Cytotec) to protect the stomach lining

INTERVENTIONS AND RATIONALES

- Monitor GI status *to detect signs of bleeding.*
- Monitor cardiovascular status *to detect early signs of GI hemorrhage.*
- Monitor and record vital signs, intake and output, laboratory studies, fecal occult blood, and gastric pH *to detect signs of bleeding.*
- Observe the consistency, color, amount, and frequency of stools *to detect early signs of GI bleeding.*
- Maintain the patient's diet as tolerated *to meet metabolic needs and promote healing.*
- Maintain position, patency, and low suction of NG tube if gastric decompression is ordered *to prevent nausea and vomiting.*
- Administer medications, as prescribed, *to maintain or improve the patient's condition.*
- Provide nose and mouth care *to maintain tissue integrity.*
- Provide postoperative care if necessary (don't reposition NG tube; irrigate it gently if ordered; medicate for pain as needed and ordered; monitor dressings for drainage; evaluate bowel sounds; assist with incentive spirometry; apply a sequential compression device while the patient is on bedrest; get patient out of bed as tolerated) *to detect early complications and promote healing.*

Teaching topics

- Reducing stress
- Relaxation techniques
- Following dietary recommendations and restrictions such as avoiding caffeine, alcohol, and spicy and fried foods
- Following postoperative care and restrictions
- Smoking cessation

Peritonitis

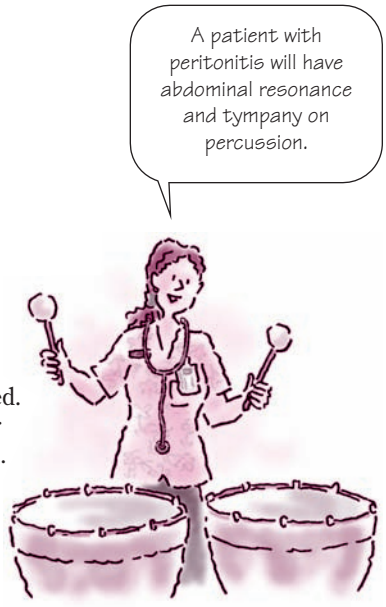
Peritonitis is a localized or generalized inflammation of the peritoneal cavity. It occurs when irritants in the peritoneal area cause inflammatory edema, vascular congestion, and hypermotility of the bowel.

CAUSES

- Bacterial invasion
- Chemical invasion
- Trauma

DATA COLLECTION FINDINGS

- Abdominal resonance and tympany on percussion
- Abdominal rigidity and distention
- Anorexia
- Constant, diffuse, and intense abdominal pain
- Decreased or absent bowel sounds
- Decreased peristalsis
- Decreased urine output
- Fever
- Malaise
- Nausea
- Rebound tenderness
- Shallow respirations
- Weak, rapid pulse



DIAGNOSTIC FINDINGS

- Abdominal X-ray shows free air in the abdomen under the diaphragm.
- Hematologic study shows increased WBC count and low Hb level and HCT if blood loss has occurred.
- Peritoneal aspiration is positive for blood, pus, bile, bacteria, or amylase.

NURSING DIAGNOSES

- Anxiety
- Acute pain
- Deficient fluid volume

TREATMENT

- Withholding food or fluid until the cause of peritonitis is known and condition allows.
- NG tube insertion to prevent nausea and vomiting.
- Surgical intervention when the patient's condition is stabilized (surgery is chosen to treat the cause [for example, if the patient has a perforated appendix, appendectomy is indicated]; drains will also be placed for drainage of infected material)

Drug therapy

- Analgesic: morphine
- Antibiotics: gentamicin (Garamycin), clindamycin (Cleocin), ofloxacin (Floxin), meropenem (Merrem), pipercillin and tazobactam (Zosyn), metronidazole (Flagyl)

INTERVENTIONS AND RATIONALES

- Monitor abdominal and respiratory status and fluid balance *to detect signs of fluid volume deficit.*
- Monitor and record vital signs, intake and output, laboratory studies, daily weight, and urine specific gravity *to detect signs of fluid volume deficit.*
- Measure and record the patient's abdominal girth *to detect for abdominal distention.*
- Withhold food and fluids *to prevent nausea and vomiting.*
- Administer I.V. fluids *to maintain hydration and electrolyte balance.*
- Provide routine postoperative care (monitor vital signs and intake and output, including drainage from drains; assist with turning, incentive spirometry, coughing, and deep breathing; apply a sequential compression device when the patient is on bedrest and get the patient out of bed on the first postoperative day if his condition allows) *to promote healing and prevent and detect early complications.*
- Maintain position, patency, and low suction of NG tube *to prevent nausea and vomiting.*
- Place the patient in semi-Fowler's position *to promote comfort and prevent pulmonary complications.*
- Maintain TPN *to meet the patient's metabolic needs.*
- Administer medications, as prescribed, *to treat infection and control pain.*

Teaching topics

- Recognizing the signs and symptoms of infection
- Recognizing the signs and symptoms of GI obstruction
- Performing ostomy self-care if indicated

Ulcerative colitis

Ulcerative colitis is an inflammatory disorder of the colon. It's commonly a chronic condition and causes damage to the large intestine's mucosal and submucosal layers.

CAUSES

- Genetics
- Idiopathic cause
- Allergies
- Autoimmune disease
- Emotional stress
- Viral and bacterial infections

DATA COLLECTION FINDINGS

- Abdominal cramping
- Abdominal distention
- Abdominal tenderness
- Anorexia
- Bloody, purulent, mucoid, watery stools (15 to 20 per day)
- Cachexia
- Debilitation
- Fever
- Hyperactive bowel sounds
- Nausea and vomiting
- Signs and symptoms of dehydration
- Weakness
- Weight loss

DIAGNOSTIC FINDINGS

- Barium enema shows ulcerations.
- Blood chemistry shows decreased potassium level and increased osmolality.
- Hematology shows increased WBC count and decreased Hb level and HCT.
- Sigmoidoscopy shows ulceration and hyperemia.
- Stool specimen is positive for blood and mucus.
- Urine chemistry result shows increased urine specific gravity.

NURSING DIAGNOSES

- Diarrhea
- Deficient fluid volume
- Imbalanced nutrition: Less than body requirements

TREATMENT

- Colectomy or pouch ileostomy
- High-protein, high-calorie, low-residue diet, with bland foods in small, frequent meals and restricted intake of milk and gas-forming foods or no food or fluids
- TPN if necessary to rest the GI tract
- Transfusion therapy with packed RBCs, as indicated

Drug therapy

- Analgesic: morphine
- Antianemics: ferrous sulfate (Feosol), ferrous gluconate (Fergon)
- Antibiotic: sulfasalazine (Azulfidine)
- Anticholinergics: propantheline (Pro-Banthine), dicyclomine (Bentyl)
- Antidiarrheals: diphenoxylate (Lomotil), loperamide (Imodium)
- Antiemetic: prochlorperazine (Compazine)
- Anti-inflammatory: olsalazine (Dipentum)
- Corticosteroid: hydrocortisone (Solu-Cortef)
- Immunosuppressants: azathioprine (Imuran), cyclophosphamide (Cytoxan)
- Potassium supplements: potassium chloride (K-Lor), potassium gluconate (Kaon)
- Sedative: lorazepam (Ativan)

INTERVENTIONS AND RATIONALES

- Monitor GI status and fluid balance *to determine fluid volume deficit.*
- Monitor and record vital signs, intake and output, laboratory studies, daily weight, urine specific gravity, calorie count, and fecal occult blood *to determine fluid volume deficit.*
- Monitor the number, amount, and character of stools *to determine status of nutrient absorption.*
- Maintain the patient's diet; withhold food and fluids as necessary *to prevent nausea and vomiting.*
- Maintain I.V. fluids and TPN *to maintain hydration and improve nutritional status.*
- Maintain the position, patency, and low suction of the NG tube *to prevent nausea and vomiting.*
- Place the patient in semi-Fowler's position *to promote comfort.*
- Administer medications, as prescribed, *to maintain or improve the patient's condition.*
- Provide skin, mouth, nares, and perianal care *to promote comfort and prevent skin breakdown.*

Teaching topics

- Monitoring weight
- Reducing stress and performing relaxation techniques
- Recognizing the early signs and symptoms of rectal hemorrhage and intestinal obstruction
- Contacting the United Ostomy Association and the National Foundation of Ileitis and Colitis

Pump up on practice questions

1. A client begins a fecal fat analysis test on a Monday. The nurse should instruct the client to begin the 3-day stool collection on:

1. Monday.
2. Tuesday.
3. Wednesday.
4. Thursday.

Answer: 4. The fecal fat analysis test requires a 3-day period in which the client eats a high-fat diet. On the day after the 3-day diet, the client begins collecting his stool. In this scenario, that would be Thursday. Selecting Monday, Tuesday, or Wednesday would be erro-

neously teaching the client to begin the test prematurely, which may nullify the test's accuracy.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

2. A client returns from an endoscopic procedure during which he was sedated. Before offering the client food, it's most important for the nurse to:

1. monitor his oxygen saturation levels.
2. evaluate his gag reflex.
3. place him in the side-lying position.
4. have him drink sips of water.

Answer: 2. The sedation associated with a procedure, such as endoscopy, can impair the gag reflex. If a client is fed before the gag reflex returns, the client can experience airway obstruction and aspiration. Therefore, the nurse should check the client's gag reflex before offering the client food. Monitoring oxygen saturation levels is important after an endoscopic procedure but its results won't support feeding the client. In this situation, the side-lying position isn't necessary. Having the client drink water isn't the proper method of assessing for a gag reflex.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

3. A client with a history of hiatal hernia reports to the nurse that he has trouble sleeping because of abdominal pain. It would be most beneficial to the client if the nurse instructed him to sleep:

1. with his upper body elevated.
2. in the prone position.
3. flat or in a side-lying position.
4. with his lower body slightly elevated.

Answer: 1. Upper body elevation can reduce the gastric reflux associated with hiatal hernia. The other positions won't benefit the client.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Analysis

4. A client with peptic ulcer disease secondary to chronic NSAID use is prescribed misoprostol (Cytotec). The nurse would be most accurate in informing the client that the drug:

1. reduces gas formation.
2. increases the speed of gastric emptying.
3. protects the stomach's lining.
4. increases lower esophageal sphincter pressure.

Answer: 3. Misoprostol (Cytotec) is a synthetic prostaglandin that, like prostaglandin, protects the gastric mucosa. NSAIDs decrease prostaglandin production and predispose the client to peptic ulceration. Cytotec is prescribed to clients with peptic ulcer disease who are also taking NSAIDs. Misoprostol doesn't reduce gas formation, improve emptying of the stomach, or increase lower esophageal sphincter pressure.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

5. What's the priority nursing goal for a client who has had a barium enema?

1. To prevent fecal incontinence
2. To monitor for bleeding
3. To prevent constipation
4. To limit fluid intake

Answer: 3. Barium should be promptly eliminated from the client's system after it has

been introduced into the colon to prevent mass formation and possible bowel obstruction. Therefore, laxatives or enemas are commonly given after a barium enema to prevent the client from becoming constipated. Fecal incontinence isn't an issue because the passage of stool is desired. Bleeding isn't commonly anticipated after a barium enema and the client should be encouraged to increase, not decrease, fluid intake.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

6. A physician orders gastric decompression for a client with small-bowel obstruction. The nurse should plan for the suction to be:

1. low pressure and intermittent.
2. low pressure and continuous.
3. high pressure and intermittent.
4. high pressure and continuous.

Answer: 1. Gastric decompression is typically low pressure and intermittent. High pressure and continuous gastric suctioning predisposes the gastric mucosa to injury and ulceration.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

7. A client with Crohn's disease has a serum potassium level of 3.1 mEq/dl. The client is prescribed 30 mEq of oral potassium chloride (K-Lor) twice daily. The nurse should plan to give the supplement:

1. with food or after the client eats.
2. on an empty stomach.
3. with no other medications.
4. 2 hours before or after eating.

Answer: 1. Supplemental potassium can be irritating to the esophagus and stomach and is best tolerated with meals or shortly after meals. It's typically appropriate to give oral potassium at the same time other medications are being administered.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

8. Which factor should be the initial focus of nursing management in a client with acute pancreatitis?

1. Dietary management
2. Prevention of skin breakdown
3. Management of hypoglycemia
4. Pain control

Answer: 4. The priority is to provide adequate pain control. This is essential to minimize discomfort and restlessness, which may further stimulate pancreatic secretion. Initially, the client with acute pancreatitis isn't permitted food and oral intake. Although prevention of skin breakdown is important, it isn't the initial focus. Clients are at risk for hyperglycemia, not hypoglycemia.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

9. A client with a history of peptic ulcer disease develops a fever of 101° F (38.3° C). Which accompanying sign most strongly indicates the client has peritonitis?

1. Leukopenia
2. Hyperactive bowel sounds
3. Abdominal rigidity
4. Polyuria

Answer: 3. Abdominal rigidity is a classic sign of peritonitis. The client would more likely have leukocytosis, hypoactive bowel sounds, and decreased urine output with peritonitis.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

10. Daily abdominal girth measurements are prescribed for a client with liver dysfunction and ascites. To increase accuracy, the nurse should use which landmark?

1. Xiphoid process
2. Umbilicus
3. Iliac crest
4. Symphysis pubis

Answer: 2. The proper technique for abdominal girth measurement involves circumventing the abdomen with a tape measure using the umbilicus as a landmark. The other sites would give inaccurate measurements.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

9 Endocrine system

In this chapter, you'll review:

- components of the endocrine system and their function
- tests used to diagnose endocrine disorders
- common endocrine disorders.

Brush up on key concepts

The endocrine system consists of specialized cell clusters called glands that secrete chemical transmitters called hormones. These combine to regulate growth and development, and influence the reproductive system, energy level, metabolic rate, and the ability to adapt to stress.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 278 to 281.

Thermostat central

The **hypothalamus** is an organ that controls temperature, respiration, and blood pressure. Its functions affect the emotional states. The hypothalamus also produces hypothalamic-stimulating hormones, which affect the inhibition and release of pituitary hormones.

Heavy on the hormones

The **pituitary gland** is composed of anterior and posterior lobes. Together these lobes produce a variety of hormones that affect the body.

The anterior lobe secretes:

- **follicle-stimulating hormone,** which stimulates graafian follicle growth and estrogen secretion in women
- **luteinizing hormone,** which induces ovulation and development of the corpus luteum in women and stimulates testosterone secretion in men
- **adrenocorticotropic hormone (ACTH),** also called corticotropin, which stimulates secretion of hormones from the adrenal cortex
- **thyroid-stimulating hormone (TSH),** which regulates the secretory activity of the thyroid gland
- **growth hormone,** which is an insulin antagonist that stimulates the growth of cells, bones, muscle, and soft tissue.

The posterior lobe secretes:

- **vasopressin** (antidiuretic hormone, also called ADH), which helps the body retain water
- **oxytocin,** which stimulates uterine contractions during labor and milk secretion in lactating women.

Growth gland

The **thyroid gland** accelerates growth and cellular reactions, including basal metabolic rate (BMR). It's controlled by the pituitary gland's secretion of TSH.

The thyroid gland produces thyrocalcitonin, triiodothyronine (T_3), and thyroxine (T_4), which are necessary for growth and development.

Coping with calcium

The **parathyroid gland** secretes parathyroid hormone (parathormone, or PTH), which regulates calcium and phosphorus levels and promotes the resorption of calcium from bones.

The adrenal fab 5

The **adrenal glands** are composed of the adrenal cortex and the adrenal medulla. The adrenal cortex secretes three major hormones:

- **glucocorticoids** (cortisol, cortisone, and corticosterone), which mediate the stress response, promote sodium and water retention and potassium secretion, and suppress ACTH secretion
- **mineralocorticoids** (aldosterone and deoxycorticosterone), which promote sodium and water retention and potassium secretion
- **sex hormones** (androgens, estrogens, and progesterone), which develop and maintain secondary sex characteristics and libido.

(Text continues on page 281.)

Cheat sheet

Endocrine refresher

ACROMEGALY AND GIGANTISM

Key signs and symptoms

Acromegaly

- Enlarged supraorbital ridge
- Thickened ears and nose
- Thickening of the tongue

Gigantism

- Excessive growth in all parts of the body

Key test result

- Plasma human growth hormone (HGH) levels measured by radioimmunoassay typically are elevated. However, because HGH secretion is pulsatile, the results of random sampling may be misleading. IGF-1 (somatomedin-C) levels offer a better screening alternative.

Key treatments

- Surgery to remove the affecting tumor (transsphenoidal hypophysectomy)
- Thyroid hormone replacement therapy after surgery: levothyroxine (Synthroid)
- Corticosteroid: cortisone (Cortone)
- Inhibitor of HGH release: bromocriptine (Parlodel)
- Somatotropic hormone: octreotide (Sandostatin)

Key interventions

- Provide the patient with emotional support.
- Perform or assist with range-of-motion (ROM) exercises.
- Keep in mind that this disease can also cause inexplicable mood changes. Reassure the family that these mood changes result from the disease and can be modified with treatment.
- After surgery, monitor vital signs and neurologic status. Be alert for any alterations in level of consciousness, pupil equality, or visual acuity as well as vomiting, falling pulse rate, and rising blood pressure.
- Check blood glucose levels.
- Measure intake and output hourly, watching for large increases.
- Encourage the patient to ambulate on the first or second day after surgery.

ADDISON'S DISEASE

Key signs and symptoms

- Orthostatic hypotension
- Weakness and lethargy
- Weight loss

Key test results

- Blood chemistry reveals decreased cortisol, glucose, sodium, chloride, and aldosterone levels; and increased blood urea nitrogen (BUN) and potassium level.
- Hematology tests reveal elevated hematocrit and decreased hemoglobin.
- Blood or capillary glucose levels reveal hypoglycemia.
- Urine chemistry shows decreased 17-ketosteroids and hydroxycorticosteroids (17-OHCS).

Key treatments

- With adrenal crisis, I.V. hydrocortisone given promptly along with 3 to 5 L of normal saline solution
- Glucocorticoids: cortisone (Cortone), hydrocortisone (Solu-Cortef)
- Mineralocorticoid: fludrocortisone (Florinef)

Key interventions

- Administer appropriate medications.
- Maintain I.V. fluids.
- Don't allow the patient to sit up or stand quickly.

CUSHING'S SYNDROME

Key signs and symptoms

- History of amenorrhea
- History of mood swings
- Hypertension
- Muscle wasting
- Weight gain, especially truncal obesity, buffalo hump, and moonface

Key test results

- Blood chemistry shows increased cortisol, aldosterone, sodium, corticotropin, and glucose levels and a decreased potassium level.
- Dexamethasone suppression test shows no decrease in 17-OHCS.

Endocrine refresher *(continued)*

CUSHING'S SYNDROME *(continued)*

• Magnetic resonance imaging shows pituitary or adrenal tumors.

Key treatments

• Hypophysectomy or bilateral adrenalectomy
• Antidiabetic agents: insulin or oral agents such as glyburide (DiaBeta, Micronase), glipizide (Glucotrol), metformin (Glucophage)

Key interventions

• Perform postoperative care.
• Observe for edema.
• Limit water intake.
• Weigh the patient daily.

DIABETES INSIPIDUS

Key signs and symptoms

• Polydipsia (consumption of 4 to 40 L/day)
• Polyuria (greater than 5 L/day of dilute urine)

Key test result

• Urine chemistry shows urine specific gravity less than 1.005, osmolality 50 to 200 mOsm/kg, decreased urine pH, and decreased sodium and potassium levels.

Key treatments

• I.V. therapy: hydration (when first diagnosed, intake and output must be matched milliliter to milliliter to prevent dehydration), electrolyte replacement
• Antidiuretic hormone replacement: vasopressin (Pitressin), lypressin (Diapid nasal spray)

Key interventions

• Monitor fluid balance and daily weight.
• Monitor and record vital signs, intake and output (urine output should be measured every hour when first diagnosed), urine specific gravity (check every 1 to 2 hours when first diagnosed), and laboratory studies.
• Maintain I.V. fluid.

DIABETES MELLITUS

Key signs and symptoms

• Polydipsia
• Polyphagia
• Polyuria
• Weight loss (with type 1)

Key test results

• Fasting blood glucose level is increased (greater than or equal to 126 mg/dl).
• Glycosylated hemoglobin assay is increased to 7 or above.
• 2-hour postprandial blood glucose level shows hyperglycemia (greater than 200 mg/dl).

Key treatments

• Antidiabetic agents: insulin or oral agents, such as glimepiride (Amaryl), glyburide (DiaBeta, Micronase), glipizide (Glucotrol), metformin (Glucophage)

Key interventions

• Monitor acid-base and fluid balance.
• Monitor for signs of hypoglycemia (altered mental status, dizziness, weakness, pallor, tachycardia, diaphoresis, seizures, and coma), ketoacidosis (acetone breath, dehydration, weak or rapid pulse, Kussmaul's respirations), and hyperosmolar coma (polyuria, thirst, neurologic abnormalities, stupor).
• Be prepared to treat hypoglycemia; immediately give carbohydrates in the form of fruit juice, hard candy, or honey. If the patient is unconscious, maintain safety until glucogen or dextrose is administered I.V.
• Be prepared to maintain I.V. fluid. Administer insulin and, usually, potassium replacement for ketoacidosis or hyperosmolar coma.
• Monitor wound healing.
• Maintain the patient's diet.
• Provide meticulous skin and foot care. Patients with diabetes are at increased risk for infection from impaired leukocyte activity.
• Foster independence.

GOITER

Key signs and symptoms

• Single or multinodular, firm, irregular enlargement of the thyroid gland
• Dizziness or syncope when the patient raises his arms above his head (Pemberton's sign)
• Dysphagia

Key test result

• Laboratory tests reveal high or normal thyroid-stimulating hormone (TSH), low serum thyroxine (T_4) concentrations, and increased iodine 131 uptake.

Key treatments

• Subtotal thyroidectomy
• Thyroid hormone replacement: levothyroxine (Synthroid)

Key interventions

• Measure the patient's neck circumference. Also check for the development of hard nodules in the gland.
• Provide preoperative teaching and postoperative care if subtotal thyroidectomy is indicated.

(continued)

Endocrine refresher *(continued)*

HYPERTHYROIDISM

Key signs and symptoms

- Atrial fibrillation
- Bruit or thrill over thyroid
- Diaphoresis
- Palpitations
- Tachycardia

Key test results

- Blood chemistry shows increased triiodothyronine (T_3), T_4, and free thyroxine levels and decreased TSH and cholesterol levels.
- Radioactive iodine uptake (RAIU) is increased.

Key treatments

- Radiation therapy
- Thyroidectomy
- Iodine preparations: potassium iodide (SSKI), radioactive iodine

Key interventions

- Monitor cardiovascular status.
- Avoid stimulants, such as caffeine-containing drugs and foods.
- Maintain I.V. fluids.
- Weigh the patient daily.
- Provide postoperative care.

HYPOTHYROIDISM

Key signs and symptoms

- Dry, flaky skin and thinning nails
- Fatigue
- Hypothermia
- Menstrual disorders
- Mental sluggishness
- Weight gain or anorexia

Key test results

- Blood chemistry shows decreased T_3, T_4, free thyroxine, and sodium levels; TSH levels are increased with thyroid insufficiency and decreased with hypothalamic or pituitary insufficiency.
- RAIU is decreased.

Key treatment

- Thyroid hormone replacement: levothyroxine (Synthroid), liothyronine (Cytomel), thyroglobulin (Proloid)

Key interventions

- Avoid sedation; administer one-half to one-third the normal dose of sedatives or opioids.
- Check for constipation and edema.
- Encourage fluids.

PANCREATIC CANCER

Key signs and symptoms

- Dull, intermittent epigastric pain (early in disease)
- Continuous pain that radiates to the right upper quadrant or dorsolumbar area and may be colicky, dull, or vague and unrelated to activity or posture
- Anorexia
- Rapid, profound weight loss
- Palpable mass in the subumbilical or left hypochondrial region

Key test results

- Percutaneous fine-needle aspiration biopsy of the pancreas identifies malignant cells.
- Blood studies reveal increased serum bilirubin, increased serum amylase and lipase, prolonged prothrombin time, elevated alkaline phosphatase (with biliary obstruction), and elevated aspartate aminotransferase and alanine aminotransferase (when liver cell necrosis is present).
- Fasting blood glucose may indicate hyperglycemia or hypoglycemia.

Key treatments

- Blood transfusion, if indicated.
- I.V. fluid therapy
- Whipple's procedure or pancreatoduodenectomy (excision of the head of the pancreas along with the encircling loop of the duodenum)
- Antineoplastic combinations: fluorouracil (Adrucil), streptozocin (Zanosar), ifosfamide (Ifex), and doxorubicin (Adriamycin)
- Insulin after pancreatic resection to provide adequate exogenous insulin supply
- Opioid analgesics: morphine and codeine, which can lead to biliary tract spasm and increase common bile duct pressure (used only when other methods fail)
- Pancreatic enzyme: pancrelipase (Pancrease)

Key interventions

Before surgery

- Monitor blood transfusions.
- Administer vitamin K and antibiotics; perform gastric lavage, as necessary.

After surgery

- Monitor fluid balance, abdominal girth, metabolic state, and weight daily. Replace nutrients I.V., orally, or by nasogastric tube. Maintain dietary restrictions such as a low-sodium or fluid retention diet as required). Maintain a 2,500 calorie diet for the patient.
- Administer an oral pancreatic enzyme at mealtimes, if needed.
- Administer pain medication, antibiotics, and antipyretics, as necessary.

Endocrine refresher *(continued)*

PANCREATIC CANCER *(continued)*

- Watch for signs of hypoglycemia or hyperglycemia; administer glucose or an antidiabetic agent as necessary. Monitor blood glucose levels.
- Apply antiembolism stockings and a sequential compression device, and assist with ROM exercises. If thrombosis occurs, elevate the patient's legs and give an anticoagulant, as ordered.

THYROID CANCER

Key signs and symptoms

- Enlarged thyroid gland
- Painless, firm, irregular, and enlarged thyroid nodule or mass

Key test results

- Blood chemistry shows increased calcitonin, serotonin, and prostaglandin levels.
- RAIU shows a "cold," or nonfunctioning, nodule.
- Thyroid biopsy shows cytology positive for cancer cells.

Key treatments

- Radiation therapy
- Thyroidectomy (total or subtotal); with or without radical neck excision

Key interventions

- Monitor respiratory status for signs of airway obstruction.
- Evaluate ability to swallow.
- Provide postoperative thyroidectomy care.

THYROIDITIS

Key signs and symptoms

- Thyroid enlargement
- Fever
- Pain
- Tenderness and reddened skin over the gland

Key test results

Note: Precise diagnosis depends on the type of thyroiditis.

- With autoimmune thyroiditis, high titers of thyroglobulin and microsomal antibodies may be present in serum.
- With subacute granulomatous thyroiditis, tests may reveal elevated erythrocyte sedimentation rate, increased thyroid hormone levels, and decreased thyroidal RAIU.
- With chronic infective and noninfective thyroiditis, varied findings occur, depending on underlying infection or other disease.

Key treatments

- Partial thyroidectomy to relieve tracheal or esophageal compression in Riedel's thyroiditis
- Thyroid hormone replacement: levothyroxine (Synthroid) for accompanying hypothyroidism

Key intervention

- Check vital signs and examine the patient's neck for unusual swelling, enlargement, or redness.
- If the neck is swollen, measure and record the circumference daily.

After thyroidectomy

- Check vital signs every 15 to 30 minutes until the patient's condition stabilizes. Stay alert for signs of tetany secondary to accidental parathyroid injury during surgery. Keep 10% calcium gluconate available for I.M. use if needed.
- Check dressings frequently for excessive bleeding.
- Keep the head of the patient's bed elevated.
- Watch for signs of airway obstruction, such as difficulty talking and increased swallowing; keep tracheotomy equipment handy.

The adrenal medulla secretes two hormones:

- **norepinephrine,** which regulates generalized vasoconstriction
- **epinephrine,** which regulates instantaneous stress reaction and increases metabolism, blood glucose levels, and cardiac output.

Endo (in) and exo (out)

The **pancreas** is an accessory gland of digestion. In its **exocrine function,** it secretes digestive enzymes (amylase, lipase, and trypsin). Amylase breaks down starches into smaller carbohydrate molecules. Lipase breaks down fats into fatty acids and glycerol. Trypsin breaks down proteins. Note that exocrine glands secrete outwardly via a duct; the pancreas secretes enzymes into the duodenum through the pancreatic duct.

In its **endocrine function,** the pancreas secretes hormones from the islets of Langerhans (insulin, glucagon, and somatostatin) inwardly to the blood or lymph. Insulin regulates fat, protein, and carbohydrate metabolism and lowers blood glucose levels by promoting glucose transport into cells. Glucagon increases blood glucose levels by promoting hepatic glyconeogenesis. Somatostatin inhibits the release of insulin, glucagon, and somatotropin. Note that endocrine glands discharge secretions into the blood or lymph.

Keep abreast of diagnostic tests

Below are some diagnostic tests for evaluating endocrine disorders as well as common nursing actions associated with each test.

Draw blood and test, part 1

Blood chemistry tests analyze blood samples for potassium, sodium, calcium, phosphorus, glucose, bicarbonate, blood urea nitrogen (BUN), creatinine, protein, albumin, osmolality, amylase, lipase, alkaline phosphatase, lactate dehydrogenase, aldosterone, cortisol, ketones, cholesterol, triglycerides, and carbon dioxide.

Nursing actions

- Check the venipuncture site for bleeding.

Draw blood and test, part 2

A **hematologic study** analyzes a blood sample for red blood cells (RBCs), white blood cells (WBCs), platelets, hemoglobin (Hb) level, and hematocrit (HCT).

Nursing actions

- Note current drug therapy.
- Check the venipuncture site for bleeding.

A **coagulation study** analyzes a blood sample for prothrombin time (PT), international normalized ratio, partial thromboplastin time, and D-dimer.

Nursing actions

- Note current drug therapy.
- Check the venipuncture site for bleeding.

Fast and test

The **fasting blood glucose test** measures plasma glucose levels following a 12- to 14-hour fast.

Nursing actions

- Withhold food and fluids for 12 to 14 hours before fasting sample is drawn.
- Withhold insulin until the test is completed.

Eat carbs and test

With a **2-hour postprandial glucose test,** a blood sample analyzes the body's insulin response to carbohydrate ingestion.

Nursing actions

- List any medications that might interfere with the test.
- Note pregnancy, trauma, or infectious disease.
- Provide the patient with a 100 g carbohydrate diet before the test and then ask him to fast for 2 hours.
- Instruct the patient to avoid smoking, caffeine, alcohol, and exercise after the meal.

Carbo absorption assessment

The **glucose tolerance test** (GTT) uses blood and urine samples to measure absorption of carbohydrates.

Nursing actions

- List any medications that might interfere with the test.
- Note pregnancy, trauma, or infectious disease.
- Provide the patient with a high-carbohydrate diet for 3 days.
- Instruct the patient to fast for 10 to 16 hours before the test.
- Advise the patient not to smoke, drink caffeine or alcohol, or exercise strenuously for 8 hours before or during the test.
- Withhold any medications that may interfere with testing.
- Draw a fasting blood sample and have the patient provide a urine specimen at the same time.
- Administer the test dose of oral glucose and record the time of administration.
- Request laboratory collection of serum glucose and urine samples at 30, 60, 120, and 180 minutes.
- Refrigerate samples and assess the patient for hypoglycemia.

Check those blood glucose levels

Glycosylated Hb (Hb A_{1c}) testing uses a blood sample to measure glycosylated Hb levels. This provides information about average

blood glucose levels from the preceding 2 to 3 months. This test is used to evaluate the long-term effectiveness of diabetes therapy.

Nursing actions

- Explain to the patient that this test is used to evaluate diabetes therapy.
- Tell the patient that he need not restrict food or fluids and instruct him to maintain his prescribed medication and diet regimen.

Check for cortisol

The **rapid adrenocorticotropic hormone stimulation test**, also known as the cosyntropin test, is the most effective test for evaluating adrenal hypofunction.

Nursing actions

- List any medications that might interfere with the test.
- Know that pregnancy contraindicates this test.
- Draw a baseline blood sample and label it "baseline."
- Administer cosyntropin 250 mg I.V. over 2 minutes.
- Draw a blood sample 30 minutes after injection and label it "30 minutes post injection."
- Draw a blood sample 60 minutes after injection and label it "60 minutes post injection."

Blood analysis (with drug)

The **dexamethasone suppression test,** which involves administration of dexamethasone, is used to analyze a blood sample for serum cortisol. Dexamethasone suppresses levels of circulating adrenal steroid hormones such as cortisol in normal people but fails to suppress them in patients with Cushing's syndrome and some forms of clinical depression.

Nursing actions

- On the first day, give the patient 1 mg of dexamethasone at 11 p.m.
- On the next day, collect blood samples at 4 p.m. and 11 p.m.
- Monitor the venipuncture site; if hematoma develops, apply warm soaks.
- List any medications that might interfere with the test.

Urine analysis (24-hour collection)

The **24-hour urine test for 17-ketosteroids (17-KS) and 17-hydroxycorticosteroids (17-OHCS)** is a quantitative laboratory analysis of urine collected over 24 hours to determine hormone precursors.

Nursing actions

- Withhold all medications for 48 hours before the test.
- Instruct the patient to void and note the time (collection of urine starts with the next voiding).
- Place urine collection container on ice.
- Measure each voided urine collection.
- If done on an outpatient basis, teach the patient how to collect the 24-hour specimen properly.
- List any medications that might interfere with the test.

Epi-no-fun exam

The **urine vanillylmandelic acid test** is a quantitative analysis of urine collected over 24 hours to determine the end products of catecholamine metabolism (epinephrine and norepinephrine).

Nursing actions

- List any medications, previous tests, and medical conditions that might interfere with the test.
- Restrict foods that contain vanilla, coffee, tea, citrus fruits, bananas, nuts, and chocolate for 3 days prior to test.
- Withhold any medications that might interfere with testing such as antihypertensives and aspirin.
- Instruct the patient to void and note the time (collection of urine starts with the next voiding).
- Place urine container on ice.
- Measure each voided urine specimen.

Eyesight exam

Visual acuity and field testing is done to evaluate the patient's central and peripheral vision.

The eyes have it! Remind patients to wear or bring their contacts or glasses for the eyesight exam.

Nursing actions

• Ask the patient to wear or bring corrective lenses for the test.

Inspecting the abdomen

Computed tomography (CT) scan provides visualization of the sella turcica and abdomen.

Nursing actions

• Note the patient's allergies to iodine, seafood, and radiopaque dyes.
• Instruct the patient to fast for 4 hours prior to the procedure.

Echo exam

Ultrasonography provides visualization of the thyroid, pelvis, and abdomen through the use of reflected sound waves.

Nursing actions

• Evaluate whether the patient can lie still during the procedure.

Taking thyroid tissue

A **closed percutaneous thyroid biopsy** is the percutaneous, sterile aspiration of a small amount of thyroid tissue for histologic evaluation.

Nursing actions

Before the procedure

• Withhold food and fluids after midnight.
• Make sure that the patient's written, informed consent has been obtained.

After the procedure

• Maintain bed rest for 24 hours.
• Monitor vital signs.
• Watch for esophageal or tracheal puncture and bleeding or respiratory distress caused by hematoma or edema.

Memory jogger

To recall interventions for Sulkowitch's test, remember that hypercomes *before* hypoalphabetically. Then remember to collect a urine specimen *before* a meal for hypercalcemia and *after* for hypocalcemia.

Thyroid function test

A **thyroid uptake,** also called **radioactive iodine uptake** or **RAIU**, is used to measure the amount of radioactive iodine taken up by the thyroid gland in 24 hours. This measurement evaluates thyroid function.

Nursing actions

• Instruct the patient not to ingest iodine-rich foods for 24 hours before the test
• Discontinue all thyroid and cough medications 7 to 10 days before the test.

Radiograph of the 'roid

A **thyroid scan** provides visual imaging of radioactivity distribution in the thyroid gland that helps determine the size, shape, position, and anatomic function of the thyroid.

Nursing actions

• If iodine-123 (^{123}I) or ^{131}I is to be used, tell the patient to fast after midnight the night before the test. Fasting isn't required if an I.V. injection of ^{99m}Tc pertechnetate is used.
• Withhold any medications that may interfere with the procedure.
• Instruct the patient to stop consuming iodized salt, iodinated salt substitutes, and seafood 1 week before the procedure.
• Imaging follows oral administration (^{123}I or ^{131}I) by 24 hours and I.V. injection (^{99m}Tc pertechnetate) by 20 to 30 minutes.
• Remove dentures, jewelry, and other materials that may interfere with imaging.
• After the procedure, tell the patient he may resume medications that were suspended for testing.

Work of artery

Arteriography is a fluoroscopic examination of the arterial blood supply to the parathyroid, adrenal, and pancreatic glands.

Nursing actions

Before the procedure

• Check for written, informed consent.
• Note the patient's allergies to iodine, seafood, and radiopaque dyes.
• Withhold food and fluids after midnight.

After the procedure

• Monitor vital signs.
• Check the insertion site for bleeding and assess pulses distal to the site.

Counting calcium

Sulkowitch's test is done to analyze urine to measure the amount of calcium being excreted.

Nursing actions

- If hypercalcemia is indicated, collect a single urine specimen *before* a meal.
- If hypocalcemia is indicated, collect a single urine specimen *after* a meal.

Polish up on patient care

Major endocrine disorders include acromegaly and gigantism, Addison's disease, Cushing's syndrome, diabetes insipidus, diabetes mellitus, goiter, hyperthyroidism, hypothyroidism, pancreatic cancer, and thyroid cancer.

Acromegaly and gigantism

Acromegaly and gigantism are marked by hormonal dysfunction and startling skeletal overgrowth. Both are chronic, progressive diseases that occur when the pituitary gland produces too much growth hormone, causing excessive growth. Acromegaly develops slowly; gigantism develops abruptly.

Acromegaly occurs after epiphyseal closure takes place (around age 18 in females and around age 21 in males), causing bone thickening and transverse growth and visceromegaly (enlargement of the viscera). In other words, acromegaly may occur any time after adolescence, when the arms and legs have stopped growing. Signs of this disorder include swelling and enlargement of the arms, legs, and face.

Gigantism begins before epiphyseal closure and causes proportional overgrowth of all body tissues. In other words, gigantism begins in childhood or adolescence when the arms and legs are still growing. That's why these patients may attain giant proportions.

CAUSES

- Oversecretion of human growth hormone (HGH)
- Tumors of the anterior pituitary gland (which lead to oversecretion of HGH)

DATA COLLECTION FINDINGS

Acromegaly

- Bitemporal hemianopia
- Diaphoresis
- Enlarged supraorbital ridge
- History of gradual development
- Loss of visual acuity
- Oily skin
- Possible blindness
- Prognathism (projection of the jaw) that becomes marked and may interfere with chewing
- Severe headache
- Thickened ears and nose
- Thickening of the tongue

Gigantism

- Abrupt, excessive growth in all parts of the body
- Remarkable height increases, as much as 6″ (15.2 cm) per year; infants and children may grow to three times the normal height for their age; adults may reach heights above 6′8″

Because endocrine disorders often affect fluid balance, monitoring fluid status is a key element of patient care.

DIAGNOSTIC FINDINGS

- Plasma HGH levels measured by radioimmunoassay typically are elevated. However, because HGH secretion is pulsatile, the results of random sampling may be misleading. IGF-1 (somatomedin-C) levels offer a better screening alternative.
- Glucose normally suppresses HGH secretion; therefore, a glucose infusion that doesn't suppress the hormone level to below the accepted normal value of 5 ng/ml, when combined with characteristic clinical features, strongly suggests hyperpituitarism.
- Skull X-rays, a CT scan, arteriography, and magnetic resonance imaging (MRI) show the presence and extent of the pituitary lesion.

It's a question of timing. Acromegaly may occur any time after adolescence, when the arms and legs have stopped growing. Gigantism begins in childhood or adolescence, when the arms and legs are still growing.

NURSING DIAGNOSES

- Disturbed body image
- Chronic pain
- Impaired physical mobility

TREATMENT

- Surgery to remove the affecting tumor (transsphenoidal hypophysectomy)
- Pituitary radiation therapy

Think about therapeutic communication. The patient needs help coping with his body image as well as mood changes brought on by the disorder.

Drug therapy

- Thyroid hormone replacement therapy after surgery: levothyroxine (Synthroid)
- Corticosteroid: cortisone (Cortone)
- Inhibitor of growth hormone release: bromocriptine (Parlodel)
- Somatotropic hormone: octreotide (Sandostatin)

INTERVENTIONS AND RATIONALES

- Provide the patient with emotional support *to help him cope with his changing body image. Dramatic body changes characteristic of this disorder can cause severe psychological stress.*
- Examine the patient for skeletal manifestations, such as arthritis of the hands and osteoarthritis of the spine, *to detect complications*.
- Administer prescribed medications *to improve the patient's condition*.
- Perform or assist with range-of-motion (ROM) exercises *to promote maximum joint mobility.*
- Evaluate muscular weakness, especially in the patient with late-stage acromegaly. Check the strength of his grasp *to monitor for disease progression*. If it's weak, help with tasks such as cutting food into bitesize pieces.
- Keep the skin dry. Avoid using an oily lotion *because the skin is already oily.*
- Test blood glucose *to detect early signs of hyperglycemia*.
- Check for signs of hyperglycemia (fatigue, polyuria, polydipsia, polyphagia) *to avoid treatment delay*.
- Be aware that the patient's tumor may cause vision problems. If the patient has hemianopia, stand where he can see you *to reduce anxiety*.
- Keep in mind that this disease can also cause inexplicable mood changes. Reassure the family that these mood changes result from the disease and can be modified with treatment *to help the family cope with the patient's illness.*
- Before surgery, reinforce what the surgeon has told the patient, if possible, and provide a clear and honest explanation of the scheduled operation *to allay the patient's fears and anxiety.*
- If the patient is a child, explain to his parents that such surgery prevents permanent soft-tissue deformities but won't correct bone changes that have already taken place. Arrange for counseling, if necessary, *to help the child and parents cope with permanent defects.*
- After surgery, diligently monitor vital signs and neurologic status. Be alert for alterations in level of consciousness, pupil equality, or visual acuity as well as vomiting, falling pulse rate, and rising blood pressure. *These changes may signal an increase in intracranial pressure due to intracranial bleeding or cerebral edema.*
- Check blood glucose level often. *HGH levels usually fall rapidly after surgery, removing an insulin antagonist effect in many patients and possibly precipitating hypoglycemia.*
- Measure intake and output hourly, watching for large increases. *Transient diabetes insipidus, which sometimes occurs after surgery for hyperpituitarism, can cause such increases in urine output.*
- If the transsphenoidal approach is used for surgery, a large nasal pack should be kept in place for several days. Because the patient must breathe through his mouth, give good mouth care *to prevent breakdown of the oral mucosa*.
- Watch for cerebrospinal fluid (CSF) leaks from the packed surgical site. Look for increased external nasal drainage or drainage into the nasopharynx. CSF leaks may necessitate additional surgery to repair the leak. *These measures detect complications quickly and avoid treatment delays.*
- Apply a sequential compression device while the patient is on bedrest *to prevent deep vein thrombosis.*
- Encourage the patient to ambulate on the first or second day after surgery *to prevent complications of immobility.*

Teaching topics

- Receiving annual follow-up checkups (there's a slight chance that the tumor that caused his condition could recur)
- Continuing hormone replacement therapy following surgery (warn against stopping the hormones suddenly)
- Wearing a medical identification bracelet at all times and bringing his hormone replace-

ment schedule with him whenever he goes for medical care.

Addison's disease

Addison's disease, also known as *adrenal hypofunction,* occurs when the adrenal gland fails to secrete sufficient mineralocorticoids, glucocorticoids, and androgens. With carefully monitored steroid replacement therapy, most people with Addison's disease can live a normal life.

Addisonian crisis (adrenal crisis) is a critical deficiency of mineralocorticoids and glucocorticoids. It generally occurs in patients who have chronic adrenal insufficiency and follows acute stress, sepsis, trauma, surgery, or omission of steroid therapy. It's a medical emergency that necessitates immediate, vigorous treatment.

CAUSES

- Autoimmune disease
- Histoplasmosis
- Idiopathic atrophy of adrenal glands
- Metastatic lesions from lung cancer
- Pituitary hypofunction
- Surgical removal of adrenal glands
- Trauma
- Tuberculosis

DATA COLLECTION FINDINGS

- Anorexia, diarrhea, and nausea
- Bronzed skin pigmentation on nipples, scars, and buccal mucosa
- Decreased pubic and axillary hair
- Depression and personality changes
- Orthostatic hypotension
- Signs and symptoms of dehydration
- Weakness and lethargy
- Weight loss

DIAGNOSTIC FINDINGS

- Blood chemistry reveals decreased cortisol, glucose, sodium, chloride, and aldosterone levels; and increased BUN and potassium levels.
- Hematology tests reveal elevated HCT and decreased Hb.
- BMR is decreased.
- Electrocardiogram demonstrates prolonged PR and QT intervals.
- Blood or capillary glucose levels reveal hypoglycemia.
- Urine chemistry shows decreased 17-KS and 17-OHCS.

NURSING DIAGNOSES

- Deficient fluid volume
- Imbalanced nutrition: Less than body requirements
- Risk for infection

TREATMENT

- High-carbohydrate, high-protein, high-sodium, low-potassium diet in small, frequent feedings before steroid therapy; high-potassium and low-sodium diet while on steroid therapy
- With adrenal crisis, monitor I.V. administration 3 to 5 L of normal saline solution after I.V. hydrocortisone is administered.

Drug therapy

- Antacids: magnesium and aluminum hydroxide (Maalox), aluminum hydroxide gel (Gelusil)
- Glucocorticoids: cortisone (Cortone), hydrocortisone (Solu-Cortef)
- Mineralocorticoid: fludrocortisone (Florinef)
- Vasopressor: phenylephrine (Neo-Synephrine)

INTERVENTIONS AND RATIONALES

- Be prepared to maintain I.V. normal saline solution after administration of I.V. hydrocortisone if the patient is in adrenal crisis *to reverse shock and hyponatremia.*
- Monitor fluid balance (and increase fluid intake in hot weather) *to prevent addisonian crisis, which may be precipitated by salt or fluid loss in hot weather and during exercise.*
- Encourage fluid intake *to improve fluid status and prevent addisonian crisis.*
- Monitor and record vital signs, intake and output, urine specific gravity, and laboratory studies *to detect fluid volume deficit.*
- Maintain the patient's diet *to promote nutritional balance.*

• Maintain I.V. fluids *to maintain hydration and prevent addisonian crisis.*
• Weigh the patient daily *to determine nutritional status and detect fluid loss.*
• Administer medications, as prescribed, *to maintain or improve the patient's condition.*
• Don't allow the patient to sit up or stand quickly *to avoid orthostatic hypotension.*
• Assist with activities of daily living *to conserve energy and decrease metabolic demands.*
• Maintain a quiet environment *to conserve energy and decrease metabolic demands.*

Teaching topics

• Recognizing the signs and symptoms of adrenal crisis (profound weakness, fatigue, nausea, vomiting, hypotension, dehydration and, occasionally, high fever followed by hypothermia)
• Carrying injectable dexamethasone (Decadron)
• Avoiding over-the-counter drugs
• Avoiding strenuous exercise, particularly in hot weather
• Learning stress-reduction techniques
• Maintaining life-long follow-up care

The signs of Cushing's syndrome are distinctive. Let's see…rapidly developing fatty tissue in the face, neck, and trunk and purple streaks on the skin.

Cushing's syndrome

Cushing's syndrome, also known as *hypercortisolism,* is characterized by hyperactivity of the adrenal cortex. It results in excessive secretion of glucocorticoids, particularly cortisol. An increase in mineralocorticoids and sex hormones may also occur.

CAUSES

• Adenoma or carcinoma of the adrenal cortex
• Adenoma or carcinoma of the pituitary gland
• Excessive or prolonged administration of glucocorticoids or corticotropin
• Exogenous secretion of corticotropin by malignant neoplasms in the lungs or gallbladder
• Hyperplasia of the adrenal glands
• Hypothalamic stimulation of the pituitary gland

DATA COLLECTION FINDINGS

• Acne
• Ecchymosis
• Edema
• Enlarged clitoris
• Fragile skin
• Gynecomastia
• Hirsutism
• History of amenorrhea
• History of mood swings
• History of recurrent infections
• Hypertension
• Muscle wasting
• Pain in joints
• Poor wound healing
• Purple striae on abdomen
• Weakness and fatigue
• Weight gain, particularly truncal obesity, buffalo hump, and moonface

DIAGNOSTIC FINDINGS

• Blood chemistry shows increased cortisol, aldosterone, sodium, corticotropin and glucose levels and a decreased potassium level.
• CT scan shows pituitary or adrenal tumors.
• Dexamethasone suppression test shows no decrease in 17-OHCS.
• GTT shows hyperglycemia.
• Hematology shows increased WBC and RBC counts and decreased eosinophil count.
• MRI shows pituitary or adrenal tumors.
• Ultrasonography shows pituitary or adrenal tumors.
• Urine chemistry shows increased 17-OHCS and 17-KS, decreased urine specific gravity, and glycosuria.
• X-ray shows pituitary or adrenal tumor and osteoporosis.

NURSING DIAGNOSES

• Disturbed body image
• Deficient fluid volume
• Impaired skin integrity

TREATMENT

• Hypophysectomy or bilateral adrenalectomy
• Low-sodium, low-carbohydrate, low-calorie, high-potassium, and high-protein diet
• Radiation therapy

• Potassium supplements: potassium chloride (K-Lor), potassium gluconate (Kaon)

Drug therapy

• Adrenal suppressants: metyrapone (Metopirone), aminoglutethimide (Cytadren)
• Antidiabetic agents: insulin or oral agents, such as glyburide (DiaBeta, Micronase), glipizide (Glucotrol), metformin (Glucophage)
• Diuretics: furosemide (Lasix), ethacrynic acid (Edecrin)

INTERVENTIONS AND RATIONALES

• Provide postoperative care *to prevent complications.*
• Monitor fluid balance *to detect fluid deficit or overload.*
• Monitor and record vital signs, intake and output, urine specific gravity, capillary glucose levels, and laboratory studies. *Changed parameters may indicate altered fluid or electrolyte status.*
• Check for edema *to detect signs of fluid volume excess.*
• Apply a sequential compression device and antiembolism stockings *to promote venous return and prevent thromboembolism formation.*
• Maintain the patient's diet *to maintain nutritional status.*
• Maintain standard precautions *to protect the patient from infection.*
• Provide meticulous skin care and reposition the patient every 2 hours *to prevent skin breakdown.*
• Limit water intake *to prevent fluid volume excess.*
• Weigh the patient daily *to detect fluid retention.*
• Administer medications, as prescribed, *to maintain or improve the patient's condition.*
• Encourage the patient to express feelings about changes in body image and sexual function *to help him cope effectively.*
• Provide rest periods *to prevent fatigue.*
• Provide postradiation nursing care *to prevent complications.*

Teaching topics

• Recognizing the signs and symptoms of infection and fluid retention
• Avoiding exposure to people with infections
• Carrying a medical identification card (and immediately reporting infections, which necessitate increased steroid dosage)
• Recognizing signs of inadequate steroid dosage (fatigue, weakness, and dizziness) and overdosage (severe edema, weight gain)
• Avoiding discontinuing steroid dosage
• Maintaining life-long follow-up care

Diabetes insipidus

Diabetes insipidus stems from a deficiency of antidiuretic hormone (ADH; vasopressin) secreted by the posterior lobe of the pituitary gland. Decreased ADH reduces the ability of distal and collecting renal tubules in the kidneys to concentrate urine, resulting in excessive urination, excessive thirst, and excessive fluid intake.

CAUSES

• Brain surgery
• Head injury
• Idiopathy
• Meningitis
• Trauma to posterior lobe of pituitary gland
• Tumor of posterior lobe of pituitary gland

DATA COLLECTION FINDINGS

• Fatigue
• Headache
• Muscle weakness and pain
• Polydipsia (excessive thirst, consumption of 4 to 40 L/day)
• Polyuria (greater than 5 L/day of dilute urine)
• Signs and symptoms of dehydration
• Tachycardia
• Weight loss

DIAGNOSTIC FINDINGS

• Blood chemistry shows decreased ADH by radioimmunoassay and increased potassium, sodium, and osmolality levels.
• Urine chemistry shows urine specific gravity less than 1.005, osmolality 50 to 200 mOsm/kg, decreased urine pH, and decreased sodium and potassium levels.

NURSING DIAGNOSES
- Deficient fluid volume
- Impaired oral mucous membrane
- Risk for imbalanced body temperature

TREATMENT
- I.V. therapy: hydration (when first diagnosed, intake and output must be matched milliliter to milliliter to prevent dehydration), electrolyte replacement
- Regular diet with restriction of foods that exert a diuretic effect

Drug therapy
- ADH replacement: vasopressin (Pitressin), lypressin (Diapid nasal spray)
- ADH stimulant: carbamazepine (Tegretol)

INTERVENTIONS AND RATIONALES
- Monitor fluid balance and daily weight *to avoid dehydration.*
- Monitor and record vital signs, intake and output (urine output should be measured every hour when first diagnosed), urine specific gravity (check every 1 to 2 hours when first diagnosed), and laboratory studies *to assess for fluid volume deficit.*
- Maintain the patient's diet *to maintain nutritional balance.*
- Force fluids *to keep intake equal to output and prevent dehydration.*
- Maintain I.V. fluids *to replace fluid and electrolyte loss.*
- Maintain the patency of the indwelling urinary catheter *to allow accurate measuring of urine output.*
- Administer medications, as prescribed, *to enable the patient to concentrate urine and prevent dehydration.*
- Weigh the patient daily *to detect fluid loss.*
- Provide a quiet environment *to promote rest.*

Teaching topics
- Recognizing the signs and symptoms of dehydration
- Increasing fluid intake in hot weather
- Carrying medications at all times
- Importance of obtaining daily weight to monitor fluid status

Memory jogger

To remember the classic signs of diabetes, think of the 3 **P**s:

Polydipsia: excessive thirst

Polyphagia: excessive hunger

Polyuria: excessive urination.

Diabetes mellitus

Diabetes mellitus is a chronic disorder resulting from a disturbance in the production, action, and rate of utilization of insulin, which in turn causes a disturbance in carbohydrate, protein and fat metabolism. There are several types of diabetes mellitus.

Type 1 (insulin-dependent diabetes mellitus) usually develops in childhood. Type 2 (non-insulin-dependent diabetes mellitus) usually develops after age 30; however, it's becoming more prevalent among children and young adults. Gestational diabetes mellitus occurs with pregnancy. Secondary diabetes is induced by trauma, surgery, pancreatic disease, or medications and can be treated as type 1 or type 2.

CAUSES
- Autoimmune disease
- Blockage of insulin supply
- Cushing's syndrome
- Exposure to chemicals
- Genetics
- Hyperpituitarism
- Hyperthyroidism
- Infection
- Medications
- Pregnancy
- Receptor defect in insulin-responsive cells
- Stress
- Surgery
- Trauma

DATA COLLECTION FINDINGS
- Acetone breath
- Anorexia
- Atrophic muscles
- Blurred vision
- Fatigue
- Flushed, warm, smooth, shiny skin
- History of multiple infections and boils
- Kussmaul's respirations (deep and rapid)
- Mottled extremities
- Pain
- Paresthesia
- Peripheral and visceral neuropathies
- Polydipsia
- Polyphagia
- Polyuria

- Poor wound healing
- Sexual dysfunction
- Signs and symptoms of dehydration
- Weakness
- Weight loss (with type 1)

DIAGNOSTIC FINDINGS

- Blood chemistry shows increased glucose, potassium, chloride, ketone, cholesterol, and triglyceride levels; decreased carbon dioxide level; and pH less than 7.4.
- Fasting blood glucose level greater than or equal to 126 mg/dl. In pre-diabetes, fasting blood glucose levels range between 100 and 125 mg/dl.
- Glycosylated hemoglobin assay is increased to 7 or above.
- GTT shows hyperglycemia.
- 2-hour postprandial blood glucose test shows a level greater than 200 mg/dl. If the results range between 140 and 199 mg/dl the patient has prediabetes.
- Urine chemistry shows increased glucose and ketone levels.

NURSING DIAGNOSES

- Imbalanced nutrition: More than body requirements
- Risk for deficient fluid volume
- Risk for impaired skin integrity

TREATMENT

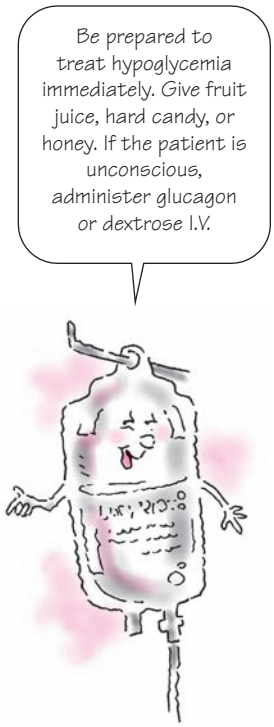
- Dietary restrictions
- Exercise
- Pancreas transplant

Drug therapy

- Antidiabetic agents: insulins or oral agents, such as glimepiride (Amaryl), glyburide (DiaBeta, Micronase), glipizide (Glucotrol), metformin (Glucophage)

INTERVENTIONS AND RATIONALES

- Monitor acid-base and fluid balance *to monitor for signs of hyperglycemia.*
- Monitor for signs of hypoglycemia (altered mental status, dizziness, weakness, pallor, tachycardia, diaphoresis, seizures, and coma), ketoacidosis (acetone breath, dehydration, weak or rapid pulse, Kussmaul's respirations), and hyperosmolar coma (polyuria, thirst, neurologic abnormalities, stupor) *to ensure early intervention and prevent complications.*
- Be prepared to treat hypoglycemia; immediately give carbohydrates in the form of fruit juice, hard candy, or honey. If the patient is unconscious, maintain safety until glucagon or dextrose is administered I.V. *to prevent neurologic complications.*
- Be prepared to maintain I.V. fluid. Administer insulin and, usually, potassium replacement for ketoacidosis or hyperosmolar coma *to reduce the risk of potentially life-threatening complications.*
- Monitor and record vital signs, intake and output, glucose monitor measurements, and laboratory studies *to check fluid and electrolyte balance.*
- Monitor wound healing *to detect for infection.*
- Maintain the patient's diet *to prevent complications of diabetes, such as hyperglycemia and hypoglycemia.*
- Encourage fluids *to maintain the patient's hydration.*
- Administer medications, as prescribed. *Tight glycemic control is necessary to prevent complications. Diabetic control requires a dynamic balance between diet, antidiabetic agent, and exercise.*
- Encourage the patient to express feelings about diet, medication regimen, and body image changes *to facilitate coping mechanisms.*
- Encourage exercise, as tolerated, *to prevent long-term complications of diabetes.*
- Weigh the patient weekly *to determine nutritional status.*
- Provide meticulous skin and foot care. Patients with diabetes are at increased risk for infection from impaired leukocyte activity. *These health care practices minimize the risk of infection and promote early detection of health problems.*
- Maintain a warm and quiet environment *to provide rest and reduce metabolic demands.*
- Foster independence *to promote self-esteem.*
- Determine the patient's compliance to diet, exercise, and medication regimens *to help develop appropriate interventions.*



As with many endocrine disorders, therapeutic care requires helping the patient with goiter cope with a change of body image.

Teaching topics

- Understanding the importance of routine follow-up care
- Exercising regularly
- Smoking cessation
- Recognizing the signs and symptoms of hyperglycemia and hypoglycemia
- Self-monitoring for infection, skin breakdown, changes in peripheral circulation, poor wound healing, and numbness in extremities
- Adjusting diet and insulin for changes in work, exercise, trauma, infection, fever, and stress
- Administering antidiabetic agents and using the insulin pump (type 1)
- Using home blood glucose monitoring equipment
- Completing daily skin and foot care (avoiding foot soaks, using water-soluble lotions, and using nail files—not nail clippers)
- Carrying an emergency supply of glucose
- Avoiding over-the-counter medication and alcohol
- Adhering to the treatment regimen to prevent complications
- Contacting the American Diabetes Association and local support groups

Goiter

A goiter is an enlargement of the thyroid gland that isn't caused by inflammation or a neoplasm. This condition is commonly referred to as nontoxic or simple goiter.

Goiter is commonly classified as endemic or sporadic. With appropriate treatment, the prognosis is good for either type.

Endemic goiter usually results from inadequate dietary intake of iodine associated with such factors as iodine-depleted soil and malnutrition. Endemic goiter affects females more than males, especially during adolescence and pregnancy, when the demand on the body for thyroid hormone increases.

Sporadic goiter follows ingestion of certain drugs or foods. It doesn't affect any specific population segment more than others.

CAUSES

- Insufficient thyroid gland production
- Depletion of glandular iodine
- Ingestion of goitrogenic foods (rutabagas, cabbage, soybeans, peanuts, peaches, peas, strawberries, spinach, and radishes)
- Use of goitrogenic drugs (propylthiouracil, methimazole [Tapazole], iodides, and lithium [Lithobid])

DATA COLLECTION FINDINGS

- Single or multinodular, firm, irregular enlargement of the thyroid gland
- Dizziness or syncope when the patient raises his arms above his head (Pemberton's sign)
- Dysphagia
- Respiratory distress

DIAGNOSTIC FINDINGS

- Tests are used to rule out Graves' disease, Hashimoto's thyroiditis, and thyroid carcinoma.
- Laboratory tests reveal high or normal TSH, low serum T_4 concentrations, and increased ^{131}I uptake.

NURSING DIAGNOSES

- Risk for suffocation
- Risk for injury
- Disturbed body image

TREATMENT

- Subtotal thyroidectomy

Drug therapy

- Thyroid hormone replacement: levothyroxine (Synthroid)
- Small doses of iodine (Lugol's or potassium iodide solution)

INTERVENTIONS AND RATIONALES

- Measure the patient's neck circumference *to check for progressive thyroid gland enlargement.* Also check for the development of hard nodules in the gland.
- Provide preoperative teaching and postoperative care if subtotal thyroidectomy is indicated. *These measures allay the patient's anxiety and prevent postoperative complications.*

Teaching topics

- Understanding the importance of iodized salt
- Taking medications as prescribed
- Recognizing the symptoms of thyrotoxicosis (increased pulse rate, palpitations, diarrhea, sweating, tremors, agitation, and shortness of breath)

Hyperthyroidism

Hyperthyroidism (also known as thyrotoxicosis) is the increased synthesis of thyroid hormone. It can result from overactivity (Graves' disease) or a change in the thyroid gland (toxic nodular goiter).

CAUSES

- Abnormal iodine metabolism
- Autoimmune disease
- Genetic
- Infection
- Other endocrine abnormalities
- Pituitary tumors
- Psychological or physiologic stress
- Thyroid adenomas

DATA COLLECTION FINDINGS

- Anxiety and mood swings
- Atrial fibrillation
- Bruit or thrill over thyroid
- Diaphoresis
- Diarrhea
- Dyspnea
- Exophthalmos
- Fine hand tremors
- Flushed, smooth skin
- Hair loss
- Heat intolerance
- Increased hunger
- Increased systolic blood pressure
- Palpitations
- Tachycardia
- Tachypnea
- Weakness
- Weight loss

DIAGNOSTIC FINDINGS

- Blood chemistry shows increased T_3, T_4, and free thyroxine levels and decreased TSH and cholesterol levels.
- RAIU is increased.
- Thyroid scan shows nodules.

NURSING DIAGNOSES

- Decreased cardiac output
- Risk for imbalanced body temperature
- Risk for injury

TREATMENT

- High-protein, high-carbohydrate, high-calorie diet; restricting stimulants such as caffeine
- Radiation therapy
- Thyroidectomy

Drug therapy

- Adrenergic-blocking agents: propranolol (Inderal), reserpine (Serpasil), guanethidine (Ismelin)
- Antithyroid agents: methimazole (Tapazole), propylthiouracil
- Cardiac glycoside: digoxin (Lanoxin)
- Glucocorticoids: cortisone (Cortone), hydrocortisone (Solu-Cortef)
- Iodine preparations: potassium iodide (SSKI), radioactive iodine
- Sedative: oxazepam (Serax)
- Vitamins: thiamine (vitamin B_1), ascorbic acid (vitamin C)

INTERVENTIONS AND RATIONALES

- Monitor cardiovascular status *to detect signs of thyroid storm (acute, severe exacerbation of hyperthyroidism), such as tachycardia, increased blood pressure, palpitations, and atrial arrhythmias. Presence of these signs may require a change in the treatment regimen.*
- Evaluate fluid balance *to determine signs of fluid volume deficit.*
- Monitor and record vital signs, intake and output, and laboratory studies *to detect early changes and guide treatment.*
- Maintain the patient's diet *to promote adequate nutrition.*
- Avoid stimulants, such as caffeine-containing drugs and foods, *to reduce or eliminate arrhythmias.*

- Maintain I.V. fluids *to promote hydration.*
- Administer medications as prescribed *to maintain or improve the patient's condition.*
- Weigh the patient daily *to evaluate metabolic status and determine nutritional needs.*
- Provide postoperative care *to promote healing and prevent complications.*
- Provide rest periods *to reduce metabolic demands.*
- Provide a quiet, cool environment *to promote comfort.*
- Provide skin and eye care *to prevent complications.*
- Encourage the patient to express feelings about changes in body image *to reduce anxiety and facilitate coping mechanisms.*
- Provide postradiation care *to prevent complications associated with treatment.*

Teaching topics

- Smoking cessation
- Recognizing the signs and symptoms of thyroid storm
- Adhering to activity limitations
- Avoiding exposure to people with infections
- Self-monitoring for infection

Hypothyroidism

Hypothyroidism, which affects women more often than men, occurs when the thyroid gland fails to produce sufficient thyroid hormone. This causes an overall decrease in metabolism.

Hypothyroidism can be classified as primary or secondary. Primary hypothyroidism occurs when the loss of thyroid tissue leads to a decrease in thyroid hormone protection. Secondary hypothyroidism stems from either the pituitary's failure to synthesize or secrete enough TSH or from target tissue failing to respond to normal levels of thyroid hormone.

Avoid sedation. Give patients with hypothyroidism one-half to one-third the normal dose of sedatives or opioids.

CAUSES

- Hashimoto's thyroiditis
- Malfunction of pituitary gland
- Overuse of antithyroid drugs
- Thyroidectomy
- Use of radioactive iodine

DATA COLLECTION FINDINGS

- Coarse hair and alopecia
- Cold intolerance
- Constipation
- Decreased diaphoresis
- Dry, flaky skin and thinning nails
- Edema
- Fatigue
- Hypersensitivity to opioids, barbiturates, and anesthetics
- Hypothermia
- Menstrual disorders
- Mental sluggishness
- Thick tongue and swollen lips
- Weight gain or anorexia

DIAGNOSTIC FINDINGS

- Blood chemistry shows decreased T_3, T_4, free thyroxine, and sodium levels; TSH levels are increased with thyroid insufficiency and decreased with hypothalamic or pituitary insufficiency.
- RAIU is decreased.

NURSING DIAGNOSES

- Activity intolerance
- Disturbed body image
- Decreased cardiac output

TREATMENT

- High-fiber, high-protein, low-calorie diet

Drug therapy

- Thyroid hormone replacement: levothyroxine (Synthroid), liothyronine (Cytomel), thyroglobulin (Proloid)

INTERVENTIONS AND RATIONALES

- Avoid sedation: administer one-half to one-third the normal dose of sedatives or opioids *to prevent complications.*
- Patients taking warfarin (Coumadin) with levothyroxine may require lower doses of warfarin *because levothyroxine enhances the effects of warfarin.*
- Monitor fluid balance *to determine fluid volume deficit or excess.*
- Encourage fluids *to maintain hydration.*
- Check for constipation and edema *to detect early changes.*

• Monitor and record vital signs, intake and output, and laboratory studies *to determine fluid status.*
• Maintain the patient's diet *to facilitate nutritional balance.*
• Administer medications as prescribed *to maintain or improve the patient's condition.*
• Encourage the patient to express feelings of depression *to promote coping.*
• Encourage physical activity and mental stimulation *to enhance self-esteem.*
• Provide a warm environment *to promote comfort because the patient with hypothyroidism may be sensitive to cold.*
• Turn the patient every 2 hours and provide skin care *to prevent skin breakdown.*
• Provide frequent rest periods *because patients with hypothyroidism are easily fatigued.*

Teaching topics

• Exercising regularly
• Taking thyroid medication (patient may develop myxedema coma if not taken)
• Recognizing the signs and symptoms of hyperthyroidism and myxedema coma (progressive stupor, hypoventilation, hypoglycemia, hyponatremia, hypotension, and hypothermia)
• Self-monitoring for constipation
• Making dietary changes to prevent constipation
• Seeking additional protection and limiting exposure during cold weather
• Avoiding sedatives

Pancreatic cancer

Pancreatic cancer progresses rapidly and is deadly. Treatment is rarely successful because the disease has usually widely metastasized by the time it's diagnosed.

Pancreatic cancer has a swift and deadly course. Therapeutic care means helping the patient and family come to terms with the end of life.

Pancreatic tumors are almost always adenocarcinomas and most arise in the head of the pancreas. Rarer tumors are those of the body and tail of the pancreas and islet cell tumors.

The two main tissue types are cylinder cell and large, fatty, granular cell.

CONTRIBUTING FACTORS

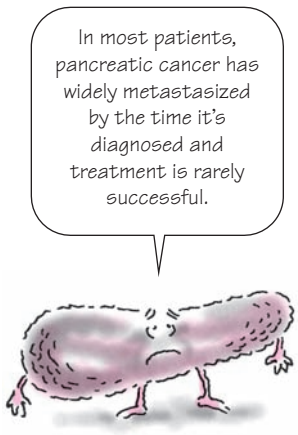
• Smoking
• Foods high in fat and protein
• Food additives
• Industrial chemicals, such as beta-naphthalene, benzidine, and urea
• Chronic pancreatitis
• Alcohol abuse

DATA COLLECTION FINDINGS

• Dull, intermittent epigastric pain (early in disease)
• Continuous pain that radiates to the right upper quadrant or dorsolumbar area and that may be colicky, dull, or vague and unrelated to activity or posture
• Anorexia
• Nausea
• Vomiting
• Diarrhea
• Jaundice
• Rapid, profound weight loss
• Palpable mass in the subumbilical or left hypochondrial region

DIAGNOSTIC FINDINGS

• Percutaneous fine-needle aspiration biopsy of the pancreas identifies malignant cells
• Laparotomy with a biopsy allows definitive diagnosis.
• Ultrasound and CT scan can show a mass but not its histology.
• Angiography can reveal the vascular supply of a tumor.
• MRI shows tumor size and location in great detail.
• Blood studies reveal increased serum bilirubin, increased serum amylase and lipase, prolonged PT, elevated alkaline phosphatase (with biliary obstruction), aspartate aminotransferase and alanine aminotransferase are elevated (when liver cell necrosis is present).
• Fasting blood glucose may indicate hyperglycemia or hypoglycemia.
• Plasma insulin immunoassay shows measurable serum insulin in the presence of islet cell tumors.



• Stool studies may show occult blood if ulceration in the GI tract or ampulla of Vater has occurred.
• Tumor markers for pancreatic cancer, including carcinoembryonic antigen, alpha-fetoprotein, and serum immunoreactive elastase I, are elevated.

NURSING DIAGNOSES

• Chronic pain
• Imbalanced nutrition: Less than body requirements
• Grieving

TREATMENT

• Blood transfusion, if indicated
• I.V. fluid therapy
• Total pancreatectomy
• Cholecystojejunostomy (surgical anastomosis of the gallbladder and the jejunum)
• Choledochoduodenostomy (surgical anastomosis of the common bile duct to the duodenum)
• Choledochojejunostomy (surgical anastomosis of the common bile duct to the jejunum)
• Whipple's procedure or pancreatoduodenectomy (excision of the head of the pancreas along with the encircling loop of the duodenum)
• Gastrojejunostomy (surgical creation of an anastomosis between the stomach and the jejunum)
• Radiation therapy

Drug therapy

• Antineoplastic combinations: fluorouracil (Adrucil), streptozocin (Zanosar), ifosfamide (Ifex), and doxorubicin (Adriamycin)
• Antibiotic: cefmetazole (Zefazone) to prevent infection and relieve symptoms
• Anticholinergic: propantheline (Pro-Banthine) to decrease GI tract spasm and motility and reduce pain and secretions
• Histamine$_2$-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)
• Diuretics: furosemide (Lasix) to mobilize extracellular fluid from ascites
• Insulin to provide adequate exogenous insulin supply after pancreatic resection
• Opioid analgesics: morphine, codeine, which can lead to biliary tract spasm and increase common bile duct pressure (used only when other methods fail)
• Pancreatic enzyme: pancrelipase (Pancrease)
• Vitamin K: phytonadione (AquaMEPHYTON)
• Stool softener: docusate (Colace)
• Laxative: bisacodyl (Dulcolax)

INTERVENTIONS AND RATIONALES

Before surgery

• Make sure that the patient is medically stable, particularly regarding nutrition (this may take 4 to 5 days). If the patient can't tolerate oral feedings, provide total parenteral nutrition and I.V. fat emulsions *to correct deficiencies and maintain positive nitrogen balance.*
• Monitor blood transfusions *to combat anemia.*
• Administer vitamin K *to overcome prothrombin deficiency,* antibiotics *to prevent postoperative infection.*
• Perform gastric lavage *to maintain gastric decompression,* as necessary.
• Teach the patient about expected postoperative procedures and expected adverse effects of radiation and chemotherapy *to allay anxiety.*

After surgery

• Watch for and report complications, such as fistula, pancreatitis, fluid and electrolyte imbalance, infection, hemorrhage, skin breakdown, nutritional deficiency, hepatic failure, renal insufficiency, and diabetes, *to ensure early detection and treatment of complications.*
• If the patient is receiving chemotherapy, treat adverse effects symptomatically *to promote patient comfort and prevent complications.*
• Throughout the illness, provide meticulous supportive care as follows:
  – Monitor fluid balance, abdominal girth, metabolic state, and weight daily *to determine fluid volume status.*
  – Replace nutrients I.V., orally, or by nasogastric (NG) tube *to combat weight loss.* Maintain dietary restrictions such as a low-sodium or fluid retention diet as required *to*

combat weight gain (due to ascites). Maintain a 2,500 calorie diet for the patient *to meet increased nutritional needs.*
– Serve small, frequent, nutritious meals *to help the patient meet increased metabolic demands.*
– Administer an oral pancreatic enzyme at mealtimes, if needed, *to aid digestion.*
– Administer laxatives, stool softeners, and cathartics as required; modify diet; and increase patient fluid intake *to prevent constipation.*
– Position the patient properly at mealtime and help him walk when he can *to increase GI motility.*
– Administer pain medication, antibiotics, and antipyretics, as necessary *to promote comfort and treat infection.*
– Monitor blood glucose levels *to detect early signs of hypoglycemia or hyperglycemia.*
– Watch for signs of hypoglycemia or hyperglycemia; administer glucose or an antidiabetic agent as necessary *to prevent complications of hypoglycemia or hyperglycemia.*
– Provide meticulous skin care *to avoid pruritus and necrosis.*
– Watch for signs of upper GI bleeding; test stools and vomitus for occult blood and keep a flow sheet of Hb values and HCT *to prevent hemorrhage.*
– Promote gastric vasoconstriction with prescribed medication *to control active bleeding.*
– Replace any fluid loss *to prevent hypovolemia.*
– Ease discomfort from pyloric obstruction with an NG tube *to provide gastric decompression.*
– Apply antiembolism stockings and a sequential compression device and assist with ROM exercises *to prevent thrombosis.* If thrombosis occurs, elevate the patient's legs *to promote venous return* and give an anticoagulant as ordered *to decrease blood viscosity and prevent further thrombosis.*

Teaching topics
• Knowing disease process and treatment options
• Contacting the American Cancer Society
• Contacting local support groups and obtaining hospice information

Thyroid cancer

Thyroid cancer is a malignant, primary tumor of the thyroid. It may not affect thyroid hormone secretion.

CAUSES
• Chronic overstimulation of the pituitary gland
• Chronic overstimulation of the thymus gland
• Neck radiation

DATA COLLECTION FINDINGS
• Dysphagia
• Dyspnea
• Enlarged thyroid gland
• Hoarseness
• Painless, firm, irregular, and enlarged thyroid nodule or mass
• Palpable cervical lymph nodes

DIAGNOSTIC FINDINGS
• Blood chemistry shows increased calcitonin, serotonin, and prostaglandin levels.
• RAIU shows a "cold," or nonfunctioning, nodule.
• Thyroid biopsy shows cytology positive for cancer cells.
• Thyroid function test result is normal.

NURSING DIAGNOSES
• Anxiety
• Compromised family coping
• Acute and chronic pain

TREATMENT
• High-protein, high-carbohydrate, high-calorie diet with supplemental feedings
• Radiation therapy
• Thyroidectomy (total or subtotal) with or without radical neck excision

Drug therapy
• Antiemetics: prochlorperazine (Compazine), ondansetron (Zofran)

• Chemotherapy: chlorambucil (Leukeran), doxorubicin (Adriamycin), vincristine (Oncovin)
• Thyroid hormone replacements: levothyroxine (Synthroid), liothyronine (Cytomel), thyroglobulin (Proloid)

INTERVENTIONS AND RATIONALES

• Monitor respiratory status for signs of airway obstruction. A tracheotomy set should be kept at the bedside *because swelling may cause airway obstruction.*
• Evaluate ability to swallow *to maintain a patent airway.*
• Provide postoperative thyroidectomy care *to promote healing and prevent postoperative complications.*
• Monitor and record vital signs, intake and output, and laboratory studies *to determine baseline and detect early changes that may occur with hemorrhage, airway obstruction, or hypocalcemia.*
• Administer medications as prescribed *to maintain or improve the patient's condition.*
• Maintain the patient's diet *to improve nutritional status.*
• Encourage the patient to express feelings *to facilitate coping mechanisms.*
• Provide postchemotherapy and postradiation nursing care *to prevent and treat complications associated with therapy.*

Teaching topics

• Recognizing the signs and symptoms of respiratory distress, infection, myxedema coma, and difficulty swallowing
• Contacting the American Cancer Society

Thyroiditis

Thyroiditis is inflammation of the thyroid gland. It may occur in a variety of forms: autoimmune thyroiditis (long-term inflammatory disease; also known as *Hashimoto's thyroiditis*), subacute granulomatous thyroiditis (self-limiting inflammation), Riedel's thyroiditis (rare, invasive fibrotic process), and miscellaneous thyroiditis (acute suppurative, chronic infective, and chronic noninfective).

CAUSES

• Antibodies to thyroid antigens
• Bacterial invasion
• Mumps, influenza, coxsackievirus, or adenovirus infection

DATA COLLECTION FINDINGS

• Thyroid enlargement
• Fever
• Pain
• Tenderness and reddened skin over the gland

DIAGNOSTIC FINDINGS

• Precise diagnosis depends on the type of thyroiditis:
  – *autoimmune*—high titers of thyroglobulin and microsomal antibodies may be present in serum
  – *subacute granulomatous*—elevated erythrocyte sedimentation rate, increased thyroid hormone levels, decreased thyroidal radioactive iodine uptake
  – *chronic infective and noninfective*—varied findings, depending on underlying infection or other disease.

NURSING DIAGNOSES

• Risk for infection
• Acute pain
• Disturbed body image

TREATMENT

• Partial thyroidectomy to relieve tracheal or esophageal compression in Riedel's thyroiditis

Drug therapy

• Thyroid hormone replacement: levothyroxine (Synthroid) for accompanying hypothyroidism
• Analgesics and anti-inflammatory agents: indomethacin (Indocin) for mild subacute granulomatous thyroiditis
• Beta-adrenergic blocker: propranolol (Inderal) for transient thyrotoxicosis

INTERVENTIONS AND RATIONALES

• Before treatment, obtain a patient history *to identify underlying diseases that may cause thy-*

roiditis, such as tuberculosis or a recent viral infection.

• Check vital signs and examine the patient's neck for unusual swelling, enlargement, or redness *to detect disease progression and signs of airway occlusion.*

• Obtain a consult for speech therapy to determine the proper consistency of fluids if the patient has difficulty swallowing, especially when due to fibrosis, *to aid swallowing and prevent aspiration.*

• If the neck is swollen, measure and record the circumference daily *to monitor progressive enlargement.*

• Check for signs of thyrotoxicosis (nervousness, tremor, weakness), which often occur in subacute thyroiditis. *Checking for early signs avoids treatment delay.*

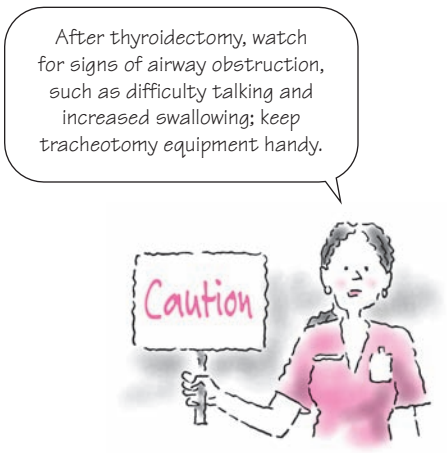
After thyroidectomy

• Check vital signs every 15 to 30 minutes until the patient's condition stabilizes. Stay alert for signs of tetany secondary to accidental parathyroid injury during surgery. Keep 10% calcium gluconate available for I.M. use if needed. *These measures help prevent serious postoperative complications.*

• Check dressings frequently for excessive bleeding *to detect signs of hemorrhage.*

• Keep the head of the patient's bed elevated.

• Watch for signs of airway obstruction, such as difficulty talking and increased swallowing; keep tracheotomy equipment handy *to avoid treatment delay if airway becomes obstructed.*



The airway may become obstructed because of postoperative edema.

Teaching topics

• Watching for and reporting signs of hypothyroidism (lethargy, restlessness, sensitivity to cold, forgetfulness, dry skin)—especially if he has Hashimoto's thyroiditis, which commonly causes hypothyroidism

• Understanding the need for lifelong thyroid hormone replacement therapy if permanent hypothyroidism occurs

• Understanding the need to watch for signs of overdose, such as nervousness and palpitations

Pump up on practice questions

1. A client with a PTH deficiency would most likely experience abnormal serum levels of:

1. sodium and chloride.
2. potassium and glucose.
3. urea and uric acid.
4. calcium and phosphorous.

Answer: 4. Because PTH regulates calcium and phosphorous metabolism, a PTH deficiency would affect calcium and phosphorous levels. PTH doesn't affect sodium, chloride, potassium, glucose, urea, or uric acid.

Client needs category: Physiological integrity

Client needs subcategory: Physiological adaptation

Cognitive level: Comprehension

2. A 28-year-old woman is scheduled for a GTT. She asks the nurse what result indicates diabetes mellitus. The nurse should respond that the minimum parameter for indication of diabetes mellitus is a 2-hour blood glucose level greater than:

1. 120 mg/dl.
2. 150 mg/dl.
3. 200 mg/dl.
4. 250 mg/dl.

Answer: 3. A GTT indicates a diagnosis of diabetes mellitus when the 2-hour blood glucose level is greater than 200 mg/dl. Confirmation occurs when at least one subsequent result is greater than 200 mg/dl.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

3. When interpreting a radioactive iodine uptake test, the nurse should know that:

1. uptake increases in hyperthyroidism and decreases in hypothyroidism.
2. uptake decreases in hyperthyroidism and increases in hypothyroidism.
3. uptake increases in both hyperthyroidism and hypothyroidism.
4. uptake decreases in both hyperthyroidism and hypothyroidism.

Answer: 1. Iodine is necessary for the synthesis of thyroid hormones. In hyperthyroidism, more iodine is taken up by the thyroid so more thyroid hormones may be synthesized. In hypothyroidism, less iodine is taken up because fewer thyroid hormones are synthesized.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

4. A client is diagnosed with hyperthyroidism. The nurse should expect clinical manifestations similar to:

1. hypovolemic shock.
2. adrenergic stimulation.
3. benzodiazepine overdose.
4. Addison's disease.

Answer: 2. Hyperthyroidism is a hypermetabolic state characterized by such signs as tachycardia, systolic hypertension, and anxiety—all seen in adrenergic (sympathetic) stimulation. Manifestations of hypovolemic shock, benzodiazepine overdose, and Addison's disease are more similar to a hypometabolic state.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

5. A client with a history of mitral valve replacement and chronic warfarin (Coumadin) usage is diagnosed with hypothyroidism and prescribed levothyroxine (Synthroid). The nurse should expect the need for the warfarin:

1. dosage to be decreased.
2. dosage to be increased.
3. frequency to be decreased.
4. frequency to be increased.

Answer: 1. Levothyroxine enhances the effects of warfarin; therefore, the warfarin dosage would need to be decreased.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

6. A client with thyroid cancer undergoes a thyroidectomy. After surgery, the client develops peripheral numbness and tingling and muscle twitching and spasms. The nurse should expect an order for which type of medication?

1. Thyroid supplement
2. Antispasmodics
3. Barbiturates
4. Calcium

Answer: 4. Removal of the thyroid gland can cause hyposecretion of PTH leading to calcium deficiency. Manifestations of calcium deficiency include numbness, tingling, and muscle spasms. Treatment includes immediate administration of calcium. A thyroid supplement will be necessary following thyroidectomy but isn't specifically related to the identified problem. An antispasmodic doesn't treat the problem's cause. A barbiturate isn't indicated.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

7. A client with intractable asthma develops Cushing's syndrome. Development of this complication can most likely be attributed to chronic use of:

1. prednisone (Deltasone).
2. theophylline (Theo-Dur).
3. metaproterenol (Alupent).
4. cromolyn (Intal).

Answer: 1. Cushing's syndrome results from excessive glucocorticoids. This can occur from frequent or chronic use of corticosteroids such as prednisone. Theophylline, metaproterenol, and cromolyn don't cause Cushing's syndrome.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Comprehension

8. During treatment of a client in adrenal crisis (addisonian crisis), the nurse should expect a physician's order for:

1. insulin.
2. normal saline solution.
3. dextrose 5% in half-normal saline solution.
4. dextrose 5% in water.

Answer: 2. A client in addisonian crisis has hyponatremia. It would be most appropriate to administer normal saline solution. Hydrocortisone, glucose, and vasopressors are also used to treat addisonian crisis. Administering dextrose 5% in half-normal saline solution, dextrose 5% in water, or insulin would be inappropriate for this client.

Client needs category: Physiological integrity

Client needs subcategory: Pharmacological therapies
Cognitive level: Application

9. A client recently diagnosed with type 1 diabetes mellitus is learning foot care. The nurse should include which of the following points in her teaching?

1. "It's OK to go barefoot at home."
2. "Trim your toenails with scissors regularly."
3. "Wear tight-fitting shoes without socks."
4. "Wear cotton socks and apply foot powder to your feet to keep them dry."

Answer: 4. The nurse should instruct the client to apply foot powder and to wear cotton socks and properly fitting shoes. The nurse should also instruct the client to avoid going barefoot to prevent injury and avoid using scissors to trim his nails. The client should be encouraged to see a podiatrist.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

10. Which nursing diagnosis is most likely for a client with an acute episode of diabetes insipidus?

1. Imbalanced nutrition
2. Deficient fluid volume
3. Impaired gas exchange
4. Ineffective tissue perfusion

Answer: 2. Diabetes insipidus causes a pronounced loss of intravascular volume. The most prominent risk to the client is deficient fluid volume. Nutrition, gas exchange, and tissue perfusion are at risk because of diabetes insipidus but this risk is a result of the fluid volume deficit caused by diabetes insipidus.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

10 Genitourinary system

In this chapter, you'll review:

- components of the genitourinary system and their functions
- tests used to diagnose genitourinary disorders
- common genitourinary disorders.

Brush up on key concepts

The genitourinary system performs various excretory, regulatory, and secretory functions. This system filters waste products from the body and expels them as urine. It does this by continuously exchanging water and solutes, such as hydrogen, potassium, chloride, bicarbonate, sulfate and phosphate, across cell membranes.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 304 to 309.

Urine producers

The **kidneys** are two bean-shaped organs that produce urine and maintain fluid and acid-base balance. To help maintain acid-base balance, the kidneys secrete hydrogen ions, reabsorb sodium and bicarbonates, acidify phosphate salts, and produce ammonia.

The kidneys have four main components:

- the cortex, which makes up the outer layer of the kidney and contains the glomeruli, the proximal tubules of the nephron, and the distal tubules of the nephron
- the medulla, which makes up the inner layer of the kidney and contains the loops of Henle and the collecting tubules
- the renal pelvis, which collects urine from the calices
- the nephron, which makes up the functional unit of the kidney and contains Bowman's capsule, the glomerulus, and the renal tubule, which consists of the proximal convoluted tubule and collecting segments.

Fluid facts

Urine is produced by a complex process centered in the kidneys.

Here's how urine is formed:

- Blood from the renal artery is filtered across the glomerular capillary membrane in Bowman's capsule.
- Blood filtration requires adequate intravascular volume and adequate cardiac output.
- Antidiuretic hormone and aldosterone control the tubular reabsorption of water and electrolytes.
- Composition of formed filtrate is similar to blood plasma without proteins.
- Formed filtrate moves through the tubules of the nephron, which reabsorb and secrete electrolytes, water, glucose, amino acids, ammonia, and bicarbonate.
- What's left is excreted as urine.

Transport tubule

The **ureter,** which transports urine from the kidney to the bladder, is a tubule that extends from the renal pelvis to the bladder floor.

Storage sac

The **bladder,** a muscular, distendable sac, can contain up to 1 L of urine at a single time.

Bagpipe

The **urethra** is a tube extending from the bladder to the urinary meatus that transports urine from the bladder to the exterior of the body.

Semen secretor

The **prostate gland** surrounds the male urethra. It contains ducts that secrete the alkaline portion of seminal fluid.

Blood pressure control

Regulation of fluid volume by the **kidneys** affects blood pressure. The renin-angiotensin system is activated by decreased blood pressure and can be altered by renal disease.

(Text continues on page 309.)

Cheat sheet

Genitourinary refresher

ACUTE POSTSTREPTOCOCCAL GLOMERULONEPHRITIS

Key signs and symptoms

- Azotemia
- Fatigue
- Oliguria
- Edema

Key test results

- Blood tests show elevated serum creatinine and potassium levels.
- 24-hour urine sample shows low creatinine clearance and impaired glomerular filtration.
- Urinalysis typically reveals proteinuria and hematuria. Red blood cells (RBCs), white blood cells, and mixed cell casts are common findings in urinary sediment.
- Kidney-ureter-bladder (KUB) X-rays show bilateral kidney enlargement.

Key treatments

- Bed rest
- Diuretics: metolazone (Zaroxolyn), furosemide (Lasix)
- Antihypertensive: hydralazine
- Fluid restriction
- High-calorie, low-sodium, low-potassium, low-protein diet

Key interventions

- Check vital signs. Monitor intake and output and daily weight. Watch for signs of acute renal failure (oliguria, azotemia, and acidosis).
- Provide good nutrition, use good hygienic technique, and prevent contact with infected people.
- Bed rest is necessary during the acute phase. Encourage the patient to gradually resume normal activities as symptoms subside.

ACUTE RENAL FAILURE

Key signs and symptoms

- Urine output less than 400 ml/day for 1 to 2 weeks followed by diuresis (3 to 5 L/day) for 2 to 3 weeks
- Weight gain

Key test results

- Creatinine clearance is low.
- Glomerular filtration rate is 20 to 40 ml/minute (renal insufficiency); 10 to 20 ml/minute (renal failure); less than 10 ml/minute (end-stage renal disease).

Key treatments

- Continuous renal replacement therapy or hemodialysis
- Low-protein, high-carbohydrate, moderate-fat, and moderate-calorie diet with potassium, sodium, and phosphorus intake regulated according to serum levels
- Inotropic agent: dopamine (Intropin) initially low-dose to improve renal perfusion
- Diuretics: furosemide (Lasix), metolazone (Zaroxolyn), bumetanide (Bumex)

Key interventions

- Monitor fluid balance, respiratory, cardiovascular, and neurologic status.
- Monitor and record vital signs, intake and output, and daily weight.
- Maintain the patient's diet.

BENIGN PROSTATIC HYPERPLASIA

Key signs and symptoms

- Decreased force and amount of urine
- Nocturia
- Urgency, frequency, and burning on urination

Key test results

- Cystoscopy shows enlarged prostate gland, obstructed urine flow, and urinary stasis.
- Digital rectal examination shows enlarged prostate gland.

Key treatments

- Forcing fluids
- Transurethral resection of the prostate (TURP) or prostatectomy

Key interventions

- Force fluids.
- Provide postoperative care.

I cannot tell a lie. When I am in a rush, I sometimes skip the chapter and just read the Cheat sheet.

Genitourinary refresher *(continued)*

BLADDER CANCER

Key signs and symptoms

- Frequent urination
- Painless hematuria
- Urgency of urination
- Urinary obstruction
- Urinary retention

Key test results

- Biopsy and cytology examination are positive for malignant cells.
- Cystoscopy reveals a bladder mass.

Key treatment

- Surgery, depending on the location and progress of the tumor

Key interventions

- Provide postoperative care. (Closely monitor urine output; observe for hematuria [reddish tint to gross bloodiness] or infection [cloudy, foul smelling, with sediment]; maintain continuous bladder irrigation, if indicated; assist with turning, coughing, deep breathing, and incentive spirometry; apply a sequential compression device while the patient is on bedrest.)
- Force fluids.

BREAST CANCER

Key signs and symptoms

- Cervical, supraclavicular, or axillary lymph node lump or enlargement on palpation
- Painless lump or mass in the breast or thickening of breast tissue
- Skin changes of the breast

Key test results

- Breast self-examination reveals a lump or mass in the breast or thickening of breast tissue.
- Fine-needle aspiration and excisional biopsy provide histologic cells that confirm diagnosis.
- Mammography and MRI detect a tumor.

Key treatments

- Bone marrow and peripheral stem cell therapy for advanced breast cancer
- Surgery: lumpectomy, skin-sparing mastectomy, partial mastectomy, total mastectomy, modified radical mastectomy, and quandrantectomy
- Chemotherapy: cyclophosphamide (Cytoxan), methotrexate (Folex), fluorouracil (Adrucil), doxorubicin (Adriamycin)
- Hormonal therapy: tamoxifen (Nolvadex), raloxifene (Evista), fulvestrant (Faslodex), toremifene (Fareston), megestrol (Megace)

Key interventions

- Note the patient's feelings about her illness, and determine what she knows about breast cancer and her expectations.
- Provide routine postoperative care.
- Perform comfort measures.
- Administer analgesics as ordered, and monitor their effectiveness.
- Watch for treatment-related complications, such as nausea, vomiting, anorexia, leukopenia, thrombocytopenia, GI ulceration, and bleeding.

CERVICAL CANCER

Key signs and symptoms

- Preinvasive: absence of symptoms
- Invasive: abnormal vaginal discharge (yellowish, blood-tinged, and foul-smelling)
- Postcoital pain and bleeding

Key test results

- Colposcopy determines the source of the abnormal cells seen on Papanicolaou test.
- Cone biopsy identifies malignant cells.

Key treatments

- Preinvasive: cryosurgery
- Invasive: radiation therapy (internal, external, or both), radical hysterectomy

Key interventions

- Encourage the patient to use relaxation techniques.
- Watch for complications related to therapy.
- Provide postoperative care.

CHLAMYDIA

Key signs and symptoms

In women

- Dyspareunia
- Mucopurulent discharge
- Pelvic pain

In men

- Dysuria
- Erythema
- Tenderness of the meatus
- Urethral discharge
- Urinary frequency

Key test result

- Antigen detection methods, including enzyme-linked immunosorbent assay and direct fluorescent antibody test, are the diag-

(continued)

Genitourinary refresher *(continued)*

CHLAMYDIA *(continued)*

nostic tests of choice for identifying chlamydial infection, although tissue cell cultures are more sensitive and specific.

Key treatments

- Antibiotics: doxycycline (Vibramycin), azithromycin (Zithromax)
- For pregnant women with chlamydial infections, azithromycin, in a single 1-g dose

Key interventions

- Practice standard and contact precautions when caring for a patient with a chlamydial infection.
- Make sure that the patient fully understands the dosage requirements of any prescribed medications for this infection.
- Obtain appropriate specimens for diagnostic testing.

CHRONIC GLOMERULONEPHRITIS

Key signs and symptoms

- Edema
- Hematuria
- Hypertension

Key test results

- Kidney biopsy identifies the underlying disease and provides data needed to guide therapy.
- Blood studies reveal rising blood urea nitrogen (BUN) and serum creatinine levels, which indicate advanced renal insufficiency.
- Urinalysis reveals proteinuria, hematuria, cylindruria, and RBC casts.

Key treatments

- Dialysis
- Kidney transplant

Key interventions

- Understand that patient care is primarily supportive, focusing on continual observation and sound patient teaching.
- Accurately monitor vital signs, intake and output, and daily weight.
- Observe for signs of fluid, and electrolyte imbalances.
- Administer medications.
- Provide good skin care.

CHRONIC RENAL FAILURE

Key signs and symptoms

- Azotemia
- Decreased urine output
- Indications of heart failure
- Lethargy
- Pruritus
- Weight gain

Key test result

- Blood chemistry shows increased BUN, creatinine, potassium, phosphorus and lipid levels and decreased calcium, carbon dioxide, and albumin levels.

Key treatments

- Limited fluids
- Low-protein, low-sodium, low-potassium, low-phosphorus, high-calorie, and high-carbohydrate diet
- Peritoneal dialysis or hemodialysis
- Antacid: aluminum hydroxide gel (AlternaGEL)
- Antiemetic: prochlorperazine (Compazine), metoclopramide (Reglan)
- Calcium supplement: calcium carbonate (Os-Cal)
- Cation exchange resin: sodium polystyrene sulfonate (Kayexalate)
- Diuretics: furosemide (Lasix), bumetanide (Bumex)

Key interventions

- Monitor renal, respiratory, and cardiovascular status and fluid balance.
- Check dialysis access for bruit and thrill.
- Follow standard precautions.
- Restrict fluids.

CYSTITIS

Key signs and symptoms

- Dark, odoriferous urine
- Frequency of urination
- Urgency of urination

Key test result

- Urine culture and sensitivity positively identifies organisms *(Escherichia coli, Proteus vulgaris,* and *Streptococcus faecalis).*

Key treatment

- Diet: increased intake of fluids and vitamin C

Key interventions

- Monitor vital signs and intake and output.
- Force fluids (cranberry or orange juice) to 3 qt (3 L)/day.
- Instruct the patient to decrease his intake of carbonated beverages and to avoid coffee, tea, and alcohol.

GONORRHEA

Key signs and symptoms

- Dysuria
- Purulent urethral or cervical discharge
- Itching, burning, and pain

Genitourinary refresher *(continued)*

GONORRHEA *(continued)*

Key test result

• A culture from the site of infection (urethra, cervix, rectum, or pharynx), is used to establish the diagnosis by isolating the organism.

Key treatments

• Antibiotics: ceftriaxone (Rocephin), doxycycline (Vibramycin), erythromycin (E-mycin)
• Prophylactic antibiotic: 1% silver nitrate or erythromycin (EryPed) eye drops to prevent infection in neonates

Key interventions

• Before treatment, establish whether the patient has any drug sensitivities.
• Follow standard and contact precautions.

HERPES SIMPLEX

Key signs and symptoms

• Blisters, which may form on any part of the mouth
• Dysuria (in genital herpes)
• Erythema
• Flulike symptoms
• Fluid-filled blisters (genital herpes)

Key test result

• Confirmation requires isolation of the virus from local lesions and a histologic biopsy.

Key treatments

• Antiviral agents: idoxuridine (Herplex Liquifilm), trifluridine (Viroptic), or vidarabine (Vira-A)
• 5% acyclovir (Zovirax) ointment (possible relief to patients with genital herpes or to immunosuppressed patients with *Herpesvirus hominis* skin infections; I.V. acyclovir to help treat more severe infections)

Key interventions

• Follow standard and contact precautions. For patients with extensive cutaneous, oral, or genital lesions, institute contact precautions.
• Administer pain medication and prescribed antiviral agents as ordered.
• Provide supportive care, as indicated, such as oral hygiene, nutritional supplementation, and antipyretics for fever.

NEUROGENIC BLADDER

Key symptom

• Altered micturition

Key test result

• Voiding cystourethrography evaluates bladder neck function, vesicoureteral reflux, and continence.

Key treatment

• Indwelling urinary catheter insertion (including teaching the patient self-catheterization techniques)

Key interventions

• Use strict sterile technique during insertion of an indwelling urinary catheter (a temporary measure to drain the incontinent patient's bladder). Don't interrupt the closed drainage system for any reason.
• Clean the catheter insertion site with soap and water at least twice a day.
• Clamp the tubing or empty the catheter bag before transferring the patient to a wheelchair or stretcher.
• Watch for signs of infection (fever, cloudy or foul-smelling urine).

OVARIAN CANCER

Key signs and symptoms

• Abdominal distention
• Pelvic discomfort
• Urinary frequency
• Weight loss

Key test result

• Abdominal ultrasonography, computed tomography scan, or X-ray may delineate tumor size.

Key treatments

• Resection of the involved ovary
• Total abdominal hysterectomy and bilateral salpingo-oophorectomy with tumor resection, omentectomy, and appendectomy
• Antineoplastics: carboplatin (Paraplatin), chlorambucil (Leukeran), cyclophosphamide (Cytoxan), dactinomycin (Cosmegen), doxorubicin (Rubex), fluorouracil (Adrucil), cisplatin (Platinol), paclitaxel (Taxol), topotecan (Hycamtin)
• Analgesics: morphine, fentanyl (Duragesic-25)

Key interventions

Before surgery

• Thoroughly explain all preoperative tests, the expected course of treatment, and surgical and postoperative procedures.

After surgery

• Monitor vital signs frequently.
• Monitor intake and output while maintaining good catheter care.
• Check the dressing regularly for excessive drainage or bleeding, and watch for signs of infection.
• Encourage coughing, deep breathing, and incentive spirometry hourly during the waking hours.
• Reposition the patient often, and encourage her to walk shortly after surgery.

(continued)

Genitourinary refresher *(continued)*

PROSTATE CANCER

Key signs and symptoms

- Decreased size and force of urinary stream
- Difficulty and frequency of urination
- Hematuria
- Urine retention

Key test results

- Carcinoembryonic antigen is elevated.
- Digital rectal examination reveals palpable firm nodule in gland or diffuse induration in posterior lobe.
- Prostatic-specific antigen is increased.

Key treatments

- Radiation implant
- Radical prostatectomy (for localized tumors without metastasis) or TURP (to relieve obstruction in metastatic disease)
- Luteinizing hormone-releasing hormone agonists: goserelin acetate (Zoladex) and leuprolide acetate (Lupron)
- Estrogen therapy: diethylstilbestrol

Key interventions

- Monitor and record vital signs and intake and output.
- Check for signs of infection.
- Monitor the patient's pain and note the effectiveness of analgesia.
- Maintain the patient's diet.
- Maintain the patency of the urinary catheter and note drainage.

RENAL CALCULI

Key sign

- Flank pain

Key test results

- Excretory urography reveals stones.
- KUB X-rays reveal stones.

Key treatments

- Diet: for calcium stones, acid-ash with limited intake of calcium and milk products; for oxalate stones, alkaline-ash with limited intake of foods high in oxalate (cola, tea); for uric acid stones, alkaline-ash with limited intake of foods high in purine
- Extracorporeal shock wave lithotripsy
- Surgery to remove the stone if other measures aren't effective (type of surgery dependent on location of the stone)

Key interventions

- Monitor the patient's urine for evidence of renal calculi. Strain all urine and save all solid material for analysis.
- Force fluids to 3 qt (3 L)/day.
- If surgery was performed, check dressings regularly for bloody drainage and report excessive amounts of bloody drainage to the doctor; use sterile technique to change the dressing; maintain nephrostomy tube or indwelling urinary catheter if indicated; and monitor the incision site for signs of infection.

SYPHILIS

Key signs and symptoms

Primary syphilis

- Chancres on the genitalia, anus, fingers, lips, tongue, nipples, tonsils, or eyelids

Secondary syphilis

- Symmetrical mucocutaneous lesions
- Malaise
- Anorexia
- Weight loss
- Slight fever

Key test results

- Fluorescent treponemal antibody-absorption test identifies antigens of *T. pallidum* in tissue, ocular fluid, cerebrospinal fluid, tracheobronchial secretions, and exudates from lesions. This is the most sensitive test available for detecting syphilis in all stages. Once reactive, it remains so permanently.
- Venereal Disease Research Laboratory (VDRL) slide test and rapid plasma reagin test detect nonspecific antibodies. Both tests, if positive, become reactive within 1 to 2 weeks after the primary lesion appears or 4 to 5 weeks after the infection begins.

Key treatment

- Antibiotics: penicillin G benzathine (Permapen); if allergic to penicillin, erythromycin (Erythrocin) or tetracycline (Panmycin)

Key interventions

- Check for a history of drug sensitivity before administering the first dose of penicillin.
- Urge the patient to seek VDRL testing after 3, 6, 12, and 24 months. A patient treated for latent or late syphilis should receive blood tests at 6-month intervals for 2 years.

TESTICULAR CANCER

Key signs and symptoms

- Firm, painless, smooth testicular mass, varying in size and sometimes producing a sense of testicular heaviness

In advanced stages

- Ureteral obstruction
- Abdominal mass
- Weight loss
- Fatigue

Genitourinary refresher *(continued)*

TESTICULAR CANCER *(continued)*

- Back pain
- Pallor

Key test results

- Regular self-examinations and testicular palpation during a routine physical examination may detect testicular tumors.
- Surgical excision and biopsy of the tumor and testes permits histologic verification of the tumor cell types.

Key treatments

- Surgery: orchiectomy (testicle removal; most surgeons remove the testicle but not the scrotum to allow for a prosthetic implant)
- High-calorie diet provided in small frequent feedings
- I.V. fluid therapy
- Antineoplastics: bleomycin (Blenoxane), carboplatin (Paraplatin), cisplatin (Platinol), dactinomycin (Cosmegen), etoposide (VePesid), ifosfamide (Ifex), plicamycin (Mithracin), vinblastine (Velban)
- Analgesics: morphine, fentanyl (Duragesic-25)
- Antiemetics: trimethobenzamide (Tigan), metoclopramide (Reglan), ondansetron (Zofran)

Key interventions

- Develop a treatment plan that addresses the patient's psychological and physical needs.

After orchiectomy

- For the first day after surgery, apply an ice pack to the scrotum and provide an analgesic.
- Check for excessive bleeding, swelling, and signs of infection.
- Give an antiemetic, as needed.
- Encourage small, frequent meals.

Female and male reproductive systems

The genitourinary system also encompasses the female and male reproductive systems. Here's a brief review of the female and male reproductive systems, including external and internal genitalia.

FEMALE EXTERNAL GENITALIA

Here's a look at the external female genitalia.

Pelvic protection

The **mons pubis** provides an adipose cushion over the anterior symphysis pubis, protects the pelvic bones, and contributes to the rounded contour of the female body.

Vulval cleft protection

The **labia majora** are two folds that converge at the mons pubis and extend to the posterior commissure. They consist of connective tissue, elastic fibers, veins, and sebaceous glands, and protect components of the vulval cleft.

Lubricating the vulva

The **labia minora** are within the labia majora and consist of connective tissue, sebaceous and sweat glands, nonstriated muscle fibers, nerve endings, and blood vessels. They unite to form the fourchette (the vaginal vestibule) and serve to lubricate the vulva, which adds to sexual pleasure and fights bacteria.

Pleasure center

The **clitoris**—located in the anterior portion of the vulva above the urethral opening—is made up of erectile tissue, nerves, and blood vessels and provides sexual pleasure. The clitoris consists of:

- the glans
- the body
- two crura.

The vestibule

The **vaginal vestibule** extends from the clitoris to the posterior fourchette and consists of:

- the vaginal orifice
- the hymen—a thin, vascularized mucous membrane at the vaginal orifice
- the fossa navicularis—a depressed area between the hymen and fourchette
- Bartholin's glands—two bean-shaped glands on either side of the vagina that secrete mucus during sexual stimulation.

Episiotomy site
The **perineal body** (the area between the vagina and the anus) is the site of episiotomy during childbirth.

Urine passage
The **urethral meatus** is located ⅜″ to 1″ (1 to 2.5 cm) below the clitoris.

Grease monkeys
The **paraurethral glands** (Skene's glands) are located on both sides of the urethral opening. Their function is to produce mucus.

FEMALE INTERNAL GENITALIA
Here's a brief review of internal female genitalia.

Copulatory and birth passage
The **vagina** is a vascularized musculomembranous tube extending from the external genitals to the uterus.

Womb for more
Hollow and pear-shaped, the **uterus** is a muscular organ divided by a slight constriction (isthmus) into an upper portion (body or corpus) and a lower portion (cervix); the body or corpus has three layers (perimetrium, myometrium, and endometrium). The uterus receives support from broad, round, uterosacral ligaments and provides an environment for fetal growth and development.

Fertilization site
The **fallopian tubes** are about 4½″ (11.5 cm) long and consist of four layers (peritoneal, subserous, muscular, mucous) divided into four portions (interstitial, isthmus, ampulla, fimbria). The fallopian tubes:
- transport ovum from the ovary to the uterus
- provide a nourishing environment for zygotes
- serve as the site of fertilization.

Ovulation site
The **ovaries** are two almond-shaped glandular structures resting below and behind the fallopian tubes on either side of the uterus. They produce sex hormones (estrogen, progesterone, androgen) and serve as the site of ovulation.

Food for thought
Although not part of the female internal or external genitalia, the **breasts** are affected by the genitourinary system. They consist of glandular, fibrous, and adipose tissue. Stimulated by secretions from the hypothalamus, anterior pituitary, and ovaries, they provide nourishment to an infant, transfer maternal antibodies during breast-feeding.

MALE EXTERNAL GENITALIA
External male genitalia include the penis and the scrotum.

Upstanding members
The **penis,** consisting of the body (shaft) and glans, has three layers of erectile tissue—two corpora cavernosa and one corpus spongiosum. The penis deposits spermatozoa in the female reproductive tract during sexual intercourse.

Protective pouch
The **scrotum** is a pouchlike structure composed of skin, fascial connective tissue, and smooth muscle fibers that houses the testes and protects spermatozoa from high body temperature.

MALE INTERNAL GENITALIA
Internal male genitalia, which are discussed here, produce and transport semen and seminal fluid.

Sperm producers
The **testes** or testicles, two oval-shaped glandular organs inside the scrotum, function to produce spermatozoa and testosterone.

Sperm storage
The **epididymides** serve as the initial section of the testes' excretory duct system and store spermatozoa as they mature and become motile.

Sperm conduit
The **vas deferens,** which connects the epididymal lumen and the prostatic urethra, serves as a conduit for spermatozoa.

Seminal passage
The **ejaculatory ducts**—located between the seminal vesicles and the urethra—serve as passageways for semen and seminal fluid.

Exit strategy
The **urethra,** which extends from the bladder through the penis to the external urethral opening, serves as the excretory duct for urine and semen.

Motility aids
The **seminal vesicles** are two pouchlike structures between the bladder and the rectum that secrete a viscous fluid that aids in spermatozoa motility and metabolism.

Lubricating gland
The **prostate gland,** located just below the bladder, is considered homologous to Skene's glands in females. It produces an alkaline fluid that enhances spermatozoa motility and lubricates the urethra during sexual activity.

Peas in a pod
The **bulbourethral glands** (or Cowper's glands) are two pea-sized glands opening into the posterior portion of the urethra. They secrete a thick alkaline fluid that neutralizes acidic secretions in the female reproductive tract, thus prolonging spermatozoa survival.

Keep abreast of diagnostic tests

Here are some diagnostic tests to help identify genitourinary disorders as well as common nursing actions associated with each test.

Urine sample study 1
Urinalysis involves an examination of urine for color, appearance, pH, urine specific gravity, protein, glucose, ketones, red blood cells (RBCs), white blood cells (WBCs), and casts.

Nursing actions
- Wash the perineal area.
- Obtain first morning urine specimen.

Urine sample study 2
A **urine culture and sensitivity test** involves examination of a urine specimen for the presence of bacteria.

Nursing actions
- Clean the perineal area and urinary meatus with bacteriostatic solution.
- Collect a midstream sample in a sterile container.

All in a day's work
A **24-hour urine collection** is used to analyze urine specimens collected over 24 hours to evaluate kidney function.

Nursing actions
- Instruct the patient to void. Sample collection starts the next time the patient voids; note this time.
- Place the urine container on ice, if indicated.
- Measure each voided urine specimen and place in the collection container.
- Instruct the patient to void at the end of the 24-hour period.

Blood study 1
Blood chemistry tests analyze blood samples for potassium, sodium, calcium, phosphorus, glucose, bicarbonate, blood urea nitrogen (BUN), creatinine, protein, albumin, osmolality, magnesium, uric acid, and carbon dioxide (CO_2) levels.

Nursing actions
- Withhold food and fluids before the procedure, as directed.
- Monitor the venipuncture site for bleeding.

Blood study 2
A **hematologic study** involves analysis of a blood sample for WBCs, RBCs, erythrocyte sedimentation rate, platelets, hemoglobin (Hb) level, and hematocrit (HCT).

Nursing actions
- Explain the purpose of the procedure.
- Check the venipuncture site for bleeding.

Maintain a sense of accomplishment while studying. Make a list of chapters to review this week and then cross them off one by one. That's satisfying!

Blood study 3

A **coagulation study** involves analysis of a blood sample for prothrombin time (PT), international normalized ratio, and partial thromboplastin time (PTT).

Nursing actions

- Explain the purpose of the procedure.
- Check the medication list and note any that may alter test results.
- Check the venipuncture site for bleeding.

Picture this

A **kidney-ureter-bladder (KUB) X-ray** provides a radiographic picture of the kidneys, ureters, and bladder.

Nursing actions

- Schedule the X-ray before other examinations requiring contrast medium.
- Make sure that the patient removes metallic belts.

Scope the whole system

Excretory urography is a fluoroscopic examination of the kidneys, ureters, and bladder.

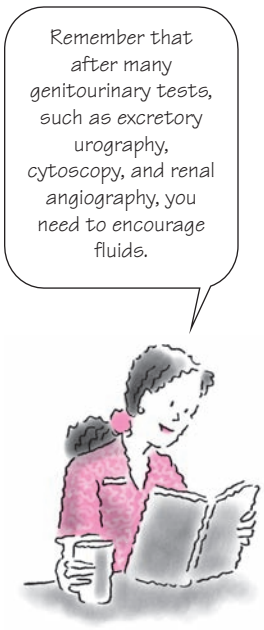
Nursing actions

Before the procedure

- Note any allergies to iodine, seafood, and radiopaque dyes.
- Withhold food and fluids after midnight.
- Administer a laxative, as prescribed.
- Make sure that written, informed consent has been obtained.
- Inform the patient that he may experience a transient burning sensation and metallic taste when the contrast is injected.

After the procedure

- Instruct the patient to drink at least 1 qt (1 L) of fluids.



Bladder inspection

With **cystoscopy,** a cystoscope is used to directly visualize the bladder. During the procedure, the bladder is usually distended with fluid to enhance visualization.

Nursing actions

Before the procedure

- Withhold food and fluids.
- Make sure that written, informed consent has been obtained.
- Administer enemas and medications, as prescribed.

After the procedure

- Monitor vital signs and intake and output.
- Administer an analgesic and sitz baths, as prescribed.
- Check the patient's urine for blood clots.
- Encourage fluids.

Examining arteries

Renal angiography is a radiographic examination of the renal arterial supply.

Nursing actions

Before the procedure

- Note any allergies to iodine, seafood, and radiopaque dyes.
- Make sure that written, informed consent has been obtained.
- Withhold food and fluids after midnight.
- Instruct the patient to void immediately before the procedure.
- Administer enemas, as prescribed.

After the procedure

- Monitor vital signs and pulses below the catheter insertion site.
- Inspect the catheter insertion site for bleeding or hematoma formation.
- Force fluids.

Go with the blood flow

A **renal scan** permits visual imaging of blood flow distribution to the kidneys.

Nursing actions

Before the procedure

- Note any allergies.
- Make sure that written, informed consent has been obtained.

After the procedure

- Monitor the patient for signs of delayed allergic reaction, such as itching and hives.
- Wear gloves when caring for incontinent patients and double-bag linens.

Taking kidney tissue

A **renal biopsy** is the percutaneous removal of a small amount of renal tissue for histologic evaluation.

Nursing actions

Before the procedure

- Record baseline vital signs.
- Withhold food and fluids after midnight.
- Make sure that written, informed consent has been obtained.

After the procedure

- Monitor and record vital signs, Hb level, and HCT.
- Check the biopsy site for bleeding.

Dye and shoot

For **cystourethrography,** a radiopaque dye and an X-ray are used to provide visualization of the bladder and ureters.

Nursing actions

Before the procedure

- Note any allergies to iodine, seafood, and radiopaque dyes.
- Make sure that written, informed consent has been obtained.
- Advise the patient about voiding requirements during the procedure.

After the procedure

- Monitor voiding.

Bladder pressure measure

Cystometrogram (CMG) graphs the pressure exerted while the bladder fills.

Nursing actions

- Advise the patient about voiding requirements during the procedure.
- Monitor voiding after the procedure.

Polish up on patient care

Major genitourinary disorders include acute poststreptococcal glomerulonephritis (APSGN), acute renal failure, benign prostatic hyperplasia (BPH), bladder cancer, breast cancer, cervical cancer, chlamydia, chronic glomerulonephritis, chronic renal failure, cystitis, gonorrhea, herpes simplex, neurogenic bladder, ovarian cancer, prostate cancer, renal calculi, syphilis, and testicular cancer.

Acute poststreptococcal glomerulonephritis

Also called *acute glomerulonephritis,* APSGN is a relatively common bilateral inflammation of the glomeruli, the kidney's blood vessels. It follows a streptococcal infection of the respiratory tract or, less often, a skin infection such as impetigo.

CAUSES

- Trapped antigen-antibody complexes (produced as an immunologic mechanism in response to streptococci) in the glomerular capillary membranes, induce inflammatory damage and impede glomerular function
- Untreated pharyngitis (inflammation of the pharynx)

DATA COLLECTION FINDINGS

- Azotemia
- Edema
- Fatigue
- Flank pain
- Hematuria
- Hypertension
- Oliguria
- Proteinuria

DIAGNOSTIC FINDINGS

- Blood tests show elevated serum creatinine and potassium levels.
- 24-hour urine sample shows low creatinine clearance and impaired glomerular filtration.
- Elevated antistreptolysin-O titers (in 80% of patients), elevated streptozyme and anti-DNase B titers, and low serum complement levels verify recent streptococcal infection.
- Renal biopsy may confirm the diagnosis in a patient with APSGN or may be used to assess renal tissue status.
- Renal ultrasonography may show a normal or slightly enlarged kidney.
- Throat culture may show group A beta-hemolytic streptococci.
- Urinalysis typically reveals proteinuria and hematuria. RBCs, WBCs, and mixed cell casts are common findings in urinary sediment.
- KUB X-rays show bilateral kidney enlargement.

Encourage pregnant women with a history of APSGN to have frequent medical evaluations because they're at increased risk for chronic renal failure.

NURSING DIAGNOSES
- Impaired urinary elimination
- Excess fluid volume
- Risk for injury

TREATMENT
- Bed rest
- Fluid restriction
- High-calorie, low-sodium, low-potassium, low-protein diet
- Dialysis (occasionally necessary)

Drug therapy
- Diuretics: metolazone (Zaroxolyn), furosemide (Lasix)
- Antihypertensive: hydralazine

INTERVENTIONS AND RATIONALES
- Check vital signs. Monitor fluid intake and output and daily weight. Watch for signs of acute renal failure (oliguria, azotemia, acidosis). *These measures detect early signs of complications and help guide the treatment plan.*
- Consult the dietitian *to provide a diet high in calories and low in protein, sodium, potassium, and fluids.*
- Provide good nutrition, use good hygienic technique, and prevent contact with infected people *to protect the debilitated patient from secondary infection.*
- Stress bed rest during the acute phase. Encourage the patient to gradually resume normal activities as symptoms subside *to prevent fatigue.*
- Provide emotional support for the patient and family. If the patient is on dialysis, explain the procedure fully. *These measures may help ease the patient's anxiety.*

With treatment, acute renal failure is usually reversible. Untreated, it may progress to end-stage renal disease or death.

Teaching topics
- Knowing the importance of immediately reporting signs of infection, such as fever and sore throat (for the patient with a history of chronic upper respiratory tract infections)
- Understanding the importance of follow-up examinations to detect chronic renal failure
- Understanding the need for regular blood pressure, urinary protein, and renal function assessments during the convalescent months to detect recurrence
- Knowing what to expect (after APSGN, gross hematuria may recur during nonspecific viral infections; abnormal urinary findings may persist for years)
- Understanding the possibility of orthostatic hypotension when taking a diuretic and the need to change position slowly
- Knowing the need for frequent medical evaluations in pregnant patients with a history of APSGN (pregnancy further stresses the kidneys, increasing the risk of chronic renal failure)

Acute renal failure

Acute renal failure is a sudden interruption of renal function resulting from obstruction, poor circulation, or kidney disease. With treatment, this condition is usually reversible; however, if left untreated, it may progress to end-stage renal disease or death.

Acute renal failure is classified as prerenal (results from conditions that diminish blood flow to the kidneys), intrarenal (results from damage to the kidneys, usually from acute tubular necrosis), or postrenal (results from obstruction of urine flow).

CAUSES
- Acute glomerulonephritis
- Acute tubular necrosis
- Anaphylaxis
- BPH
- Blood transfusion reaction
- Burns
- Cardiopulmonary bypass
- Collagen diseases
- Congenital deformity
- Dehydration
- Diabetes mellitus
- Heart failure, cardiogenic shock, endocarditis, malignant hypertension
- Hemorrhage
- Nephrotoxins: antibiotics, X-ray dyes, pesticides, anesthetics
- Renal calculi
- Septicemia
- Trauma
- Tumor

DATA COLLECTION FINDINGS

- Anorexia, nausea, and vomiting
- Circumoral numbness, tingling extremities
- Costovertebral pain
- Diarrhea or constipation
- Epistaxis
- Headache
- Irritability, restlessness
- Lethargy, drowsiness, stupor, coma
- Pallor, ecchymosis
- Stomatitis
- Thick, tenacious sputum
- Urine output less than 400 ml/day for 1 to 2 weeks followed by diuresis (3 to 5 L/day) for 2 to 3 weeks
- Weight gain

DIAGNOSTIC FINDINGS

- Arterial blood gas (ABG) analysis shows metabolic acidosis.
- Blood chemistry shows increased potassium, phosphorus, magnesium, BUN, creatinine, and uric acid levels and decreased calcium, CO_2, and sodium levels.
- Creatinine clearance is low.
- Excretory urography shows decreased renal perfusion and function.
- Glomerular filtration rate is 20 to 40 ml/minute (renal insufficiency); 10 to 20 ml/minute (renal failure); less than 10 ml/minute (end-stage renal disease).
- Hematology shows decreased Hb level, HCT, and erythrocytes.
- Coagulation studies show increased PT and PTT.
- Urine chemistry shows albuminuria, proteinuria, and increased sodium level; casts, RBCs, and WBCs; and urine specific gravity greater than 1.025, then fixed at less than 1.010.

NURSING DIAGNOSES

- Decreased cardiac output
- Excess fluid volume
- Ineffective tissue perfusion: Renal

TREATMENT

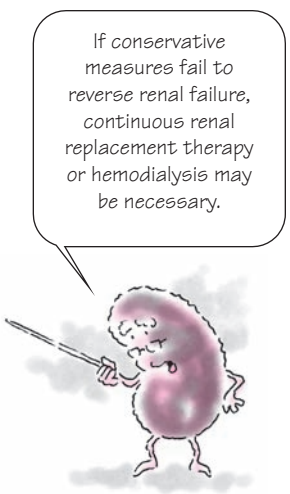
- Continuous renal replacement therapy, or hemodialysis
- Low-protein, high-carbohydrate, moderate-fat, and moderate-calorie diet with potassium, sodium, and phosphorus intake regulated according to serum levels
- Fluid intake restricted to amount needed to replace fluid loss
- Transfusion therapy with packed RBCs administered over 1 to 3 hours as needed

Drug therapy

- Alkalinizing agent: sodium bicarbonate
- Antacid: aluminum hydroxide gel (AlternaGEL)
- Antibiotic: cefazolin (Ancef)
- Anticonvulsant: phenytoin (Dilantin)
- Antiemetic: prochlorperazine (Compazine)
- Antipyretic: acetaminophen (Tylenol)
- Inotropic agent: dopamine (Intropin) initially low-dose to improve renal perfusion
- Cation exchange resin: sodium polystyrene sulfonate (Kayexalate)
- Diuretics: furosemide (Lasix), metolazone (Zaroxolyn), bumetanide (Bumex)

INTERVENTIONS AND RATIONALES

- Monitor fluid balance, respiratory, cardiovascular, and neurologic status *to detect fluid overload, a complication of acute renal failure.*
- Monitor and record vital signs, intake and output, and daily weight *to detect early signs of fluid overload.*
- Observe for the presence of dependent edema, *which may indicate fluid overload.*
- Restrict fluids *to prevent fluid volume excess.*
- Maintain I.V. fluids *to correct electrolyte imbalance and maintain hydration.*
- Place the patient in semi-Fowler's position *to facilitate lung expansion.*
- Maintain the patient's diet *to promote nutritional status.*
- Monitor total parenteral nutrition or enteral nutrition, if indicated, *to promote nutritional status.*
- Administer medications, as prescribed, *to maintain or improve the patient's condition.*
- Encourage the patient to express feelings about changes in body image *to facilitate coping mechanisms.*
- Maintain a quiet environment *to reduce metabolic demands.*
- Assist the patient with turning, coughing, and deep breathing *to mobilize secretions and promote lung expansion.*



• Provide skin and mouth care using plain water *to promote comfort and prevent tissue breakdown.*

Teaching topics
• Avoiding over-the-counter medications
• Understanding dietary modifications
• Maintaining a quiet environment

Benign prostatic hyperplasia

With BPH, the prostate gland enlarges and compresses the urethra, causing urinary obstruction.

Relate data collection findings to how the disorder affects the body. BPH can compress the urethra. Decreased force and amount of urine are key signs.

CAUSES
• Hormonal
• Unknown

DATA COLLECTION FINDINGS
• Decreased force and amount of urine
• Dribbling of urine
• Dysuria
• Hesitancy in voiding
• History of urinary tract infection (UTI)
• Nocturia
• Urgency, frequency, and burning on urination
• Urine retention

DIAGNOSTIC FINDINGS
• Blood chemistry shows increased BUN and creatinine levels.
• CMG shows abnormal pressure recordings.
• Cystoscopy shows enlarged prostate gland, obstructed urine flow, and urinary stasis.
• Digital rectal examination reveals enlarged prostate gland.
• Excretory urography shows urethral obstruction and hydronephrosis.
• In many cases, prostate-specific antigen (PSA) levels are low.
• Urinary flow rate determination shows small volume, prolonged flow pattern, and low peak flow.
• Urine chemistry shows bacteria, hematuria, alkaline pH, and increased urine specific gravity.

NURSING DIAGNOSES
• Sexual dysfunction
• Impaired urinary elimination
• Urinary retention

TREATMENT
• Encouraging fluids
• Transurethral resection of the prostate (TURP) or prostatectomy

Drug therapy
• Alpha-adrenergic antagonists: prazosin (Minipress), tamsulosin (Flomax), terazosin (Hytrin)
• Alpha-adrenergic blockers: doxazosin (Cardura), phenoxybenzamine (Dibenzyline)
• Analgesics: oxycodone and acetaminophen (Tylox)
• Antianxiety: oxazepam (Serax)
• Antibiotic: co-trimoxazole (Bactrim)
• Urinary antiseptic: phenazopyridine (Pyridium)

INTERVENTIONS AND RATIONALES
• Monitor and record vital signs and intake and output. *Accurate intake and output are essential to detect urine retention if the patient doesn't have an indwelling urinary catheter in place.*
• Monitor for UTI *to assess for complications.*
• Force fluids *to improve hydration.*
• Administer medications, as prescribed, *to maintain or improve the patient's condition.*
• Encourage the patient to express feelings about changes in body image and fear of sexual dysfunction *to help pinpoint fears, establish trust, and facilitate coping.*
• Maintain the position and patency of the indwelling urinary catheter to straight drainage *to avoid urine reflux.* (See *Inserting an indwelling urinary catheter.*)
• Maintain activity as tolerated *to promote independence.*
• Provide routine postoperative care *to prevent complications.*

Teaching topics
• Recognizing the signs and symptoms of urine retention
• Adhering to medical follow-up

Stepping up

Inserting an indwelling urinary catheter

WHY YOU DO IT

A urinary catheter, which is inserted through the urethra into the urinary bladder, can be used to empty the bladder before surgery, treat urine retention, obtain a sterile urine specimen, determine the amount of residual urine, or monitor urine output continuously in a seriously ill patient.

HOW YOU DO IT

- Explain the procedure to the patient, provide privacy, and arrange for good lighting.
- Place the female patient in the dorsal recumbent position with knees flexed and feet positioned about 2′ (61 cm) apart. Place the male patient in the supine position.
- After placing a waterproof pad under the patient, clean the genital area with soap and water and then dry it.
- Open the supplies, put on sterile gloves, and set up sterile supplies.
- Spread the labia or position the penis with your nondominant hand. Identify the meatus (in an uncircumcised male, retract the foreskin). Using cotton balls held by forceps, clean the area with antiseptic (use each cotton ball only once). For the female patient, wipe one side of the urinary meatus with a sterile cotton ball using a single downward motion. Wipe the other side with another sterile cotton ball in the same way. Then wipe directly over the meatus with still another cotton ball. For the male patient, clean the glans with a sterile cotton ball held in the forceps. Clean in a circular motion, starting at the urinary meatus and working outward. Repeat the procedure, using another cotton ball and taking care not to contaminate your sterile glove.
- Using the dominant hand, insert the catheter into the meatus until urine flows; for a female, insert the indwelling catheter 3″ to 4″ (7.5 to 10 cm); for a male, 7″ to 9″ (17.5 to 23 cm). Don't use force when advancing the catheter. If you meet resistance, rotate the catheter slightly (for a male, exert slight upward tension on the penis). Note the flow of urine from the catheter.
- Inflate the balloon with sterile water; then tug gently on the catheter to check placement.
- Attach the catheter to the drainage system (if not connected already). Position the collection bag on the bed frame. Secure the catheter to the female patient's thigh or to the male patient's abdomen or thigh, allowing sufficient slack for leg movement.
- Document the date and time of the catheter insertion, the amount of urine initially obtained, urine characteristics, the size of the catheter, and the patient's response to the procedure.

Bladder cancer

Bladder cancer is a malignant tumor that invades the mucosal lining of the bladder. It may metastasize to the ureters, prostate gland, vagina, rectum, and periaortic lymph nodes.

CAUSES

- Chronic bladder irritation
- Cigarette smoking
- Drug-induced from cyclophosphamide (Cytoxan)
- Excessive intake of coffee, phenacetin, saccharin, sodium cyclamate
- Exposure to industrial chemicals
- Radiation

DATA COLLECTION FINDINGS

- Anuria
- Chills
- Dysuria
- Fever
- Flank or pelvic pain
- Frequent urination
- Painless hematuria
- Peripheral edema
- Urgency of urination
- Urinary obstruction
- Urinary retention

DIAGNOSTIC FINDINGS

- Biopsy and cytologic examination are positive for malignant cells.
- Cystoscopy reveals a bladder mass.
- Excretory urography shows a mass or an obstruction.

Bladder cancer treatment options

Treatment options for bladder cancer depend on the patient's lifestyle, other health problems, and mental outlook.

TUMOR THAT HASN'T INVADED MUSCLE
With transurethral resection, superficial bladder tumors are removed cystoscopically by transurethral resection and electrically by fulguration. The procedure is only effective if the tumor hasn't invaded muscle. Additional tumors may develop, and fulguration may need repeating every 3 months for years.

SUPERFICIAL TUMOR
Intravesical chemotherapy is commonly used to treat superficial bladder tumors (especially when tumors are in several sites). This treatment washes the bladder with drugs that fight cancer, usually thiotepa, doxorubicin, and mitomycin.

INFILTRATING TUMOR
Radical cystectomy is the treatment choice for infiltrating bladder tumors. In this procedure, the bladder is removed and a urinary diversion is created.

REMOVAL OF A SECTION
Segmental bladder resection removes a full-thickness section of the bladder. It's only used if the tumor isn't located near the bladder neck or ureteral orifices.

• Hematology shows decreased RBC count, Hb level, and HCT.
• KUB X-ray shows mass or obstruction.
• Urinalysis shows hematuria.

NURSING DIAGNOSES

• Functional urinary incontinence
• Chronic pain
• Impaired urinary elimination

TREATMENT

• Transfusion therapy with packed RBCs
• Surgery, depending on the location and progress of the tumor (see *Bladder cancer treatment options*)

Drug therapy

• Analgesics: morphine, hydromorphone (Dilaudid)
• Antispasmodic: phenazopyridine (Pyridium)
• Sedative: oxazepam (Serax)

INTERVENTIONS AND RATIONALES

• Monitor and record vital signs and intake and output. *Accurate intake and output are essential for correct fluid replacement therapy.*
• Provide postoperative care *to promote healing and prevent complications.* (Closely monitor urine output; observe for hematuria [reddish tint to gross bloodiness] or infection [cloudy, foul smelling, with sediment]; maintain continuous bladder irrigation, if indicated; assist with turning, coughing, deep breathing, and incentive spirometry. Apply sequential compression stockings while the patient is on bedrest *to prevent blood clot formation.*)
• Maintain the patient's diet *to improve nutrition and meet metabolic demands.*
• Force fluids *to prevent dehydration.*
• Monitor I.V. fluids *to maintain hydration.*
• Administer medications, as prescribed, *to maintain or improve the patient's condition.*
• Encourage the patient to express feelings about a fear of dying *to encourage adequate coping mechanisms.*

Teaching topics

• Contacting the American Cancer Society
• Contacting community agencies and resources for supportive services
• Providing skin care after radiation therapy such as avoiding cold packs to area

Breast cancer

Breast cancer is the most common cancer in women and the second leading cause of cancer deaths in women ages 35 to 54. Breast cancer can also occur in men but the incidence is rare. Breast cancer is more commonly found in the left breast than the right. It's also more common in the upper outer quadrant. Growth rates vary. Breast cancer spreads via the lymphatic system and bloodstream through the right side of the heart to the lungs and, eventually, to the other breast, chest wall, liver, bone, and brain.

CAUSES AND CONTRIBUTING FACTORS

- Alcohol and tobacco use
- Antihypertensive therapy
- Being a premenopausal woman over age 40
- Benign breast disease
- Early onset menses or late menopause
- Endometrial or ovarian cancer
- Estrogen therapy
- Exact cause unknown
- Family history of breast cancer (scientists have discovered specific genes linked to breast cancer, which confirms that the disease can be inherited from a person's mother or father)
- First pregnancy after age 35
- High-fat diet
- Nulligravida (never pregnant)
- Obesity
- Radiation exposure

DATA COLLECTION FINDINGS

- Cervical, supraclavicular, or axillary lymph node lump or enlargement on palpation
- Clear, milky, or bloody nipple discharge
- Edema in the affected arm
- Erythema
- Nipple retraction
- Painless lump or mass in the breast or thickening of breast tissue
- Skin changes of the breast

DIAGNOSTIC FINDINGS

- Breast self-examination may be used to find a lump or mass in the breast or thickening of breast tissue.
- Chest X-rays can be used to pinpoint metastasis.
- Fine-needle aspiration and excisional biopsy provide histologic cells that confirm the diagnosis.
- Hormonal receptor assay pinpoints whether the tumor is estrogen- or progesterone-dependent.
- Mammography and MRI show the location of a tumor.
- Scans of the bone, brain, liver, and other organs can reveal distant metastasis.
- Ultrasonography distinguishes a fluid-filled cyst from a solid mass.

NURSING DIAGNOSES

- Disturbed body image
- Fear
- Chronic pain

TREATMENT

- High-protein diet
- Bone marrow and peripheral stem cell therapy for advanced breast cancer
- Radiation therapy
- Surgery; options include lumpectomy, skin-sparing mastectomy, partial mastectomy, total mastectomy, modified radical mastectomy, and quandrantectomy
- Transfusion therapy, if needed

Drug therapy

- Analgesic: morphine
- Antiemetics: trimethobenzamide (Tigan), prochlorperazine (Compazine)
- Chemotherapy: cyclophosphamide (Cytoxan), methotrexate (Folex), fluorouracil (Adrucil), doxorubicin (Adriamycin)
- Hormonal therapy: tamoxifen (Nolvadex), raloxifene (Evista), fulvestrant (Faslodex), toremifene (Fareston), megestrol (Megace)
- Aromatase inhibitors: letrozole (Femara), anastrozole (Arimidex), exemestane (Aromasin)

INTERVENTIONS AND RATIONALES

- Explore the patient's feelings about her illness, and determine what she knows about breast cancer and what her expectations are *to help identify her needs and aid in developing a care plan.*

• Encourage the patient to ask questions about her illness and treatment options *to reduce anxiety and promote autonomy.*
• Provide routine postoperative care *to prevent postoperative complications.*
• Perform comfort measures *to promote relaxation and relieve anxiety.*
• Administer analgesics as ordered, and monitor their effectiveness *to promote patient comfort.*
• Watch for treatment-related complications, such as nausea, vomiting, anorexia, leukopenia, thrombocytopenia, GI ulceration, and bleeding, *to ensure that measures are taken to prevent further complications.*
• Monitor the patient's weight and nutritional intake *to detect evidence of malnutrition.* Encourage a high-protein diet. Dietary supplements may be necessary *to meet increased metabolic demands.*
• Observe the patient's and family's ability to cope, especially if the cancer is terminal. *Counseling may be necessary to help them cope with the fear of death and dying.*

Teaching topics
• Managing adverse reactions to treatment
• Knowing importance of immediately reporting signs of infection to the doctor
• Performing breast self-examinations monthly
• Understanding community support services
• Contacting the American Cancer Society

Cervical cancer

The third most common cancer of the female reproductive system, cervical cancer is classified as either preinvasive or invasive. Preinvasive cancers range from minimal cervical dysplasia, in which the lower one-third of the epithelium contains abnormal cells, to carcinoma in situ, in which the full thickness of the epithelium contains abnormally proliferating cells.

CAUSES AND CONTRIBUTING FACTORS
• Frequent intercourse at a young age (under age 16)
• History of human papillomavirus or other bacterial or viral venereal infections
• Multiple pregnancies
• Multiple sex partners
• Untreated chronic cervicitis

DATA COLLECTION FINDINGS
Preinvasive
• Absence of symptoms

Invasive
• Abnormal vaginal discharge (yellowish, blood-tinged, and foul-smelling)
• Gradually increasing flank pain
• Leakage of feces (with metastasis to the rectum with fistula development)
• Leakage of urine (with metastasis into the bladder with formation of a fistula)
• Postcoital pain and bleeding

DIAGNOSTIC FINDINGS
• Colposcopy is used to determine the source of the abnormal cells seen on the Papanicolaou (Pap) test.
• Cone biopsy identifies malignant cells.
• Lymphangiography, cystography, and major organ and bone scans can be used to detect metastasis.

NURSING DIAGNOSES
• Fear
• Impaired tissue integrity
• Chronic pain

TREATMENT
Preinvasive
• Cryosurgery
• Hysterectomy (rare)
• Laser destruction
• Total excisional biopsy

Invasive
• Pelvic exenteration (rare)
• Radiation therapy (internal, external, or both)
• Radical hysterectomy

Drug therapy
Chemotherapy is usually ineffective in treating cervical cancer. When used, it consists of

hydroxyurea (Hydrea) in combination with radiation treatment.

INTERVENTIONS AND RATIONALES

- Encourage the patient to use relaxation techniques *to promote comfort during diagnostic procedures.*
- Watch for complications related to therapy *to ensure that measures can be instituted to prevent or alleviate complications.*
- Administer pain medication, as needed, and note its effectiveness. If pain relief isn't achieved, an alternative dose or medication may be required *to promote comfort.*
- Provide postoperative care *to prevent complications.*

Teaching topics

- Understanding postexcisional biopsy care (expecting discharge or spotting for about 1 week; avoiding douching, using tampons, or engaging in sexual intercourse during this time; reporting signs of infection)
- Knowing the importance of follow-up Pap tests and pelvic examinations

Chlamydia

Chlamydia refers to a group of bacterial infections linked to one organism: *Chlamydia trachomatis*. Chlamydia infection causes urethritis in men and urethritis and cervicitis in women. Untreated, chlamydial infections can lead to such complications as acute epididymitis, salpingitis, pelvic inflammatory disease (PID) and, eventually, sterility. Chlamydial infections are the most common sexually transmitted diseases (STDs) in the United States.

CAUSES AND CONTRIBUTING FACTORS

- Exposure to *C. trachomatis* through sexual contact

DATA COLLECTION FINDINGS

In women

- Dyspareunia
- Mucopurulent discharge
- Pelvic pain

In men

- Dysuria
- Erythema
- Pruritus
- Tenderness of the meatus
- Urethral discharge
- Urinary frequency

DIAGNOSTIC FINDINGS

- A swab from the site of infection (urethra, cervix, or rectum) is used to establish a diagnosis of urethritis, cervicitis, salpingitis, endometritis, or proctitis.
- A culture of aspirated material is used to establish a diagnosis of epididymitis.
- Antigen detection methods, including enzyme-linked immunosorbent assay and direct fluorescent antibody test, are the diagnostic tests of choice for identifying chlamydial infection, although tissue cell cultures are more sensitive and specific.

NURSING DIAGNOSES

- Impaired urinary elimination
- Chronic pain
- Deficient knowledge (disease transmission)

TREATMENT

The only treatment available for chlamydial infection is drug therapy.

Drug therapy

- Antibiotics: doxycycline (Vibramycin), azithromycin (Zithromax)
- For pregnant women with chlamydial infections, azithromycin, in a single 1-g dose

INTERVENTIONS AND RATIONALES

- Practice standard and contact precautions when caring for a patient with a chlamydial infection *to prevent the spread of infection.*
- Make sure that the patient understands the dosage requirements of any prescribed medications for this infection *to ensure compliance with the treatment regimen.*
- Suggest that the patient and his sexual partners receive testing for human immunodeficiency virus (HIV). *Unsafe sex practices which lead to chlamydial infection also place the patient at risk for contracting HIV.*

Because signs of chlamydial infection occur late in the course of illness, transmission usually occurs unknowingly.

What one little microorganism can do! Chlamydia is a group of infections linked to the bacterium *Chlamydia trachomatis.*

• Obtain appropriate specimens for diagnostic testing *to confirm the diagnosis of chlamydial infection.*

Teaching topics

• Practicing safer sex
• Understanding the importance of taking the full course of medication, even after symptoms subside
• Avoiding contact with eyes after touching discharge
• Washing hands using proper technique
• Knowing the importance of follow-up medical care

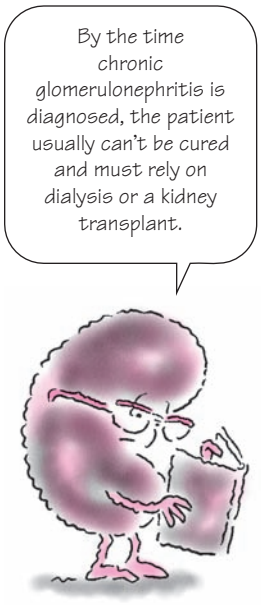
Chronic glomerulonephritis

A slowly progressive disease, chronic glomerulonephritis is characterized by inflammation of the glomeruli (the kidney's blood vessels), which results in sclerosis, scarring and, eventually, renal failure.

By the time it produces symptoms, chronic glomerulonephritis is usually irreversible.

CAUSES

• Burns
• Hemolytic transfusion reaction
• Nephrotoxic drugs
• Renal disorders
• Septicemia
• Systemic disorders (lupus erythematosus, Goodpasture's syndrome, and diabetes mellitus)



DATA COLLECTION FINDINGS

• Edema
• Hematuria
• Hypertension
• Signs of fluid overload
• Uremic symptoms (in the late stages of the disease)

DIAGNOSTIC FINDINGS

• Kidney biopsy is used to identify underlying disease and obtain data needed to guide therapy.
• Blood studies reveal rising BUN and serum creatinine levels, which indicate advanced renal insufficiency.
• Urinalysis reveals proteinuria, hematuria, cylindruria, and RBC casts.
• X-ray or ultrasonography shows small kidneys.

NURSING DIAGNOSES

• Impaired urinary elimination
• Excess fluid volume
• Risk for injury

TREATMENT

• Dialysis
• Low-sodium, high-calorie diet with adequate protein
• Kidney transplant

Drug therapy

• Antibiotic (for symptomatic UTIs)
• Antihypertensive: metoprolol (Lopressor)
• Diuretic: furosemide (Lasix)

INTERVENTIONS AND RATIONALES

• Understand that patient care is primarily supportive, focusing on continual observation and sound patient teaching. *Supportive measures encourage the patient to cope with chronic disease.*
• Accurately monitor vital signs, intake and output, and daily weight *to evaluate fluid retention.*
• Observe for signs of fluid and electrolyte imbalances *to detect early changes in the patient's condition.*
• Consult a dietitian *to plan low-sodium, high-calorie meals with adequate protein.*
• Administer medications and provide good skin care *to combat pruritus and edema.*
• Provide good oral hygiene *to prevent breakdown of the oral mucosa.*

Teaching topics

• Continuing prescribed antihypertensives as scheduled, and reporting any adverse effects
• Reporting signs of infection, particularly UTI, and avoiding contact with people who have infections
• Knowing the importance of follow-up examinations to assess renal function
• Understanding dietary modifications

Chronic renal failure

Chronic renal failure is progressive, irreversible destruction of the kidneys, leading to loss of renal function. It may result from a rapidly progressing disease of sudden onset that destroys the nephrons and causes irreversible kidney damage.

CAUSES

- Congenital abnormalities
- Dehydration
- Diabetes mellitus
- Exacerbations of nephritis
- Hypertension
- Nephrotoxins
- Recurrent UTI
- Systemic lupus erythematosus (SLE)
- Urinary tract obstructions

DATA COLLECTION FINDINGS

- Azotemia
- Bone pain
- Brittle nails and hair
- Decreased urine output
- Ecchymosis
- Lethargy
- Muscle twitching
- Paresthesia
- Pruritus
- Seizures
- Signs and symptoms of heart failure
- Stomatitis
- Weight gain

DIAGNOSTIC FINDINGS

- ABG analysis shows metabolic acidosis.
- Blood chemistry shows increased BUN, creatinine, potassium, phosphorus, and lipid levels and decreased calcium, CO_2, and albumin levels.
- Hematology shows decreased Hb level, HCT, and platelet count.
- Urine chemistry shows proteinuria, increased WBC count, sodium level, and decreased and then fixed urine specific gravity.

NURSING DIAGNOSES

- Decreased cardiac output
- Excess fluid volume
- Ineffective tissue perfusion: Renal

TREATMENT

- Limited fluids
- Low-protein, low-sodium, low-potassium, low-phosphorus, high-calorie, and high-carbohydrate diet
- Peritoneal dialysis or hemodialysis (see *Types of dialysis,* page 324)
- Transfusion therapy with packed RBCs and platelets, as indicated

Drug therapy

- Antacid: aluminum hydroxide gel (AlternaGEL)
- Antianemics: ferrous sulfate (Feosol), iron dextran (InFeD), epoetin alfa (recombinant human erythropoietin, Epogen)
- Antiemetics: prochlorperazine (Compazine), metoclopramide (Reglan)
- Calcium supplement: calcium carbonate (Os-Cal)
- Cation exchange resin: sodium polystyrene sulfonate (Kayexalate)
- Cardiac glycoside: digoxin (Lanoxin)
- Diuretics: furosemide (Lasix), bumetanide (Bumex)
- Histamine$_2$-receptor antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)
- Stool softener: docusate (Colace)
- Vitamins: pyridoxine (vitamin B_6), ascorbic acid (vitamin C)

INTERVENTIONS AND RATIONALES

- Monitor renal, respiratory, and cardiovascular status and fluid balance. *An increase in hemodynamic values and vital signs may indicate fluid overload caused by lack of kidney function.*
- Restrict fluids *to prevent fluid overload.*
- Check dialysis access for bruit and thrill *to ensure patency and detect complications.*
- Monitor and record vital signs, intake and output, daily weight, and stools for occult blood *to detect early changes in the patient's condition.*
- Monitor for ecchymosis and GI bleeding *because blood clotting mechanism may be affected.*
- Follow standard precautions *to prevent the spread of infection.*
- Maintain the patient's diet *to promote nutritional status.*

Types of dialysis

The two types of dialysis used to treat chronic renal failure are hemodialysis and peritoneal dialysis.

HEMODIALYSIS

Hemodialysis removes toxic wastes and other impurities from the blood. Blood is removed from the body through a surgically created access site, pumped through a filtration unit to remove toxins and fluid, and then returned to the body. The extracorporeal dialyzer works through osmosis, diffusion, and filtration. Hemodialysis is performed by specially trained nurses or technicians.

Nursing actions

- Monitor the venous access site for bleeding. If bleeding is excessive, maintain pressure on the site.
- Don't use the access site arm for blood pressure monitoring, I.V. catheter insertion, or venipuncture.
- At least four times daily, auscultate the access site for a bruit and palpate for thrills.

PERITONEAL DIALYSIS

Peritoneal dialysis removes toxins from the blood but, unlike hemodialysis, it uses the patient's peritoneal membrane as a semipermeable dialyzing membrane. Hypertonic dialyzing solution is instilled through a catheter inserted into the peritoneal cavity. Then by diffusion, excessive concentrations of electrolytes and uremic toxins in the blood move across the peritoneal membrane and into the dialysis solution. Next, by osmosis, excessive water in the blood does the same.

After appropriate dwelling time, the dialysis solution is drained, taking toxins, wastes, and fluids with it. The patient is trained to perform this procedure.

Nursing actions

- Check the patient's weight daily, and report any gain.
- Using aseptic technique, change the catheter dressing every 24 hours and whenever it becomes wet or soiled.
- Calculate the patient's fluid balance at the end of each dialysis session or after 8 hours in a longer session. Include oral and I.V. fluid intake as well as urine output and wound drainage. Record and report any significant imbalance, either positive or negative.

- Administer medications, as prescribed, *to improve or maintain patient's condition*.
- Encourage the patient to express feelings about chronicity of illness *to encourage coping*.
- Provide tepid baths *to promote comfort and reduce skin irritation*.
- Maintain a cool and quiet environment *to reduce metabolic demands*.
- Provide skin and mouth care using plain water *to promote comfort*.
- Avoid giving the patient I.M. injections *to prevent bleeding from the injection site*.

Teaching topics

- Maintaining a quiet environment
- Completing skin and mouth care daily
- Caring for the dialysis access site

Cystitis

Cystitis is inflammation of the urinary bladder. It's usually related to a superficial infection that doesn't extend to the bladder mucosa.

CAUSES

- Diabetes mellitus
- Incorrect sterile technique during urinary catheterization

- Incorrect perineal care
- Kidney infection
- Obstruction of the urethra
- Pregnancy
- Radiation
- Sexual intercourse
- Stagnation of urine in the bladder

DATA COLLECTION FINDINGS

- Burning or pain on urination
- Dark, odoriferous urine
- Dribbling of urine
- Dysuria
- Flank tenderness or suprapubic pain
- Lower abdominal discomfort
- Low-grade fever
- Nocturia
- Urge to bear down on urination
- Urinary frequency
- Urinary urgency

DIAGNOSTIC FINDINGS

- Cystoscopy shows obstruction or deformity.
- Urinalysis shows hematuria, pyuria, and increased protein, leukocytes, and urine specific gravity.
- Urine culture and sensitivity positively identifies organisms *(Escherichia coli, Proteus vulgaris,* or *Streptococcus faecalis)*.

NURSING DIAGNOSES

- Impaired urinary elimination
- Urge urinary incontinence
- Acute pain

TREATMENT

- Diet: increased intake of fluids and vitamin C

Drug therapy

- Antibiotics: co-trimoxazole (Bactrim), levofloxacin (Levaquin), ciprofloxacin (Cipro)
- Antipyretic: acetaminophen (Tylenol)
- Urinary antiseptic: phenazopyridine (Pyridium)

INTERVENTIONS AND RATIONALES

- Monitor and record vital signs and intake and output *to detect early complications.*
- Maintain the patient's diet *to promote nutrition.*
- Force fluids (cranberry or orange juice) to 3 qt (3 L)/day *because dilute urine lessens the irritation to the bladder mucosa and lowering urine pH with orange juice and cranberry juice consumption helps diminish bacterial growth.*
- Administer medications, as prescribed, *to maintain or improve the patient's condition.*
- Encourage voiding every 2 to 3 hours. *Frequent bladder emptying decreases bladder irritation and prevents stasis of urine.*

Teaching topics

- Avoiding coffee, tea, alcohol, and carbonated beverages
- Increasing fluid intake to 3 qt/day
- Voiding every 2 to 3 hours and after intercourse
- Performing perineal care correctly
- Avoiding bubble baths, vaginal deodorants, and tub baths
- Recognizing that urine may be orange while taking phenazopyridine

Gonorrhea

A common STD, gonorrhea is a viral infection of the genitourinary tract (especially the urethra and cervix) and, occasionally, the rectum, pharynx, and eyes. Untreated gonorrhea can spread through the blood to the joints, tendons, meninges, and endocardium; in females, it can also lead to chronic PID and sterility.

After adequate treatment, the prognosis in both males and females is excellent, although reinfection is common. Gonorrhea is especially prevalent among young people and people with multiple partners, particularly those between ages 19 and 25.

CAUSES

- Exposure to *Neisseria gonorrhoeae* through sexual contact

DATA COLLECTION FINDINGS

- Dysuria
- Itching, burning, and pain
- Purulent urethral or cervical discharge
- Redness and swelling

Emphasize to the patient with gonorrhea that he may be infectious even if no symptoms of the disease are present.

DIAGNOSTIC FINDINGS
- A culture from the site of infection (urethra, cervix, rectum, or pharynx) is used to establish the diagnosis by isolating the organism.
- A Gram stain showing gram-negative diplococci supports the diagnosis and may be sufficient to confirm gonorrhea in males.

NURSING DIAGNOSES
- Risk for infection
- Chronic pain
- Ineffective sexuality patterns

TREATMENT
- Moist heat to affected joints, if gonococcal arthritis is present

Drug therapy
- Antibiotics: ceftriaxone (Rocephin), doxycycline (Vibramycin), erythromycin (E-mycin)
- Prophylactic antibiotic: 1% silver nitrate or erythromycin (EryPed) eye drops to prevent infection in neonates

INTERVENTIONS AND RATIONALES
- Before treatment, establish whether the patient has any drug sensitivities *to prevent severe adverse reactions.*
- Warn the patient that, until cultures prove negative, he's still infectious and can transmit gonococcal infection *to prevent the spread of infection to others.*
- Follow standard and contact precautions *to prevent the spread of infection.*
- For the patient with gonococcal arthritis, apply moist heat *to ease pain in affected joints.*
- Urge the patient to inform sexual contacts of his *infection so that they can seek treatment, even if cultures are negative.* They should be advised to avoid sexual intercourse until treatment is complete *to prevent the spread of infection.*

After the first infection with HSV, the person carries the virus permanently and is vulnerable to recurrent herpes infection.

Teaching topics
- Using condoms during intercourse, washing genitalia with soap and water before and after intercourse, and avoiding sharing washcloths or douche equipment
- Understanding the importance of continuing antibiotic therapy for the duration prescribed

Herpes simplex

A recurrent viral infection, herpes simplex is caused by two types of *Herpesvirus hominis* (HSV), a widespread infectious agent:
- Herpes virus type 1, which is transmitted by oral and respiratory secretions, affects the skin and mucous membranes and commonly produces cold sores and fever blisters.
- Herpes virus type 2 primarily affects the genital area and is transmitted by sexual contact. Cross-infection may result from orogenital sex.

CAUSES
- Exposure to herpes virus type 2 through sexual contact
- Contact with herpes virus type 1 through oral or respiratory secretions

DATA COLLECTION FINDINGS
- Appetite loss
- Blisters on any part of the mouth accompanied by erythema and edema
- Conjunctivitis (herpetic keratoconjunctivitis or herpes of the eye)
- Fever
- Increased salivation
- Swelling of the lymph nodes under the jaw

Genital herpes
- Fever, swollen lymph nodes
- Fluid-filled blisters
- Flulike symptoms
- Painful urination

DIAGNOSTIC FINDINGS
- Confirmation requires isolation of the virus from local lesions and a histologic biopsy.
- Blood studies reveal a rise in antibodies and moderate leukocytosis.

NURSING DIAGNOSES
- Impaired urinary elimination
- Chronic pain
- Impaired oral mucous membrane

TREATMENT
Symptomatic and supportive treatment

Drug therapy
• Analgesic-antipyretic agent: acetaminophen (Tylenol)
• Antiviral agents: idoxuridine (Herplex Liquifilm), trifluridine (Viroptic), or vidarabine (Vira-A)
• 5% acyclovir (Zovirax) ointment (possible relief to patients with genital herpes or to immunosuppressed patients with HSV skin infections; I.V. acyclovir to help treat more severe infections)

INTERVENTIONS AND RATIONALES
• Follow standard and contact precautions. For patients with extensive cutaneous, oral, or genital lesions, institute contact precautions *to prevent the spread of infection.*
• Administer pain medication and prescribed antiviral agent as ordered *to relieve pain and treat infection.*
• Provide supportive care, as indicated, such as oral hygiene, nutritional supplementation, and antipyretics for fever. *These measures enhance the patient's well-being.*
• Abstain from direct patient care if you have herpetic whitlow (an HSV finger infection that sometimes affects health care workers) *to prevent the spread of infection*.

Teaching topics
• Caring for themselves during an outbreak of HSV and how to avoid infecting others
• Having annual Pap test (women with genital herpes)
• Avoiding kissing infants and people with eczema if a cold sore is present

Neurogenic bladder

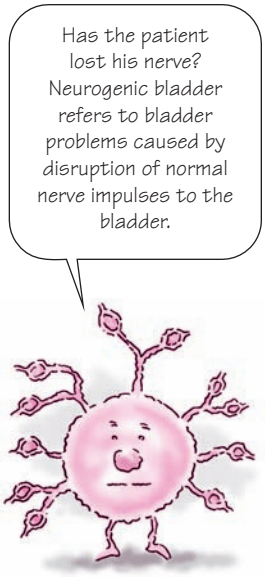
Neurogenic bladder refers to bladder dysfunction caused by an interruption of normal bladder innervation. Subsequent complications include incontinence, residual urine retention, UTI, stone formation, and renal failure. A neurogenic bladder may be described as spastic (resulting from an upper motor neuron lesion) or flaccid (resulting from a lower motor neuron lesion).

This disorder is also known as neuromuscular dysfunction of the lower urinary tract, neurologic bladder dysfunction, and neuropathic bladder.

CAUSES
• Acute infectious diseases such as Guillain-Barré syndrome
• Cerebral disorder (stroke, brain tumor [meningioma and glioma], Parkinson's disease, multiple sclerosis, dementia)
• Chronic alcoholism
• Collagen diseases such as SLE
• Disorders of peripheral innervation
• Distant effects of cancer such as primary oat cell carcinoma of the lung
• Heavy metal toxicity
• Herpes zoster
• Metabolic disturbances (hypothyroidism, porphyria, or uremia)
• Sacral agenesis
• Spinal cord disease or trauma
• Vascular diseases such as atherosclerosis

DATA COLLECTION FINDINGS
• Altered micturition
• *Flaccid neurogenic bladder:* Overflow incontinence, diminished anal sphincter tone, greatly distended bladder with an accompanying feeling of bladder fullness
• Incontinence
• *Spastic neurogenic bladder:* involuntary or frequent scanty urination without a feeling of bladder fullness, possible spontaneous spasms of the arms and legs, increased anal sphincter tone

DIAGNOSTIC FINDINGS
• Voiding cystourethrography evaluates bladder neck function, vesicoureteral reflux, and continence.
• Urodynamic studies help evaluate how urine is stored in the bladder, how well the bladder empties, and the rate of movement of urine out of the bladder during voiding.
• Retrograde urethrography reveals the presence of strictures and diverticula.



NURSING DIAGNOSES

- Impaired urinary elimination
- Urge urinary incontinence
- Urinary retention

TREATMENT

- Credé's maneuver (application of manual pressure over the lower abdomen) to evacuate the bladder
- Valsalva's maneuver to promote complete emptying of the bladder
- Indwelling urinary catheter insertion, including teaching the patient self-catheterization techniques
- Surgical repair if the patient has structural impairment
- Surgical insertion of an artificial urinary sphincter

Drug therapy

- Urinary tract stimulants: bethanechol (Urecholine) and phenoxybenzamine
- Antimuscarinic agents: propantheline (ProBanthine), flavoxate (Urispas), and dicyclomine (Antispas)

INTERVENTIONS AND RATIONALES

- Use strict sterile technique during indwelling urinary catheter insertion (a temporary measure to drain the incontinent patient's bladder). Don't interrupt the closed drainage system for any reason *to prevent infection.*
- Obtain urine specimens with a syringe and smallbore needle inserted through the aspirating port of the catheter itself (below the junction of the balloon instillation site). Irrigate in the same manner if necessary *to prevent infection.*
- Clean the catheter insertion site with soap and water at least twice a day *to prevent infection.*
- Keep the drainage bag below the tubing, and don't raise the bag above the level of the bladder *to prevent urine reflux and infection.*
- Clamp the tubing or empty the catheter bag before transferring the patient to a wheelchair or stretcher *to prevent accidental urine reflux.*
- Watch for signs of infection (fever, cloudy or foul-smelling urine) *to ensure early treatment intervention and prevent complications.*
- Try to keep the patient as mobile as possible. Perform passive range-of-motion exercise if necessary. *These measures prevent complications of immobility.*

Teaching topics

- Using evacuation techniques as necessary (Credé's method, intermittent self-catheterization techniques)
- Preventing and identifying infection

Ovarian cancer

Ovarian cancer attacks the ovaries, the female organs that produce the hormones estrogen and progesterone. After lung and bronchus, breast, colorectal, and pancreatic cancers, primary ovarian cancer ranks as the most common cause of cancer deaths among American women. In women with previously treated breast cancer, metastatic ovarian cancer is more common than cancer at any other site.

The prognosis varies with the histologic type and stage of the disease but is generally poor because ovarian tumors produce few early signs and are usually advanced at diagnosis. About 40% of women with ovarian cancer survive for 5 years.

CONTRIBUTING FACTORS

- Age at menopause
- Celibacy
- Exposure to asbestos, talc, and industrial pollutants
- Familial tendency and history of breast or uterine cancer
- Fertility drugs
- High-fat diet
- Incidence is highest in women of upper socioeconomic levels between ages 20 and 54
- Infertility

DATA COLLECTION FINDINGS

- Abdominal discomfort, dyspepsia, and other mild GI disturbances
- Abdominal distention
- Constipation
- Pelvic discomfort
- Pelvic mass

- Urinary frequency
- Weight loss

DIAGNOSTIC FINDINGS

Diagnosis requires clinical evaluation, a complete patient history, surgical exploration, and histologic studies. Preoperative evaluation includes a complete physical examination, including pelvic examination with Pap smear (positive in only a small number of women with ovarian cancer) and the following special tests:

- Abdominal ultrasonography, computed tomography (CT) scan, or X-ray may delineate tumor size.
- Chest X-ray may reveal distant metastasis and pleural effusions.
- Barium enema (especially in patients with GI symptoms) may reveal obstruction and size of tumor.
- Lymphangiography may show lymph node involvement.
- Mammography may rule out primary breast cancer.
- Liver scan in patients with ascites may rule out liver metastasis.
- Blood tests, such as ovarian carcinoma antigen, carcinoembryonic antigen (CEA), and human chorionic gonadotropin, reveal presence of cancer.

Despite extensive testing, accurate diagnosis and staging are only possible with exploratory laparotomy, including lymph node evaluation and tumor resection.

NURSING DIAGNOSES

- Fear
- Excess fluid volume
- Imbalanced nutrition: Less than body requirements

TREATMENT

Conservative treatment

Occasionally, in girls or young women with a unilateral encapsulated tumor who wish to maintain fertility, the following conservative approach may be appropriate:

- resection of the involved ovary
- biopsies of the omentum and the uninvolved ovary
- peritoneal washings for cytologic examination of pelvic fluid
- careful follow-up, including periodic chest X-rays to rule out lung metastasis.

Aggressive treatment

Ovarian cancer usually requires more aggressive treatment, including:

- Total abdominal hysterectomy and bilateral salpingo-oophorectomy with tumor resection, omentectomy, and appendectomy
- Lymph node biopsies with lymphadenectomy, tissue biopsies, and peritoneal washings.

Drug therapy

- Antineoplastics: carboplatin (Paraplatin), chlorambucil (Leukeran), cyclophosphamide (Cytoxan), dactinomycin (Cosmegen), doxorubicin (Rubex), fluorouracil (Adrucil), cisplatin (Platinol), paclitaxel (Taxol), topotecan (Hycamtin)
- Analgesics: morphine, fentanyl (Duragesic-25)
- Antipyretics: aspirin, acetaminophen (Tylenol)
- Immunotherapy: bacille Calmette-Guérin vaccine

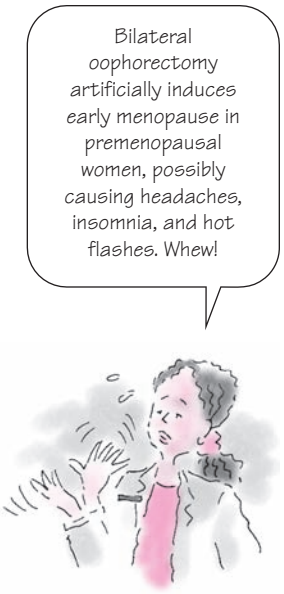
INTERVENTIONS AND RATIONALES

Before surgery

- Thoroughly explain all preoperative tests, the expected course of treatment, and surgical and postoperative procedures *to allay anxiety.*
- In premenopausal women, explain that bilateral oophorectomy artificially induces early menopause, so they may experience hot flashes, headaches, palpitations, insomnia, depression, and excessive perspiration *to help the patient cope with changes in body image that occur as a result of surgery.*

After surgery

- Monitor vital signs frequently *to detect early signs of postoperative complications, such as fluid volume deficit.*
- Monitor fluid intake and output *to detect fluid volume excess or deficit,* while maintaining good catheter care *to prevent infection.*



Encourage ambulation after surgery for ovarian cancer to help prevent complications from immobility.

• Check the dressing regularly for excessive drainage or bleeding, and watch for signs of infection. *These measures detect early signs of complications and prevent treatment delay.*
• Provide abdominal support *to promote comfort.*
• Watch for abdominal distention, *which may indicate the presence of ascites.*
• Encourage coughing, deep breathing, and incentive spirometry hourly during the waking hours *to mobilize secretions and prevent postoperative pneumonia.*
• Reposition the patient often *to prevent skin breakdown.*
• Encourage ambulation after surgery *to prevent complications of immobility.*
• Apply sequential compression stocking *to prevent blood clot formation* while the patient is on bedrest.
• Monitor and treat adverse effects of radiation and chemotherapy *to prevent complications.*
• Enlist the help of a social worker, chaplain, and other members of the health care team *to provide additional supportive care.*

Teaching topics
• Knowing the disease process and treatment options
• Preventing and reporting infection
• Managing adverse reactions to chemotherapy

Because prostate cancer can lead to sexual dysfunction, patient care may include providing information about changes in sexual activity.

Prostate cancer

Prostate cancer is a malignant tumor of the prostate gland, which can obstruct urine flow when encroaching on the bladder neck. It commonly metastasizes to bone, lymph nodes, the brain, and the lungs.

CAUSES
• Associated risk factors include family history, age, race, vasectomy, increased dietary fat
• No known etiology

DATA COLLECTION FINDINGS
• Decreased size and force of urine stream
• Difficulty and frequency of urination
• Hematuria
• Urine retention

DIAGNOSTIC FINDINGS
• CEA is elevated.
• Digital rectal examination reveals a palpable firm nodule in gland or diffuse induration in posterior lobe.
• Serum acid phosphatase level is increased.
• Radioimmunoassay for acid phosphatase is increased.
• PSA is increased.
• Transurethral ultrasound studies show mass or obstruction.
• Prostate biopsy has cytology positive for cancer cells.
• Excretory urogram shows mass or obstruction.

NURSING DIAGNOSES
• Chronic pain
• Sexual dysfunction
• Impaired urinary elimination

TREATMENT
• High-protein diet with restrictions on caffeine and spicy foods
• Radiation implant
• Radical prostatectomy (for localized tumors without metastasis) or TURP (transurethral resection to relieve obstruction in metastatic disease)

Drug therapy
• Analgesics: oxycodone and acetaminophen (Tylox), morphine
• Antiemetics: prochlorperazine (Compazine), ondansetron (Zofran)
• Antineoplastics: doxorubicin (Adriamycin), cisplatin (Platinol)
• Corticosteroid: prednisone (Deltasone)
• Estrogen therapy: diethylstilbestrol
• Immunosuppressant: cyclophosphamide (Cytoxan)
• Luteinizing hormone-releasing hormone agonists: goserelin acetate (Zoladex), leuprolide acetate (Lupron)
• Nonsteroidal anti-inflammatory drugs: indomethacin (Indocin), ibuprofen (Motrin)

• Oral flutamide (Eulexin) to block circulating testosterone
• Stool softener: docusate (Colace)

INTERVENTIONS AND RATIONALES

• Monitor and record vital signs and fluid intake and output. *Accurate intake and output are essential for correct fluid replacement therapy.*
• Maintain adequate hydration *to promote urination.*
• Check for signs of infection *to detect complications.*
• Monitor the patient's pain and note the effectiveness of analgesia *to promote comfort.*
• Administer medications, as prescribed, *to maintain or improve the patient's condition.*
• Maintain the patient's diet *to maintain nutritional level and meet increased metabolic demands.*
• Maintain the patency of the urinary catheter and note drainage *to ensure urine drainage.*
• Encourage the patient to express feelings about the changes in body image and fear of sexual dysfunction *to encourage coping and adaptation.*
• Encourage ambulation *to prevent complications of immobility.*
• Provide postoperative, postchemotherapeutic, and postradiation nursing care *to prevent complications.*

Teaching topics

• Managing changes in sexual activity
• Avoiding prolonged sitting, standing, and walking
• Avoiding the strain of exercise and lifting
• Urinating frequently
• Avoiding coffee and cola beverages
• Decreasing fluid intake during evening hours
• Performing perineal exercises
• Performing catheter care, as directed
• Self-monitoring for bloody urine, pain, burning, frequency, decreased urine output, and loss of bladder control
• Contacting the American Cancer Society
• Contacting community agencies and resources for supportive services

Renal calculi

Just reading about kidney stones hurts. But you shouldn't skip this section.

Renal calculi, also known as *kidney stones,* are crystalline substances that lodge in the ureter. Under normal circumstances, calculi are dissolved and excreted in the urine. However, larger calculi can cause great pain and may cause urinary obstruction.

CAUSES

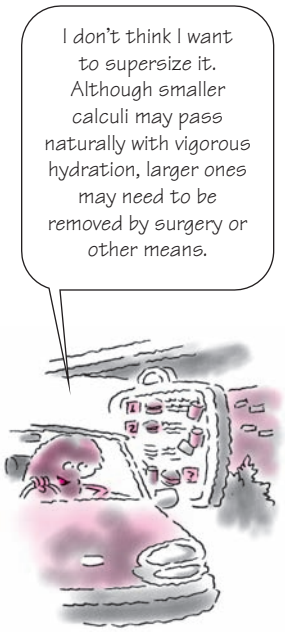
• Chemotherapy
• Dehydration
• Diet high in calcium, vitamin D, milk, protein, oxalate, alkali
• Excessive vitamin C intake
• Genetics
• Gout
• Hypercalcemia
• Hyperparathyroidism
• Idiopathic origin
• Immobility
• Leukemia
• Polycythemia vera
• Urinary stasis
• UTI
• Urinary tract obstruction

DATA COLLECTION FINDINGS

• Chills and fever
• Cool, moist skin
• Costovertebral tenderness
• Diaphoresis
• Dysuria
• Flank pain
• Frequency of urination
• Nausea and vomiting
• Pallor
• Renal colic
• Syncope
• Urgency of urination

DIAGNOSTIC FINDINGS

• 24-hour urine collection shows increased uric acid, oxalate, calcium, phosphorus, and creatinine levels.
• Blood chemistry shows increased calcium, phosphorus, creatinine, BUN, uric acid, protein, and alkaline phosphatase levels.
• Cystoscopy is used to visualize stones.



• Excretory urography reveals stones.
• KUB X-ray reveals stones.
• Urinalysis shows pyuria, proteinuria, hematuria, presence of WBCs, and increased urine specific gravity.

NURSING DIAGNOSES

• Acute pain
• Risk for infection
• Impaired urinary elimination

TREATMENT

• Diet: for calcium stones, acid-ash with limited intake of calcium and milk products; for oxalate stones, alkaline-ash with limited intake of foods high in oxalate (cola, tea); for uric acid stones, alkaline-ash with limited intake of foods high in purine
• Extracorporeal shock wave lithotripsy (ESWL) to shatter calculi
• Increased fluid intake to 3 qt (3 L)/day
• Moist heat to flank; hot baths
• Percutaneous nephrostolithotomy
• Surgery if other measures to remove the stone aren't effective (type of surgery dependent on the location of the stone)

Drug therapy

• Acidifiers: ammonium chloride, methenamine mandelate (Mandelamine)
• Alkalinizing agents: potassium acetate, sodium bicarbonate
• Analgesics: morphine, hydromorphone (Dilaudid)
• Antibiotics: cefazolin (Ancef), cefoxitin (Mefoxin)
• Antiemetic: prochlorperazine (Compazine)
• Antigout agent: sulfinpyrazone (Anturane)

INTERVENTIONS AND RATIONALES

• Monitor the patient's pain and effectiveness of analgesia, *which allows for care plan modification as needed.*
• Monitor and record vital signs, intake and output, and daily weight *to evaluate renal status.*
• Monitor the patient's urine for evidence of renal calculi. Strain all urine and save all solid material for analysis *to determine spontaneous passage of calculi.*
• Force fluids to 3 qt (3 L)/day *to moisten mucous membranes and dilute chemicals within the body.*
• Maintain the patient's diet *to promote adequate nutrition.*
• Administer medications, as prescribed, *to maintain and improve the patient's condition.*
• Apply warm soaks to flank *to promote comfort.*
• If surgery was performed, check dressings regularly for bloody drainage and report excessive amounts of bloody drainage to the doctor; use sterile technique to change the dressing; maintain nephrostomy tube or indwelling urinary catheter if indicated; monitor incision for signs of infection *to promote healing and detect complications.*

Teaching topics

• Increasing fluid intake, especially during hot weather, illness, and exercise
• Voiding whenever urge is felt
• Testing urine pH
• Increasing fluids at night and voiding frequently

Syphilis

Syphilis is a chronic, infectious STD that begins in the mucous membranes and quickly becomes systemic, spreading to nearby lymph nodes and the bloodstream. This disease, when untreated, is characterized by progressive stages: primary, secondary, latent, and late (formerly called *tertiary*). In women, chancres can be overlooked because they often develop internally.

CAUSES

• Exposure to the spirochete (spiral bacterium) *Treponema pallidum* through sexual contact
• Transmission from an infected mother to her fetus

DATA COLLECTION FINDINGS

Primary syphilis

• Chancres on the genitalia, anus, fingers, lips, tongue, nipples, tonsils, or eyelids

Secondary syphilis

- Symmetrical mucocutaneous lesions
- General lymphadenopathy
- Headache
- Malaise
- Anorexia
- Weight loss
- Nausea
- Vomiting
- Sore throat
- Slight fever

DIAGNOSTIC FINDINGS

- Dark-field examination is used to identify *T. pallidum* from a lesion. This method is most effective when moist lesions are present, as in primary, secondary, and prenatal syphilis.
- Fluorescent treponemal antibody-absorption test is used to identify antigens of *T. pallidum* in tissue, ocular fluid, cerebrospinal fluid (CSF), tracheobronchial secretions, and exudates from lesions. This is the most sensitive test available for detecting syphilis in all stages. When reactive, it remains so permanently.
- Venereal Disease Research Laboratory (VDRL) slide test and rapid plasma reagin test are used to detect nonspecific antibodies. Both tests, if positive, become reactive 1 to 2 weeks after the primary lesion appears or 4 to 5 weeks after the infection begins.
- CSF examination is used to identify neurosyphilis when the total protein level is greater than 40 mg/100 ml, VDRL slide test is reactive, and CSF cell count exceeds five mononuclear cells per microliter.

NURSING DIAGNOSES

- Ineffective sexuality patterns
- Impaired skin integrity
- Deficient knowledge (disease process and treatment plan)

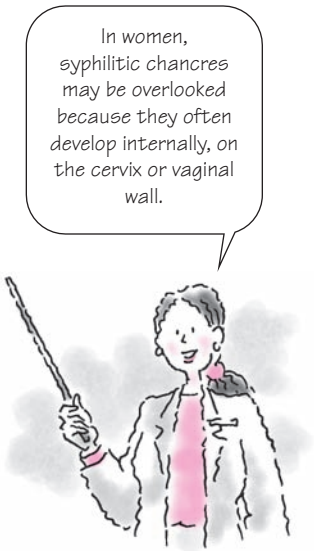
TREATMENT

Drug therapy

- Antibiotics (the only treatment): penicillin G benzathine (Permapen); if allergic to penicillin, then erythromycin (Erythrocin) or tetracycline (Panmycin)

INTERVENTIONS AND RATIONALES

- Follow standard and contact precautions when in direct contact with the patient, collecting specimens, and treating lesions *to prevent the spread of infection.*
- Check for a history of drug sensitivity before administering the first dose of penicillin *to prevent anaphylaxis.*
- With secondary syphilis, keep lesions clean and dry. If they're draining, dispose of contaminated materials properly *to prevent the spread of infection.*
- With late syphilis, provide supportive care *to relieve the patient's symptoms during prolonged treatment.*
- Urge patients to seek VDRL testing after 3, 6, 12, and 24 months *to detect possible relapse.* Patients treated for latent or late syphilis should receive blood tests at 6-month intervals for 2 years *to detect possible relapse.*
- Refer the patient and his sexual partners for HIV testing. *High risk behaviors that caused the patient to contract syphilis also place the patient at risk for HIV.*



Teaching topics

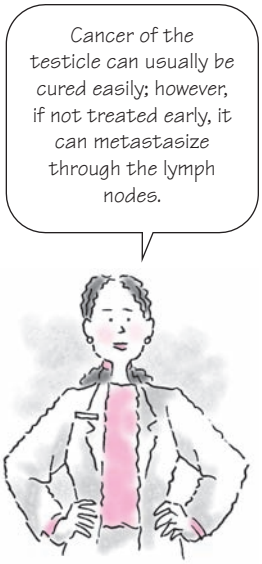
- Safer sex practices
- Importance of completing the course of therapy even after symptoms subside
- Follow-up VDRL testing

Testicular cancer

Testicular cancer affects the testes or testicles, the two oval-shaped glandular organs inside the scrotum that produce spermatozoa and testosterone. Malignant testicular tumors primarily affect young to middle-aged men. Testicular tumors in children are rare.

Most testicular tumors originate in gonadal cells. About 40% are seminomas (uniform, undifferentiated cells resembling primitive gonadal cells). The remainder are nonseminomas (tumor cells showing various degrees of differentiation).

The prognosis varies with the cell type and disease stage. When treated with surgery and radiation, almost all patients with localized disease survive beyond 5 years.



CONTRIBUTING FACTORS

- Age (incidence peaks between ages 20 and 40)
- Higher incidence in men with cryptorchidism and in men whose mothers used diethylstilbestrol during pregnancy

DATA COLLECTION FINDINGS

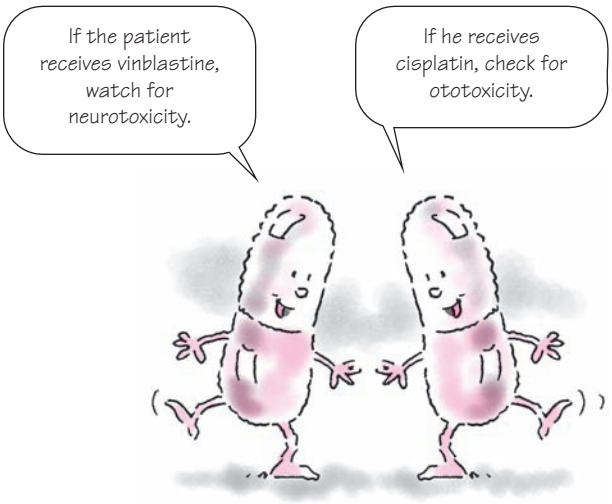
- Firm, painless, smooth testicular mass, varying in size and sometimes producing a sense of testicular heaviness

In advanced stages

- Ureteral obstruction
- Abdominal mass
- Back pain
- Cough
- Hemoptysis
- Shortness of breath
- Weight loss
- Fatigue
- Pallor
- Lethargy

DIAGNOSTIC FINDINGS

- Regular self-examinations and testicular palpation during a routine physical examination may detect testicular tumors.
- Transillumination can distinguish between a tumor (which doesn't transilluminate) and a hydrocele or spermatocele (which does).
- CT scan can show metastasis.



- Scrotal ultrasonography can be used to differentiate between a cyst and solid mass.
- Chest X-ray may show pulmonary metastasis.
- Excretory urography may reveal ureteral deviation resulting from para-aortic node involvement.
- Serum alpha-fetoprotein and beta-human chorionic gonadotropin levels—indicators of testicular tumor activity—provide a baseline for measuring response to therapy and determining the prognosis.
- Surgical excision and biopsy of the tumor and testis permits histologic verification of the tumor cell type.
- Inguinal exploration (examination of the groin) is used to determine the extent of nodal involvement.

NURSING DIAGNOSES

- Disturbed body image
- Fear
- Sexual dysfunction

TREATMENT

- Radiation therapy
- Surgery: orchiectomy (testicle removal; most surgeons remove the testicle but not the scrotum to allow for a prosthetic implant)
- Retroperitoneal lymph node dissection (dissection of lymph nodes posterior to the peritoneum)
- Bone marrow transplantation (follows chemotherapy and radiation therapy in patients with unresponsive tumors)
- High-calorie diet provided in small frequent feedings
- I.V. fluid therapy

Drug therapy

- Diuretics: furosemide (Lasix), mannitol (Osmitrol)
- Antineoplastics: bleomycin (Blenoxane), carboplatin (Paraplatin), cisplatin (Platinol), dactinomycin (Cosmegen), etoposide (VePesid), ifosfamide (Ifex), plicamycin (Mithracin), vinblastine (Velban)
- Analgesics: morphine, fentanyl (Duragesic-25)

• Antiemetics: trimethobenzamide (Tigan), metoclopramide (Reglan), ondansetron (Zofran)
• Hormone replacement therapy (after bilateral orchiectomy)

INTERVENTIONS AND RATIONALES

• Develop a treatment plan that addresses the patient's psychological and physical needs *to enhance the patient's well-being.*

Before orchiectomy

• Reassure the patient that sterility and impotence need not follow unilateral orchiectomy, that synthetic hormones can restore hormonal balance, and that most surgeons don't remove the scrotum. In many cases, a testicular prosthesis can correct anatomic disfigurement. *These interventions can help allay the patient's anxiety.*

After orchiectomy

• For the first day after surgery, apply an ice pack to the scrotum *to reduce swelling* and provide analgesics *to promote comfort.*
• Check for excessive bleeding, swelling, and signs of infection *to detect early signs of complications and prevent treatment delay.*
• Provide an athletic supporter *to minimize pain during ambulation.*

During chemotherapy

• Give an antiemetic, as needed, *to treat or prevent nausea and vomiting.*
• Encourage small, frequent meals *to maintain oral intake despite anorexia.*
• Establish a mouth care regimen *to prevent breakdown of the oral mucosa.*
• Check for stomatitis *to detect early signs and avoid treatment delay.*
• Encourage increased fluid intake and maintain I.V. fluids, a potassium supplement, and diuretics *to prevent renal damage.*

Teaching topics

• Knowing disease process and treatment options
• Preventing and reporting infection
• Managing adverse reactions to chemotherapy and radiation

Pump up on practice questions

1. The nurse has taught a client with genital herpes how to prevent the spread of the herpes simplex virus. Which client behavior demonstrates an accurate understanding of transmission prevention techniques?

1. The client keeps the area moist.
2. The client keeps his fingernails long.
3. The client wears tight-fitting blue jeans.
4. The client washes his hands before and after touching the lesions.

Answer: 4. Because hand-to-body contact is a common method of transmitting the herpes simplex virus, the client should wash his hands before and after touching lesions to prevent the spread of the disease. To promote lesion drying and client comfort, the client should keep the affected area dry. To prevent scratching the lesions, the client should keep the fingernails short, instead of long. The client should wear loose-fitting garments because tight-fitting clothes help retain heat and moisture, which can delay healing and cause discomfort.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Comprehension

2. A client with fever and urinary urgency is asked to provide a urine specimen for culture and sensitivity. The nurse should instruct the client to collect the specimen from the:

1. first stream of urine from the bladder.
2. middle stream of urine from the bladder.
3. final stream of urine from the bladder.
4. full volume of urine from the bladder.

Answer: 2. The midstream specimen is recommended because it's less likely to be contaminated with microorganisms from the external genitalia than other specimens. It isn't necessary to collect a full volume of urine for a urine culture and sensitivity.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

3. Which steps should the nurse follow to insert a straight urinary catheter?

1. Create a sterile field, drape the client, clean the meatus, and insert the catheter only 6 inches.
2. Put on gloves, prepare the equipment, create a sterile field, expose the urinary meatus, and insert the catheter 6″ (15.2 cm).
3. Prepare the client and equipment, create a sterile field, put on gloves, clean the urinary meatus, and insert the catheter until urine flows.
4. Prepare the client, prepare the equipment, create a sterile field, test the catheter balloon, clean the meatus, and insert the catheter until urine flows.

Answer: 3. The nurse must prepare the client and equipment before creating a sterile field, putting on gloves, and performing other tasks. A straight urinary catheter, which doesn't have a balloon attached is inserted until urine flows.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Knowledge

4. A client with dysuria is prescribed phenazopyridine (Pyridium). The nurse should teach the client to expect urine to be:

1. greater in volume.
2. orange in color.
3. pungent in odor.
4. concentrated in consistency.

Answer: 2. Phenazopyridine causes the urine to have an orange color. The other urine characteristics aren't caused by phenazopyridine.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

5. A client is scheduled for ESWL. When teaching the client about ESWL, the nurse should inform the client that the kidney stones will be:

1. dissolved.
2. shattered.
3. radiated.
4. suctioned.

Answer: 2. ESWL is a procedure in which the client's kidney stones are shattered or pulverized, not dissolved, radiated, or suctioned.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

6. The nurse is instructing the client with renal calculi about recommended daily fluid consumption. The nurse would be most helpful by telling the client to drink approximately:

1. 4 cups per day.
2. 8 cups per day.
3. 12 cups per day.
4. 16 cups per day.

Answer: 3. A client with renal calculi should drink 3 L of fluid per day. This is equivalent to 12 cups.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

7. A client with acute renal failure is being checked to determine if the cause is prerenal, renal, or postrenal. If the cause if prerenal, which condition most likely caused it?

1. Heart failure
2. Glomerular nephritis
3. Ureterolithiasis
4. Aminoglycoside toxicity

Answer: 1. By causing inadequate renal perfusion, heart failure can lead to prerenal failure. Nephritis and aminoglycoside toxicity are renal causes and ureterolithiasis is a postrenal cause.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

8. A client reports finding a small lump in the left breast near the nipple. What should the nurse tell the client to do?

1. Inform the physician immediately.
2. Squeeze the nipple to check for drainage.
3. Check the area after the next menstrual period.
4. Put a heating pad on the area to reduce inflammation.

Answer: 1. The client should notify the physician immediately because a breast lump may be a sign of breast cancer. The client shouldn't squeeze the nipple to check for drainage until the physician examines the area. The client shouldn't wait until after the next menstrual period to inform the physician of the breast lump because prompt treatment may be necessary. The client doesn't need to place a heating pad on the area because it would have no effect on a breast lump.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

9. The nurse is teaching a client with chronic renal failure about foods to avoid. It would be most accurate for the nurse to teach the client to avoid foods high in:

1. monosaccharides.
2. disaccharides.
3. iron.
4. protein.

Answer: 4. Proteins are typically restricted in clients with chronic renal failure because of their metabolites. Iron and carbohydrates aren't restricted.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

10. Following a diagnosis of bladder cancer, a client receives local radiation therapy and experiences a dry skin reaction. In recommending care of the skin, the nurse should instruct the client to avoid:

1. lubrication.
2. cleansers.
3. cold packs.
4. cotton garments.

Answer: 3. Cold packs over the area of a dry reaction to radiation therapy are contraindicated because they reduce capillary circulation to the site and hamper healing. Lubrication, cleansers and cotton garments aren't unconditionally contraindicated.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

11 Integumentary system

In this chapter, you'll review:

- components of the integumentary system and their functions
- tests used to diagnose integumentary disorders
- common integumentary disorders.

Brush up on key concepts

The skin, hair, and nails make up the integumentary system, which serves as protection for the body's inner organs. It also helps regulate body temperature through the sweat glands.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 340 and 341.

Outer defense layer

The **skin** provides the first line of defense against microorganisms. It's composed of three layers:

- the **epidermis** (outer layer), which contains keratinocytes and melanocytes and acts as a protective barrier against the environment
- the **dermis** (middle layer), a collagen layer that supports the epidermis, contains nerves and blood vessels, and is the origin of hair, nails, sebaceous glands, eccrine sweat glands, and apocrine sweat glands
- the **hypodermis** (third layer), which is composed of loose connective tissue filled with fatty cells and provides heat, insulation, shock absorption, and a nutritional reservoir (also known as subcutaneous tissue).

Additional protection

Hair provides protection and coverage for most of the body, with the exception of the palms, lips, soles of the feet, nipples, penis, and labia.

Taking care of the tips

The **nails,** which protect the tips of the fingers and toes, are composed of dead cells filled with keratin.

Oil and sweat

The integumentary system also contains three types of glands:

- **sebaceous (oil) glands,** which lubricate the hair and the epidermis and are stimulated by sex hormones
- **eccrine sweat glands,** which regulate body temperature through water secretion
- **apocrine sweat glands,** which are located in the axilla, nipple, anal, and pubic areas and secrete odorless fluid. (Decomposition of this fluid by bacteria causes odor.)

Keep abreast of diagnostic tests

Here are some diagnostic tests for assessing integumentary disorders as well as common nursing actions associated with each test.

Testing blood for this…

A **blood chemistry test** analyzes a blood sample for potassium, sodium, calcium, phosphorus, ketones, glucose, osmolality, chloride, blood urea nitrogen, and creatinine.

Nursing actions

- Withhold food and fluids before the procedure as directed.
- Check the venipuncture site for bleeding after the procedure.

…And for that

Hematologic studies are used to analyze a blood sample for red blood cells, white blood

Cheat sheet

Integumentary refresher

ATOPIC DERMATITIS

Key signs and symptoms

- Erythematous lesions that eventually become scaly and lichenified
- Excessively dry skin
- Hyperpigmentation
- Skin eruptions

Key test result

- Serum immunoglobulin E levels are commonly elevated but this finding doesn't confirm that the patient has atopic dermatitis.

Key treatments

- Antihistamines: diphenhydramine (Benadryl), hydroxyzine (Atarax)
- Corticosteroid: hydrocortisone (Dermacort)

Key interventions

- Help the patient set up an individual schedule and plan for daily skin care.
- Instruct the patient to bathe in plain water. (He may have to limit bathing, according to the severity of the lesions.) Tell him to bathe with a special nonfatty soap and tepid water (96° F [35.6° C]), to avoid using any soap when lesions are acutely inflamed, and to limit baths and showers to 5 to 7 minutes.
- For scalp involvement, advise the patient to shampoo frequently and to apply corticosteroid solution to the scalp afterward.
- Lubricate the skin after a shower or bath.

BURNS

Key signs and symptoms

- Superficial partial-thickness burn: erythema, edema, pain, blanching
- Deep dermal partial-thickness burn: pain, oozing, fluid-filled vesicles; erythema; shiny and wet subcutaneous layer after vesicles rupture
- Full-thickness burn: eschar, edema, little or no pain

Key test result

- Visual inspection allows the examiner to estimate the extent of the burn (determined by the Rule of Nines and the Lund and Browder chart).

Key treatments

- I.V. therapy: hydration and electrolyte replacement using a fluid replacement formula such as the Parkland formula.
- Skin grafts
- Analgesic: morphine
- Antianxiety agent: lorazepam (Ativan)
- Antibiotic: gentamicin (Garamycin)
- Anti-infectives: mafenide (Sulfamylon), silver sulfadiazine (Silvadene), silver nitrate
- Antitetanus: tetanus toxoid
- Colloid: albumin 5% (Albuminar-5)

Key interventions

- Monitor respiratory status.
- Monitor fluid status.
- Maintain I.V. fluids.
- Administer oxygen.
- Monitor total parenteral or enteral feedings.
- Maintain protective precautions.

HERPES ZOSTER

Key signs and symptoms

- Neuralgia
- Severe, deep pain
- Unilaterally clustered skin vesicles along peripheral sensory nerves on the trunk, thorax, or face

Key test results

- A skin study identifies the organism.
- Visual inspection identifies vesicles along the peripheral sensory nerves.

Key treatments

- Analgesics: acetaminophen (Tylenol), codeine
- Antianxiety agents: lorazepam (Ativan), hydroxyzine (Vistaril)
- Anti-inflammatory: triamcinolone (Aristocort)
- Antipruritic: diphenhydramine (Benadryl)
- Antiviral agents: acyclovir (Zovirax), valacyclovir (Valtrex), famciclovir (Famvir)

Key interventions

- Monitor neurologic status.
- Monitor pain and note the effectiveness of analgesics.
- Prevent scratching and rubbing of affected areas.

Integumentary refresher *(continued)*

PRESSURE ULCERS

Key sign

- Signs are determined by stage of ulceration.

Key treatments

- High-protein, high-calorie diet in small, frequent feedings; parenteral or enteral feedings if the patient is unable or unwilling to take adequate nutrients orally
- Topical wound care according to facility protocol
- Wound debridement; tissue flap

Key interventions

- Monitor skin integrity and watch for signs of infection.
- Monitor any bedridden patient for possible changes in skin color, turgor, temperature, and sensation.
- Reposition the patient every 1 to 2 hours.
- Provide meticulous skin care and check bony prominences.
- Maintain the patient's diet and encourage oral fluid intake.

PSORIASIS

Key signs and symptoms

- Itching
- Lesions (red and usually well-defined patches)
- Pustules (with secondary infection)

Key test result

- A skin biopsy is positive for the disorder.

Key treatments

- Antipsoriatic agents: calcipotriene (Dovonex), anthralin (Anthra-Derm)
- Corticosteroid ointments: hydrocortisone (Dermacort), clobetasol (Cormax)
- Ultraviolet light to retard cell production; may be used in conjunction with psoralens (PUVA therapy)

Key interventions

- Make sure the patient understands his prescribed therapy; provide written instructions.
- Watch for adverse reactions, especially allergic reactions to anthralin; atrophy and acne from steroids; and burning, itching, nausea, and squamous cell epitheliomas from PUVA therapy.
- Caution the patient receiving PUVA therapy to stay out of the sun on the day of treatment and to protect his eyes with sunglasses that screen UVA for 24 hours after treatment. Tell him to wear goggles during any exposure to this light.

SKIN CANCER

Key signs and symptoms

- Change in color, size, or shape of preexisting lesion
- Irregular, circular bordered lesion with hues of tan, black, or blue (melanoma)
- Small, red, nodular lesion that begins as an erythematous macule or plaque with indistinct margins (squamous cell carcinoma)
- Waxy nodule with telangiectasis (basal cell epithelioma)

Key test result

- A skin biopsy shows cytology positive for cancer cells.

Key treatments

- Chemosurgery with zinc chloride
- Cryosurgery with liquid nitrogen
- Curettage and electrodesiccation
- Antimetabolite: fluorouracil (Adrucil)

Key interventions

- Monitor treated lesion sites.
- Administer medications as prescribed.
- Provide postchemotherapy and postradiation nursing care.

cells (WBCs), erythrocyte sedimentation rate, platelets, hemoglobin (Hb), and hematocrit (HCT).

Nursing actions

- Check the venipuncture site for bleeding after the procedure.

...And also for this

Coagulation studies analyze a blood sample for prothrombin time, international normalized ratio, and partial thromboplastin time.

Nursing actions

- Check the patient's medication list and note any that might interfere with the test results.
- Check the venipuncture site for bleeding after the procedure.

Tissue punch test

A **skin biopsy,** also known as a punch biopsy, involves use of a circular punch instrument to remove a small amount of skin tissue for histologic evaluation.

Check it out. Checking the test site for infection and bleeding after the procedure is a common nursing responsibility associated with skin tests.

Nursing actions
- Make sure that written, informed consent has been obtained.
- After the procedure, check the site for bleeding and infection.

Allergy exam

Skin testing involves use of a patch, scratch, or intradermal injection to administer an allergen to the skin's surface or into the dermis. The skin is then checked for reaction.

Nursing actions
- Keep the test area dry.
- Record the site, date, and time of test.
- Inspect the test site for erythema, papules, vesicles, edema, and induration.
- Record the date and time for the follow-up site reading.

Scrape and study

A **skin scraping** involves scraping a small sample of skin, nail, or hair for evaluation under a microscope.

Nursing actions
- After the procedure, check the scraping site for bleeding and infection.

Under the microscope

A **skin study** is a microscopic examination of skin that includes a Gram stain, culture and sensitivity testing, cytology, and immunofluorescence technique.

Nursing actions
- Follow laboratory procedure guidelines.
- Note current antibiotic therapy.

UV inspection

Wood's light test involves use of ultraviolet (UV) light to directly examine the skin.

Nursing actions
- Explain the procedure to the patient.

Atopic dermatitis is characterized by intense itching. Scratching the skin intensifies itching and creates red, weeping lesions.

Polish up on patient care

Major integumentary disorders include atopic dermatitis, burns, herpes zoster, pressure ulcers, psoriasis, and skin cancer.

Atopic dermatitis

Atopic dermatitis is a chronic skin disorder characterized by superficial skin inflammation and intense itching. It also may be called *atopic eczema* or *infantile eczema*.

Atopic dermatitis may be associated with other atopic diseases, such as bronchial asthma and allergic rhinitis. It usually develops in infants and toddlers between ages 1 month and 1 year, commonly in those with strong family histories of atopic disease. In many cases, these children acquire other atopic disorders as they grow older.

Typically, this form of dermatitis flares and subsides repeatedly before finally resolving during adolescence. However, it can persist into adulthood.

CONTRIBUTING FACTORS

- Chemical irritants
- Food allergies
- Genetic predisposition
- Immune dysfunction (possibly linked to elevated serum immunoglobulin E [IgE] levels or defective T-cell function)
- Infections (with *Staphylococcus aureus*)

DATA COLLECTION FINDINGS

- Characteristic location of lesions: areas of flexion and extension, such as the neck, antecubital fossa (inside the elbow), popliteal folds (posterior surface of the knee), and behind the ears
- Erythematous lesions that eventually become scaly and lichenified
- Excessively dry skin
- Hyperpigmentation
- Skin eruptions

DIAGNOSTIC FINDINGS

• Serum IgE levels are commonly elevated, but this finding doesn't confirm atopic dermatitis.

NURSING DIAGNOSES

• Impaired skin integrity
• Disturbed body image
• Anxiety

TREATMENT

• Washing of lesions with water and mild soap
• Environmental control of the offending allergens

Drug therapy

• Antihistamines: diphenhydramine (Benadryl), hydroxyzine (Atarax)
• Corticosteroid: hydrocortisone (Dermacort)

INTERVENTIONS AND RATIONALES

• Warn that drowsiness is possible with the use of an antihistamine to relieve daytime itching. *Informing the patient about this potential adverse effect can help to prevent injury.*
• If nocturnal itching interferes with sleep, suggest methods for inducing natural sleep, such as drinking a glass of warm milk, *to prevent overuse of sedatives.*
• An antihistamine may also be useful at bedtime *because antihistamines relieve itching and cause drowsiness.*
• Help the patient set up an individual schedule and plan for daily skin care *to help him cope with the chronic condition and to promote compliance.*
• Instruct the patient to bathe in plain water. (He may have to limit bathing, according to the severity of the lesions.) Tell him to bathe with a special nonfatty soap and tepid water (96° F [35.6° C]), to avoid using any soap when lesions are acutely inflamed, and to limit baths or showers to 5 to 7 minutes. *These measures prevent worsening of the condition.*
• For scalp involvement, advise the patient to shampoo frequently and to apply corticosteroid solution to the scalp afterward *to improve skin integrity.*
• Instruct the patient to keep his fingernails short *to limit excoriation and secondary infections caused by scratching.*
• Lubricate the skin after a shower or bath *to prevent excessive dryness.*
• Apply occlusive dressings (such as a plastic film) over a corticosteroid cream intermittently, as necessary, *to help clear lichenified skin.*
• Encourage the patient to verbalize his feelings about his skin condition. *Coping with disfigurement is extremely difficult, especially for children and adolescents.*

Teaching topics

• Understanding factors that exacerbate the condition (fabrics, detergents, stress)
• Following appropriate skin care
• Wearing clothing made of cotton

Burns

A burn destroys skin integrity and causes the loss of intracellular fluid and electrolytes. A burn is characterized by the extent (area) and depth of the burn. Most burns are a combination of thicknesses:

• A superficial partial-thickness burn (previously known as a first-degree burn) involves only the epidermal layer.
• A deep dermal partial-thickness burn (previously known as a second-degree burn) involves the epidermal and dermal layers.
• A full-thickness burn (previously known as third- and fourth-degree burns) involves epidermal, dermal, subcutaneous layers, and nerve endings, muscle, and bone.

Number 9…Number 9

The Rule of Nines is a method used to estimate the size of a burned area. With this method, a person's skin area is divided into several sections, each representing 9% (or multiples of 9%) of the total body area. By observing the size and location of a burn and assigning the appropriate body percentage, the nurse can roughly determine what percentage of a patient's body has been burned.

Lund and Browder

The Lund and Browder chart is another method of estimating body surface area that's been burned. This method accounts for the changes in body proportion that occur with age. It helps determine a patient's exact fluid replacement requirements after a burn injury because it's more accurate.

CAUSES

- Chemical: acids, alkalies, vesicants
- Electrical: lightning, electrical wires
- Mechanical: friction
- Radiation: X-ray, sun, nuclear
- Thermal: flame, frostbite, scald

DATA COLLECTION FINDINGS

- Superficial partial-thickness: erythema, edema, pain, blanching
- Deep dermal partial-thickness: pain, oozing, fluid-filled vesicles, erythema, shiny and wet subcutaneous layer after vesicles rupture
- Full-thickness: eschar, edema, little or no pain

DIAGNOSTIC FINDINGS

- Visual inspection allows the examiner to estimate the extent of the burn (determined by the Rule of Nines and the Lund and Browder chart).
- A 24-hour urine collection shows decreased creatinine clearance and negative nitrogen balance.
- Arterial blood gas analysis shows metabolic acidosis.
- As indicated, blood chemistry test shows increased potassium level and decreased sodium, albumin, complement fixation, and immunoglobulin levels.
- Hematology shows increased Hb and HCT and decreased fibrinogen and platelets and WBC count.
- Urine chemistry shows hematuria and myoglobinuria.

NURSING DIAGNOSES

- Deficient fluid volume
- Acute pain
- Risk for infection

TREATMENT

- Biological dressings
- Diet high in protein, fat, calories, and carbohydrates with small, frequent feedings
- Early excisional therapy
- Escharotomy (surgical excision of burned tissue)
- I.V. therapy: hydration and electrolyte replacement, using a fluid replacement formula such as the Parkland formula
- Isolation to protect the patient from infection
- Skin grafts
- Splints to maintain proper joint position and prevent contractures
- Transfusion therapy of fresh frozen plasma, platelets, packed RBCs, and albumin
- Withholding oral food and fluids until allowed

Drug therapy

- Analgesic: morphine
- Antacids: magnesium and aluminum hydroxide (Maalox), aluminum hydroxide gel (AlternaGEL)
- Antianxiety agent: lorazepam (Ativan)
- Antibiotic: gentamicin (Garamycin)
- Anti-infectives: mafenide (Sulfamylon), silver sulfadiazine (Silvadene), silver nitrate
- Antitetanus: tetanus toxoid
- Colloid: albumin 5% (Albuminar-5)
- Diuretic: mannitol (Osmitrol)
- Histamine antagonists: cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)
- Mucosal barrier fortifier: sucralfate (Carafate)
- Vitamins: phytonadione (AquaMEPHYTON), cyanocobalamin (vitamin B_{12})

INTERVENTIONS AND RATIONALES

- Monitor respiratory status. *Upper airway injury is common with burns to the face, neck, and chest. Edema may narrow airways.*
- Monitor fluid status *to detect hypovolemia.*
- If the patient has undergone skin grafting, keep pressure off the donor site *to maintain blood flow to the site and promote wound healing.*

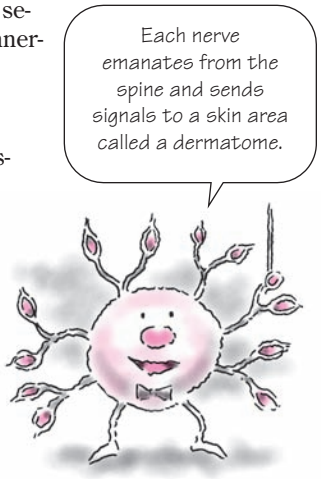
• Monitor for signs of infection *to determine whether the treatment plan must be altered.*
• Check the effectiveness of pain medication *to promote comfort.*
• Monitor and record vital signs, fluid intake and output, stool for occult blood, calorie count, daily weight, and neurovascular checks *to detect complications.*
• Monitor bowel sounds *to determine motility of the GI tract.*
• Maintain I.V. fluids *to maintain hydration and replace fluid loss.*
• Administer oxygen to *meet cellular demands.*
• Provide suctioning; assist with turning, coughing, and deep breathing; and perform chest physiotherapy and postural drainage *to maintain a patent airway.*
• Monitor total parenteral nutrition or administer enteral feedings *to meet the patient's increased metabolic demands.*
• Administer medications, as prescribed, *to maintain or improve the patient's condition.*
• Encourage the patient to express feelings about disfigurement, immobility from scarring, and a fear of dying *to encourage him to adopt coping mechanisms.*
• Provide treatments: range-of-motion (ROM) exercises, Hubbard tank (for immersing the patient), bed cradle, splints, and Jobst clothing *to maintain ROM and prevent complications.*
• Elevate the affected extremities *to promote venous drainage and decrease edema.*
• Maintain a warm environment during acute period *because the patient is unable to regulate body temperature.*
• Maintain protective precautions *to prevent transmission of infection to the patient.*
• Provide skin and mouth care *to promote comfort.*

Teaching topics

• Following dietary recommendations and restrictions
• Avoiding restrictive clothing
• Using splints and Jobst clothing
• Contacting community agencies and resources

Herpes zoster

Herpes zoster, also known as shingles, is an acute viral infection of nerve structures caused by varicella zoster; affected areas include the spinal and cranial sensory ganglia and posterior gray matter of the spinal cord. Herpes zoster produces localized vesicular skin lesions confined to a dermatome and severe neurologic pain in peripheral areas innervated by the inflamed root ganglia.



CAUSES

• Cytotoxic drug-induced immunosuppression
• Debilitating disease
• Exposure to varicella zoster
• Hodgkin's disease

DATA COLLECTION FINDINGS

• Anorexia
• Edematous skin
• Erythema
• Fever
• Headache
• Malaise
• Neuralgia
• Paresthesia
• Pruritus
• Severe, deep pain
• Unilaterally clustered skin vesicles along peripheral sensory nerves on the trunk, thorax, or face

DIAGNOSTIC FINDINGS

• A skin study identifies the infecting organism.
• Visual inspection identifies vesicles along the peripheral sensory nerves.

NURSING DIAGNOSES

• Acute pain
• Risk for infection
• Impaired skin integrity

TREATMENT

• Comfort promotion

Drug therapy

- Analgesics: acetaminophen (Tylenol), codeine
- Anti-inflammatory: triamcinolone (Aristocort)
- Antianxiety agents: lorazepam (Ativan), hydroxyzine (Vistaril)
- Antipruritic: diphenhydramine (Benadryl)
- Antiviral agents: acyclovir (Zovirax), famciclovir (Famvir), valacyclovir (Valtrex)
- Nerve blocker: lidocaine (Xylocaine)

INTERVENTIONS AND RATIONALES

- Monitor the patient's neurologic status *to determine a baseline and then detect changes.*
- Note the patient's level of pain and the effectiveness of analgesics *to promote comfort and evaluate the need for a change in the current treatment plan.*
- Monitor and record vital signs, laboratory results, and cranial nerve function *to determine a baseline and then detect changes.*
- Administer medications, as directed, *to maintain or improve the patient's condition.*
- Encourage the patient to express feelings about changes in his physical appearance and the recurrent nature of the illness *to help him adapt.*
- Prevent scratching and rubbing of affected areas *to prevent infection.*

Teaching topics

- Avoiding wool and synthetic clothing
- Wearing lightweight, loose cotton clothing
- Keeping blisters intact
- Promoting skin care

Pressure ulcers

Pressure ulcers are localized areas of cellular necrosis that occur most commonly in skin and subcutaneous tissue over bony prominences. These ulcers may be superficial, caused by local skin irritation with subsequent surface maceration, or deep, originating in underlying tissue. Deep lesions may go undetected until they penetrate the skin; by then, they usually have caused subcutaneous damage.

CAUSES

- Pressure, particularly over bony prominences
- Shearing, friction

Risk factors

- Diabetes
- Immobility
- Obesity or emaciation
- Poor hydration
- Poor nutrition

DATA COLLECTION FINDINGS

Signs and symptoms of pressure ulcers occur in various stages.

Deep-tissue injury

- Skin discoloration: purple or maroon localized area
- Intact skin or blood-filled blister

Stage 1

- Intact skin
- Nonblanchable erythema

Stage 2

- Open or ruptured skin
- Partial-thickness skin loss involving the epidermis and dermis
- Shallow ulcer, without slough

Stage 3

- Deep crater with or without undermining of adjacent tissue
- Full-thickness skin loss involving damage or necrosis of subcutaneous tissue, which may extend down to, but not through, underlying fasciae
- Slough (possible)

Stage 4

- Damage to muscle, bone, tendon, or joint
- Full-thickness skin loss with extensive destruction
- Tissue necrosis; slough or eschar (possible)
- Tunneling or undermining (possible)

Preventing pressure ulcers

As a health care provider, you play a key role in maintaining the patient's skin integrity by promoting comfort through averting dryness and itching and preventing pressure ulcers, a major complication. Because your patient's skin condition largely depends on his overall health, you'll need to help him maintain optimal nutrition and hydration. You may also need to provide additional guidance in personal hygiene and how to protect the skin from harsh environmental conditions.

PUTTING ON THE PRESSURE

As their name implies, pressure ulcers develop when pressure—applied with great force for a short period of time or with less force over a long period of time—impairs circulation, depriving tissues of oxygen and nutrients. If left untreated, ischemic areas can progress to tissue breakdown and infection.

Most pressure ulcers develop over bony prominences, where friction and shearing combine with pressure to break down skin and underlying tissues.

MAKING THE DIFFERENCE

Preventing pressure ulcers is crucial, especially in older adults, because ulcers take a long time to heal, increasing the patient's risk of infection and other complications.

To help prevent pressure ulcers, follow these steps:

- Turn or reposition the patient every 1 to 2 hours, unless contraindicated.
- Lift the patient rather than sliding him because sliding causes friction.
- Use pillows to position the patient.
- Avoid placing your patient directly on his trochanter.
- Except for brief periods, avoid raising the head of the bed more than 30 degrees to prevent shearing.
- As appropriate, perform active and passive range-of-motion exercises to relieve pressure and promote circulation.
- Keep the patient's skin surfaces clean, and use moisturizers and moisture barriers.
- Take steps to improve the patient's nutritional and hydration status.

Unstageable

- Full-thickness wound covered with eschar or slough that prevents full assessment of ulcer

DIAGNOSTIC FINDINGS

- Visual inspection identifies a pressure ulcer.
- A wound culture and sensitivity identifies the infecting organism.

NURSING DIAGNOSES

- Impaired physical mobility
- Imbalanced nutrition: Less than body requirements
- Impaired skin integrity

TREATMENT

- High-protein, high-calorie diet in small, frequent feedings; parenteral or enteral feedings if the patient is unable or unwilling to take adequate nutrients orally
- Topical wound care according to the facility's protocol
- Wound debridement; tissue flap

INTERVENTIONS AND RATIONALES

- Monitor the patient's skin integrity and watch for signs of infection *to detect complications.*
- Monitor a bedridden patient for possible changes in skin color, turgor, temperature, and sensation *to prevent further skin breakdown.*
- Reposition the patient every 1 to 2 hours *to prevent pressure ulcers.* (See *Preventing pressure ulcers.*)
- Provide meticulous skin care and check bony prominences *to help prevent development of pressure ulcers.*
- Maintain the patient's diet and encourage oral fluid intake *to promote wound healing.*
- Provide wound care *to promote healing.*
- Provide ROM exercises *to promote circulation.*

Teaching topics

- Avoiding prolonged periods of immobility
- Performing meticulous skin care
- Changing positions frequently when bedridden
- Recognizing the signs of skin breakdown
- Recognizing the signs and symptoms of infection

Psoriasis

Psoriasis, a chronic, recurrent disease, is marked by epidermal proliferation. Lesions appear as erythematous papules and plaques covered with silver scales and vary widely in severity and distribution.

Although this disorder commonly affects young adults, it may strike at any age, including infancy. Psoriasis is characterized by recurring partial remissions and exacerbations.

CAUSES

- Genetic predisposition

DATA COLLECTION FINDINGS

- Arthritic symptoms
- Characteristic locations of lesions: scalp, chest, elbows, knees, back, buttocks
- Itching
- Lesions (red and usually forming well-defined patches)
- Pain
- Patches consisting of silver scales that flake off or thicken and cover the lesions
- Pustules (if secondary infection is present)

DIAGNOSTIC FINDINGS

- A skin biopsy is positive for the disorder.
- Blood studies reveal elevated serum uric acid level in severe cases, due to accelerated nucleic acid degradation; indications of gout are absent.

NURSING DIAGNOSES

- Impaired skin integrity
- Risk for infection
- Disturbed body image

TREATMENT

- Tar, wet dressings, or oatmeal baths
- UV light to retard cell production; may be used in conjunction with psoralens (PUVA therapy)

Drug therapy

- Corticosteroid ointments: hydrocortisone (Dermacort), clobetasol (Cormax)
- Corticosteroid: intralesional steroid injections
- Antipsoriatic agents: calcipotriene (Dovonex), anthralin (Anthra-Derm)
- Antihypocalcemic agent: calcitriol (Rocaltrol)
- Antineoplastic agent: methotrexate (Trexall)
- Immunosuppressants: alefacept (Amevive), cyclosporine (Gengraf)

INTERVENTIONS AND RATIONALES

- Make sure the patient understands his prescribed therapy; provide written instructions *to avoid confusion and promote compliance.*
- Watch for adverse reactions, especially allergic reactions to anthralin, atrophy and acne from steroids, and burning, itching, nausea, and squamous cell epitheliomas from PUVA therapy *to prevent complications.*
- Caution the patient receiving PUVA therapy to stay out of the sun on the day of treatment and to protect his eyes with sunglasses that screen UVA for 24 hours after treatment. Tell him to wear goggles during any exposure to this light. *These measures protect the patient from injury caused by excessive ultraviolet A exposure.*
- Be aware that psoriasis can cause stress and emotional upset. Assure the patient that psoriasis isn't contagious and that although exacerbations and remissions occur, they're controllable with treatment. *Appropriate teaching helps the patient develop healthy coping strategies*
- Help the patient learn to cope with stressful situations *because they tend to exacerbate psoriasis.*

Teaching topics

- Correctly applying prescribed ointments, creams, and lotions (a steroid cream, for example, should be applied in a thin film and rubbed gently into the skin until the cream disappears)
- Avoiding occlusive dressings over anthralin
- Using mineral oil, then soap and water, to remove anthralin
- Washing the skin gently, not vigorously
- Using a soft brush to remove scales
- Contacting the National Psoriasis Foundation

Skin cancer

Skin cancer is a malignant primary tumor of the skin. There are three types:
• Basal cell carcinoma is the most common form of skin cancer and is usually caused by prolonged exposure to the sun. It tends to grow slowly and rarely metastasizes.
• Melanoma is a neoplasm that arises from melanocytes. Melanoma spreads quickly through the lymph and vascular systems and metastasizes to the lymph nodes, skin, liver, lungs, and central nervous system. It's the most lethal form of skin cancer.
• Squamous cell carcinoma grows more rapidly than basal cell carcinoma. It requires early treatment to prevent metastasis.

CAUSES

• Chemical irritants
• Friction or chronic irritation
• Heredity
• Immunosuppressive drugs
• Infrared heat or light
• Precancerous lesions: leukoplakia, nevi, senile keratoses
• Radiation
• UV rays

DATA COLLECTION FINDINGS

• Change in color, size, or shape of an existing lesion
• Irregular, circular bordered lesion with hues of tan, black, or blue (in the case of melanoma)
• Local soreness
• Oozing, bleeding, crusting lesion
• Pruritus
• Small, red, nodular lesion that begins as an erythematous macule or plaque with indistinct margins (in the case of squamous cell carcinoma)
• Waxy nodule with telangiectasis (in the case of basal cell epithelioma)

DIAGNOSTIC FINDINGS

• A skin biopsy shows cytology positive for cancer cells.

NURSING DIAGNOSES

• Anxiety
• Disturbed body image
• Impaired skin integrity

TREATMENT

• Chemosurgery with zinc chloride
• Cryosurgery with liquid nitrogen
• Curettage and electrodesiccation
• Radiation therapy

Drug therapy

• Alkylating agents: carmustine (BiCNU), dacarbazine (DTIC-Dome)
• Antiemetics: prochlorperazine (Compazine), ondansetron (Zofran)
• Antimetabolite: fluorouracil (Adrucil)
• Antineoplastics: hydroxyurea (Hydrea), vincristine (Oncovin)
• Immunotherapy for melanoma: bacille Calmette-Guérin vaccine
• Unclassified drug: imiquimod (Aldara) for superficial basal cell carcinoma

INTERVENTIONS AND RATIONALES

• Monitor skin punch biopsy site *for bleeding.*
• Monitor lesions. *Regular observation allows early detection in case of recurrence.*
• Monitor and record vital signs *to determine baseline and detect changes.*
• Administer medications as prescribed *to maintain and improve the patient's condition.*
• Encourage the patient to express feelings about changes in body image and a fear of dying *to help him accept changes in body image.*
• Provide postchemotherapy and postradiation nursing care *to promote healing.*

Teaching topics

• Avoiding contact with chemical irritants
• Wearing sun block and layered clothing when outdoors
• Self-monitoring for lesions that don't heal and moles that change characteristics
• Removing moles that are constantly irritated
• Contacting the Skin Cancer Foundation
• Contacting community agencies and other resources

Pump up on practice questions

1. A client experiences problems with body temperature regulation associated with a skin impairment. Which gland is most likely involved?

1. Eccrine
2. Sebaceous
3. Apocrine
4. Endocrine

Answer: 1. Eccrine glands are associated with body temperature regulation, sebaceous glands lubricate the skin and hair, and apocrine glands are involved in bacteria decomposition. Endocrine glands are a group of glands that secrete hormones that regulate body processes, such as metabolism and glucose balance.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

2. A client undergoes a circular skin punch biopsy to confirm a diagnosis of skin cancer. Immediately following the procedure, the nurse should observe the site for what reaction?

1. Infection
2. Dehiscence
3. Hemorrhage
4. Swelling

Answer: 3. The nurse's main concern following a circular skin punch biopsy is to monitor the site for bleeding. Dehiscence is more likely in larger wounds such as surgical incisions of the abdomen or thorax. Later, infection is a possible consequence of a skin punch. Swelling is a normal reaction associated with any event that traumatizes the skin.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

3. A client undergoes hypersensitivity testing with the intradermal technique. When the nurse administers the allergen, at what angle should the needle be inserted?

1. 0 degrees
2. 15 degrees
3. 45 degrees
4. 90 degrees

Answer: 2. The proper angle for intradermal injections is 15 degrees. There are no injections requiring a 0-degree insertion. The subcutaneous angle is 45 degrees, and the intramuscular angle is 90 degrees.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

4. What is the best method for preventing hypovolemic shock in a client admitted with severe burns?

1. Administering dopamine (Intropin)
2. Applying medical antishock trousers
3. Infusing I.V. fluids
4. Infusing fresh frozen plasma

Answer: 3. During the early postburn period, large amounts of plasma fluid extravasate into interstitial spaces. Replacing the lost fluid is necessary to prevent hypovolemic shock; this is best accomplished with crystalloid and colloid solutions. Dopamine causes vasoconstriction and elevates blood pressure, but it doesn't prevent hypovolemia in burn clients. Medical antishock trousers would be applied to treat—not prevent—shock. Fresh frozen plasma is expensive and introduces a slight risk of disease transmission.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

5. Which nursing intervention can help a client maintain healthy skin?

1. Keep the client well hydrated.
2. Bathe the client without soap.
3. Remove adhesive tape quickly from the skin.
4. Recommend tight-fitting clothes for hot weather.

Answer: 1. Keeping the client well hydrated helps prevent skin cracking and infection because intact healthy skin is the body's first line of defense. To help a client maintain healthy skin, the nurse should avoid strong or harsh detergents and should use mild soap. The nurse shouldn't remove adhesive tape too quickly because this action can strip or scrape the skin. The nurse should recommend wearing loose clothes in hot weather to promote heat loss by evaporation.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

6. The skin lesions evident in herpes zoster are similar to those seen in:

1. impetigo.
2. syphilis.
3. varicella.
4. rubella.

Answer: 3. Varicella (chickenpox) characteristically has vesicles as the hallmark lesion much like herpes zoster. Impetigo has pustules. The primary lesion in syphylis is the chancre; in rubella, the lesion is a maculopapular rash.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

7. A client with widespread herpes zoster is placed on I.V. hydrocortisone (Solu-Cortef). The nurse should be aware that the drug can cause an elevation of which serum chemistry value?

1. Potassium
2. Calcium
3. Glucose
4. Magnesium

Answer: 3. Corticosteroids are known to elevate the blood glucose level and tend to lower serum potassium and calcium levels. Their effect on magnesium isn't substantial.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Comprehension

8. A 19-year-old female client comes to a clinic with dark red lesions on her hands, wrists, and waistline. She has scratched several of the lesions until they're open and bleeding. The nurse instructs the client to try pressing on the itchy lesions. What is the rationale for this intervention?

1. Pressing the skin promotes beneficial microorganisms.
2. Pressing is suggested before scratching.
3. Pressing the skin promotes breaks in the skin.
4. Pressing the skin stimulates nerve endings.

Answer: 4. Pressing the skin stimulates nerve endings, doesn't promote breaks in the skin, and can reduce the sensation of itching. Scratching the skin spreads microorganisms and opens a portal for the entry of bacteria.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

9. Deep partial-thickness burn wounds are characterized by:

1. erythema.
2. blanching.
3. eschar.
4. fluid-filled vesicles.

Answer: 4. Deep partial-thickness skin destruction (also referred to as second-degree burns) is characterized by fluid-filled vesicles. Erythema and blanching on pressure are characteristic of partial-thickness skin destruction. Eschar is a manifestation of full-thickness skin destruction.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

10. The nurse is caring for a client with a new donor site that was harvested to treat a burn. The nurse should position the patient to:

1. allow ventilation of the site.
2. make the site dependent.
3. avoid pressure on the site.
4. keep the site fully covered.

Answer: 3. A universal concern in the care of donor sites for burn care is to keep the site away from sources of pressure. Ventilation of the site and keeping the site fully covered are practices in some institutions but aren't hallmarks of donor site care. The donor site shouldn't be placed in a dependent position.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

Pump up on more practice questions

1. A client experiences abdominal pain and exhibits blood in his stools and emesis. He's scheduled to undergo several diagnostic tests. It isn't necessary for the nurse to withhold all food from the client if he's scheduled for:

1. an endoscopy.
2. a fecal occult blood test.
3. an endoscopic retrograde cholangiopancreatography.
4. a barium swallow.

Answer: 2. The client may eat normally when a fecal occult blood test is scheduled; however, for endoscopic tests, an upper GI series, or a barium swallow, the client should have nothing by mouth before the test.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

2. The nurse is providing teaching for a client with a hiatal hernia. The nurse asks the client which foods he regularly consumes. What answer would indicate the need for more teaching on this topic?

1. Milk products
2. Small meals
3. Fatty foods
4. Soft drinks

Answer: 4. Carbonated beverages stimulate belching and gastric reflux, causing lower esophageal irritation and the associated pain of hiatal hernia. Milk products, small meals, and fatty foods aren't prohibited in the diet of a patient with hiatal hernia.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

3. The nursing staff has just been taught how to use and care for a new blood glucose monitor. Which nursing intervention demonstrates the proper use of a blood glucose monitor?

1. Take off your gloves before removing the test strip.
2. Smear the drop of blood onto the reagent pad.
3. Calibrate the machine after installing a new battery.
4. Start the timer on the machine while gathering supplies.

Answer: 3. To obtain accurate readings, the nurse should calibrate the machine whenever a new battery is installed. To adhere to standard precautions and prevent contact with blood, the nurse's hands should remain gloved throughout blood glucose testing. The nurse should drop the blood—not smear it—on the reagent pad because smearing can cause an inaccurate reading. To ensure accurate results, the nurse shouldn't start the timer before the sample is collected.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Knowledge

4. A client with Crohn's disease asks the nurse which food she should eat. What should the nurse recommend?

1. Celery
2. Peanut butter
3. Honey
4. Fudge

Answer: 3. The dietary recommendations for regional enteritis are foods high in protein, carbohydrates, and calories and low in fat, residue, and fiber. Honey is a high-calorie carbohydrate. Celery isn't recommended because it's high in residue and fiber. Peanut butter isn't recommended because it's high in

fat. Fudge is typically high-fat and shouldn't be recommended.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

5. A client is prescribed misoprostol (Cytotec) for treatment of a gastric ulcer. The nurse should be alert for which common, dose-related adverse reaction?

1. Diarrhea
2. Nausea
3. Vomiting
4. Bloating

Answer: 1. Misoprostol commonly causes diarrhea. This reaction is usually dose-related. Nausea and vomiting are adverse reactions that might be associated with misoprostol administration, but they're uncommon. Bloating isn't an adverse reaction to misoprostol.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Knowledge

6. A diabetic client suddenly develops hypoglycemia. What should the nurse do *first*?

1. Give the client a glass of orange juice to drink.
2. Administer 5 more units of regular insulin.
3. Check the client's blood glucose level.
4. Call the client's physician.

Answer: 1. Drinking a glass of orange juice should raise the client's blood glucose level, thus correcting hypoglycemia. Receiving additional insulin lowers the client's blood glucose level even further, causing hypoglycemia to worsen. The nurse shouldn't take the time to check the client's blood glucose level or call the physician first because the client needs immediate attention to prevent unconsciousness. Blood glucose level should be checked after the client consumes the orange juice.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

7. The nurse is seeking to meet the nutritional needs of a client with acute peritonitis. The nurse should monitor:

1. nasal enteral feedings.
2. gastric enteral feedings.
3. oral feedings.
4. parenteral feedings.

Answer: 4. To avoid the introduction of nutritional products into the abdominal cavity through a perforation of the GI tract, the client with peritonitis is typically fed using the parenteral route either with total parenteral nutrition or peripheral parenteral nutrition. Feedings through an enteral tube or the oral route are avoided.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

8. The nurse is providing discharge teaching to a client with pancreatitis. The nurse and client are discussing hyperglycemia. Which of the following symptoms is the nurse most likely to bring up in her discussion?

1. Thirst
2. Oliguria
3. Weight gain
4. Loss of appetite

Answer: 1. One of the classic manifestations of hyperglycemia is polydipsia (extreme thirst). With hyperglycemia, the expectation is polyuria rather than oliguria. Typically, weight loss is a manifestation of hypergly-

cemia because the cells aren't being nourished because of a lack of insulin. With hyperglycemia, the client typically experiences hunger rather than a loss of appetite.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

9. After an arteriogram procedure, a client reports itching skin. The nurse notes red blotches on the client's trunk. How should the nurse respond initially?

1. Notify the physician.
2. Administer an antihistamine.
3. Check vital signs.
4. Plan to monitor findings closely.

Answer: 3. An arteriogram involves administration of a radiopaque dye. Some clients are hypersensitive to the dye and exhibit related manifestations or pruritus and urticaria. More severe manifestations can also occur, including hypotension and dyspnea. Therefore, it's important to monitor vital signs initially. The other responses have lesser priority.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

10. A client develops recurrent urolithiasis. What mineral will most likely be restricted in the client's diet?

1. Phosphorus
2. Calcium
3. Magnesium
4. Sodium

Answer: 2. In most cases, renal stones are heavily composed of calcium; therefore, calcium-restricted diets will be prescribed in recurrent urolithiasis. The other minerals listed aren't typically restricted in the diet of the client with urolithiasis.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

11. A client with Cushing's syndrome is admitted to the medical-surgical unit. During the admission process, the nurse notes that the client is agitated and irritable, has poor memory, reports loss of appetite, and appears disheveled. These findings are consistent with which problem?

1. Depression
2. Neuropathy
3. Hypoglycemia
4. Hyperthyroidism

Answer: 1. Agitation, irritability, poor memory, loss of appetite, and neglect of the client's appearance may signal depression, which is common in clients with Cushing's syndrome. Neuropathy affects clients with diabetes mellitus, not Cushing's syndrome. Although hypoglycemia can cause irritability, it also produces increased appetite, rather than loss of appetite. Hyperthyroidism typically causes such signs as goiter, nervousness, heat intolerance, and weight loss despite increased appetite.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

12. A 26-year-old client with chronic renal failure expects to receive a kidney transplant. Recently, the physician told the client that he's a poor candidate for a transplant because of chronic uncontrolled hypertension and diabetes mellitus. Now, the client tells the nurse, "I want to go off dialysis. I'd rather not live than be on this treatment for the rest of my life." How should the nurse respond?

1. "We all have days when we don't feel like going on."
2. "You're feeling upset about the news you got about the transplant."
3. "The treatments are only three times a week. You can live with that."
4. "Whatever decision you make, we will support you."

Answer: 2. In reflecting the client's implied feelings, the nurse is promoting communication. Using responses such as "We all have days when we don't feel like going on" fails to address the individual client's needs. Reminding the client of the treatment frequency isn't

addressing the client's needs. Offering support is therapeutic but doesn't address the client's expressed need to discuss the decision to go off dialysis.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

13. A client experiences urinary retention from benign prostatic hyperplasia and undergoes a transurethral resection of the prostate. Following the procedure, the client receives continuous bladder irrigation. The nurse notices that the drainage from the catheter has stopped. How should the nurse respond?

1. Replace the existing catheter.
2. Increase the infusion rate.
3. Irrigate the catheter.
4. Notify the urologist.

Answer: 3. Most likely, the apparatus is blocked by a blood clot, which the nurse may remove by either gentle aspiration of the clot from the catheter or irrigation through the out-port. It's probably unnecessary to replace the apparatus. Increasing the flow may cause bladder distention and pain. Calling the physician isn't an appropriate initial nursing response because the nurse has the autonomy to solve this problem without calling the physician first.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

14. A nurse is assisting with a screening clinic. A client visits the clinic to be screened for prostate cancer. Which laboratory measure is used to screen for prostate cancer?

1. Creatinine kinase (CK)
2. Aspartate aminotransferase (AST)
3. Blood urea nitrogen (BUN)
4. Prostate-specific antigen (PSA)

Answer: 4. PSA measurement is widely used as a screening test for prostate cancer. CK measurement is most commonly associated with myocardial damage, AST measurement provides information about liver damage, and BUN measurement provides information about kidney function.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

15. The nurse is instructing a client regarding skin tests for hypersensitivity reactions. The nurse should teach the client to:

1. keep skin test areas moist with a mild lotion.
2. stay out of direct sunlight until tests are read.
3. wash the sites daily with a mild soap.
4. have the sites read on the scheduled date.

Answer: 4. An important facet of evaluating skin tests is to read the skin test results at the proper time. Evaluating the skin test too late or too early will give inaccurate and unreliable results. The sites should be kept dry. There's no requirement to wash the sites with soap, and direct sunlight isn't prohibited.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

16. A client is admitted to the hospital with an acute exacerbation of asthma. Auscultation of the lungs reveals almost absent breath sounds. Thirty minutes after administering albuterol by nebulizer, the nurse auscultates diffuse inspiratory and expiratory wheezes throughout all lung fields. This finding most likely represents:

1. increased airflow.
2. no change in airflow
3. decreased airflow.
4. no correlation with airflow.

Answer: 1. Changes in breath sounds provide a general indication of response to treatment. Nearly absent breath sounds or no breath sounds indicate severe airflow obstruction. A noisy chest is a sign that air is flowing through the air passages even though they're partially obstructed.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

17. A client is scheduled to undergo a 24-hour urine test beginning at 8 a.m. on the first day and ending at the same time on the second day. The nurse should instruct the client to:

1. discard the second-day 8 a.m. sample.
2. discard the first and last samples.
3. discard the first-day 8 a.m. sample.
4. retain all samples collected.

Answer: 3. In a 24-hour urine test, the first sample is discarded and the last sample is retained.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

18. The nurse is planning to administer levothyroxine (Synthroid) to an adult client. Which vital sign measurements indicate that the nurse should consider withholding the dose and consulting the physician?

1. Temperature 97.8° F (36.6° C), pulse 88 beats/minute, respirations 22 breaths/minute, blood pressure 110/70 mm Hg
2. Temperature 98.4° F (36.9° C), pulse 54 beats/minute, respirations 16 breaths/minute, blood pressure 100/56 mm Hg
3. Temperature 99.0° F (37.2° C), pulse 110 beats/minute, respirations 20 breaths/minute, blood pressure 136/88 mm Hg
4. Temperature 98.8° F (37.1°C), pulse 72 beats/minute, respirations 12 breaths/minute, blood pressure 118/72 mm Hg

Answer: 3. Levothyroxine can cause tachycardia, indicated here by a pulse rate of 110 beats/minute. Tachycardia is an indication of thyroid toxicity. None of the other choices indicate that the nurse should withhold the dose and consult the physician.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

19. A client with diabetes mellitus and a hearing impairment is admitted to the medical-surgical unit. For this client, the nursing team is developing a care plan that includes daily self-administration of insulin. Which intervention should the team include in the plan?

1. Use facial expressions as needed.
2. Chew gum while giving instructions.
3. Shine a light on the client's face.
4. Raise an arm or hand to get the client's attention.

Answer: 4. The nurse should avoid relying on facial expressions to get the client's attention because these expressions may be misinterpreted. A client who depends on visual cues might think they're signs of annoyance or other feelings. The nurse shouldn't chew gum when teaching a client with limited hearing because chewing can distort the sounds that the client can hear. If needed, a light may be shone on the nurse's face—not the client's face—to help the client lip-read.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Application

20. A client scheduled for a gastroscopy has had nothing by mouth since midnight. The procedure is scheduled for 8 a.m. At 6:30 a.m., the nurse collects a capillary blood glucose sample that registers 40 mg/dl on the glucose monitor. The client is alert, has clear speech, and states, "I don't feel like my sugar is too low." Initially, the nurse should:

1. document the finding and withhold the client's morning insulin.
2. repeat the capillary blood glucose test.
3. give the client an oral simple sugar.
4. immediately inform a registered nurse (RN) so she can administer dextrose 50 g I.V.

Answer: 2. An error may have occurred in obtaining the result because the client is asymptomatic for hypoglycemia but the capillary blood glucose reading is significantly subnormal. The nurse should repeat the test to determine whether she should notify the RN to administer I.V. glucose because the client should not receive anything by mouth. Responding to the reading has precedence over documenting findings because the blood glucose reading is so low.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

21. A client who receives immunosuppressive drugs for systemic lupus erythematosus develops a fever. The nurse should:

1. administer an antipyretic.
2. place the client in isolation.
3. apply cooling measures immediately.
4. obtain cultures to try to identify the cause.

Answer: 4. Immunosuppressive drugs impair the client's immunocompetence and predispose him to infection. Fever is a manifestation of infection; therefore, it's most important to discover the cause of the fever as soon as possible. Antipyretics should be withheld until cultures have been obtained. Isolation isn't indicated unless the absolute neutrophil count is less than 1,000. Cooling measures may be indicated after cultures have been obtained.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

22. Which clinical finding distinguishes rheumatoid arthritis from osteoarthritis and gouty arthritis?

1. Crepitus with range of motion
2. Symmetry of joint involvement
3. Elevated serum uric acid levels
4. Dominance in weight-bearing joints

Answer: 2. Rheumatoid arthritis is bilateral and symmetrical; in contrast, osteoarthritis and gouty arthritis are unilateral. Crepitus is most associated with osteoarthritis. Elevated serum uric acid levels are seen in gouty arthritis; weight-bearing joint dominance occurs in osteoarthritis.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

23. A client has a newly created colostomy. After participating in counseling with the nurse and receiving support from his spouse, the client decides to change the colostomy pouch unaided. Which behavior suggests that the client is beginning to accept the change in body image?

1. The client closes his eyes when the abdomen is exposed.
2. The client avoids talking about his recent surgery.
3. The client asks his spouse to leave the room.
4. The client touches his altered body part.

Answer: 4. By touching his body, the client recognizes the bodily change and establishes that the change is real. Closing his eyes, not

looking at his abdomen when the colostomy is exposed, or avoiding any discussion of his surgery reflects denial, instead of acceptance of the change. Asking his spouse to leave the room signifies that the client is ashamed of the change and isn't coping with it.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

24. Which of the following is a warning sign of colon cancer?

1. Hoarseness
2. Indigestion
3. Rectal bleeding
4. A sore that doesn't heal

Answer: 3. Rectal bleeding of dark to bright red blood is a warning sign of colon cancer. Hoarseness, indigestion, and a sore that doesn't heal are potential warning signs of other disorders.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

25. A few minutes after a blood transfusion was started, the nurse notes that the client has chills, dyspnea, and urticaria. The nurse stops the transfusion and reports this to the physician because the client is probably experiencing which problem?

1. A hemolytic reaction to mismatched blood
2. A hemolytic reaction to blood that isn't Rh-compatible
3. A hemolytic reaction caused by exposure to an antigen
4. A hemolytic reaction caused by bacterial contamination of donor blood

Answer: 3. Hemolytic allergic reactions are fairly common and may cause chills, fever, urticaria, tachycardia, dyspnea, chest pain, hypotension, and other signs of anaphylaxis after blood transfusion begins. Although rare, a hemolytic reaction to mismatched blood can occur, triggering a more severe reaction and possibly leading to disseminated intravascular coagulation. A hemolytic reaction to blood that isn't Rh-compatible is less severe and occurs several days to 2 weeks after a transfusion. Bacterial contamination of donor blood causes a high fever, nausea, vomiting, diarrhea, abdominal cramps and, possibly, shock.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Comprehension

26. Which of the following is a characteristic sign of systemic lupus erythematosus (SLE)?

1. A butterfly rash
2. Watery eyes
3. Diplopia
4. Ptosis

Answer: 1. A butterfly rash (lesions over the cheeks and bridge of the nose in a butterfly pattern) is a characteristic sign of SLE. It may be accompanied by photosensitivity, oral or nasopharyngeal ulcerations, arthritis, and proteinuria. Watery eyes are associated with hay fever and diplopia, and ptosis may signal myasthenia gravis.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

27. A client with a herniated nucleus pulposus of the lumbar spine is scheduled for a laminotomy. The nurse is providing preoperative teaching. How should the nurse instruct the client to get out of bed after the procedure?

1. Pulling himself up using an over-the-bed trapeze
2. Logrolling to a side-lying position
3. Twisting to a sitting position
4. Avoiding use of the abdominal muscles

Answer: 2. Following back surgery such as a laminotomy, it's best for the client to initially get out of bed by logrolling to his side. Using an over-the-bed trapeze or twisting may put strain on the surgical site. When repositioning, the client should actually tighten his abdominal muscles.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

28. To prevent dislocation in a client on the first postoperative day after a right total hip replacement, the nurse should avoid positioning him:

1. with the right leg externally rotated.
2. in the left lateral decubitus position.
3. with the legs adducted.
4. in semi-Fowler's position.

Answer: 3. To prevent dislocation following a total hip replacement, leg adduction should be avoided. Instead, the legs should be abducted. External rotation of the affected leg is appropriate as well as sitting at a 45-degree angle.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

29. A client with Parkinson's disease is receiving carbidopa-levodopa (Sinemet). The best indication of the effectiveness of the drug is a decrease in the frequency of the client's:

1. tremors.
2. swallowing.
3. seizures.
4. lacrimation.

Answer: 1. A common sign of Parkinson's disease is tremors. Successful therapy with carbidopa-levodopa should result in diminution of tremors. More frequent swallowing and lacrimation aren't manifestations of Parkinson's disease. Seizures aren't associated with Parkinson's disease.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

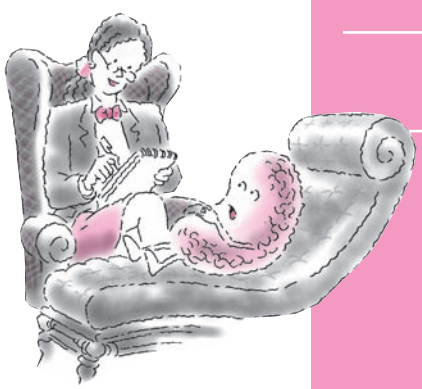
30. The nurse is providing care for a client experiencing a myasthenic crisis. Which body system should the nurse monitor most carefully?

1. Respiratory
2. Immune
3. Cardiovascular
4. Hepatic and renal

Answer: 1. The client's ability to ventilate and oxygenate are at great risk during a myasthenic crisis. Mechanical ventilation is often required. The immune, cardiovascular, hepatic, and renal systems may be involved, but they aren't the primary body systems in jeopardy.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

Part III Psychiatric care



12 Essentials of psychiatric nursing

In this chapter, you'll review:

- the nurse's role in psychiatric care
- psychiatric assessment
- tests commonly used to diagnose psychiatric disorders.

Brush up on key concepts

Effective patient care requires consideration of the psychological and physiologic aspects of health. A patient who seeks medical help for chest pain, for example should also be assessed for anxiety or depression. As a nurse, you'll need a fundamental understanding of communication techniques as well as an understanding of psychiatric disorders.

The key to any relationship

Therapeutic communication is the foundation for developing a nurse-patient relationship, which makes it a vital topic for the NCLEX. It's the primary intervention in psychiatric nursing. Therapeutic communication requires awareness of the patient's verbal and nonverbal messages.

To uncover and investigate the patient's inner thoughts, personal problems, and emotions, establish trust and help the patient feel safe and respected. A therapeutic relationship helps the patient feel understood as well as comfortable about discussing his problems. It can help him develop better ways to meet his emotional needs and develop satisfying relationships.

Tuned in?

Listening intently to the patient enables you to hear and analyze what the patient is saying and to learn about the patient's communication patterns.

Connect the dots

Succinct **rephrasing** of key patient statements helps ensure understanding and emphasizes important points in the patient's message. For example, say, "You're feeling angry, and you say it's because of the way your friend treated you yesterday."

Keep the door open

Using **broad openings** and **general statements** to initiate conversation encourages the patient to talk about any subject that comes to mind. These openings allow the patient to focus the conversation and demonstrate a willingness to interact. An example of this technique is: "Is there something you would like to talk about?"

Polish the rough edges

Asking the patient to **clarify** a confusing or vague message demonstrates the nurse's desire to understand what the patient is saying. It can also elicit precise information crucial to the patient's recovery. An example of clarifying is: "I'm not sure I understood what you said."

A sharper focus

Using the technique called **focusing** assists the patient in redirecting attention toward something specific. This fosters the patient's self-control and helps avoid vague generalizations, which enables the patient to accept responsibility for facing problems. "Let's go back to what we were just talking about," is one example of this technique.

It's golden

Refraining from comment can have several benefits: **Silence** gives the patient time to talk, think, and gain insight into problems. It

also gives you the opportunity to gather more information. Use this technique judiciously, to avoid giving the impression of disinterest or judgment.

Valuable assistance

When used correctly, the technique of **suggesting collaboration** gives the patient the opportunity to explore the pros and cons of a suggested approach. Take care to avoid directing the patient. An example of this technique is: "Perhaps we can meet with your parents to discuss the matter."

A two-way street

Using the technique called **sharing impressions,** describe the patient's feelings and then seek corrective feedback from the patient. This allows the patient to clarify any misperceptions and gives a better understanding of the patient's true feelings. For example, say, "Tell me whether my perception of what you're telling me agrees with yours."

Brush up on data collection

As a nurse, you're likely to be the health care provider who develops a long-term relationship with the patient. Therefore, you're likely most capable of determining the emotional and mental health care needs of a patient and identifying the appropriate interventions.

During the data collection stage, determine a patient's psychological and physiologic status by assessing:

- the patient's history
- the patient's physical status
- laboratory and diagnostic tests.

Gathering data #1: Getting history

A complete **patient history** provides information about:

- the patient's chief complaint or concern
- the history of the current illness
- medication history
- past psychiatric and physical illness
- personal or developmental history
- family history
- social history, including whether the client has a viable support system or whether the client is homeless
- cultural considerations that may affect the patient's outcome—for example, some cultures feel seeking mental health care is a sign of weakness, and others prefer natural remedies instead of prescription medications.

Gathering data #2: Getting physical

The **physical examination** is used to gather objective data that will help confirm or rule out observations made during the health history interview.

In addition to the information collected during the routine physical examination, collect data about the psychological aspects of the patient's condition. Be sure to note these aspects of the patient:

- General appearance—The patient's appearance indicates his general emotional and mental status. Note specifically his dress and grooming.
- Behavior—Note the patient's demeanor and overall attitude as well as any extraordinary behavior.
- Mood—Ask the patient to describe his current feelings in concrete terms and to suggest possible reasons for these feelings. Be sure to note inconsistencies between body language and mood.
- Thought processes and cognitive function—The patient's orientation to time, place, or person can indicate confusion or disorientation. The presence of delusions, hallucinations, obsessions, compulsions, fantasies, and daydreams should be noted.
- Coping mechanisms—A patient faced with a stressful situation may adopt excessive coping or defense mechanisms, which operate on an unconscious level to protect the ego. Examples include denial, regression, displacement, projection, reaction formation, and fantasy. Some patients may turn to drugs and alcohol.

• Potential for self-destructive behavior—A patient who has lost touch with reality may cut or mutilate his body to focus on physical pain, which may be less overwhelming than his emotional distress.

Keep abreast of diagnostic tests

Diagnosing psychiatric disorders differs from diagnosing other medical disorders. (See *The authority.*) Many medical tests involve instrumentation and physical analyses, but psychological testing focuses on questioning and observing the patient.

Performing diagnostic tests on a patient with a suspected psychiatric disorder may help diagnose it accurately, can reveal underlying physiologic disorders, helps establish the patient's normal renal and hepatic function, and monitors for therapeutic medication levels.

Blood study #1

A **blood chemistry test** assesses a blood sample for potassium, sodium, calcium, phosphorus, glucose, bicarbonate, blood urea nitrogen, creatinine, protein, albumin, osmolality, amylase, lipase, alkaline phosphatase, ammonia, bilirubin, lactate dehydrogenase, aspartate aminotransferase, and alanine aminotransferase.

Nursing actions

• Withhold food and fluids before the procedure as directed.
• Check the site for bleeding after the procedure.

Blood study #2

A **hematologic study** analyzes a blood sample for red blood cells, white blood cells, erythrocyte sedimentation rate, platelets, hemoglobin, and hematocrit.

Nursing actions

• Note the patient's current drug therapy before the procedure.
• Check the venipuncture site for bleeding after the hematologic study.

Blood study #3

A **coagulation study** analyzes a blood sample for prothrombin time, international normalized ratio, and partial thromboplastin time.

Nursing actions

• Note the patient's current drug therapy before taking the blood sample.
• Check the venipuncture site for bleeding after the procedure.

AIDS-related blood study #1

An **enzyme-linked immunosorbent assay** involves analyzing a blood sample to detect the human immunodeficiency virus (HIV)-1 antibody. Patients with acquired immunodeficiency syndrome may experience psychiatric complications.

The authority

Published by the American Psychiatric Association, the *Diagnostic and Statistical Manual of Mental Disorders (DSM)* is a standard interdisciplinary psychiatric diagnostic system designed to be used by all members of the mental health care team. The manual includes a complete description of psychiatric disorders and other conditions and describes diagnostic criteria that must be met to support each diagnosis.

The current manual is a text revision of the fourth edition, commonly known as *DSM-IV-TR.* The *DSM* is updated regularly to include new concepts and revised information about psychological disorders.

Nursing actions

- Verify that informed consent has been obtained and documented.
- Provide the patient with appropriate pretest counseling.
- After the procedure, check the venipuncture site for bleeding.

AIDS-related blood study #2

A **Western blot test** analyzes a blood sample to detect the presence of specific viral proteins, which confirm the presence of an HIV infection.

Nursing actions

- Verify that informed consent has been obtained and documented.
- After the procedure, check the venipuncture site for bleeding.

Drug detection

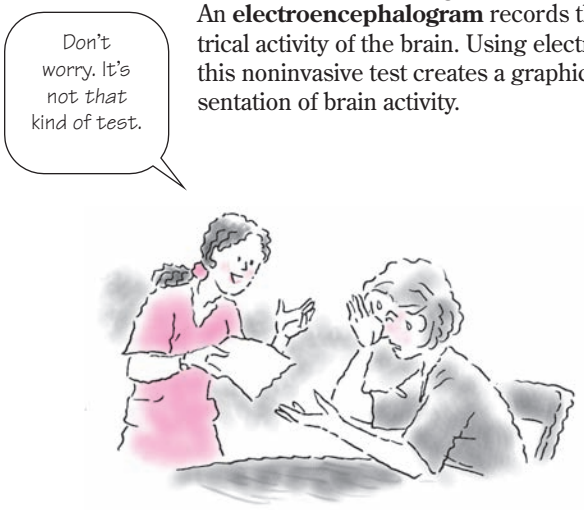
Toxicology screening analyzes a urine specimen to detect the presence of drugs.

Nursing actions

- Make sure that written, informed consent has been obtained.
- Watch the patient urinate to make sure that the specimen hasn't been tampered with, and process the specimen according to facility protocol.

Brain meter-reading

An **electroencephalogram** records the electrical activity of the brain. Using electrodes, this noninvasive test creates a graphic representation of brain activity.



Nursing actions

- Determine whether the patient can lie still long enough for the test.
- Reassure the patient that electrical shock won't occur.
- Explain that the patient will be subjected to stimuli, such as lights and sounds.
- Withhold food for 8 hours before the procedure.
- Withhold medications and caffeine for 24 to 48 hours before the procedure as ordered.

Dye job

A **computed tomography scan,** used to identify brain abnormalities, produces a finely detailed image of the brain and its structures. It may be performed with or without the injection of a contrast dye.

Nursing actions

- Note any patient allergies to iodine, seafood, and radiopaque dyes.
- Allay the patient's anxiety.
- Inform the patient about possible throat irritation and flushing of the face, if a contrast dye is injected.

Mental picture

Magnetic resonance imaging involves the use of electromagnetic energy to create a detailed visualization of the brain and its structures.

Nursing actions

- Obtain a written informed consent according to facility policy.
- Be aware that patients with pacemakers, surgical and orthopedic clips, or shrapnel can't be scanned.
- Remove jewelry and metal objects from the patient before testing.
- Determine whether the patient can lie still long enough for the test.
- Administer sedation as prescribed.

Brain metabolism test

Positron emission tomography involves injection of a radioisotope, which allows visualization of the brain's oxygen uptake, blood flow, and glucose metabolism.

Nursing actions

- Determine whether the patient can lie still during the test.
- Withhold alcohol, tobacco, and caffeine for 24 hours before the procedure.
- Withhold medications, as directed, before the procedure.
- Check the injection site for bleeding after the procedure.

Keep abreast of psychological tests

Psychological tests are used to evaluate the patient's mood, personality, and mental status. Those for alcoholism and cocaine addiction are typically performed by an addiction specialist. Here's a review of the most common psychological tests.

Pop quiz

The **Mini–Mental Status Examination** measures the patient's orientation, registration, recall, calculation, language, and motor skills.

Cognitive capacity

The **Cognitive Capacity Screening Examination** measures the patient's orientation, memory, calculation, and language.

General knowledge

The **Cognitive Assessment Scale** measures the patient's orientation, general knowledge, mental ability, and psychomotor function.

Measuring what's lost

The **Global Deterioration Scale** is used to assess and determine the stage of the patient's primary degenerative dementia, based on orientation, memory, and neurologic function.

Getting by

The **Functional Dementia Scale** measures the patient's orientation, affect, and ability to perform activities of daily living.

Measuring depression

The **Beck Depression Inventory** helps to diagnose depression, determine its severity, and monitor the patient's response to treatment.

What's on the menu?

The **Eating Attitudes Test** is used to detect patterns that suggest an eating disorder.

Who are you?

The **Minnesota Multiphasic Personality Inventory** helps to identify personality traits and ego function in adolescents and adults. Test results include information on coping strategies, defenses, strengths, gender identification, and self-esteem. The pattern of the tests results may strongly suggest a diagnostic category, point to a suicide risk, or indicate the patient's potential for violence.

Alcoholism test #1

The **Michigan Alcoholism Screening Test** is a 24-item timed test. A score of 5 or higher classifies the patient as an alcoholic.

Alcoholism test #2

The **CAGE Questionnaire** is a four-question tool in which two or three positive responses indicate alcoholism.

Cocaine addiction tests

The **Cocaine Addiction Severity Test** and the **Cocaine Assessment Profile** are used when cocaine use is suspected.

Polish up on patient care

A variety of treatment options coexist in psychiatric and mental health care. Use one specific treatment approach or a combination of approaches to guide patient care.

One on one

Individual therapy is the establishment of a structured relationship with a patient in an attempt to achieve change in the patient. Work with the patient to develop an approach to resolve conflict, decrease emotional pain, and develop appropriate ways of meeting the patient's needs. This relationship with the patient consists of three overlapping phases:

- In the *orientation phase,* build a connection with the patient by establishing rapport and a sense of trust (formulate goals during this phase).
- In the *working phase,* the patient becomes increasingly involved in self-exploration (assist the patient as he tries to develop self-understanding, and encourage him to take risks in terms of changing dysfunctional behavior).
- In the *termination phase,* work with the patient to determine that closure of the relationship is appropriate (you and the patient agree that the problem that initiated the relationship has been alleviated or has become manageable).

Milling around

During **milieu therapy,** use all aspects of the hospital environment in a therapeutic manner. Patients are exposed to rules, expectations, peer pressure, and social interactions. Encourage the patient to communicate, and provide opportunities for enhancing self-esteem and learning new skills and behaviors. The goal of therapy is to enable the patient to live outside the institutional setting.

Treating disease and imbalance

Biological therapies are called for when emotional and behavioral disturbances are thought to be caused by chemical imbalances or by disease-causing organisms.

Some examples of biological therapies are:

- psychoactive drugs
- electroconvulsive therapy.

Changing ideas

Cognitive therapy employs strategies to modify the beliefs and attitudes that influence a patient's feelings and behaviors.

Some basic cognitive interventions include:

- teaching thought substitution
- identifying problem-solving strategies
- finding ways to modify negative self-talk
- role playing
- modeling strategies for coping.

The real world

Reality therapy involves focusing on helping the patient meet two basic emotional needs:

- loving and being loved
- feeling worthwhile and feeling that others are worthwhile.

Emphasize the patient's personal responsibility for his behavior, controlling his own life, and fulfilling his own basic needs.

All in the family

During **family therapy,** the entire family is considered the treatment unit. The primary goal of therapy is to improve the functioning of the family. The types of patients that can benefit most from family therapy are those involved in marital issues, intergenerational conflicts, sibling concerns, and family crises, such as death and divorce.

The gang's all here

Group therapy includes an advanced practice nurse–therapist and six to eight people who meet regularly for the purpose of increasing self-awareness, improving interpersonal relationships, and changing maladaptive behavioral problems. Like individual therapy, group therapy goes through the orientation phase, working phase, and termination phase.

Urgent care

Crisis intervention is a systemic type of short-term therapy for a patient, family, or group that's experiencing a stressful situation. Initiate actions to decrease the patient's sense of personal danger and facilitate the patient's ability to control the situation.

Trance time

Hypnosis is a method of inducing deep relaxation by altering the patient's state of consciousness. The result of hypnotic induction is a trancelike state during which patients use memories, mental associations, and concentration to discover experiences that are connected to their current distress. Hypnosis is effective for dealing with anxiety disorders, some types of pain, repressed traumatic events, and addictive disorders.

Pump up on practice questions

1. A 35-year-old client tells the nurse that he never disagrees with anyone and that he has loved everyone he has ever known. What would be the nurse's best response to this client?

1. "How do you manage to do that?"
2. "That's hard to believe. Most people couldn't do that."
3. "What do you do with your feelings of dissatisfaction or anger?"
4. "How did you come to adopt such a way of life?"

Answer: 4. Inquiring about the client's way of life allows the nurse to further explore the message he's trying to convey. Option 1 has too narrow a focus and doesn't permit a full exploration of the client's experience. Option 2 is incorrect because the client could misinterpret it as a challenge and become even more defensive. Option 3 is incorrect because the nurse shouldn't identify the client's feelings for him.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

2. The nurse is working with a client who has just stimulated her anger by using a condescending tone of voice. Which of the following responses by the nurse would be the most therapeutic?

1. "I feel angry when I hear that tone of voice."
2. "You make me so angry when you talk to me that way."
3. "Are you trying to make me angry?"
4. "Why do you use that condescending tone of voice with me?"

Answer: 1. This response allows the nurse to provide feedback without making the client responsible for the nurse's reaction. Option 2 is accusatory and blocks communication. Option 3 is a challenging remark that can lead to power struggles, lowers the client's self-esteem, and blocks opportunities for open communication. Avoid "why" questions such as the one in option 4 because these questions put the client on the defensive.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

3. A client on the unit tells the nurse that his wife's nagging really gets on his nerves. He asks the nurse whether she'll talk with his wife about her nagging during their family session tomorrow afternoon. Which of the following responses would be the most therapeutic?

1. "Tell me more specifically about her complaints."
2. "Can you think why she might nag you so much?"
3. "I'll help you think about how to bring this up yourself tomorrow."
4. "Why do you want me to initiate this discussion in tomorrow's session rather than you?"

Answer: 3. The client needs to learn how to communicate directly with his wife about her behavior. The nurse's assistance will enable him to practice a new skill and will communicate the nurse's confidence in his ability to confront this situation directly. Options 1 and 2 inappropriately direct attention away from the client and toward his wife, who isn't present. Option 4 implies that there might be a legitimate reason for the nurse to assume responsibility for something that rightfully belongs to the client. Instead of focusing on his problems, he'll waste time convincing the nurse why she should do his work.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

4. The nurse is caring for a client diagnosed with conversion disorder who has developed paralysis of her legs. Diagnostic tests fail to uncover a physiologic cause. During the working phase of the nurse-client relationship, the client says to her nurse, "You think I could walk if I wanted to, don't you?" What would be the nurse's best response?

1. "Yes, if you really wanted to, you could."
2. "Tell me why you're concerned about what I think."
3. "Do you think you could walk if you wanted to?"
4. "I think you are unable to walk now, whatever the cause."

Answer: 4. This response answers the question honestly and nonjudgmentally and helps to preserve the client's self-esteem. Option 1 is an open and candid response but diminishes the client's self-esteem. Option 2 doesn't answer the client's question and isn't helpful. Option 3 would increase the client's anxiety because her inability to walk is directly related to an unconscious psychological conflict that hasn't yet been resolved.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

5. A 42-year-old client arrives in the emergency department with uncontrollable crying and anxiety. Her husband of 17 years has recently asked her for a divorce. The client is sitting in a chair, rocking back and forth. Which is the best response for the nurse to make?

1. "You must stop crying so that we can discuss your feelings about the divorce."
2. "Once you find a job, you'll feel much better and more secure."
3. "I can see how upset you are. Let's sit in the office so that we can talk about how you're feeling."
4. "Once you have a lawyer looking out for your interests, you'll feel better."

Answer: 3. This response validates the client's distress and provides an opportunity for her to talk about her feelings. Because clients in crises have difficulty making decisions, the nurse must be directive as well as supportive. Option 1 doesn't provide the client with adequate support. Options 2 and 4 don't acknowledge the client's distress. Moreover, clients in

crises can't think beyond the immediate moment, so discussing long-range plans isn't helpful.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

6. A 60-year-old client is hospitalized after complaining of difficulty sleeping, extreme apprehension, shortness of breath, and a sense of impending doom. Which response by the nurse would be best?

1. "You have nothing to worry about. You're in a safe place. Try to relax."
2. "Has anything happened recently that may have triggered these feelings?"
3. "We've given you a medication that will help to decrease these feelings of anxiety."
4. "Take some deep breaths and try to calm down."

Answer: 2. This provides support, reassurance, and an opportunity to gain insight into the cause of the client's anxiety. Option 1 dismisses the client's feelings and offers false reassurance. Options 3 and 4 don't allow the client to discuss his feelings, which he must do to understand and resolve the cause of his anxiety.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

7. A 26-year-old male client is admitted to an inpatient psychiatric hospital after having been picked up by the local police while walking around the neighborhood at night without shoes in the snow. He appears confused and disoriented. Which of the following actions should take priority?

1. Stabilize the client's medical needs.
2. Stabilize the client's psychological needs.
3. Attempt to locate the nearest family members to get an accurate history.
4. Arrange a transfer to the nearest medical facility.

Answer: 1. The possibility of frostbite and the cause of confusion must be evaluated before the other interventions. The other choices don't address the client's immediate medical needs.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

8. What occurs during the work phase of the nurse-client relationship?

1. The nurse identifies the client's needs and develops a care plan.
2. The nurse and client together evaluate and modify the goals of the relationship.
3. The nurse and client discuss their feelings about terminating the relationship.
4. The nurse and client explore each other's expectations of the relationship.

Answer: 2. The therapeutic nurse-client relationship consists of three overlapping phases: the orientation, the work, and the termination. During the work phase, the nurse and the client together evaluate and refine goals established during the orientation phase. In addition, major therapeutic work takes place, and insight is integrated into a plan of action.

The orientation phase involves assessing the client, formulating a contract, exploring feelings, and establishing expectations about the relationship. During the termination phase, the nurse prepares the client for separation and explore his feelings about the end of the relationship.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Knowledge

9. The optimal number of clients in a group for group therapy would be:

1. 6 to 8.
2. 10 to 12.
3. 3 to 5.
4. unlimited.

Answer: 1. Clinicians generally consider 6 to 8 people to be the ideal number of clients for a therapeutic group. The size allows opportunities for maximum therapeutic exchange and participation. In groups of 5 or fewer, participation commonly is inhibited by self-consciousness and insecurity. In groups larger than 8, participation and exchange among certain members may be lost.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

10. A therapeutic nurse-client relationship begins with the nurse's:

1. sincere desire to help others.
2. acceptance of others.
3. self-awareness and understanding.
4. sound knowledge of psychiatric nursing.

Answer: 3. Although all of the options are desirable, the nurse's knowledge of self is the basis for building a strong, therapeutic nurse-client relationship. Being aware of and understanding her personal feelings and behavior is a prerequisite for understanding and helping clients.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Knowledge

13 Somatoform & sleep disorders

In this chapter, you'll review:

- stages of sleep
- key concepts related to sleep and somatoform disorders
- common sleep and somatoform disorders.

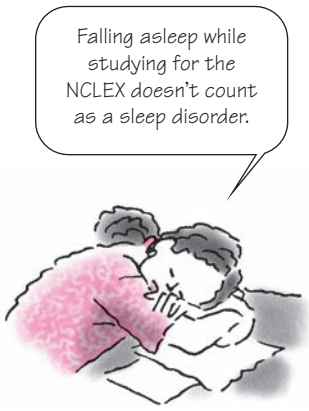
Brush up on key concepts

The patient with a sleep disorder commonly suffers from excessive daytime sleepiness and impaired ability to perform daily tasks safely or properly. The patient with a somatoform disorder commonly suffers physical symptoms related to an inability to handle stress. These physical symptoms have no physiologic cause but are overwhelming to the patient.

At any time, you can review the major points of each disorder by consulting the *Cheat sheet* on pages 374 and 375.

Somatoform disorders

The patient with a somatoform disorder complains of physical symptoms and typically travels from doctor to doctor in search of sympathetic and enthusiastic treatment. Physical examinations and laboratory tests, however, fail to uncover an organic basis for the patient's symptoms. Because the patient doesn't produce the symptoms intentionally or feel a sense of control over them, he's usually unable to accept that his illness has a psychological cause.



From mind to body

Psychosomatic is a term used to describe conditions in which a psychological state contributes to the development of a physical illness.

An expression of emotional stress

Somatization is the manifestation of physical symptoms that result from psychological distress. Anyone who feels the pain of a sore throat or the ache of flu has a somatic symptom, but it isn't considered somatization unless the physical symptoms are an expression of emotional stress.

All bottled up

Internalization refers to the condition in which a patient's anxiety, stress, and frustration are expressed through physical symptoms rather than confronted directly.

Sleep disorders

The patient with a primary sleep disorder is unable to initiate or maintain sleep. Primary sleep disorders are categorized as dyssomnias or parasomnias.

Too much or not enough

Dyssomnias involve excessive sleep or difficulty initiating and maintaining sleep. Examples of dyssomnias include primary insomnia, circadian rhythm sleep disorder, breathing-related sleep disorder, primary hypersomnia, and narcolepsy.

Strange things in the night

Parasomnias are physiologic or behavioral reactions *during* sleep. Examples of parasomnias include nightmare disorder, sleep terror disorder, and sleepwalking disorder.

You're getting sleepy...

Sleep can be broken down into five distinct stages, **rapid-eye-movement** (REM) sleep and four stages of **non-rapid-eye-movement** (NREM) sleep (stages 1, 2, 3, and 4):

• Stage 1 NREM sleep is a transition from wakefulness to sleep and occupies about 5% of time spent asleep in healthy adults.

Cheat sheet

Somatoform & sleep disorders refresher

CONVERSION DISORDER

Key sign or symptom

• La belle indifférence (a lack of concern about the symptoms or limitation on functioning)

Key test result

• The absence of expected diagnostic findings can confirm the disorder.

Key treatment

• Individual therapy

Key interventions

• Establish a supportive relationship that communicates acceptance of the patient but keeps the focus away from symptoms.
• Review all laboratory and diagnostic study results.

HYPOCHONDRIASIS

Key signs and symptoms

• Abnormal focus on bodily functions and sensations
• Anger, frustration, and depression
• History of frequent visits to doctors and specialists despite assurance from health care providers that the patient is healthy
• Intensified physical symptoms around sympathetic people
• Rejection of the idea that the symptoms are stress related
• Use of symptoms to avoid difficult situations

Key treatments

• Individual therapy
• Tricyclic antidepressants: amitriptyline (Elavil), imipramine (Tofranil), doxepin (Sinequan), phenelzine (Nardil)

Key interventions

• Evaluate the patient's level of knowledge about how emotional issues can affect physiologic functioning.
• Encourage emotional expression.
• Respond to the patient's symptoms in a matter-of-fact way.

PAIN DISORDER

Key signs and symptoms

• Acute and chronic pain not associated with a physiologic cause
• Anger, frustration, and depression
• Drug-seeking behavior in an attempt to relieve pain
• History of frequent visits to multiple doctors to seek pain relief
• Insomnia

Key test result

• Test results don't support patient complaints.

Key treatments

• Individual therapy
• Tricyclic antidepressants: amitriptyline (Elavil), imipramine (Tofranil), doxepin (Sinequan)

Key interventions

• Acknowledge the patient's pain.
• Encourage the patient to recognize situations that precipitate pain.

DYSSOMNIAS

Key signs and symptoms

Primary insomnia

• History of light or easily disturbed sleep or difficulty falling asleep
• Insomnia

Breathing-related sleep disorder

• Abnormal breathing events during sleep, including apnea, abnormally slow or shallow respirations, and hypoventilation (abnormal blood oxygen and carbon dioxide levels)
• Dull headache on awakening
• Fatigue
• Snoring

Primary hypersomnia

• Confusion on awakening
• Difficulty awakening
• Poor memory

Narcolepsy

• Cataplexy (bilateral loss of muscle tone triggered by strong emotion)
• Generalized daytime sleepiness

Somatoform & sleep disorders refresher *(continued)*

DYSSOMNIAS *(continued)*

- Hypnagogic hallucination (intense dreamlike images)
- Irresistible attacks of refreshing sleep

Key test result

- Polysomnography is diagnostic for individual sleep disorder.

Key treatment

- Hypnotic: zolpidem (Ambien)

Key interventions

For primary insomnia and circadian rhythm disturbance

- Encourage the patient to discuss concerns that may be preventing sleep.
- Schedule regular sleep and awakening times.

For breathing-related sleep disorder

- Administer continuous positive nasal airway pressure.

For primary hypersomnia and narcolepsy

- Administer medications as prescribed.
- Develop strategies to manage symptoms and integrate them into the patient's daily routine, such as taking naps during lunch or work breaks.

PARASOMNIAS

Key signs and symptoms

Nightmare disorder

- Dream recall
- Mild autonomic arousal on awakening (sweating, tachycardia, tachypnea)

Sleep terror disorder

- Autonomic signs of intense anxiety (tachycardia, tachypnea, flushing, sweating, increased muscle tone, dilated pupils)
- Inability to recall dream content
- Screaming or crying

Sleepwalking disorder

- Amnesia of the episode or limited recall
- Sitting up, talking, walking, or engaging in inappropriate behavior during episode

Key test result

- Polysomnography is diagnostic for individual sleep disorder.

Key interventions

- Lock the windows and doors if sleepwalking occurs.
- Provide emotional support.

- Stage 2 NREM sleep, which is characterized by specific EEG waveforms (sleep spindles and K complexes), occupies about 50% of time spent asleep.
- Stages 3 and 4 NREM sleep (also known collectively as *slow-wave sleep*) are the deepest levels of sleep and occupy about 10% to 20% of sleep time.
- REM sleep, during which the majority of typical storylike dreams occur, occupies about 20% to 25% of total sleep.

Patterns after dark

Stages of sleep have a characteristic temporal organization. NREM stages 3 and 4 tend to occur in the first one-third to one-half of the night. REM sleep occurs in cycles throughout the night, alternating with NREM sleep about every 80 to 100 minutes. REM sleep periods increase in duration toward the morning.

Sparks in the night

Polysomnography is the monitoring of multiple electrophysiologic parameters during sleep and generally includes measurement of EEG activity, electro-oculographic activity (electrographic tracings made by movement of the eye), and electromyographic activity (electrographic tracings made by skeletal muscles at rest).

Additional polysomnographic measures may include oral or nasal airflow, respiratory effort, chest and abdominal wall movement, oxyhemoglobin saturation, or exhaled carbon dioxide concentration. These measures are used to monitor respiration during sleep and to detect the presence and severity of sleep apnea. Measurement of peripheral electromyographic activity may be used to detect abnormal movements during sleep.

You can do it during the daytime, too!

Most polysomnographic studies are performed during the patient's usual sleeping hours—that is, at night. However, daytime polysomnographic studies are also used to quantify daytime sleepiness.

Polish up on patient care

Major somatoform disorders include conversion disorder, hypochondriasis, and pain disorder. Sleep disorders include dyssomnias (primary insomnia, circadian rhythm sleep disorder, breathing-related sleep disorder, primary hypersomnia, and narcolepsy) and parasomnias (nightmare disorder, sleep terror disorder, and sleepwalking disorder).

Absence means presence. The absence of expected diagnostic findings can confirm conversion disorder.

Conversion disorder

The patient with conversion disorder exhibits symptoms that suggest a physical disorder, but evaluation and observation don't reveal a physiologic cause. The onset of symptoms is preceded by psychological trauma or conflict, and the physical symptoms are a manifestation of the conflict.

CONTRIBUTING FACTORS

- Psychological conflict
- Overwhelming stress

DATA COLLECTION FINDINGS

- Aphonia (inability to produce sound)
- Blindness
- Deafness
- Dysphagia
- Impaired balance and impaired coordination
- La belle indifférence (a lack of concern about the symptoms or limitation on functioning)
- Loss of touch sensation
- Lump in the throat
- Paralysis
- Seizures
- Urinary retention

DIAGNOSTIC FINDINGS

- Test results are inconsistent with physical findings.
- The absence of expected diagnostic findings can confirm the disorder.

Memory jogger

When thinking of conversion disorder, think of the term **convert,** which means "to change from one form or function to another." Patients with conversion disorder convert stress into physical ailments.

NURSING DIAGNOSES

- Ineffective coping
- Anxiety
- Chronic low self-esteem

TREATMENT

- Individual therapy

Drug therapy

- Benzodiazepines: lorazepam (Ativan), alprazolam (Xanax)

INTERVENTIONS AND RATIONALES

- Ensure and maintain a safe environment *to protect the patient.*
- Establish a supportive relationship that communicates acceptance of the patient but keeps the focus away from symptoms *to help him learn to recognize and express anxiety.*
- Encourage the patient to identify any emotional conflicts that began before the physical symptoms *to make the relationship between the conflict and the symptoms more clear.*
- Promote social interaction *to decrease the patient's level of self-involvement.*
- Identify constructive coping mechanisms *to encourage the patient to use practical coping skills and relinquish the role of being sick.*

Teaching topics

- Setting limits on the patient's sick role behavior while continuing to provide support
- Using stress-reduction methods

Hypochondriasis

With hypochondriasis, the patient is preoccupied by fear of a serious illness, despite medical assurance of good health. The patient with hypochondriasis interprets all physical sensations as indications of illness, impairing his ability to function normally.

CONTRIBUTING FACTORS

- Death of a loved one
- Family member with a serious illness
- Previous serious illness

DATA COLLECTION FINDINGS
- Abnormal focus on bodily functions and sensations
- Anger, frustration, and depression
- History of frequent visits to doctors and specialists despite assurance from health care providers that the patient is healthy
- Intensified physical symptoms around sympathetic people
- Rejection of the idea that the symptoms are stress related
- Use of symptoms to avoid difficult situations
- Vague physical symptoms

DIAGNOSTIC FINDINGS
- The test results are inconsistent with the patient's complaints and physical findings.

NURSING DIAGNOSES
- Deficient knowledge (treatment plan)
- Ineffective coping
- Ineffective health maintenance

TREATMENT
- Individual therapy

Drug therapy
- Benzodiazepines: lorazepam (Ativan), alprazolam (Xanax)
- Tricyclic antidepressants: amitriptyline (Elavil), imipramine (Tofranil), doxepin (Sinequan), phenelzine (Nardil)

INTERVENTIONS AND RATIONALES
- Evaluate the patient's level of knowledge about how emotional issues can affect physiologic functioning *to promote understanding of the condition.*
- Encourage the patient to express his emotions *to avoid emotional repression, which can have physical consequences.*
- Respond to the patient's symptoms in a matter-of-fact way *to reduce secondary gain the patient achieves from talking about symptoms.*

Teaching topics
- Using relaxation and assertiveness techniques
- Initiating conversations that focus on something other than physical maladies

Pain disorder

With pain disorder, the patient experiences pain in which psychological factors play a significant role in the onset, severity, exacerbation, or maintenance of the pain. The pain isn't intentionally produced or feigned by the patient. The pain becomes a major focus of life, and the patient is often unable to function socially or at work. The patient may have a physical ailment but shouldn't be experiencing pain at the level he describes.

CONTRIBUTING FACTORS
- A traumatic, stressful, or humiliating experience

DATA COLLECTION FINDINGS
- Acute and chronic pain not associated with a physiologic cause
- Anger, frustration, and depression
- Drug-seeking behavior in an attempt to relieve pain
- History of frequent visits to multiple doctors to seek pain relief
- Insomnia

DIAGNOSTIC FINDINGS
- Test results don't support patient complaints.
- With psychotherapy, the patient may recall a past traumatic event.

NURSING DIAGNOSES
- Acute or chronic pain
- Ineffective coping
- Anxiety

TREATMENT
- Individual therapy

Drug therapy
- Anxiolytics (benzodiazepines): lorazepam (Ativan), alprazolam (Xanax)

Acknowledging the patient's pain helps to discourage him from striving to convince you the pain is real.

• Tricyclic antidepressants: amitriptyline (Elavil), imipramine (Tofranil), doxepin (Sinequan)

INTERVENTIONS AND RATIONALES

• Ensure a safe, accepting environment for the patient *to promote therapeutic communication.*

• Acknowledge the patient's pain *to discourage the patient from striving to convince you that the pain is real and to reinforce a therapeutic relationship.*

• Encourage the patient to recognize situations that precipitate pain *to foster an understanding of the disorder.*

Teaching topics

• Promoting social interaction

• Establishing constructive coping mechanisms

• Using problem-solving techniques

• Attempting to use nonpharmacologic pain management, such as guided imagery, massage, therapeutic touch, relaxation, heat, and cold

Nursing care for a pain disorder may focus on pain management techniques, such as relaxation and meditation.

Dyssomnias

Dyssomnias are primary disorders of initiating or maintaining sleep or excessive sleepiness. These disorders are characterized by a disturbance in the amount, quality, or timing of sleep.

Primary insomnia is characterized by difficulty initiating or maintaining sleep that lasts for at least 1 month. Alternatively, the patient may report that sleep isn't refreshing. A key symptom of primary insomnia is the patient's intense focus and anxiety about not getting sleep. Commonly, the patient reports being a "light sleeper."

With **circadian rhythm sleep disorder,** there's a mismatch between the internal sleep-wake circadian rhythm and timing and the duration of sleep. The patient may report insomnia at particular times during the day and excessive sleepiness at other times. Causes can be intrinsic, such as delays in the sleep phases, or extrinsic, such as in jet lag or shift work.

Another class of sleep disorder identified in the *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed., Text Revision, is **breathing-related sleep disorder.** Specific disorders in this class include central sleep apnea syndrome, central alveolar hypoventilation syndrome, and obstructive sleep apnea syndrome. Obstructive sleep apnea syndrome is the most commonly diagnosed breathing-related sleep disorder.

With breathing-related sleep disorder, a disturbance in breathing leads to a disruption in sleep that results in excessive sleepiness or insomnia. Excessive sleepiness is the most common complaint of patients. Naps usually aren't refreshing and may be accompanied by a dull headache. These patients often minimize the problem by bragging that they can sleep anywhere and at any time.

With **primary hypersomnia,** the patient experiences excessive sleepiness lasting at least 1 month. The patient may take daytime naps or sleep extended periods of time at night. People with primary hypersomnia typically sleep 8 to 12 hours per night. They fall

Drugs that affect sleep

When caring for a patient with a sleep disorder, keep in mind that certain medications can affect sleep. Review the patient's medication list to see whether he's receiving any such medications. Examples are listed here.

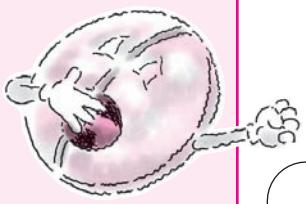
INCREASE TOTAL SLEEP TIME
- Barbiturates
- Benzodiazepines
- Alcohol (during the first half of the night)
- Phenothiazines

DECREASE TOTAL SLEEP TIME
- Amphetamines
- Alcohol (during the second half of the night)
- Caffeine

ALTER DREAMING AND REM SLEEP
- Beta-adrenergic blockers: decreased rapid-eye-movement (REM) sleep, possible nightmares
- Levodopa: vivid dreams and nightmares
- Amphetamines: decreased REM sleep
- Tricyclic antidepressants and monoamine oxidase inhibitors: decreased REM sleep
- Barbiturates: decreased REM sleep
- Benzodiazepines: decreased REM sleep

INCREASE WAKING AFTER SLEEP ONSET
- Steroids
- Opioids
- Beta-adrenergic blockers

DECREASE WAKING AFTER SLEEP ONSET
- Benzodiazepines
- Barbiturates



asleep easily and sleep through the night but often have trouble awakening in the morning. Some mornings they awake confused and combative. These patients have great difficulty with morning obligations.

With **narcolepsy,** the patient develops an overwhelming urge to sleep at any time of the day regardless of the amount of previous sleep. The patient may fall asleep two to six times a day during inappropriate times, such as while driving a car or attending a class. The patient's sleepiness typically decreases after a sleep attack, only to return several hours later. The sleep attacks must occur daily over a period of 3 months to confirm the diagnosis.

CONTRIBUTING FACTORS

Primary insomnia
- Illness (especially pheochromocytoma or hyperthyroidism)
- Many illegal drugs
- Older than age 65
- Stress
- Use of certain legal drugs (see *Drugs that affect sleep*)

Circadian rhythm sleep disorder
- Delayed sleep phase
- Jet lag
- Shift work

Breathing-related sleep disorder
- Instability in the respiratory control center, which causes periods of apnea
- Obstruction or collapse of the airway, which causes periods of apnea
- Slow or shallow breathing, which causes arterial oxygen desaturation

Primary hypersomnia
- Autonomic nervous system dysfunction
- Genetic predisposition

Narcolepsy
- Genetic predisposition

DATA COLLECTION FINDINGS

Primary insomnia
- Anxiety related to sleep loss
- Fatigue
- Haggard appearance
- History of light or easily disturbed sleep or difficulty falling asleep
- Insomnia
- Poor concentration
- Tension headache

Circadian rhythm sleep disorder
- Cardiovascular and GI disturbances, such as palpitations, peptic ulcer disease, and gastritis
- Fatigue
- Haggard appearance
- Poor concentration

Breathing-related sleep disorder
- Abnormal breathing events during sleep, including apnea, abnormally slow or shallow respirations, and hypoventilation (abnormal blood oxygen and carbon dioxide levels)
- Dull headache on awakening
- Fatigue
- Gastroesophageal reflux
- Large neck circumference
- Mild systemic hypertension with elevated diastolic blood pressure
- Snoring

Primary hypersomnia
- Confusion on awakening
- Difficulty awakening
- Poor memory

Narcolepsy
- Cataplexy (bilateral loss of muscle tone triggered by strong emotion)
- Frequent, intense, and vivid dreams that may occur during nocturnal sleep
- Generalized daytime sleepiness
- Hypnagogic hallucination (intense dream-like images)
- Irresistible attacks of refreshing sleep

DIAGNOSTIC FINDINGS

Primary insomnia
- Polysomnography shows poor sleep continuity, increased stage 1 sleep, decreased stages 3 and 4 sleep, increased muscle tension, or increased amounts of EEG alpha activity during sleep.
- Psychophysiologic testing may show high arousal (increased muscle tension or excessive physiologic reactivity to stress).

Circadian rhythm sleep disorder
- Polysomnography shows short sleep latency (length of time it takes to fall asleep), reduced sleep duration, and sleep continuity disturbances. (Results may vary depending on the time of day testing is performed.)

Breathing-related sleep disorder
- Polysomnography measures of oral and nasal airflow are abnormal, and oxyhemoglobin saturation is reduced.

Primary hypersomnia
- Polysomnography demonstrates a normal to prolonged sleep duration, short sleep latency, normal to increased sleep continuity, and normal distributions of REM and NREM sleep. Some individuals may have increased amounts of slow-wave sleep.

Narcolepsy
- Polysomnography shows sleep latencies of less than 10 minutes and frequent REM periods, frequent transient arousals, decreased sleep efficiency, increased stage 1 sleep, increased REM sleep, and increased eye movements within the REM periods. Periodic limb movements and episodes of sleep apnea are also often noted.

For a patient with primary insomnia or circadian rhythm disturbance, plan activities that require him to wake at a regular hour and stay out of bed during the day.

NURSING DIAGNOSES

- Insomnia
- Fatigue
- Impaired home maintenance

TREATMENT

- Hypnosis
- Relaxation techniques
- Sleep restrictions (patients are instructed to avoid napping and to stay in bed only when sleeping)

Drug therapy

For primary insomnia or circadian rhythm sleep disorder

- Antidepressant: trazodone (Desyrel)
- Benzodiazepines: lorazepam (Ativan), alprazolam (Xanax)
- Hypnotic: zolpidem (Ambien)
- Sleep aid: diphenhydramine (Benadryl)

For primary hypersomnia or narcolepsy

- Stimulants: caffeine, methylphenidate (Ritalin), pemoline (Cylert), dextroamphetamine (Dexedrine), modafinil (Provigil)

INTERVENTIONS AND RATIONALES

- Monitor the patient and document his sleep disturbance symptoms *to gain information for developing a care plan.*

Primary insomnia and circadian rhythm disturbance

- Encourage the patient to discuss concerns that may be preventing sleep. *Active listening helps elicit underlying causes of sleep disturbance such as stress.*
- Help him establish a sleep routine *to promote relaxation and sleep.*
- Schedule regular sleep and awakening times for the patient *to help ensure that progress is maintained after he leaves the facility.*
- Administer medications as prescribed *to induce sleep and to reduce anxiety.*
- Provide warm milk at bedtime. *L-tryptophan, found in milk, is a precursor to serotonin, a neurotransmitter necessary for sleep.*
- Plan activities that require the patient to wake at a regular hour and stay out of bed during the day *to reinforce natural circadian rhythms.*

Breathing-related sleep disorder

- Administer continuous positive nasal airway pressure *to treat obstructive sleep disorders.*

Primary hypersomnia and narcolepsy

- Administer medications as prescribed *to help the patient stay awake and to maintain patient safety.*
- Develop strategies to manage symptoms and integrate them into the patient's daily routine, such as taking naps during lunch or work breaks, *to help maintain patient safety and promote normal functioning.*

Teaching topics

For primary insomnia and circadian rhythm disorder

- Using relaxation techniques and other measures to promote sleep, such as consuming warm milk before bedtime and using the bedroom only for sleep, not for watching television or reading
- Limiting caffeine, alcohol, and spicy foods
- Avoiding exercise within 3 hours before bedtime
- Identifying ways to reduce stressors

For breathing-related sleeping disorder

- Using a positive nasal airway pressure device at home

For primary hypersomnia and narcolepsy

- Integrating a nap period into the daily routine

Parasomnias

Parasomnias are characterized by abnormal behavior that occurs during sleep. They include nightmare disorder, sleep terror disorder, and sleepwalking disorder.

Nightmare disorder is characterized by the recurrence of frightening dreams that cause the patient to awaken from sleep. When the patient awakens, he's fully alert and experiences persistent anxiety or fear. Typically,

the patient can recall details of a dream that involved physical danger.

Sleep terror disorder is characterized by episodes of sleep terrors that cause distress or impairment of social or occupational functioning. The patient may sit up in bed screaming or crying with a frightened expression and signs of intense anxiety. During such episodes, the patient is difficult to awaken and, if he does awaken, is generally confused or disoriented. The patient has no recollection of the dream content.

With **sleepwalking disorder,** the patient arises from bed and walks about. The patient has limited recall of the event on awakening.

CONTRIBUTING FACTORS

- Severe psychosocial stressors
- Genetic predisposition
- Sleep deprivation
- Fever

DATA COLLECTION FINDINGS

Nightmare disorder

- Anxiety
- Depression
- Dream recall
- Excessive sleepiness
- Irritability
- Mild autonomic arousal on awakening (sweating, tachycardia, tachypnea)
- Poor concentration

Sleep terror disorder

- Autonomic signs of intense anxiety (tachycardia, tachypnea, flushing, sweating, increased muscle tone, dilated pupils)
- Inability to recall dream content
- Screaming or crying

Sleepwalking disorder

- Amnesia of the episode or limited recall
- Episode possibly includes sitting up, talking, walking, or engaging in inappropriate behavior

DIAGNOSTIC FINDINGS

Nightmare disorder

- Polysomnography demonstrates abrupt awakenings from REM sleep that correspond to the individual's report of nightmares.

These awakenings usually occur during the second half of the night. Heart rate and respiratory rate may increase or show increased variability before the awakening.

Sleep terror disorder

- Polysomnography reveals that sleep terrors begin during deep NREM sleep characterized by slow-frequency EEG activity.

Sleepwalking disorder

- Polysomnography reveals episodes of sleepwalking that begin within the first few hours of sleep, usually during NREM stage 3 or 4 sleep.

NURSING DIAGNOSES

- Insomnia
- Fatigue
- Ineffective role performance

TREATMENT

- Hypnosis

Drug therapy

- Benzodiazepines: lorazepam (Ativan), alprazolam (Xanax)

INTERVENTIONS AND RATIONALES

- Monitor the patient and document his sleep disturbance symptoms *to aid in formulating a treatment plan.*
- Lock the windows and doors if the patient walks in his sleep *to maintain patient safety.*
- Provide emotional support *to allay the patient's anxiety.*
- Establish a sleep routine *to promote relaxation and sleep.*
- Schedule regular sleep and awakening times *so that the patient can learn specific planning strategies for managing sleep.*
- Administer medications as prescribed *to promote sleep.*

Teaching topics

- Employing safety measures (in the case of sleepwalking disorder)
- Identifying ways to reduce stressors

Pump up on practice questions

1. A client complains of experiencing an overwhelming urge to sleep. He states that he's been falling asleep while working at his desk. He reports that these episodes occur about five times daily. This client is most likely experiencing which sleep disorder?

1. Breathing-related sleep disorder
2. Narcolepsy
3. Primary hypersomnia
4. Circadian rhythm disorder

Answer: 2. Narcolepsy is characterized by irresistible attacks of refreshing sleep that occur two to six times per day and last for 5 to 20 minutes. The client with breathing-related sleep disorder suffers from interruptions in sleep that leave him excessively sleepy. With hypersomnia, the client suffers from excessive sleepiness and reports prolonged periods of nighttime sleep or daytime napping. With circadian rhythm disorder, the client has periods of insomnia followed by periods of increased sleepiness.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

2. The nurse is caring for a client who complains of fatigue, inability to concentrate, and palpitations. The client states that he has been experiencing these symptoms for the past 6 months. The nurse suspects that the client is experiencing circadian rhythm sleep disorder related to which factor?

1. History of recent fever
2. Shift work
3. Hyperthyroidism
4. Pheochromocytoma

Answer: 2. The client is experiencing circadian rhythm sleep disorder (palpitations, GI disturbances, fatigue, haggard appearance, and poor concentration), which is typically caused by shift work, jet lag, or a delayed sleep phase. Fever is a contributing factor in parasomnias. Hyperthyroidism and pheochromocytoma are causative factors for primary insomnia.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

3. A client comes to the clinic complaining of the inability to sleep over the past 2 months. He states that his inability to sleep is ruining his life because "getting sleep" is all he can think about. This client is most likely experiencing which sleep disorder?

1. Circadian rhythm sleep disorder
2. Breathing-related sleep disorder
3. Primary insomnia
4. Primary hypersomnia

Answer: 3. The client with primary insomnia experiences difficulty initiating or maintaining sleep. Key symptoms of primary insomnia are the client's intense focus and anxiety about not getting sleep. The client diagnosed with circadian rhythm sleep disorder reports periods of insomnia at particular times during a 24-hour period and excessive sleepiness at other times. Excessive sleepiness is the most common complaint of clients affected by breathing-related sleep disorder. The client experiencing primary hypersomnia typically sleeps 8 to 12 hours per night. He falls asleep easily and sleeps through the night but commonly has trouble awakening in the morning.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

4. The nurse is helping prepare a teaching plan for a client diagnosed with primary insomnia. Which teaching topic should be included in the plan?

1. Eating unlimited spicy foods and limiting caffeine and alcohol
2. Exercising 1 hour before bedtime to promote sleep
3. Importance of sleeping whenever the client tires
4. Drinking warm milk before bed to induce sleep

Answer: 4. A client diagnosed with primary insomnia should be taught that drinking warm milk before bedtime can help induce sleep. He should also be taught the importance of limiting spicy foods, alcohol, and caffeine. He should avoid exercise within 3 hours before bedtime, establish a routine bedtime, and avoids naps.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

5. The nurse is caring for a client hospitalized on numerous occasions for complaints of chest pain and fainting spells, which he attributes to his deteriorating heart condition. No relatives or friends report ever actually seeing a fainting spell. After undergoing an extensive cardiac, pulmonary, GI, and neurologic workup, he's told that all test results are negative. The client remains persistent in his belief that he has a serious illness. What diagnosis may be appropriate for this client?

1. Exhibitionism
2. Somatoform disorder
3. Degenerative dementia
4. Echolalia

Answer: 2. Somatoform disorders are characterized by recurrent and multiple physical symptoms that have no organic or physiologic base. Exhibitionism involves public exposure of genitals. Degenerative dementia is characterized by deterioration of mental capacities. Echolalia is a repetition of words or phrases.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Analysis

6. The nurse is caring for a client who believes he has cancer. He has visited several oncologists and undergone many tests. Thus far, no evidence of cancer has been found. The client remains convinced he's gravely ill and tells the nurse he doesn't expect to live much longer. What specific type of disorder is the client exhibiting?

1. Hypochondriasis
2. Dependency
3. Denial
4. Confabulation

Answer: 1. Hypochondriasis is marked by the client's persistent fear or belief that he has a serious illness. Dependency involves expectations that another person should do all the work to change the client from relative illness to health. Denial is lack of awareness and is usually an unconscious defense mechanism. Confabulation is a reaction in which the client invents answers, attempting to fill in memory gaps.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Knowledge

7. The nurse is caring for a client who exhibits signs of somatization. Which statement is most relevant?

1. Clients with somatization are cognitively impaired.
2. Anxiety rarely coexists with somatization.
3. Somatization exists when medical evidence supports the symptoms.
4. Clients with somatization often have lengthy medical records.

Answer: 4. Clients with somatization are prone to "doctor shop" and have extensive medical records as a result of their multiple procedures and tests. Clients with somatization aren't usually cognitively impaired. These clients have coexisting anxiety and depression and no medical evidence to support a clear-cut diagnosis.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

8. The nurse is caring for a client who reveals symptoms of a sleep disorder during the admission assessment. The client also admits that he has "broken down and cried for no apparent reason." Which criteria is most important for the nurse to consider initially to gain insight into the client's patterns of sleep and feelings of depression?

1. Stressors in the client's life
2. The client's weight
3. Periods of apnea
4. Sexual activity

Answer: 1. Recognizing that sleep disturbances are commonly symptoms of stress, depression, and anxiety, the nurse is prudent to discuss these possible factors initially. If the client has a weight problem, suffers from sleep apnea, or reports sexual problems, these also can affect sleep; however, consideration of life stressors occurs first.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

9. The nurse is caring for a client who displays gait disturbances, paralysis, pseudoseizures, and tremors. These symptoms may be manifestations of what psychiatric disorder?

1. Pain disorder
2. Adjustment disorder
3. Delirium
4. Conversion disorder

Answer: 4. Conversion disorders are most frequently associated with psychologically mediated neurologic deficits, such as those mentioned. Pain disorders and adjustment disorders aren't generally expressed in terms of neurologic deficits. Delirium is associated with cognitive impairment.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

10. The nurse is caring for a client who complains of chronic pain. Given this complaint, why would the nurse simultaneously evaluate both general physical and psychosocial problems?

1. Depression is commonly associated with pain disorders and somatic complaints.
2. Combining evaluations will save time and allow for quicker delivery of health care.
3. Most insurance plans won't cover evaluation of both as separate entities.
4. The physician doesn't have the training to evaluate for psychosocial considerations.

Answer: 1. Psychosocial factors should be suspected when pain persists beyond the normal tissue healing time and physical causes have been investigated. The other choices may or may not be correct but certainly aren't credible in all cases.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

14 Anxiety & mood disorders

In this chapter, you'll review:

- basic concepts of anxiety and mood disorders
- common anxiety and mood disorders.

Brush up on key concepts

Anxiety disorders are characterized by extreme anxiety and avoidant behavior. Patients are overwhelmed by feelings of impending catastrophe, guilt, shame, and worthlessness. Patients with extreme anxiety cling to maladaptive behaviors in an attempt to alleviate their distress, but these behaviors only increase their symptoms.

Mood disorders are characterized by depressed or elevated moods that alter the patient's ability to cope with reality and to function normally.

At any time, you can review the major points of each disorder by consulting the *Cheat sheet* on pages 388 and 389.

Polish up on patient care

Major mood disorders include bipolar disorder and major depression. Major anxiety disorders include generalized anxiety, obsessive-compulsive disorder, panic disorder, phobias, and posttraumatic stress disorder.

Bipolar disorder

Also known as manic depression, bipolar disorder is a severe disturbance in affect, manifested by episodes of extreme sadness alternating with episodes of euphoria. Severity and duration of episodes vary. The exact biological basis of bipolar disorder remains unknown.

Two common patterns of bipolar disorder include:

- bipolar I, in which depressive episodes alternate with full manic episodes (hyperactive behavior, delusional thinking, grandiosity, and often hostility)
- bipolar II, characterized by recurrent depressive episodes and occasional manic episodes.

CONTRIBUTING FACTORS

- Concurrent major illness
- Environment
- Heredity
- History of psychiatric illnesses
- Seasons and circadian rhythms that affect mood
- Sleep deprivation
- Stressful events, which may produce limbic system dysfunction

DATA COLLECTION FINDINGS

During periods of mania

- Bizarre and eccentric appearance and behavior
- Cognitive manifestations, such as difficulty concentrating, flight of ideas, delusions of grandeur, and impaired judgment
- Decreased sleep
- Delusions, paranoia, and hallucinations
- Deteriorated physical appearance
- Euphoria and hostility
- Feelings of grandiosity
- Impulsiveness
- Increased energy (feeling of being charged up)
- Increased sexual interest and activity
- Increased social contacts
- Inflated sense of self-worth
- Lack of inhibition
- Rapid, jumbled speech
- Recklessness

(Text continues on page 390.)

Cheat sheet

Anxiety & mood disorders refresher

BIPOLAR DISORDER

Key signs and symptoms

During periods of mania

- Euphoria and hostility
- Feelings of grandiosity
- Inflated sense of self-worth
- Increased energy (feeling of being charged up)

During periods of depression

- Altered sleep patterns
- Anorexia and weight loss
- Helplessness
- Irritability
- Lack of motivation
- Low self-esteem
- Sadness and crying

Key test result

- EEG is abnormal during the depressive episodes of bipolar I disorder and major depression.

Key treatments

- Individual therapy
- Family therapy
- Antimanic agents: lithium carbonate (Eskalith), lithium citrate (Cibalith-S)

Key interventions

During manic phase

- Decrease environmental stimuli by behaving consistently and supplying external controls.
- Ensure a safe and supportive environment.
- Define and explain acceptable behaviors and then set limits.
- Monitor drug levels, especially lithium.

During depressive phase

- Ensure a safe and supportive environment for the patient.
- Evaluate the risk of suicide and formulate a safety contract with the patient, as appropriate.
- Observe the patient for medication compliance and adverse effects.
- Encourage the patient to identify current problems and stressors.

GENERALIZED ANXIETY DISORDER

Key signs and symptoms

- Easy startle reflex
- Excessive worry and anxiety
- Fatigue
- Fears of grave misfortune or death
- Motor tension
- Muscle tension

Key test result

- Laboratory tests rule out physiologic causes.

Key treatments

- Individual therapy focusing on coping skills
- Anxiolytics: alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin), buspirone (BuSpar)

Key interventions

- Help the patient identify and explore coping mechanisms used in the past.
- Observe for signs of mounting anxiety.

MAJOR DEPRESSION

Key signs and symptoms

- Altered sleep patterns
- Anorexia and weight loss
- Helplessness
- Irritability
- Lack of motivation
- Low self-esteem
- Sadness and crying

Key test result

- Beck depression inventory indicates depression.

Key treatments

- Selective serotonin reuptake inhibitors (SSRIs): paroxetine (Paxil), fluoxetine (Prozac), sertraline (Zoloft), escitalopram (Lexapro), bupropion (Wellbutrin), citalopram (Celexa), venlafaxine (Effexor)
- Tricyclic antidepressants (TCAs): imipramine (Tofranil), desipramine (Norpramin), amitriptyline (Elavil), clomipramine (Anafranil), doxepin (Sinequan), nortriptyline (Pamelor)
- Other antidepressants: mirtazapine (Remeron, nefazodone (Serzone)

Anxiety & mood disorders refresher *(continued)*

MAJOR DEPRESSION *(continued)*

Key interventions

- Ensure a safe and supportive environment for the patient.
- Evaluate the risk of suicide and formulate a safety contract with the patient.
- Observe the patient for medication compliance and adverse effects.

OBSESSIVE-COMPULSIVE DISORDER

Key signs and symptoms

- Compulsive behavior (which may include repetitive touching or counting, doing and undoing small tasks, or any other repetitive activity)
- Obsessive thoughts (which may include thoughts of contamination, repetitive worries about impending tragedy, or repeating and counting images or words)

Key test result

- Positron emission tomography shows increased activity in the frontal lobe of the cerebral cortex.

Key treatments

- Behavioral therapy
- Individual therapy
- Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin)
- SSRIs: fluoxetine (Prozac), fluvoxamine (Luvox), paroxetine (Paxil), sertraline (Zoloft)

Key interventions

- Encourage the patient to express his feelings.
- Encourage the patient to identify situations that produce anxiety and precipitate obsessive-compulsive behavior.
- Work with the patient to develop appropriate coping skills.

PANIC DISORDER

Key signs and symptoms

- Diminished ability to focus, even with direction from others
- Edginess or impatience
- Loss of objectivity
- Severely impaired rational thought
- Uneasiness and tension

Key test result

- Medical tests rule out physiologic causes.

Key treatments

- Individual therapy
- Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin)

Key interventions

During panic attacks

- Distract the patient from the attack.
- Approach the patient calmly and unemotionally.
- Use short, simple sentences.

PHOBIAS

Key signs and symptoms

- Panic when confronted with the feared object
- Persistent fear of specific things, places, or situations

Key test results

- No specific test is available to diagnose phobias.

Key treatments

- Family therapy
- Supportive therapy
- Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin)

Key interventions

- Provide a safe and supportive environment.
- Collaborate with the patient to identify the feared object or situation.
- Assist in desensitizing the patient.

POSTTRAUMATIC STRESS DISORDER

Key signs and symptoms

- Anxiety
- Flashbacks of the patient's traumatic experience
- Nightmares about the traumatic experience
- Poor impulse control
- Social isolation
- Survivor guilt

Key test results

- No specific tests are available to identify or confirm posttraumatic stress disorder.

Key treatments

- Individual therapy
- Group therapy
- Systematic desensitization
- Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin)
- TCAs: imipramine (Tofranil), amitriptyline (Elavil)

Key interventions

- Work with the patient to identify stressors.
- Provide a safe and supportive environment.
- Encourage the patient to explore the traumatic event and the meaning of the event.
- Assist the patient with problem solving and resolving guilt.

During periods of depression

- Altered sleep patterns
- Anorexia and weight loss
- Confusion and indecisiveness
- Constipation
- Decreased alertness
- Delusions and hallucinations
- Difficulty thinking logically
- Flat affect
- Guilt
- Helplessness
- Hisory of amenorrhea
- Impotence and lack of interest in sex
- Inability to experience pleasure
- Irritability
- Lack of motivation
- Low self-esteem
- Pessimism
- Poor hygiene
- Poor posture
- Sadness and crying

DIAGNOSTIC FINDINGS

- Abnormal dexamethasone suppression test results indicate bipolar I disorder.
- Cortisol secretion increases during manic episodes of bipolar I disorder.
- EEG is abnormal during the depressive episodes of bipolar I disorder and major depression.

NURSING DIAGNOSES

- Disturbed thought processes
- Bathing or hygiene self-care deficit
- Insomnia

TREATMENT

- Electroconvulsive therapy (ECT), if drug therapy fails
- Individual therapy
- Family therapy

Drug therapy

- Anticonvulsant agents: carbamazepine (Tegretol), divalproex sodium (Depakote)
- Antimanic agents: lithium carbonate (Eskalith), lithium citrate (cibalith-S)
- Selective serotonin reuptake inhibitors (SSRIs): paroxetine (Paxil), fluoxetine (Prozac)

INTERVENTIONS AND RATIONALES

During manic phase

- Decrease environmental stimuli by behaving consistently and supplying external controls *to promote the patient's ability to relax and sleep.*
- Ensure a safe and supportive environment *to protect the patient from himself.*
- Define and explain acceptable behaviors and set limits *to begin a process in which the patient will eventually define and set his own limits.*
- Monitor drug levels, especially lithium levels.

During depressive phase

- Ensure a safe and supportive environment for the patient *to protect him from self-inflicted harm.*
- Evaluate the risk of suicide and formulate a safety contract with the patient, as appropriate, *to ensure well-being and open lines of communication.*
- Observe the patient for medication compliance and adverse effects*; without compliance, there's little hope of progress.*
- Encourage the patient to identify current problems and stressors *so that he can begin therapeutic treatment.*
- Promote opportunities for increased involvement in activities through a structured, daily program *to help the patient feel comfortable with himself and others.*
- Select activities that ensure success and accomplishment *to increase self-esteem.*
- Help the patient to modify negative expectations and think more positively *because positive thinking will help the patient begin a healing process.*
- Spend time with the patient, even if the patient is too depressed to talk, *to enhance the therapeutic relationship.*

Teaching topics

- Following the pharmacologic regimen faithfully and recognizing that therapeutic results may take 1 to 3 weeks
- Thinking more positively
- Participating in therapy
- Obtaining follow-up laboratory tests as indicated

Generalized anxiety disorder

A patient with generalized anxiety disorder worries excessively and experiences extreme anxiety almost daily. The worry lasts for longer than 6 months and is usually disproportionate to the situation. Both adults and children can be diagnosed with generalized anxiety disorder, although the content of the worry may differ.

CONTRIBUTING FACTORS

- Family history of anxiety
- Preexisting psychiatric problems, such as social phobia, panic disorder, and major depression

DATA COLLECTION FINDINGS

- Autonomic hyperactivity
- Distractibility
- Easy startle reflex
- Excessive attention to surroundings
- Excessive worry and anxiety
- Fatigue
- Fears of grave misfortune or death
- Motor tension
- Muscle tension
- Pounding heart
- Repetitive thoughts
- Sleep disorder
- Strained expression
- Tingling of hands or feet
- Vigilance and scanning

DIAGNOSTIC FINDINGS

- Laboratory tests rule out physiologic causes.

NURSING DIAGNOSES

- Anxiety
- Ineffective coping
- Deficient knowledge (treatment plan)

TREATMENT

- Individual therapy focusing on coping skills

Drug therapy

- Anxiolytics: alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin), buspirone (BuSpar)
- Beta-adrenergic blocker: propranolol (Inderal)
- Antihypertensive: clonidine (Catapres)
- Monoamine oxidase inhibitors (MAOIs): phenelzine (Nardil), tranylcypromine (Parnate)
- SSRIs: paroxetine (Paxil), sertraline (Zoloft), fluoxetine (Prozac)
- Tricyclic antidepressants (TCAs): imipramine (Tofranil), desipramine (Norpramin)

INTERVENTIONS AND RATIONALES

- Help the patient identify and talk about how he uses coping mechanisms. *Establishing a baseline for the level of current functioning will enable you to help the patient build his knowledge.*
- Observe the patient for signs of mounting anxiety *to direct measures to moderate it.*
- Negotiate a contract with the patient to work on goals *that give him control of his own situation.*
- Alter his environment *to reduce his anxiety and meet his needs.*
- Monitor his diet and nutrition and encourage him to decrease his caffeine intake *to reduce anxiety.*

Teaching topics

- Recognizing sources of anxiety
- Altering diet when receiving MAOIs (caffeine can cause arrhythmias; foods containing tyramine, such as fava beans, yeast-containing and fermented foods, and avocados, can cause a hypertensive crisis)
- Understanding the medication regimen and recognizing that therapeutic results may take 2 to 3 weeks

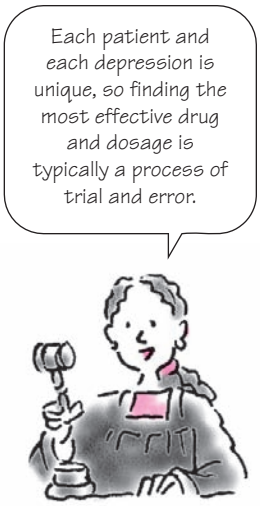
Major depression

Major depression is a syndrome of persistent sad, dysphoric mood that's accompanied by disturbances in sleep and appetite from lethargy and an inability to experience pleasure.

Major depression can profoundly alter social functioning, but the most severe complication of major depression is the potential for suicide.

CONTRIBUTING FACTORS

- Current substance abuse



Treatment for depression usually requires collaboration with the patient to find an effective program of drug therapy and psychotherapy.

Memory jogger

When dealing with depressive patients, think **COMPARE:**

Consult with staff.

Observe the suicidal patient.

Maintain personal contact.

Provide a safe environment.

Assess for clues to suicide.

Remove dangerous objects.

Encourage expression of feelings.

- Deficiencies in the receptor sites for some neurotransmitters: norepinephrine, serotonin, dopamine, and acetylcholine
- Family history of depressive disorders
- Hormonal imbalances
- Lack of social support
- Nutritional deficiencies
- Prior episode of depression
- Significant medical problems
- Stressful life events

DATA COLLECTION FINDINGS

- Altered sleep patterns
- Amenorrhea
- Anorexia and weight loss
- Confusion and indecisiveness
- Constipation
- Decreased alertness
- Delusions and hallucinations
- Difficulty thinking logically
- Flat affect
- Guilt
- Helplessness
- Impotence or lack of interest in sex
- Inability to experience pleasure
- Irritability
- Lack of motivation
- Low self-esteem
- Pessimism
- Poor hygiene
- Poor posture
- Sadness and crying

DIAGNOSTIC FINDINGS

- Thyroid test results are abnormal in major depression.
- Beck depression inventory indicates depression.

NURSING DIAGNOSES

- Hopelessness
- Impaired social interaction
- Chronic low self-esteem

TREATMENT

- ECT
- Individual therapy
- Family therapy
- Phototherapy

Drug therapy

- MAOIs: phenelzine (Nardil)
- SSRIs: paroxetine (Paxil), fluoxetine (Prozac), sertraline (Zoloft), escitalopram (Lexapro), bupropion (Wellbutrin), citalopram (Celexa), venlafaxine (Effexor)
- TCAs: imipramine (Tofranil), desipramine (Norpramin), amitriptyline (Elavil), clomipramine (Anafranil), doxepin (Sinequan), nortriptyline (Pamelor)
- Other antidepressants: mirtazapine (Remeron), nefazodone (Serzone)

INTERVENTIONS AND RATIONALES

- Ensure a safe and supportive environment for the patient *to protect him from self-inflicted harm.*
- Evaluate the patient's risk of suicide and formulate a safety contract with him, as appropriate, *to ensure his well-being and open lines of communication.*
- Reorient the patient undergoing ECT as needed. *Patients receiving ECT commonly have temporary memory loss.*
- Observe the patient for medication compliance and adverse effects*; without compliance, there's little hope of progress.*
- Encourage the patient to identify his current problems and stressors *so that he can begin therapeutic treatment.*
- Promote opportunities that increase the patient's involvement in activities through a structured, daily program *to help him feel comfortable with himself and others.*
- Select activities that ensure his success and accomplishment *to increase his self-esteem.*
- Help the patient to modify his negative expectations and think more positively *because positive thinking helps him begin the healing process.*
- Spend time talking with the patient, even if he's too depressed to talk, *to enhance the therapeutic relationship.*
- Involve family members in patient care *to help them* develop *coping skills.*

Teaching topics

- Learning relaxation and sleep methods
- Complying with therapy
- If taking MAO inhibitors, avoiding tyramine-containing foods, such as wine, beer, cheeses, and preserved fruits, meats, and vegetables

• Understanding medication regimen and recognizing that therapeutic results may take 2 to 3 weeks

Obsessive-compulsive disorder

Obsessive-compulsive disorder, also known as OCD, is characterized by recurrent obsessions (intrusive thoughts, images, and impulses) and compulsions (repetitive behaviors in response to an obsession). The obsessions and compulsions cause intense stress and impair the patient's functioning. Some patients have simultaneous symptoms of depression.

CONTRIBUTING FACTORS

• Brain lesions
• Childhood trauma
• Lack of role models to teach coping skills
• Multiple stressors

DATA COLLECTION FINDINGS

• Compulsive behavior (which may include repetitive touching or counting, doing and undoing, or any other repetitive activity)
• Obsessive thoughts (which may include thoughts of contamination, repetitive worries about impending tragedy, or repeating and counting images or words)
• Social impairment

DIAGNOSTIC FINDINGS

• Positron emission tomography shows increased activity in the frontal lobe of the cerebral cortex.

NURSING DIAGNOSES

• Anxiety
• Ineffective coping
• Chronic low self-esteem

TREATMENT

• Behavioral therapy
• Individual therapy

Drug therapy

• Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin)
• MAOIs: phenelzine (Nardil), tranylcypromine (Parnate)
• SSRIs: fluoxetine (Prozac), fluvoxamine (Luvox), paroxetine (Paxil), sertraline (Zoloft)
• TCAs: imipramine (Tofranil), desipramine (Norpramin), clomipramine (Anafranil)

INTERVENTIONS AND RATIONALES

• Encourage the patient to express his feelings *to decrease his level of stress.*
• Help the patient to recognize how his compulsive behaviors affect his functioning. The patient needs *to realistically evaluate the consequences of his behavior.*
• Encourage the patient to identify situations that produce anxiety and precipitate obsessive-compulsive behavior *to help him evaluate and cope with his condition.*
• Work with the patient to develop appropriate coping skills *to reduce anxiety.*

Teaching topics

• Understanding anxiety and obsessive-compulsive disorder

Panic disorder

While everyone experiences some level of anxiety, patients with panic disorder experience a nonspecific feeling of terror and dread accompanied by symptoms of physiologic stress. This level of anxiety makes it difficult, if not impossible, for the patient to carry out the normal functions of everyday life.

CONTRIBUTING FACTORS

• Agoraphobia (fear of being alone or in public places)
• Asthma
• Cardiovascular disease
• Familial pattern
• GI disorders
• History of anxiety disorders
• History of depression
• Neurologic abnormalities: abnormal activity on the medial portion of the temporal lobe in the parahippocampal area and significant asymmetrical atrophy of the temporal lobe
• Neurotransmitter involvement
• Stressful lifestyle

DATA COLLECTION FINDINGS

- Abdominal discomfort or pain, nausea, heartburn, or diarrhea
- Avoidance (the patient's refusal to encounter situations that may cause anxiety)
- Chest pressure, lump in throat, or choking sensation
- Confusion
- Decreased ability to relate to others
- Diminished ability to focus, even with direction from others
- Edginess or impatience
- Eyelid twitching
- Fidgeting or pacing
- Flushing or pallor
- Generalized weakness
- Increased or decreased blood pressure
- Insomnia
- Itching
- Loss of appetite or revulsion toward food
- Loss of objectivity
- Palpitations and tachycardia
- Physical tension
- Potential for dangerous, impulsive actions
- Rapid speech
- Rapid, shallow breathing or shortness of breath
- Severely impaired rational thought
- Startle reaction
- Sudden urge and frequent urination
- Sweating
- Tremors
- Uneasiness and tension

DIAGNOSTIC FINDINGS

- Medical test results eliminate a physiologic cause.
- Urine and blood test results indicate the presence of psychoactive agents.

NURSING DIAGNOSES

- Anxiety
- Ineffective coping
- Powerlessness

TREATMENT

- Individual therapy
- Group therapy
- Family therapy

Drug therapy

- Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin)
- MAOIs: phenelzine (Nardil); in patients with severe panic disorder, tranylcypromine (Parnate)
- SSRIs: paroxetine (Paxil), fluoxetine (Prozac), sertraline (Zoloft)
- TCAs: imipramine (Tofranil), desipramine (Norpramin), clomipramine (Anafranil)

INTERVENTIONS AND RATIONALES

- During the patient's panic attack, distract or redirect him from the attack *to alleviate the effects of panic.*
- Discuss other methods of coping with his stress *to make the patient aware of alternatives.*
- Approach the patient calmly and unemotionally *to reduce the risk of further stressing the patient.*
- Use short, simple sentences *because the patient's ability to focus and to relate to others is diminished.*
- Administer medications, as needed, *to ensure a therapeutic response.*

Teaching topics

- Recognizing sources of stress and panic triggers
- Learning decision-making and problem-solving skills
- Learning relaxation techniques

Phobias

A phobia is an intense, irrational fear that's out of proportion to reality. This fear often stems from early painful or unpleasant experiences that involve a particular object or situation. Phobias are resistant to insight-oriented therapies.

CONTRIBUTING FACTORS

- Biochemical, involving neurotransmitters
- Familial patterns
- Traumatic events

DATA COLLECTION FINDINGS
- Displacement (shifting of the patient's emotions from their original object) and symbolization
- Disruption in the patient's social or work life
- Dysfunctional social interactions and relationships
- Panic when confronted with the feared object
- Persistent fear of specific things, places, or situations

DIAGNOSTIC FINDINGS
- No specific test is available to diagnose phobias.

NURSING DIAGNOSES
- Anxiety
- Fear
- Powerlessness

TREATMENT
- Individual therapy
- Family therapy
- Supportive therapy
- Systematic desensitization

Drug therapy
- Beta-adrenergic blocker: propranolol (Inderal) for phobia related to public speaking
- Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin)
- MAOIs: phenelzine (Nardil), tranylcypromine (Parnate)
- SSRIs: paroxetine (Paxil), sertraline (Zoloft)
- TCAs: imipramine (Tofranil), desipramine (Norpramin)

INTERVENTIONS AND RATIONALES
- Provide a safe and supportive environment *to decrease anxiety.*
- Collaborate with the patient to identify the feared object or situation *to develop an effective treatment plan.*
- Assist in desensitizing the patient *to diminish his fear.*
- Remind the patient about resources and personal strengths *to build self-esteem.*

Teaching topics
- Learning assertiveness techniques
- Learning relaxation and coping techniques
- Participating in the desensitizing process
- Understanding medication regimen and recognizing that therapeutic results may take 2 to 3 weeks.

Posttraumatic stress disorder

Posttraumatic stress disorder (PTSD) is a group of symptoms that the patient develops after a traumatic event. This traumatic event may involve death, injury, or threat to his physical integrity. In PTSD, ordinary coping behaviors fail to relieve the anxiety. The patient may experience reactions that are acute, chronic, or delayed.

CONTRIBUTING FACTORS
- Anxiety
- Low self-esteem
- Personal experience of threatened injury or death
- Preexisting psychopathology
- Witnessing a traumatic event happen to a close friend or family member

DATA COLLECTION FINDINGS
- Anger
- Anxiety
- Avoidance of people involved in the trauma
- Avoidance of places where the trauma occurred
- Chronic tension
- Detachment
- Difficulty concentrating
- Difficulty falling or staying asleep
- Emotional numbness
- Flashbacks of the traumatic experience
- History of military service
- Hyperalertness
- Inability to recall details of the traumatic event
- Labile affect
- Nightmares about the traumatic experience
- Poor impulse control
- Social isolation
- Survivor guilt

DIAGNOSTIC FINDINGS

- No specific test is available to identify or confirm PTSD.

NURSING DIAGNOSES

- Posttrauma syndrome
- Powerlessness
- Situational low self-esteem

TREATMENT

- Alcohol and drug rehabilitation, when indicated
- Individual therapy
- Group therapy
- Progressive relaxation techniques
- Systematic desensitization

Drug therapy

- Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin)
- Beta-adrenergic blocker: propranolol (Inderal)
- MAOIs: phenelzine (Nardil), tranylcypromine (Parnate)
- SSRIs: paroxetine (Paxil), sertraline (Zoloft)
- TCAs: imipramine (Tofranil), amitriptyline (Elavil)

INTERVENTIONS AND RATIONALES

- Work with the patient to identify stressors *to initiate effective coping.*
- Provide a safe and supportive environment *to decrease anxiety and the chance of injury.*
- Encourage the patient to discuss and explore the meaning of the traumatic event *to promote effective coping.*
- Assist the patient with problem solving and resolving guilt *to help him understand that uncontrollable factors probably played a larger part in the trauma than did his personal actions, decisions, or inactions.*

Teaching topics

- Joining a support group
- Learning relaxation techniques
- Promoting social interaction

Pump up on practice questions

1. The nurse is caring for a client who's experiencing a panic attack. Which intervention would be most appropriate?

1. Tell the client that he's all right and that there's no need to panic.
2. Speak to the client in short, simple sentences.
3. Explain to the client that there's no need to worry because he's safe.
4. Give the client a detailed explanation of his panic reaction.

Answer: 2. The client experiencing a panic attack is unable to focus, and his ability to relate to others is diminished. Therefore, short, simple sentences are the most effective means of communication. The other options minimize the client's concerns about his anxiety.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

2. The nurse is caring for a client who reports that he often feels a choking sensation in his throat, a racing heart, dizziness, and fearfulness. All of these symptoms have occurred almost daily for the past 3 months. After the nurse decides that a psychological component may be causing these symptoms, what would she anticipate administering?

1. Benzodiazepines
2. Proton pump inhibitors
3. Nitroprusside
4. Lithium carbonate

Answer: 1. Pharmacologic management would consist of either tricyclic antidepressants or benzodiazepines. Proton pump inhibitors are used for GI disorders. Nitroprusside is a potent vasodilator used for hypertensive emergencies. Lithium carbonate is an antimanic agent.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

3. The nurse is caring for a client who complains of a choking sensation in his throat, a racing heart, dizziness, and fearfulness. Which of the following conditions could cause these symptoms?

1. Substance abuse
2. Panic disorder
3. Phobia
4. Huntington's chorea

Answer: 2. Panic disorder is diagnosed when associated symptoms occur more than four times in 1 month. Other related symptoms include rubbery legs, faintness, chest discomfort, preoccupation with health, and a feeling of going insane. Substance abuse can cause a large spectrum of similar symptoms, but the symptoms would depend on what was ingested. Phobias are generally related to a specific phobic stimulus (heights, for instance). Huntington's chorea is a neurologic degenerative disease.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Knowledge

4. A client in his mid-40s complains of severe palpitations, sweating, and intense fear when he has to speak in public. Because his job entails lecturing in auditoriums, what would the nurse suggest?

1. Behavioral therapy and beta-adrenergic blockers
2. Quitting his job
3. Telling jokes to reduce anxiety
4. Monoamine oxidase (MAO) inhibitors

Answer: 1. Behavioral therapy and beta-adrenergic blockers have been shown to decrease anxiety related to speaking in public. Quitting a job is a drastic means that would be suggested only after all other therapies failed. Telling jokes wouldn't reduce anxiety in this situation for this person; in fact, this may increase anxiety (for example, worrying about telling the joke well). MAO inhibitors aren't indicated for periods of episodic anxiety.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

5. The nurse is caring for a client who complains of palpitations, sweating, and intense fear when speaking in public. What would be a possible diagnosis for that client?

1. Panic attack
2. Major depression
3. Phobia
4. Malingering

Answer: 3. Even though a panic attack may have similar symptoms, phobias are characterized by episodic anxiety in response to a specific precipitating event. Panic attacks may not have such a specific cause. Symptoms of major depression are long term and are associated with considerable disability. Malingering occurs when an incentive for symptoms exists.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

6. The nurse is caring for one client with panic disorder and another client with a phobia. What is one major difference between those two disorders?

1. Specific precipitants are present with panic disorders.
2. Specific precipitants are present with phobias.
3. The symptoms are different for each disorder.
4. Phobias are one cause of major depressive states.

Answer: 2. Phobias are characterized by episodic anxiety in response to specific precipitants, such as flying, talking in public, and insects. Both may be associated with similar,

not different, symptoms. Neither phobias nor panic disorders cause depressive states.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

7. The nurse is caring for a client who served in the military and was on duty during a bombing of an American embassy. Which findings would suggest PTSD?

1. Seizures and headaches
2. Stuttering, flashbacks, and memory loss
3. Paralysis, flashbacks, and seizures
4. Anger, depression, and flashbacks

Answer: 4. PTSD occurs after a person experiences a trauma that is outside the range of normal human experience. The disorder is characterized by nightmares, flashbacks, anxiety, and depression. The other symptoms don't apply.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Knowledge

8. The nurse is caring for a client who has generalized anxiety disorder. Which statement is true about this client?

1. The client has regular obsessions.
2. Relaxation techniques and psychotherapy are necessary for cure.
3. Nightmares and flashbacks are common in individuals who suffer from generalized anxiety disorder.
4. The client has experienced episodes of anxiety for longer than 6 months.

Answer: 4. Constant patterns of anxiety that affect the client for more than 6 months and interfere with normal activities are characteristic of generalized anxiety disorder. Frequently, pharmaceutical therapy with benzodiazepines can help. Clients having regular obsessions are probably suffering from obsessive-compulsive disorder. Nightmares and flashbacks are typical symptoms of posttraumatic stress disorder.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

9. The nurse is caring for a client who has a mood disorder. This disorder has a strong biological and genetic component. What disorder might this client have?

1. Generalized anxiety disorder
2. Adjustment disorder with depressed mood
3. Posttraumatic stress disorder
4. Bipolar disorder

Answer: 4. Formerly called *manic depression,* bipolar disorder has a genetic link. About 10% of children who have a parent with this disorder will develop it themselves. The other choices have no clear-cut genetic or biological link.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

10. The nurse is caring for a client who suffers from depression. Two weeks after the start of treatment, this client has gained 2 lb (0.9 kg), combs her hair, and is beginning to participate in therapy. The nurse explains that because she's showing signs of improvement, she'll be able to choose her daily menu. She tells the client that she must avoid cheese, yogurt, and preserved meats, fruits, and vegetables. Based on this information, the client is most likely receiving which drug therapy to treat her depression?

1. MAO inhibitor
2. Benzodiazepine
3. SSRI
4. TCA

Answer: 1. This client is receiving an MAO inhibitor, which requires her to avoid tyramine-rich foods, such as cheese, beer, wine, yogurt, and preserved fruits, vegetables, and meats. Benzodiazepines, SSRIs, and TCAs require no dietary restrictions other than avoiding alcoholic beverages.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

15 Cognitive disorders

In this chapter, you'll review:

- factors that contribute to the development of cognitive disorders
- the difference between delirium and dementia
- clinical features of cognitive disorders.

Brush up on key concepts

Cognitive disorders result from conditions that alter or destroy brain tissue and, in turn, impair cerebral functioning. Symptoms of cognitive disorders include cognitive impairment, behavioral dysfunction, and personality changes. The most common cognitive disorders described in the *Diagnostic and Statistical Manual of Mental Disorders,* 4th ed., Text Revision, are delirium, dementia, and amnesic disorders.

At any time, you can review the major points of each disorder by consulting the *Cheat sheet* on pages 400 and 401.

Catching up on cognitive disorders

Cognitive mental disorders are characterized by the disruption of cognitive functioning. Clinically, cognitive disorders are manifested as mental deficits in patients who hadn't previously exhibited such deficits.

Cognitive disorders are difficult to identify and treat. The key to diagnosis lies in the discovery of an organic problem with the brain's tissue.

Cognitive disorders may result from:

- a primary brain disease
- the brain's response to a systemic disturbance such as a medical condition
- the brain tissue's reaction to a toxic substance, as in substance abuse.

Brain disruptions

Delirium is commonly caused by the disruption of brain homeostasis. When the source of the disturbance is eliminated, cognitive deficits generally resolve.

Common causes of delirium include postoperative conditions or metabolic disorders, withdrawal from alcohol and drugs, and toxic substances. Toxic substances are especially difficult to deal with because they can have residual effects. Drugs present another problem—a medication may be innocuous by itself but deadly when taken with another medication or food. Elderly patients are especially susceptible to the toxic effects of medication.

Brain defects

Unlike delirium, **dementia** is caused by primary brain pathology. Consequently, reversal of cognitive defects is less likely. Dementia can easily be mistaken for delirium, so the cause needs to be thoroughly investigated.

Polish up on patient care

Major cognitive disorders include Alzheimer's-type dementia, amnesic disorder, delirium, and vascular dementia.

Alzheimer's-type dementia

A patient with Alzheimer's-type dementia suffers from a global impairment of cognitive functioning, memory, and personality. The dementia develops gradually but with continuous decline. Damage from Alzheimer's-type dementia is irreversible. Because of the difficulty of obtaining direct pathological evidence of Alzheimer's disease, the diagnosis can be made only when the etiologies for the dementia have been eliminated. A definitive diagnosis can only be made with an autopsy after the patient's death.

Researchers have developed different scales to measure the progression of symp-

Cheat sheet

Cognitive disorders refresher

ALZHEIMER'S-TYPE DEMENTIA

Key signs and symptoms

Stage 1 (mild symptoms)
- Confusion and short-term memory loss
- Disorientation to time and place
- Difficulty performing routine tasks
- Changes in personality and judgment

Stage 2 (moderate symptoms)
- Anxiety
- Obvious memory loss
- Suspiciousness
- Agitation
- Wandering
- Difficulty recognizing family members

Stage 3 (moderate to severe symptoms)
- Increasing loss of expressive language skills
- Loss of reasoning ability
- Loss of ability to perform activities of daily living

Stage 4 (severe symptoms)
- Absent cognitive abilities
- Disorientation to time and place
- Impaired or absent motor skills
- Bowel and bladder incontinence.

Key test results

- The cognitive assessment scale demonstrates cognitive impairment.
- The functional dementia scale shows the degree of the dementia.
- Magnetic resonance imaging (MRI) shows apparent structural and neuralgic changes.
- The Mini–Mental Status Examination reveals disorientation and cognitive impairment.

Key treatments

- Group therapy
- Anticholinesterase agents: tacrine (Cognex), donepezil (Aricept), rivastigmine (Exelon), galantamine (Reminyl)

Key interventions

- Remove hazardous items or potential obstacles from the patient's environment.
- Communicate verbally and nonverbally with the patient in a consistent, structured way.
- Increase the patient's social interaction.
- Encourage the use of community resources.

AMNESIC DISORDER

Key signs and symptoms

- Confusion, disorientation, and lack of insight
- Inability to learn and retain new information
- Tendency to remember the remote past better than more recent events

Key test result

- The Mini–Mental Status Examination shows that the patient is disoriented and has difficulty recalling events and information.

Key treatments

- Correction of the underlying medical cause
- Group therapy
- Family therapy

Key interventions

- Ensure the patient's safety.
- Encourage him to explore his feelings.
- Provide simple, clear medical information.

DELIRIUM

Key signs and symptoms

- Altered psychomotor activity, such as apathy, withdrawal, and agitation
- Bizarre, destructive behavior that's worse at night
- Disorganized thinking
- Distractibility
- Impaired decision making
- Inability to complete tasks
- Insomnia or daytime sleepiness
- Poor impulse control
- Rambling, bizarre, or incoherent speech

Key test result

- Laboratory results indicate that the delirium is a result of a physiologic condition, intoxication, substance withdrawal, toxic exposure, prescribed medicines, or a combination of these factors.

Key treatments

- Correction of the underlying physiologic problem
- Cholinesterase inhibitor: physostigmine (Antilirium)
- Antipsychotic agent: risperidone (Risperdal)

Cognitive disorders refresher *(continued)*

DELIRIUM *(continued)*

Key interventions

- Minimize excessive sensory stimuli
- Create a structured, safe, and supportive environment.
- Keep a light on in the patient's room.

VASCULAR DEMENTIA

Key signs and symptoms

- Depression
- Difficulty following instructions
- Emotional lability
- Inappropriate emotional reactions
- Memory loss
- Wandering and getting lost in familiar places

Key test results

- The cognitive assessment scale shows a deterioration in cognitive ability.
- Global Deterioration Scale signifies degenerative dementia.
- The Mini–Mental Status Examination reveals that the patient is disoriented and has difficulty recalling information.

Key treatments

- Carotid endarterectomy to remove blockages in the carotid artery
- Treatment of the underlying condition (hypertension, high cholesterol, or diabetes)
- Antiplatelet aggregate drugs: aspirin, ticlopidine (Ticlid)

Key interventions

- Orient the patient to his surroundings.
- Monitor the patient's environment.
- Encourage the patient to express his feelings of sadness and loss.

toms. The Clinical Dementia Rating delineates five stages in the disease. Another scale, the Global Deterioration Scale, delineates seven. However, most health care providers categorize the disease in only three stages: mild, moderate, and severe. These three stages may overlap, and the appearance and progression of symptoms may vary from one individual to the next.

CONTRIBUTING FACTORS

- Alterations in acetylcholine (a neurotransmitter)
- Altered immune function, with autoantibody production in the brain
- Family history, such as a first-degree relative with Alzheimer's disease or Down syndrome
- Increased brain atrophy with wider sulci and cerebral ventricles than seen in patients who are aging normally
- Neurofibrillary tangles and beta amyloid neuritic plaques, mainly in the frontal and temporal lobes

DATA COLLECTION FINDINGS

Stage 1 (mild symptoms)

- Lasts from 1 to 3 years
- Confusion and short-term memory loss
- Disorientation to time and place
- Difficulty performing routine tasks
- Changes in personality and judgment
- Decreased attention span

Stage 2 (moderate symptoms)

- Lasts from 2 to 10 years
- Anxiety
- Obvious memory loss
- Confusion
- Suspiciousness
- Agitation
- Irritability
- Wandering
- Pacing
- Sleep disturbances
- Difficulty recognizing family members

Stage 3 (moderate to severe symptoms)

- Lasts from 5 to 15 years
- Increasing loss of expressive language skills
- Loss of ability to perform activities of daily living
- Loss of reasoning ability
- Loss of appetite
- Weight loss

Stage 4 (severe symptoms)

- Lasts from 5 to 15 years
- Absent cognitive abilities

• Disorientation to time and place
• Impaired or absent motor skills
• Bowel and bladder incontinence

DIAGNOSTIC FINDINGS

• The cognitive assessment scale demonstrates that the patient has cognitive impairment.
• The functional dementia scale shows the degree of the dementia.
• Magnetic resonance imaging (MRI) shows apparent structural and neurologic changes.
• The Mini–Mental Status Examination reveals that the patient has disorientation and cognitive impairment.
• The patient's spinal fluid contains increased beta amyloid.

NURSING DIAGNOSES

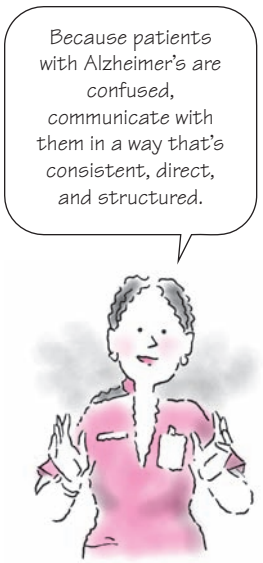
• Bathing or hygiene self-care deficit
• Impaired memory
• Risk for caregiver role strain

TREATMENT

• Group therapy
• Palliative medical treatment
• Diet adequate in folic acid
• Family support

Drug therapy

• Anticholinesterase agents: tacrine (Cognex), donepezil (Aricept), rivastigmine (Exelon), galantamine (Reminyl)
• Antipsychotic agents: haloperidol (Haldol), risperidone (Risperdal) in low doses, olanzapine (Zyprexa)
• Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan), oxazepam (Serax)
• Vitamin E supplements
• Antidepressants: fluoxetine (Prozac), paroxetine (Paxil), sertraline (Zoloft)
• N-methyl-D-aspartate receptor antagonist: memantine (Namenda)



INTERVENTIONS AND RATIONALES

• Remove any hazardous items or potential obstacles from the patient's environment *to maintain a safe environment.*
• Monitor the patient's food and fluid intake *because he may not maintain adequate nutrition.*
• Identify triggers to agitation (typically, changes in the patient's environment).
• Redirect the patient's focus, rather than arguing, disagreeing, or being confrontational, *to prevent increasing agitation.*
• Simplify the patient's environmental tasks and routines *to prevent agitation.*
• Encourage the consumption of foods containing folic acid, such as green, leafy vegetables, citrus fruits and juices, whole wheat bread, and dry beans, *to maintain nutrition.*
• Encourage the patient and his caregiver to initiate health care directives and decisions while the patient still has the capacity to do so, *which can ease the burden on the caregiver as the disease progresses.*
• Provide verbal and nonverbal communication that's consistent and structured *to prevent added confusion.*
• State expectations simply and completely *to orient the patient.*
• Increase the patient's social interaction *to provide stimuli.*
• Encourage the use of community resources and make appropriate referrals *to provide outside support for caregivers.*
• Promote physical activity and sensory stimulation *to alleviate symptoms of the disorder.*
• Provide an identification bracelet for the patient *to help identify him if he wanders off.*

Teaching topics

• Finding support and education (for caregivers) (see *Caring for the caregiver*)
• Learning stress-relief techniques (for caregivers and patients)
• Contacting the Alzheimer's Association

Amnesic disorder

With amnesic disorder, the patient experiences a loss of both short-term and long-term memory. He's unable to recall some or many past events. The patient's abstract thinking, judgment, and personality usually remain intact. Symptoms may have a sudden or gradual onset and may be transient or long-lasting. Amnesic disorder differs from dissociative amnesia in that it results from an identifiable

Caring for the caregiver

Caring for a family member or friend with Alzheimer's disease can place considerable strain on the caregiver. Therefore, it's important to encourage the caregiver to express his feelings. In many cases, caregivers feel confused, fearful, guilty, and grief stricken when a family member is diagnosed with Alzheimer's disease. Help the caregiver cope using these techniques:

- Discuss situations that are typically stressful, such as dealing with the patient's hostility, anxiety, and suspicion.
- Discuss resources needed to provide adequate, safe care. (The care of a patient with Alzheimer's disease can place financial strain on a family.)
- Work with the caregiver to develop a plan to obtain assistance from other family members, neighbors, and friends.
- Reinforce the importance of the caregiver establishing a plan for maintaining personal well-being, including recreation, rest, and exercise. (The stress of caring for a patient with Alzheimer's disease can leave the caregiver susceptible to illness.)

Many NCLEX questions about Alzheimer's-type dementia focus on caregivers, who are also significantly affected by this disorder.

physical cause, rather than psychosocial stressors.

CONTRIBUTING FACTORS

- Adverse effects of certain medications
- Brain surgery
- Cerebrovascular events
- Encephalitis
- Exposure to a toxin
- Poorly controlled type 1 diabetes
- Substance abuse
- Sustained nutritional deficiency
- Traumatic brain injury

DATA COLLECTION FINDINGS

- Apathy and emotional blandness
- Confabulation in early stages
- Confusion, disorientation, and lack of insight
- Inability to learn and retain new information
- Tendency to remember the remote past better than more recent events

DIAGNOSTIC FINDINGS

- Medical tests (electrolyte levels, MRI, and computed tomography [CT] scan) confirm a physical basis.
- The Mini–Mental Status Examination shows the patient's disorientation and inability to recall events and information.
- Neuropsychological testing demonstrates memory deficits.

NURSING DIAGNOSES

- Dressing or grooming self-care deficit
- Impaired memory
- Deficient knowledge (source of amnesia)

TREATMENT

- Correction of the underlying medical cause
- Group therapy
- Family therapy

INTERVENTIONS AND RATIONALES

- Use appropriate measures to promote the patient's safety *because he may be unable to maintain a safe environment.*
- Use environmental cues—for example, post the patient's name and schedule in his room—*to promote orientation.*
- Spend time with the patient and talk about his health and self-care needs *to encourage greater self-understanding.*
- Identify realistic short-term goals *so the patient doesn't become overwhelmed.*
- Encourage him to explain his feelings, *which can spark memory.*
- Provide simple, clear medical information *to help him understand his condition.*

Teaching topics

- Understanding the underlying illness and its relationship to amnesic disorder

Delirium

Delirium is a condition that has a rapid onset and is characterized by disorientation, impaired memory, changed personality, and misperceptions of the environment that can't be attributed to preexisting dementia. Delirium develops over a short period of time, usually hours to days, and tends to fluctuate during the course of the day. It's potentially reversible but can be life-threatening if not treated.

Dehydration is a common cause of delirium, especially in older patients.

CONTRIBUTING FACTORS

- Cerebral hypoxia
- Dehydration (common cause in elderly patients)
- Effects of medication
- Fever
- Fluid and electrolyte imbalances
- Hepatic and renal disease
- Infection (especially of the urinary tract and upper respiratory system)
- Metabolic disorders
- Neurotransmitter imbalance
- Pain
- Polypharmacy, especially anticholinergics
- Sensory overload or deprivation
- Sleep deprivation
- Stress
- Substance intoxication

Memory jogger

To help remember the difference between delirium and dementia, think **DR. DID** (delirium reversible; dementia irreversible damage):

Delirium is **re**versible (though serious if not treated).

Dementia stems from **i**rreversible **d**amage.

DATA COLLECTION FINDINGS

- Altered psychomotor activity, such as apathy, withdrawal, and agitation
- Altered respiratory depth or rhythm
- Bizarre, destructive behavior that worsens at night
- Disorganized thinking
- Disorientation (especially to time and place)
- Distractibility
- Generalized seizures
- Impaired decision making
- Inability to complete tasks
- Insomnia or daytime sleepiness
- Picking at bed linen and clothes
- Poor impulse control
- Rambling, bizarre, or incoherent speech
- Tremors
- Visual and auditory hallucinations

DIAGNOSTIC FINDINGS

- Laboratory results indicate that delirium is a result of a physiologic condition, intoxication, substance withdrawal, toxic exposure, prescribed medicines, or a combination of these factors.

NURSING DIAGNOSES

- Risk for injury
- Impaired memory
- Disturbed thought processes

TREATMENT

- Correction of the underlying physiologic problem
- Individual therapy

Drug therapy

- Tranquilizer: droperidol (Inapsine)
- Benzodiazepine: low-dose lorazepam (Ativan)
- Cholinesterase inhibitor: physostigmine (Antilirium)
- Antipsychotic agent: risperidone (Risperdal)

INTERVENTIONS AND RATIONALES

- Minimize excessive sensory stimuli *to help the patient relax.*
- Create a structured, safe, and supportive environment *to prevent the patient from harming himself.*
- Institute measures to comfort the patient *to help him relax and fall asleep.*
- Keep the patient's room lit *to allay his fears and prevent visual hallucinations.*
- Monitor the effects of medications *to prevent exacerbating symptoms.*

Teaching topics

- Contacting community resources
- Developing family coping skills
- Managing the patient's basic needs
- Understanding the medication regimen

Vascular dementia

Also called multi-infarct dementia, vascular dementia impairs the patient's cognitive func-

tioning, memory, and personality but doesn't affect the patient's level of consciousness. It's caused by an irreversible alteration in brain function that damages or destroys brain tissue.

CONTRIBUTING FACTORS

- Cerebral emboli or thrombosis
- Diabetes
- Heart disease
- High cholesterol level
- Hypertension (leading to stroke)
- Transient ischemic attacks

DATA COLLECTION FINDINGS

- Depression
- Difficulty following instructions
- Dizziness
- Emotional lability
- Inappropriate emotional reactions
- Memory loss
- Neurologic symptoms that last only a few days
- Rapid onset of symptoms
- Slurred speech
- Syncopal episodes
- Wandering and getting lost in familiar places
- Weakness in an extremity

DIAGNOSTIC FINDINGS

- The cognitive assessment scale shows a deterioration in cognitive ability.
- The global deterioration scale signifies that the patient has degenerative dementia.
- The Mini–Mental Status Examination reveals that the patient is disoriented and has difficulty recalling information.
- Structural and neurologic changes can be seen on MRI or CT scans.
- A carotid ultrasound may show stenosis.

NURSING DIAGNOSES

- Disturbed thought processes
- Impaired memory
- Risk for injury

TREATMENT

- Carotid endarterectomy to remove blockages in the carotid artery
- Low-fat diet
- Smoking cessation
- Treatment of the underlying condition (hypertension, high cholesterol, or diabetes)

Drug therapy

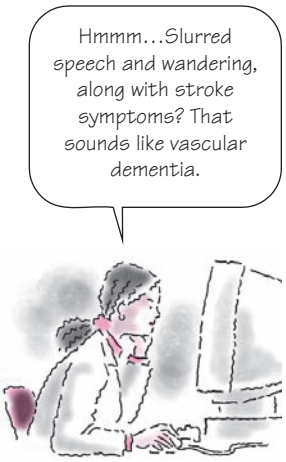
- Antiplatelet aggregation drugs: aspirin, ticlopidine (Ticlid)

INTERVENTIONS AND RATIONALES

- Orient the patient to his surroundings *to alleviate his anxiety.*
- Monitor the patient's environment *to prevent overstimulation.*
- Encourage him to express his feelings of sadness and loss *to foster a healthy therapeutic environment.*

Teaching topics

- Controlling weight and diet
- Exercising to decrease cardiovascular risk factors



Pump up on practice questions

1. The nurse is caring for one client diagnosed with dementia and another client diagnosed with delirium. How does dementia differ from delirium?

1. Dementia is confined to elderly people.
2. Delirium occurs only with substance abuse.
3. Delirium is an acute or subacute onset of confusion.
4. They aren't different; their defining characteristics are interchangeable.

Answer: 3. Delirium is characterized by an acute or subacute onset of confusion, interspersed with alert and drowsy states. Neither disorder is age-specific. Neither disorder is restricted to individuals with histories of substance abuse. Their defining characteristics are different.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

2. The nurse is caring for a 78-year-old client hospitalized with bilateral pneumonia. Shortly after admission, he becomes extremely belligerent, confused, and hypotensive and develops tachypnea. The nurse immediately administers oxygen and anti-infectives and requests that the CT scan of his head be delayed. Why?

1. The client's change in mental status may be related to hypoxia, metabolic encephalopathy, and sepsis.
2. Taking this client to the radiology department would jeopardize his condition.
3. The client exhibited no signs of focal neurologic impairment.
4. The client's prognosis was poor and didn't justify a CT scan.

Answer: 1. Severe functional abnormalities and confusion are commonly caused by nonneurologic diseases, especially in elderly clients. Encephalopathies such as these are reversible if the underlying cause is treated. The other choices—poor prognosis, absence of signs of focal neurologic impairment, and an unstable condition—aren't appropriate justifications for delaying a diagnostic CT scan.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

3. The nurse is reading the autopsy report of a client who recently died. The report reveals senile plaques, neurofibril tangles, and atrophy. These changes are characteristic of which illness?

1. Meningitis
2. Delirium tremors
3. Neurosyphilis
4. Alzheimer's disease

Answer: 4. Although some of these changes can occur as part of the normal aging process, these findings are characteristic of Alzheimer's disease—not of the other three illnesses.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

4. The nurse is caring for a client diagnosed with Alzheimer's-type dementia. Which of the following medications is indicated for treatment of this disorder?

1. Donepezil (Aricept)
2. Benazepril (Lotensin)
3. Fosinopril (Monopril)
4. Lisinopril (Prinivil)

Answer: 1. Donepezil is an anticholinesterase drug indicated for treatment of Alzheimer's-type dementia. Benazepril, fosinopril, and lisinopril are angiotensin-converting enzyme inhibitors that are indicated for treatment of hypertension.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Knowledge

5. The nurse is caring for a client with vascular dementia. Which of the following diagnostic tests or findings helps confirm the diagnosis?

1. A drug screen for toxicology
2. The findings upon autopsy
3. MRI
4. The client's response to electroconvulsive therapy

Answer: 3. Vascular dementia is commonly caused by cerebrovascular disease and very small cerebral infarctions, which can be detected with an MRI. Attempts to diagnosis vascular dementia wouldn't be delayed until autopsy. A positive drug screen wouldn't be helpful in diagnosing dementia caused by the vascular problems. Electroconvulsive therapy is occasionally used in the treatment for selected psychiatric disorders, but it isn't a diagnostic tool for dementia.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

6. The nurse is caring for a client diagnosed with delirium. Which statement describes the characteristics of delirium?

1. An acute onset and a duration of about 1 month.
2. A slowly evolving onset and a duration of about 1 week.
3. A slowly evolving onset and a duration of about 1 month.
4. An acute onset and a duration of hours to a number of days

Answer: 4. Delirium has an acute onset and usually a duration of hours to a number of days.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

7. Which of the following can be caused by cerebral hypoxia, infection, drugs, or metabolic disorders?

1. Dementia
2. Anxiety disorder
3. Delirium
4. Amnesia

Answer: 3. Delirium is commonly a sign of underlying medical problems, especially in older clients; it can be caused by hypoxia, infection, drugs, and metabolic disturbances. It's potentially reversible. Dementia is usually characterized by irreversible alterations in brain function. Although both amnesia and anxiety may have some association with underlying medical problems, neither is caused by such problems.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

8. The nurse is caring for a client who's diagnosed with delirium. What must the nurse provide for the client?

1. A safe environment
2. An opportunity to release frustration
3. Prescribed medications
4. Medications as needed, judiciously

Answer: 1. Keeping the client with delirium safe is the most important aspect of care. All other choices are logical and appropriate, but safety issues and meeting the client's basic physiologic needs are of primary importance.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Application

9. The nurse is caring for a client experiencing severe psychosocial stress. This condition could trigger which disorder?

1. Wilson's disease
2. Huntington's disease
3. Amnesia
4. Multiple sclerosis

Answer: 3. Amnesia is usually triggered by severe psychosocial stress, not physiologic causes. The other three choices are neurodegenerative disorders that commonly have physiologic causes.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

10. A 76-year-old client is admitted to a long-term care facility with a diagnosis of Alzheimer's-type dementia. The client has been wearing the same dirty clothes for several days, and the nurse contacts the family to bring in clean clothing. Which intervention would best prevent further regression in the client's personal hygiene?

1. Encouraging the client to perform as much self-care as possible
2. Making the client assume responsibility for physical care
3. Assigning a staff member to take over the client's physical care
4. Accepting the client's desire to go without bathing

Answer: 1. Clients with Alzheimer's-type dementia tend to fluctuate in their capabilities. Encouraging self-care to the extent possible will help increase the client's orientation and promote a trusting relationship with the nurse. Insisting that the client assume responsibility for his physical care is unreasonable. Assigning a staff member to take over care restricts the client's independence. Accepting the client's desire to go without bathing promotes bad hygiene.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

16 Personality disorders

In this chapter, you'll review:

- factors that contribute to the development of personality disorders
- characteristics displayed by patients with personality disorders
- common personality disorders.

Be prepared for defensiveness. A patient suffering from a personality disorder isn't likely to recognize it in himself.

Brush up on key concepts

Personality traits are behavior patterns that reflect how people perceive and relate to others and themselves. Personality disorders occur when these traits become **rigid** and **maladaptive.** According to the *Diagnostic and Statistical Manual of Mental Disorders,* 4th ed., Text Revision, a personality disorder is a problematic pattern occurring in two of the following areas: cognition, affectivity, interpersonal functioning, and impulse control. A person with a personality disorder uses maladaptive behavior to relate to others and to fulfill basic emotional needs. The patient commonly doesn't perceive that a problem exists, so medical treatment can be difficult.

At any time, you can review the major points of each disorder by consulting the *Cheat sheet* on pages 410 and 411.

Polish up on patient care

Major personality disorders include antisocial personality disorder, borderline personality disorder, dependent personality disorder, and paranoid personality disorder.

Antisocial personality disorder

With antisocial personality disorder, the patient displays disregard for the rights of others. Antisocial personality disorder can begin in early childhood and continue into adulthood, but actual diagnosis requires that the patient be at least 18 years old and that he displayed some symptoms of the disorder before age 15.

CONTRIBUTING FACTORS

- Childhood trauma
- Genetic predisposition
- Physical abuse
- Sexual abuse
- Social isolation
- Transient friendships
- Unstable or erratic parenting

DATA COLLECTION FINDINGS

- Destructive tendencies
- Excessively opinionated nature
- General disregard for the rights and feelings of others
- Impulsive actions
- Inability to maintain close personal or sexual relationships
- Inflated and arrogant self-appraisal
- Lack of remorse
- Possible concurrent psychiatric disorders
- Power-seeking behavior
- Previous violations of societal norms or rules
- Substance abuse
- Sudden or frequent changes in job, residence, or relationships
- Superficial charm (manipulative)

DIAGNOSTIC FINDINGS

- The Minnesota Multiphasic Personality Inventory–2 reveals an antisocial personality disorder.

NURSING DIAGNOSES

- Risk for other-directed violence
- Chronic low self-esteem

Cheat sheet

Personality disorders refresher

ANTISOCIAL PERSONALITY DISORDER

Key signs and symptoms

- Destructive tendencies
- General disregard for the rights and feelings of others
- Lack of remorse
- Sudden or frequent changes in job, residence, or relationships

Key test result

- The Minnesota Multiphasic Personality Inventory–2 reveals an antisocial personality disorder.

Key treatments

- Behavioral therapy
- Antimanic agent: lithium carbonate (Eskalith)
- Beta-adrenergic blocker: propanolol (Inderal) for controlling aggressive outbursts
- Selective serotonin reuptake inhibitor (SSRI): paroxetine (Paxil)

Key interventions

- Help the patient to identify manipulative behaviors.
- Establish a behavioral contract with the patient.
- Hold the patient responsible for his behavior.

BORDERLINE PERSONALITY DISORDER

Key signs and symptoms

- Destructive behavior
- Impulsive behavior
- Inability to develop a healthy sense of self
- Inability to maintain relationships
- Moodiness
- Self-mutilation

Key test result

- Standard psychological tests reveal a high degree of dissociation.

Key treatments

- Individual therapy
- Antimanic medications: valproate (Depakote), lithium carbonate (Eskalith)
- Anxiolytic: buspirone (BuSpar)
- SSRIs: paroxetine (Paxil), fluoxetine (Prozac), sertraline (Zoloft)

Key interventions

- Recognize the behaviors that the patient uses to manipulate others.
- Set limits on behavior.
- Provide a positive role model.

DEPENDENT PERSONALITY DISORDER

Key signs and symptoms

- Clinging, demanding behavior
- Fear and anxiety about losing the people the patient is dependent on
- Hypersensitivity to potential rejection and decision making
- Inability to make decisions
- Low self-esteem

Key test result

- Laboratory tests rule out any underlying medical condition.

Key treatments

- Behavior modification through assertiveness training
- Individual therapy
- Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin)
- SSRIs: paroxetine (Paxil), sertraline (Zoloft)

Key interventions

- Support the patient in accepting increased decision making (such as balancing his checkbook, planning meals, and paying his bills).
- Help him to identify his manipulative behaviors, focusing on specific examples.

PARANOID PERSONALITY DISORDER

Key signs and symptoms

- Feelings of being deceived
- Hostility
- Major distortions of reality
- Social isolation
- Suspiciousness and mistrust of friends and relatives

Key treatments

- Possible drug-free treatment to reduce the chance of causing increased paranoia

Personality disorders refresher *(continued)*

PARANOID PERSONALITY DISORDER *(continued)*

- Individual therapy
- Antipsychotic agents: olanzapine (Zyprexa), risperidone (Risperdal), chlorpromazine (Thorazine), thioridazine (Mellaril), fluphenazine (Prolixin), haloperidol (Haldol), quetiapine (Seroquel)

Key interventions

- Establish a therapeutic relationship by listening and responding to the patient.
- Instruct the patient in and help him to practice strategies that facilitate the development of social skills.

TREATMENT

- Alcohol or drug rehabilitation (if appropriate)
- Behavioral therapy
- Group therapy
- Individual therapy

Drug therapy

- Antimanic agent: lithium carbonate (Eskalith)
- Beta-adrenergic blocker: propranolol (Inderal) for controlling aggressive outbursts
- Selective serotonin reuptake inhibitor (SSRI): paroxetine (Paxil)

INTERVENTIONS AND RATIONALES

- Help the patient to identify manipulative behaviors *to help him counteract the perception that others are extensions of himself.*
- Establish a behavioral contract *to communicate to the patient that other behavior options are available.*
- Avoid confrontations and power struggles *to maintain the opportunity for therapeutic communication.* (See *Dealing with antisocial personality disorder,* page 412.)
- Hold the patient responsible for his behavior *to promote development of a collaborative relationship with the patient.*
- Help the patient to manage anger, and observe him for physical and verbal signs of agitation. *These steps will help him maintain a healthy therapeutic environment.*

Teaching topics

- Learning appropriate behaviors
- Continuing treatment after discharge

Borderline personality disorder

Borderline personality disorder results in a pattern of instability in a person's mood, interpersonal relationships, self-esteem, self-identity, behavior, and cognition. Impulsiveness is its most prominent characteristic. Although the exact cause isn't knowing, it occurs more commonly in families with a history of the disorder.

CONTRIBUTING FACTORS

- Brain dysfunction in the limbic system or frontal lobe
- Decreased serotonin activity
- Early parental loss or separation
- Increased activity in alpha-2-noradrenergic receptors
- Major losses early in life
- Physical abuse
- Sexual abuse
- Substance abuse

DATA COLLECTION FINDINGS

- Compulsive behavior
- Destructive behavior
- Dissociation (separating objects from their emotional significance)
- Dysfunctional lifestyle
- Emotional reactions, with few coping skills
- Extreme fear of abandonment
- High self-expectations
- History of substance abuse
- Impulsive behavior
- Inability to develop a healthy sense of self

Be careful! Patients receiving drug therapy for borderline personality disorder should take medications only for targeted symptoms and only for a short period.

Dealing with antisocial personality disorder

Aggressive behavior makes caring for the patient with antisocial personality disorder a challenge. Patients with this disorder are typically impulsive. They tend to lash out at those who interfere with their need for immediate gratification. Therefore, helping these patients express their anger in a nonviolent manner takes priority. The following steps may be helpful:

- Maintain a safe environment.
- Encourage the patient to verbalize his aggressive feelings.
- Talk with him about appropriate ways to handle anger such as channeling energy into socially acceptable activities.
- Teach the patient coping strategies, such as negotiation skills, stress-reduction techniques, and ways to communicate anger effectively.

- Inability to maintain relationships
- Moodiness
- Paranoid ideation
- Self-directed anger
- Self-mutilation
- Shame
- Suicidal behavior
- Viewing others as either extremely good or bad

DIAGNOSTIC FINDINGS

- Standard psychological tests reveal a high degree of dissociation.

NURSING DIAGNOSES

- Impaired social interaction
- Risk for self-directed violence
- Chronic low self-esteem

TREATMENT

- Alcohol and drug rehabilitation, as indicated
- Group therapy
- Family therapy
- Individual therapy

Drug therapy

- Antimanic medications: valproate (Depakote), lithium carbonate (Eskalith)
- Anxiolytic: buspirone (BuSpar)
- Monoamine oxidase inhibitor (MAOI): phenelzine (Nardil)
- Narcotic detoxification adjunct agent: naltrexone (ReVia)
- SSRIs: paroxetine (Paxil), fluoxetine (Prozac), sertraline (Zoloft)

INTERVENTIONS AND RATIONALES

- Recognize the behaviors that the patient uses to manipulate others *to avoid unconsciously reinforcing these behaviors.*
- Set limits on behavior *to teach appropriate interactions.*
- Provide a positive role model *to help the patient identify appropriate behavior.*
- Respect the patient's sense of personal space *to increase trust.*
- Provide a safe and supportive environment. Observe the patient frequently *to prevent him from injuring himself.*

Teaching topics

- Developing problem-solving skills
- Developing therapeutic communication skills
- Implementing relaxation techniques

Dependent personality disorder

The patient with dependent personality disorder experiences an extreme need to be taken care of that leads to submissive, clinging behavior and fear of separation. This pattern begins by early adulthood, when behaviors designed to elicit caring from others become predominant. These behaviors arise from the patient's perception that he's unable to function adequately without others.

CONTRIBUTING FACTORS
- Childhood traumas
- Closed family system that discourages relationships with others
- Genetic predisposition
- Physical abuse
- Separation anxiety disorder
- Sexual abuse
- Social isolation

DATA COLLECTION FINDINGS
- Clinging, demanding behavior
- Exaggerated fear of losing approval
- Fear and anxiety about losing the people he's dependent on
- Hypersensitivity to potential rejection and decision making
- Inability to make decisions
- Indirect resistance to occupational and social performance
- Low self-esteem
- Tendency to be passive

DIAGNOSTIC FINDINGS
- Laboratory tests rule out any underlying medical condition.

NURSING DIAGNOSES
- Interrupted family processes
- Ineffective coping
- Chronic low self-esteem

TREATMENT
- Behavior modification through assertiveness training
- Individual therapy
- Group therapy

Drug therapy
- Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin)
- SSRIs: paroxetine (Paxil), sertraline (Zoloft)

INTERVENTIONS AND RATIONALES
- Encourage activities that require decision making (balancing his checkbook, planning meals, and paying his bills) *to promote independence.*
- Help the patient establish and work toward goals *to foster a sense of independence.*
- Help the patient identify manipulative behaviors, focusing on specific examples, *to decrease the perception that others are extensions of himself.*
- Limit interactions with the patient to a few staff members *to increase the patient's sense of security.*

Teaching topics
- Expressing ideas and feelings assertively
- Improving social skills and promoting social interaction
- Substituting positive self-talk for negative self-talk

Paranoid personality disorder

Paranoid personality disorder is characterized by extreme distrust of others. Paranoid people avoid relationships in which they aren't in control or have the potential of losing control.

CONTRIBUTING FACTORS
- Genetic link to schizophrenia
- Neurochemical alteration
- Parental modeling of paranoid behaviors

DATA COLLECTION FINDINGS
- Bad temper
- Delusional thinking
- Emotional reactions, including nervousness, jealousy, anger, or envy
- Feelings of being deceived
- Hostility
- Hyperactivity
- Hypervigilance
- Irritability
- Lack of humor
- Lack of social support systems
- Major distortions of reality
- Need to be in control
- Refusal to confide in others
- Self-righteousness
- Social isolation
- Sullen attitude
- Suspiciousness (mistrust of friends and relatives)

DIAGNOSTIC FINDINGS

• No specific test is available to diagnose paranoid personality disorder.

NURSING DIAGNOSES

• Ineffective coping
• Risk for other-directed violence
• Social isolation

TREATMENT

• Possible drug-free treatment to reduce the chance of causing increased paranoia
• Individual therapy

Drug therapy

• Antipsychotic agents: olanzapine (Zyprexa), risperidone (Risperdal), chlorpromazine (Thorazine), thioridazine (Mellaril), fluphenazine (Prolixin), haloperidol (Haldol) in low doses, quetiapine (Seroquel)

INTERVENTIONS AND RATIONALES

• Establish a therapeutic relationship by listening and responding to the patient *to initiate therapeutic communication.*
• Encourage the patient to take part in social interactions *to introduce other people's perceptions and realities to him.*
• Help the patient identify negative behaviors that interfere with his relationships *so he can see how his behavior affects others.*
• Instruct the patient in strategies that aid the development of social skills and help him practice them. *This approach can help him gain confidence and practice interacting with others.*
• Avoid situations that the patient may perceive as demeaning *to decrease any hostile response.*

Teaching topics

• Learning coping strategies
• Understanding the disorder (family and patient)

Pump up on practice questions

1. A client with a personality disorder is accurately identifed when admitted to a medical-surgical unit after a recent surgery. The nurse deliberately interacts with this client more than she interacts with another client, who had the same surgery. Both clients are recovering equally well. Why would the nurse do this?

1. Other caregivers commonly minimize contact with such clients.
2. The nurse feels sorry for the client.
3. One client has health insurance; the other client doesn't.
4. The nurse suspects that the first client isn't recovering as well as reported.

Answer: 1. Because clients with personality disorders can be demanding and difficult, health care providers with little psychiatric experience commonly try to limit their contact with them. This tends to perpetuate behavioral problems, not improve them. This nurse is acting to balance that trend. Sympathy for a client, lack of health insurance, and unfounded suspicions aren't relevant considerations.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

2. The nurse is caring for a client diagnosed with paranoid personality disorder in an acute care facility. Which intervention would the nurse use to help reduce the patient's suspiciousness?

1. Keeping messages clear and consistent, while avoiding deception
2. Providing pharmacologic therapy
3. Providing social interactions with others on the unit
4. Attending to basic daily needs of the client on a consistent basis

Answer: 1. Keeping messages consistent, fostering trust, and avoiding deception will help reduce the patient's suspiciousness. Encouraging social interaction, attending to basic daily needs, and providing pharmacologic therapy are general nursing interventions appropriate for patients with any psychiatric disorder.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Analysis

3. A client arrives on the psychiatric unit from the emergency department. His diagnosis is personality disorder, and he exhibits manipulative behavior. As the nurse reviews the unit rules with him, the client asks, "Can I go to the snack shop just one time, and then I will answer whatever you ask?" Which of the following is the most appropriate response?

1. "Yes, but hurry, because I need to finish your assessment."
2. "Okay, but be back in 5 minutes."
3. "No, you can't go."
4. "No, you can't go. The rules here apply to everyone."

Answer: 4. This response sets limits with an appropriate explanation. Allowing the client to go (options 1 and 2) gives in to his manipulative behavior. Option 3 doesn't explain the reason for the refusal.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

4. The nurse is caring for a client who's a talented, renowned neurosurgeon. He has been married several times and can't manage to keep an employee because of his constant belittling and preoccupation with power and control. What might be a diagnosis for this client?

1. Personality disorder with low self-esteem
2. Depression with need for counseling
3. Bipolar disorder with intense need for pharmacologic therapy
4. Suffering from lingering effects of childhood abuse

Answer: 1. Given as much information as presented, a diagnosis of some type of personality disorder and a nursing observation of low self-esteem are appropriate. Any of the other diagnoses and treatment options are possible concomitant problems, but further information is needed.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

5. The nurse is caring for a client who displays limited insight, a predilection for risky behavior, and a history of trouble with the legal system. The client moves frequently, making it difficult for him to maintain stable friendships. These characteristics are all associated with which diagnosis?

1. Obsessive-compulsive disorder
2. Midlife crisis
3. Cultural awareness deprivation
4. Antisocial personality disorder

Answer: 4. The characteristics described are associated with impaired social functioning, a trait commonly attributed to clients with antisocial personality disorder. Persons with obsessive-compulsive disorder are generally less inclined to engage in risky behavior or get in trouble with the legal system. Lack of awareness of cultural norms and midlife crisis aren't official psychiatric diagnoses.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

6. A nurse is teaching a client about healthy interpersonal relationships. Which characteristic would the nurse include?

1. Minimal self-revelation
2. Willingness to risk self-revelation
3. Ego-dystonic behavior
4. Intimacy and merging of identities

Answer: 2. Willingness to risk self-revelation and achieving intimacy, while maintaining separate identities, are characteristics of healthy interpersonal relationships. Ego-dystonic behavior, the opposite of ego-syntonic behavior, refers to thoughts, impulses, attitudes, and behavior that the client feels are distressing, repugnant, or inconsistent with the rest of his personality.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

7. The nurse is caring for a client with a personality disorder. What is the most significant obstacle for the nurse to overcome?

1. Clients with personality disorders generally lack the motivation to change.
2. In-house treatment is necessary, but most insurance plans don't cover such measures.
3. Appropriate pharmacologic therapy has significant, potentially lethal adverse effects.
4. Neuroleptic medications aren't always effective in helping the client maintain control of his behavior.

Answer: 1. Lack of client motivation is the most common cause of treatment failure in clients with personality disorders. The other options may contribute to treatment failure in other psychiatric disorders but are less applicable in clients with personality disorders.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

8. The nurse is caring for a client who has a personality disorder. Which statement is true regarding that client?

1. Personality disorders are temporary patterns of conflict within the individual.
2. Developmental growth patterns and chronological age will halt any behavior disturbances.
3. Personality disorders are associated with high self-esteem.
4. Personality disorders are lifelong behavior patterns.

Answer: 4. Personality disorders are considered to be lifelong patterns with little relationship to age and developmental growth. Personality disorders are associated with low self-esteem.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

9. The nurse is caring for a client who has a personality disorder. Which of the following findings should the nurse expect?

1. Manipulative behavior and inflated feelings of self-worth
2. Manipulative behavior and inability to tolerate frustration
3. Suicidal ideation and starvation
4. Patterns of bulimia and starvation

Answer: 2. Manipulative behavior and inability to tolerate frustration are important clues about personality. Low self-esteem—not inflated feelings of self-worth—are more likely in clients with personality disorders. The other choices are more likely to be observed in clients with eating disorders.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

10. The nurse is caring for a client with borderline personality disorder. Which intervention should the nurse perform?

1. Setting limits on manipulative behavior
2. Allowing the client to set limits
3. Using restraints judiciously
4. Encouraging acting-out behavior

Answer: 1. Setting limits on manipulative behavior provides the structure that the client needs. Encouraging acting-out behavior and allowing the client to set limits would be contraindicated. The need to restrain a client who has borderline personality disorder is rare, unless the patient has coexisting disorders.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

17 Schizophrenic & delusional disorders

In this chapter, you'll review:

- major characteristics of schizophrenic and delusional disorders
- common schizophrenic and delusional disorders
- treatments and interventions used in the care of patients with schizophrenic and delusional disorders.

Brush up on key concepts

Schizophrenic and delusional disorders fall under the diagnostic umbrella of **psychosis.** A psychotic illness is a brain disorder characterized by an impaired perception of reality, commonly coupled with mood disturbances.

The patient experiencing psychosis lacks insight into the unusual or bizarre thinking or behavior that accompanies the psychosis. Psychosis can be either progressive or episodic.

Schizophrenia is characterized by disturbances (for at least 6 months) in thought content and form, perception, affect, sense of self, volition, interpersonal relationships, and psychomotor behavior.

Delusional disorders are marked by false beliefs with a plausible basis in reality. Previously referred to as *paranoid disorders,* delusional disorders affect less than 1% of the population.

At any time, you can review the major points of each disorder by consulting the *Cheat sheet* on pages 418 and 419.

Positive or negative

Symptoms of schizophrenia may be characterized as positive or negative. **Positive symptoms** focus on a distortion of normal functions; **negative symptoms** focus on a loss of normal functions. Examples of positive symptoms are delusions, hallucinations, disorganized speech, and grossly disorganized or catatonic behavior. Examples of negative symptoms include flat affect, alogia (poverty of speech), and avolition (lack of self-initiated behaviors).

Thought broadcasting

Delusions are false, fixed beliefs that aren't shared by other members of the patient's social, cultural, or religious background. Commonly, delusions occur in the form of thought broadcasting, in which people believe that their personal thoughts are broadcast to the external world. Many times, the patient believes that his feelings, thoughts, or actions aren't his own.

Look for a theme

Common themes characterize delusions. Delusional themes are described as **persecutory, somatic, erotomanic, jealous,** or **grandiose.** An example of a persecutory delusion is the idea that one is being followed, tricked, tormented, or made the subject of ridicule. The patient with erotomanic delusions falsely believes he shares an idealized relationship with another person, usually someone of higher status such as a celebrity. An example of a somatic delusion is a patient who believes his body is deteriorating from within. An example of jealous delusion is the patient's feeling that his or her spouse or lover is unfaithful. The patient with grandiose delusions has an exaggerated sense of self-importance.

Hearing voices

Most commonly, schizophrenics experience **auditory hallucinations.** When the patient hears voices, he perceives these voices as being separate from his own thoughts. The content of the voices may be threatening and derogatory. Many times, the voices tell the patient to commit an act of violence against himself or others.

All over the place

When a patient has **disorganized thinking** or **looseness of associations,** his speech

Cheat sheet

Schizophrenic & delusional disorders refresher

CATATONIC SCHIZOPHRENIA

Key signs and symptoms

- Bizarre postures, waxy flexibility (posture held in odd or unusual fixed positions for extended periods of time), and resistance to being moved
- Displacement (switching emotions from their original object to a more acceptable substitute)
- Dissociation (separation of things from their emotional significance)
- Echolalia (repetition of another's words)
- Echopraxia (involuntary imitation of another person's movements and gestures)

Key test results

- Magnetic resonance imaging (MRI) shows possible enlargement of lateral ventricles, enlarged third ventricle, and enlarged sulci.
- The patient shows impaired performance on neuropsychological and cognitive tests.

Key treatments

- Milieu therapy
- Supportive psychotherapy
- Antipsychotics: aripiprazole (Abilify), mesoridazine (Serentil), fluphenazine (Prolixin), haloperidol (Haldol), olanzapine (Zyprexa), quetiapine (Seroquel), risperidone (Risperdal), thioridazine (Mellaril)

Key interventions

- Provide skin care and reposition the patient every 1 to 2 hours to prevent skin breakdown.
- Monitor the patient for adverse effects of antipsychotic drugs, such as dystonic reactions, tardive dyskinesia, and akathisia.
- Be aware of the patient's personal space; use gestures and touch judiciously.
- Provide appropriate measures to ensure the patient's safety.
- Collaborate with the patient to identify anxious behaviors as well as probable causes.

DISORGANIZED SCHIZOPHRENIA

Key signs and symptoms

- Cognitive impairment
- Fantasy
- Hallucinations
- Loose associations
- Magical thinking (patient believes his thoughts control others)
- Word salads

Key test results

- Neuropsychological and cognitive tests indicate impaired performance.

Key treatments

- Milieu therapy
- Social skills training
- Supportive psychotherapy
- Antipsychotics: chlorpromazine (Thorazine), fluphenazine (Prolixin), haloperidol (Haldol), olanzapine (Zyprexa), quetiapine (Seroquel), risperidone (Risperdal), thioridazine (Mellaril), aripiprazole (Abilify), mesoridazine (Serentil)

Key interventions

- Help the patient meet his basic needs for food, comfort, and a sense of safety.
- During an acute psychotic episode, remove any potentially hazardous items from the patient's environment.
- If the patient experiences hallucinations, ensure his safety and provide comfort and support.
- Encourage the patient with auditory hallucinations to repeat what the voices are telling him.
- Encourage the patient to participate in one-on-one interactions, and then help him progress to small groups.
- Provide positive reinforcement for socially acceptable behavior such as an effort to improve his hygiene and table manners.
- Encourage the patient to express his feelings about the hallucinations he has experienced.

PARANOID SCHIZOPHRENIA

Key signs and symptoms

- Delusions and auditory hallucinations
- Dissociation
- Inability to trust

Schizophrenic & delusional disorders refresher *(continued)*

PARANOID SCHIZOPHRENIA *(continued)*

Key test results

• MRI may show an enlargement of the ventricles and an enlarged sulci. The presence of an enlarged sulci suggests cortical loss, particularly in the frontal lobe.

Key treatments

• Milieu therapy
• Supportive psychotherapy
• Antipsychotics: chlorpromazine (Thorazine), clozapine (Clozaril), fluphenazine (Prolixin), haloperidol (Haldol), olanzapine (Zyprexa), risperidone (Risperdal), thioridazine (Mellaril), aripiprazole (Abilify), mesoridazine (Serentil)

Key interventions

• Inform the patient that you'll help him control his behavior.
• Set limits on aggressive behavior and communicate your expectations to the patient.
• Maintain a low level of stimuli.
• Provide reality-based diversional activities.
• Provide a safe environment.
• Reorient the patient to time and place when appropriate.

DELUSIONAL DISORDER

Key signs and symptoms

• Delusions that are visual, auditory, or tactile
• Inability to trust
• Projection

Key test results

• Blood and urine tests eliminate an organic or chemical cause.
• Endocrine function tests rule out hyperadrenalism, pernicious anemia, and thyroid disorders.
• Neurologic evaluations rule out an organic cause.

Key treatments

• Milieu therapy
• Supportive psychotherapy
• Antipsychotics: chlorpromazine (Thorazine), clozapine (Clozaril), fluphenazine (Prolixin), haloperidol (Haldol), olanzapine (Zyprexa), risperidone (Risperdal), thioridazine (Mellaril), aripiprazole (Abilify), mesoridazine (Serentil)

Key interventions

• Explore events that trigger delusions.
• Don't directly attack the delusion.
• After the dynamics of the delusions are understood, discourage repetitious talk about delusions and refocus the conversation on the patient's underlying feelings.
• Recognize the delusion as the patient's perception of the environment.

shifts randomly from one topic to another, with only a vague connection between the topics. While speaking, the patient may digress to unrelated topics, make up new words (neologisms), repeat words involuntarily (perseveration), or repeat words or phrases similar in sound only (clang association).

Loss of self

The patient may demonstrate a blunted, flat, or inappropriate affect manifested by poor eye contact; a distant, unresponsive facial expression; and very limited body language. His sense of self is disturbed, an experience referred to as **loss of ego boundaries.** This loss of a coherent sense of self causes the patient to experience difficulty in maintaining an ongoing sense of identity. This may make it impossible for the patient to maintain interpersonal relationships or function at work and in other life roles.

Polish up on patient care

Major psychotic disorders include catatonic schizophrenia, disorganized schizophrenia, paranoid schizophrenia, and delusional disorder.

Catatonic schizophrenia

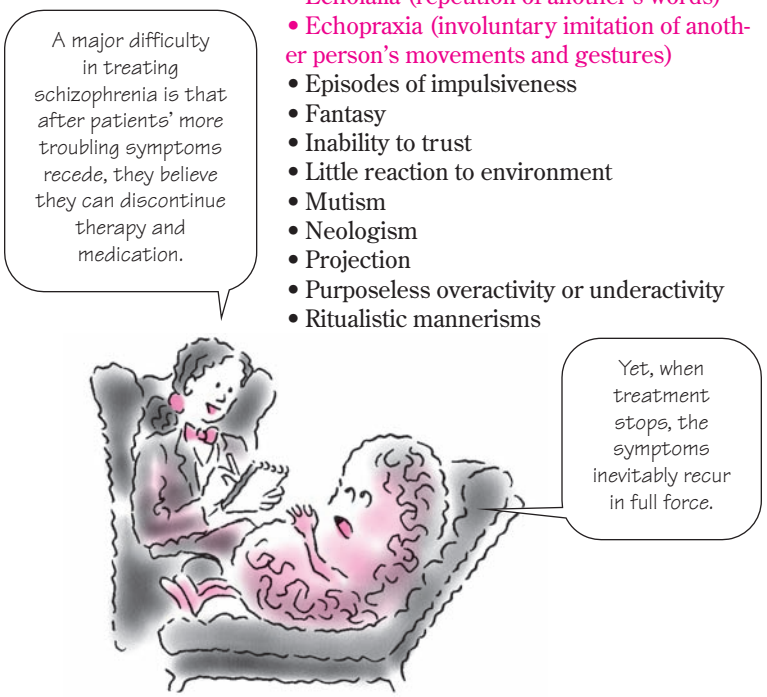
A patient with catatonic schizophrenia shows little reaction to his environment. Catatonic behavior involves remaining completely motionless or continuously repeating one motion. This behavior can last for hours at a time. Catatonic schizophrenia is the least common type of schizophrenia.

CONTRIBUTING FACTORS

- A fragile ego that can't withstand the demands of reality
- Brain abnormalities
- Developmental abnormalities
- Genetic factors
- Hyperactivity of the neurotransmitter dopamine
- An infectious agent or autoimmune response (unproven cause)
- Social or environmental stress, interacting with the person's inherited biological makeup

DATA COLLECTION FINDINGS

- Agitation that may be unexpected and dangerous
- Bizarre postures, waxy flexibility (posture held in odd or unusual fixed positions for extended periods of time), and resistance to being moved
- Childlike, regressed behavior
- Clang association
- Displacement (switching emotions from their original object to a more acceptable substitute)
- Dissociation (separation of things from their emotional significance)
- Echolalia (repetition of another's words)
- Echopraxia (involuntary imitation of another person's movements and gestures)
- Episodes of impulsiveness
- Fantasy
- Inability to trust
- Little reaction to environment
- Mutism
- Neologism
- Projection
- Purposeless overactivity or underactivity
- Ritualistic mannerisms
- Social isolation
- Speech resembling a word salad (string of words that aren't connected in any way)



DIAGNOSTIC FINDINGS

- Magnetic resonance imaging (MRI) may show an enlargement of lateral ventricles, an enlarged third ventricle, and an enlarged sulci.
- The patient shows impaired performance on neuropsychological and cognitive tests.

NURSING DIAGNOSES

- Disturbed thought processes
- Ineffective coping
- Dressing or grooming self-care deficit

TREATMENT

- Electroconvulsive therapy
- Family therapy
- Milieu therapy
- Outpatient group therapy
- Psychoeducational programs
- Social skills training
- Stress management
- Supportive psychotherapy

Drug therapy

- Antiparkinsonian agent: benztropine (Cogentin) for adverse effects of antipsychotics
- Antipsychotics: aripiprazole (Abilify), mesoridazine (Serentil), fluphenazine (Prolixin), haloperidol (Haldol), olanzapine (Zyprexa), quetiapine (Seroquel), risperidone (Risperdal), thioridazine (Mellaril)

INTERVENTIONS AND RATIONALES

- Provide skin care and reposition the patient every 1 to 2 hours *to prevent skin breakdown.*
- Monitor intake and output. *Body weight may decrease as a result of inadequate intake.*
- Monitor the patient for adverse effects of antipsychotic drugs, such as dystonic reactions, tardive dyskinesia, and akathisia. *Early identification of extrapyramidal effects can help diminish or eliminate the patient's anxiety about these symptoms.*
- Be aware of the patient's personal space; use gestures and touch judiciously. *Invading the patient's personal space can increase his anxiety.*

• When discussing the patient's care, give short, simple explanations at his level of understanding *to increase cooperation.*
• Provide appropriate measures to ensure the patient's safety. Explain to the patient why you're doing so. *Implementing and explaining safety measures can promote trust and decrease anxiety while increasing the patient's sense of security.*
• Promote a trusting relationship *to create a safe environment in which the patient can practice social interaction skills to prepare for social experiences.*
• Briefly explain procedures, routines, and tests *to allay the patient's anxiety.*
• Collaborate with the patient to identify anxious behavior as well as probable causes. *Involving the patient in examination of behavior can increase his sense of control.*
• Provide opportunities for the patient to learn adaptive social skills in a nonthreatening environment. *Learning new social skills can enhance the patient's adjustment after discharge.*

Teaching topics

• Accepting that his feelings are valid
• Understanding the importance of continuing medications as prescribed
• Recognizing extrapyramidal effects of antipsychotic medications
• Preventing photosensitivity reactions to the drugs by avoiding exposure to sunlight

Disorganized schizophrenia

Disorganized schizophrenics have a flat or inappropriate affect and incoherent thoughts. Patients with this disorder exhibit loose associations and disorganized speech and behaviors.

CONTRIBUTING FACTORS

• A fragile ego that can't withstand the demands of external reality
• Brain abnormalities
• Developmental involvement
• Genetic factors
• Neurotransmitter abnormalities
• Social or environmental stress, interacting with the person's inherited biological makeup

DATA COLLECTION FINDINGS

• Cognitive impairment
• Disorganized speech
• Displacement
• Fantasy
• Flat or inappropriate affect
• Grimacing
• Hallucinations
• Lack of coherence
• Loose associations
• Magical thinking (patient believes his thoughts can control others)
• Word salads

DIAGNOSTIC FINDINGS

• MRI shows possible enlargement of the ventricles and prominent cortical sulci.
• Neuropsychological and cognitive tests indicate impaired performance.

NURSING DIAGNOSES

• Disturbed thought processes
• Social isolation
• Ineffective coping

TREATMENT

• Family therapy
• Milieu therapy
• Psychoeducational programs
• Social skills training
• Stress management
• Supportive psychotherapy

Drug therapy

• Antiparkinsonian agent: benztropine (Cogentin) for adverse effects of antipsychotic medications
• Antipsychotics: chlorpromazine (Thorazine), fluphenazine (Prolixin), haloperidol (Haldol), olanzapine (Zyprexa), quetiapine (Seroquel), risperidone (Risperdal), thioridazine (Mellaril), aripiprazole (Abilify), mesoridazine (Serentil)

INTERVENTIONS AND RATIONALES

• Help the patient meet his basic needs for food, comfort, and a sense of safety *to ensure the patient's well-being and build trust.*

Memory jogger

To remember the major needs of schizophrenic patients, think **SDS:**

Structure—because they tend to have too little in their lives

Diversion—to distract them from disturbing thoughts

Stress reduction—to minimize the severity of the disorder

• During an acute psychotic episode, remove potentially hazardous items from the patient's environment *to promote safety.*
• Briefly explain procedures, routines, and tests *to decrease the patient's anxiety.*
• Protect the patient from self-destructive tendencies or aggressive impulses *to ensure his safety.*
• Convey sincerity and understanding when communicating *to promote a trusting relationship.*
• Formulate realistic goals with the patient. *Including him in formulating goals can help diminish suspicion while increasing self-esteem and a sense of control.*
• If the patient experiences hallucinations, don't attempt to reason with him or challenge his perception of hallucinations. Instead, ensure the patient's safety and provide comfort and support. *Attempts to reason with the patient increase anxiety, possibly making hallucinations worse.*
• Encourage the patient with auditory hallucinations to reveal what the voices are telling him *to help prevent harm to the patient and others.*
• Encourage the patient to participate in one-on-one interactions, and then help him progress to small groups, *which can enable him to practice his newly acquired social skills.*
• Provide positive reinforcement for socially acceptable behavior such as his effort to improve his hygiene and table manners. *These steps foster improved social relationships and acceptance from others.*
• Encourage the patient to express his feelings about experiencing hallucinations *to promote better understanding of his experiences. Allowing the patient to vent emotions reduces anxiety.*

Distraction techniques, such as singing along with music, can alleviate hallucinations and help bring the patient back to reality. Are you two here to help with that?

Teaching topics
• Learning to use distraction techniques
• Understanding the importance of following the medication regimen

Paranoid schizophrenia

Patients with paranoid schizophrenia have delusions unrelated to reality. Patients commonly display bizarre behavior, are easily angered, and may act violently toward others. The prognosis for independent functioning is typically better than the outlook for other types of schizophrenia.

CONTRIBUTING FACTORS
• A fragile ego that can't withstand the demands of external reality
• Brain abnormalities
• Developmental involvement
• Genetic factors
• Neurotransmitter abnormalities
• Social or environmental stress, interacting with the person's inherited biological makeup

DATA COLLECTION FINDINGS
• Anxiety
• Argumentativeness
• Delusions and auditory hallucinations
• Displacement
• Dissociation
• Easily angered
• Inability to trust
• Potential for violence
• Projection
• Withdrawal or aloofness

DIAGNOSTIC FINDINGS
• MRI may show an enlargement of the ventricles and an enlarged sulci. The presence of the enlarged sulci suggests cortical loss, particularly in the frontal lobe.
• Neuropsychological and cognitive tests indicate impaired performance.

NURSING DIAGNOSES
- Disturbed thought processes
- Social isolation
- Ineffective coping

TREATMENT
- Family therapy
- Group therapy
- Milieu therapy
- Psychoeducational programs
- Social skills training
- Stress management
- Supportive psychotherapy

Drug therapy
- Antiparkinsonian agent: benztropine (Cogentin) for adverse effects of antipsychotic drugs
- Antipsychotics: chlorpromazine (Thorazine), clozapine (Clozaril), fluphenazine (Prolixin), haloperidol (Haldol), olanzapine (Zyprexa), quetiapine (Seroquel), risperidone (Risperdal), thioridazine (Mellaril), aripiprazole (Abilify), mesoridazine (Serentil)

INTERVENTIONS AND RATIONALES
- Inform the patient that you'll help him control his behavior *to promote feelings of safety.*
- Set limits on the patient's aggressive behavior and communicate your expectations *to prevent injury to the patient and others.*
- Maintain a low level of stimuli *to minimize the patient's anxiety, agitation, and suspiciousness.*
- Provide reality-based diversional activities.
- Provide a safe environment.
- Reorient the patient to time and place when appropriate.
- Be flexible; allow the patient to have some control. Let him talk about anything he wishes, but keep the conversation light and social *to avoid power struggles.*
- Don't let the patient put you on the defensive, and don't take his remarks personally. If he tells you to leave him alone, do leave but return soon. *Brief contacts with the patient may be most useful at first.*
- Don't make attempts to combat the patient's delusions with logic. Instead, respond to feelings, themes, or underlying needs. For example, say, "It seems that you feel you've been treated unfairly." *Combatting delusions may increase the patient's feelings of persecution or hostility.*

Teaching topics
- Avoiding exposure to sunlight (to prevent photosensitive reactions to antipsychotics)
- Reporting any adverse affects of antipsychotic medications
- Understanding the importance of following the medication regimen
- Visiting the hospital weekly to have blood chemistry monitored

Interventions for schizophrenia promote the patient's safety, meet physical needs, and help the patient deal with reality.

Delusional disorder

Patients with delusional disorder hold firmly to false beliefs, despite contradictory information. They tend to be intelligent and can have high levels of competence but also typically have impaired social and personal relationships. One indication of delusional disorder is an absence of hallucinations.

CONTRIBUTING FACTORS
- Brain abnormalities
- Developmental involvement
- Family history of schizophrenic, avoidant, and paranoid personality disorders
- Lower socioeconomic status
- Neurotransmitter abnormalities
- Social or environmental stress that interacts with the person's inherited biological makeup

DATA COLLECTION FINDINGS
- Antagonism
- Brushes with the law
- Delusions that are visual, auditory, or tactile
- Denial
- Ideas of reference (everything in the environment takes on a personal significance)
- Inability to trust
- Irritable or depressed mood
- Marked anger and violence
- Projection
- Stalking behavior (as in erotomania, which is the belief that the patient is loved by a prominent person)

DIAGNOSTIC FINDINGS

- Blood and urine tests eliminate an organic or chemical cause.
- Endocrine function tests rule out hyperadrenalism, pernicious anemia, and thyroid disorders.
- Neurologic evaluations rule out an organic cause.

NURSING DIAGNOSES

- Impaired social interaction
- Ineffective coping
- Risk for other-directed violence

TREATMENT

- Family therapy
- Group therapy
- Milieu therapy
- Psychoeducational programs
- Stress management
- Supportive psychotherapy

Differentiating delusional disorder from schizophrenia can be tricky. Delusions reflect reality in a somewhat distorted way. Schizophrenia is indicated by scattered and incoherent thoughts unrelated to reality.

Drug therapy

- Antiparkinsonian agent: benztropine (Cogentin) for adverse effects of antipsychotic medications
- Antipsychotics: chlorpromazine (Thorazine), clozapine (Clozaril), fluphenazine (Prolixin), haloperidol (Haldol), olanzapine (Zyprexa), risperidone (Risperdal), thioridazine (Mellaril), aripiprazole (Abilify), mesoridazine (Serentil)

INTERVENTIONS AND RATIONALES

- Formulate realistic goals with the patient. *Including the patient when setting goals may help diminish suspicion and increase his self-esteem and sense of control.*
- Establish a therapeutic relationship *to foster the patient's trust.*
- Explore the events that trigger the patient's delusions. Discuss the anxiety associated with these triggering events. *Discussing the triggers will help you understand the dynamics of the patient's delusional system.*
- Don't directly attack the patient's delusions. Instead, be patient in formulating a trusting relationship. *Directly attacking the patient's delusions can increase his anxiety.*
- After the dynamics of the delusions are understood, discourage repetitious talk about delusions. Refocus the conversation on the patient's underlying feelings. *As the patient identifies and explores his feelings, he will decrease reliance on delusional thought.*
- Recognize that the delusions are the patient's perception of the environment. Avoid getting into arguments with him about the content of the delusions *to foster his trust.*

Teaching topics

- Learning decision-making, problem-solving, and negotiating skills
- Understanding the importance of complying with the medication regimen
- Understanding the potential adverse effects of the medications

Pump up on practice questions

1. The nurse is caring for a client diagnosed with schizophrenia. Which of the following is an example of a negative symptom?

1. Delusions
2. Disorganized speech
3. Flat affect
4. Catatonic behavior

Answer: 3. Negative symptoms focus on a loss of normal functions and include flat affect, alogia, and avolition. Positive symptoms focus on a distortion of normal functions and include delusions, hallucinations, disorganized speech, and grossly disorganized or catatonic behavior.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Knowledge

2. The nurse is caring for a client who the police found huddled in her apartment. The client stares toward one corner of the room and seems to be responding to something that others can't see. She appears hyperalert and scared. How would you evaluate this situation?

1. The client may be hallucinating.
2. The client is suicidal.
3. Nothing is wrong because the client isn't a threat to society.
4. The client is malingering.

Answer: 1. The scenario describes a client who may be hallucinating. Not enough information is available to suggest that she's a threat to society or to herself. Malingering refers to a medically unproved symptom that's consciously motivated.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

3. The nurse is caring for a client who she suspects is paranoid. How would the nurse communicate with this client?

1. Indirect questioning
2. Direct questioning
3. Lead-in sentences
4. Open-ended sentences

Answer: 2. A direct question (such as "Do you hear voices?" or "Do you feel safe right now?") is the most appropriate technique for eliciting a verifiable response from a psychotic client. The other options may not elicit helpful responses.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

4. The nurse is caring for a client who's experiencing auditory hallucinations. What would be most crucial for the nurse to evaluate?

1. Possible hearing impairment
2. Family history of psychosis
3. Content of the hallucinations
4. Possible sella turcica tumors

Answer: 3. To prevent the client from harming himself or others, the nurse should encourage him to reveal the content of auditory hallucinations. Family history, although important because of possible genetic components, isn't an immediate concern. Olfactory hallucinations, not auditory hallucinations, are associated with sella turcica tumors. Assessing for hearing impairment would be inappropriate.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Application

5. The nurse is caring for a client who's displaying signs of an acute confused state. What are the two most common causes of such a condition?

1. Advanced age and alcohol intake
2. Sensory deprivation and physical challenges
3. Acute schizophrenia and bipolar illness
4. Cardiac arrhythmias and stroke

Answer: 3. Acute schizophrenia and bipolar illness are the two most commonly cited causes of acute confused states. Advanced age, alcohol intake, and sensory deprivation can cause confusion, but chronic or subacute causes are more likely. Cardiac and cerebral problems are less likely to cause psychological symptoms.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Knowledge

6. The nurse is preparing to care for a client diagnosed with catatonic schizophrenia. In anticipation of his arrival, what should the nurse do?

1. Notify security.
2. Prepare a magnesium sulfate drip.
3. Place a specialty mattress overlay on the bed.
4. Tell the dietary department that the client should receive nothing by mouth.

Answer: 3. The nurse should first focus on meeting the client's immediate physical needs and preventing complications related to his catatonic state. The need for intervention from security personnel is unlikely. A magnesium sulfate drip isn't needed. The nurse should address the client's nutritional status after he's undergone a complete evaluation.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

7. The nurse is caring for a client with disorganized schizophrenia. He's responding well to therapy but has had limited social contact with others. Which intervention is most appropriate?

1. Discourage the client from interacting with others because, if his efforts fail, the experience will be too traumatic for him.
2. Encourage the client to attend a party thrown for the residents of the facility.
3. Encourage the client to participate in one-on-one interactions.
4. Encourage the client to place a personal advertisement in the local newspaper but not to reveal his mental disability.

Answer: 3. Encourage the client to participate in one-on-one interactions, and then help him progress to small groups. This enables him to practice his newly acquired social skills.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

8. What's the least common type of schizophrenia?

1. Undifferentiated
2. Paranoid
3. Residual
4. Catatonic

Answer: 4. Catatonic schizophrenia is the least common type of schizophrenia.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Knowledge

9. For clients with which type of schizophrenia should the nurse expect to provide the most physical care?

1. Disorganized type
2. Catatonic type
3. Paranoid type
4. Undifferentiated type

Answer: 2. With catatonic schizophrenia, the client exhibits little reaction to his environment, although periods of excitement may surface at times. Bizarre postures and the inability to feed, wash, and dress himself also occur with this type of schizophrenia. Activities of daily living may be affected in varying degrees in clients with other types of schizophrenia, but to a lesser extent.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Knowledge

10. The nurse is caring for a client who has schizophrenia. What is the first-line treatment for this client?

1. Group therapy
2. Thyroid replacement therapy in selected individuals
3. Milieu therapy
4. Antipsychotic medications

Answer: 4. Antipsychotic medications are the first-line treatment for schizophrenia. Although thyroid disorders can be a cause of psychotic-like symptoms, they aren't a cause of schizophrenia. Milieu therapy may be helpful but isn't a first-line treatment. Group therapy also wouldn't be a first-line treatment.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

18 Substance-related disorders

In this chapter, you'll review:

- classes of controlled substances
- common substance abuse disorders
- substance abuse assessment and treatment.

Brush up on key concepts

The relationship between mental illness and substance use and abuse is complex. Alcohol and psychoactive drugs alter a person's perceptions, feelings, and behavior. People may use substances for that reason. Many people who suffer from emotional disorders or mental illness turn to drugs and alcohol to self-medicate as a coping mechanism. Yet, this method of self-treating is usually ineffective and may result in dependence.

Nursing care for a substance abuser begins with identification of which substance is being abused. During the acute phase, care focuses on maintaining the patient's vital functions and safety. Rehabilitation involves helping the patient to realize his substance abuse problem and find alternative methods of dealing with stress. The nurse helps him to achieve recovery and stay drug-free.

At any time, you can review the major points of each disorder by consulting the *Cheat sheet* on page 430.

Social use?

Substance intoxication is the development of a reversible substance-specific syndrome due to ingestion of or exposure to a substance. The clinically significant maladaptive behavior or psychological changes vary from substance to substance.

It's a problem

The essential feature of **substance abuse** is a maladaptive pattern of substance use coupled with recurrent and significant adverse consequences.

The monkey ON the back

Substance dependence is characterized by physical, behavioral, and cognitive changes resulting from persistent substance use. Persistent drug use can result in tolerance and withdrawal.

Just can't get enough

Tolerance is defined as an increased need for a substance or a need for an increased amount of the substance to achieve an effect.

The monkey OFF the back

Withdrawal occurs when the tissue and blood levels of the substance decrease in a person who has engaged in prolonged, heavy use of the substance.

When uncomfortable withdrawal symptoms persist, the person usually takes the substance to relieve the symptoms. Withdrawal symptoms vary from substance to substance.

Classes of controlled substances

Each class of controlled substance has a different effect on the body and thus produces different reactions. Common classes of controlled substances include:

- cannabis
- depressants
- designer drugs
- hallucinogens
- inhalants
- opiates and related analgesics
- phencyclidine
- stimulants.

CANNABIS

Tetrahydrocannabinol, the active ingredient in hashish and marijuana, alters sensory perceptions and produces a type of euphoria, in-

Cheat sheet

Substance-related disorders refresher

ALCOHOL DISORDER

Key signs and symptoms

- History of alcohol intake
- History of blackouts
- Pathologic intoxication
- Symptoms of withdrawal

Key test results

- CAGE questionnaire responses indicate alcoholism.
- Michigan Alcoholism Screening test results indicate alcoholism.

Key treatments

- Alcoholics Anonymous
- Individual therapy
- Rehabilitation
- Antidepressants: bupropion (Wellbutrin)
- Anxiolytics: chlordiazepoxide (Librium), diazepam (Valium), lorazepam (Ativan)
- Disulfiram (Antabuse) to prevent relapse into alcohol abuse (the patient must be alcohol-free for 12 hours before administering this drug)
- Naltrexone (Trexan) to prevent relapse into alcohol abuse
- Selective serotonin reuptake inhibitors (SSRIs): fluoxetine (Prozac), paroxetine (Paxil)

Key interventions

- Evaluate the patient's use of alcohol as a coping mechanism.
- Set limits on denial and rationalization.
- Have the patient formulate goals for actions that will help him maintain a lifestyle free from substance abuse.

COCAINE-USE DISORDER

Key signs and symptoms

- Elevated energy and mood
- Grandiose thinking
- Impaired judgment

Key test result

- A drug screening is positive for cocaine.

Key treatments

- Detoxification
- Rehabilitation (inpatient or outpatient)
- Narcotics Anonymous
- Individual therapy
- Anxiolytics: lorazepam (Ativan), Alprazolam (Xanax)
- Dopamine agent: bromocriptine (Parlodel)
- SSRIs: fluoxetine (Prozac), paroxetine (Paxil)

Key interventions

- Establish a trusting relationship with the patient.
- Provide the patient with well-balanced meals.
- Set limits on the patient's attempts to rationalize his behavior.

OTHER SUBSTANCE ABUSE DISORDERS

Key signs and symptoms

- Blaming others for problems
- Development of biological or psychological need for a substance
- Dysfunctional anger
- Feelings of grandiosity
- Impulsiveness
- Use of denial and rationalization to explain consequences of behavior

Key test result

- A drug screening is positive for the abused substance.

Key treatments

- Individual therapy
- Clonidine (Catapres) for opiate withdrawal symptoms
- Methadone maintenance for opiate addiction detoxification

Key interventions

- Ensure a safe, quiet environment free from stimuli.
- Monitor for withdrawal symptoms, such as tremors, seizures, and anxiety.
- Help the patient understand the consequences of substance abuse.
- Encourage the patient to vent fear and anger.

creased appetite, tachycardia, lack of coordination, and impaired judgment and memory.

Marijuana is considered a "gateway drug"—a drug whose use often leads to a higher level of drug use.

DEPRESSANTS

These substances slow down central nervous system (CNS) functioning, causing slurred speech, impaired judgment, and mood swings. They can cause respiratory distress when taken in overdose. Common depressants include:

- alcohol
- barbiturates
- benzodiazepines.

DESIGNER DRUGS

These substances are similar to other classes of drugs, but they're manufactured with chemical changes that, in some cases, make them more dangerous. Common designer drugs include:

- china white (synthetic type of heroin)
- ecstasy.

HALLUCINOGENS

These substances produce sympathetic and parasympathetic stimulation, hallucinations, dissociative states, and bizarre, irrational, aggressive, and sometimes violent behavior. They may also cause confusion, delusions, and paranoia. Common hallucinogens include:

- lysergic acid diethylamide (LSD)
- mushrooms (psilocybin)
- mescaline (from peyote cactus).

INHALANTS

Use of inhalants is called "huffing." These substances aren't drugs, but can alter a person's sensorium after he inhales the fumes. Common inhalants include:

- glue
- cleaning solutions
- nail polish remover
- aerosols
- petroleum products
- paint thinners.

OPIATES AND RELATED ANALGESICS

These substances dull the senses and bring about sedation and a dreamlike state, and can cause respiratory depression and cardiac arrest:

- heroin
- morphine
- codeine
- opium
- methadone
- meperidine.

PHENCYCLIDINE

Phencyclidine (PCP), also known as *angel dust,* heightens the patient's CNS function, distorts his perception, and has powerful analgesic effects.

STIMULANTS

These substances stimulate the CNS:

- amphetamines
- cocaine (including crack cocaine)
- caffeine
- nicotine.

Polish up on patient care

Patients can become dependent on almost any controlled substance. Though specific circumstances may vary, the causes and treatments remain similar for each substance.

Alcohol disorder

A patient's dependence on and abuse of alcohol is considered a substance abuse disorder. However, the data collected and the recommended treatment differ somewhat from that for other types of substance abuse. Alcohol is a sedative, but it may also create a feeling of euphoria. The level of sedation increases with the amount the patient ingests. Respiratory depression and coma can occur with toxicity.

CAUSES

- Familial tendency
- Gender (males have an increased likelihood of dependence)
- History of abuse, depression, or anxiety
- Influence of nationality and ethnicity
- Personality disorders
- Religious or family taboos regarding alcohol consumption

DATA COLLECTION FINDINGS

- GI bleeding
- Hallucinations
- History of alcohol intake
- History of blackouts
- History of liver disease
- Irrational behavior
- Korsakoff's psychosis
- Paranoid conversations
- Pathologic intoxication
- Peripheral neuropathy
- Symptoms of withdrawal

DIAGNOSTIC FINDINGS

- A drug screening is positive for alcohol.
- The responses to a CAGE questionnaire indicate alcoholism. (See *The CAGE questionnaire*.)
- Michigan Alcoholism Screening test results indicate alcoholism.

NURSING DIAGNOSES

- Ineffective denial
- Ineffective coping
- Risk for injury

TREATMENT

- Alcoholics Anonymous
- Individual therapy
- Rehabilitation

Drug therapy

- Antidepressant: bupropion (Wellbutrin)
- Anxiolytics: chlordiazepoxide (Librium), diazepam (Valium), or lorazepam (Ativan) to treat withdrawal symptoms
- Disulfiram (Antabuse) to prevent the patient's relapse into alcohol abuse (he must be alcohol-free for 12 hours before administering this drug)
- Naltrexone (Trexan) to prevent relapse into alcohol abuse
- Selective serotonin reuptake inhibitors (SSRIs): fluoxetine (Prozac), paroxetine (Paxil)

INTERVENTIONS AND RATIONALES

- Provide safety measures to help prevent injury.
- Monitor the patient for signs of withdrawal, such as elevated blood pressure, tachycardia, nausea, vomiting, anxiety, and agitation. The patient may also experience hallucinations, tremors, and delirium.
- Evaluate the patient's use of alcohol as a coping mechanism *to formulate a therapeutic care plan.*
- Encourage him to verbalize his anger, fear, inadequacy, grief, and guilt *to promote healthy coping behaviors.*
- Set limits on denial and rationalization *to help the patient gain control and perspective.*
- Have the patient formulate goals for actions that will *help him maintain a drug-free lifestyle and avoid relapses.*

Teaching topics

- Understanding substance abuse and relapse prevention
- Maintaining good nutrition

The CAGE questionnaire

The CAGE questionnaire is a brief, unscored examination meant to provide a standard for assessing alcohol addiction. Any two positive responses to these four yes-or-no questions strongly suggest alcohol dependence.

1. Have you ever felt you should **C**ut down on your drinking?
2. Have people **A**nnoyed you by criticizing your drinking?
3. Have you ever felt bad or **G**uilty about your drinking?
4. Have you ever had an **E**ye-opener first thing in the morning because of a hangover or just to get the day started?

Cocaine-use disorder

Cocaine-use disorder results from the potent euphoric effects of the drug. Individuals exposed to cocaine develop dependence after a very short period of time. Maladaptive behavior follows, resulting in social dysfunction. Cocaine use can also cause serious physical complications, such as cardiac arrhythmias, myocardial infarction, seizures, and stroke.

CONTRIBUTING FACTORS

- Genetic predisposition
- History of abuse, depression, or anxiety
- Personality disorder

DATA COLLECTION FINDINGS

- Elevated energy and mood
- Grandiose thinking
- Impaired judgment
- Impaired social functioning
- Paranoia
- Violent behavior
- Weight loss

DIAGNOSTIC FINDINGS

- A drug screening is positive for cocaine.

NURSING DIAGNOSES

- Ineffective health maintenance
- Imbalanced nutrition: Less than body requirements
- Risk for other-directed violence

TREATMENT

- Detoxification
- Rehabilitation (inpatient or outpatient)
- Narcotics Anonymous
- Individual therapy

Drug therapy

- Anxiolytics: lorazepam (Ativan), alprazolam (Xanax)
- Dopamine agent: bromocriptine (Parlodel)
- SSRIs: fluoxetine (Prozac), paroxetine (Paxil)

INTERVENTIONS AND RATIONALES

- Establish a trusting relationship with the patient *to alleviate any anxiety or paranoia.*
- Provide well-balanced meals *to compensate for nutritional deficits.*
- Provide a safe environment. *The patient may pose a risk to himself or others.*
- Set limits on the patient's attempts to rationalize behavior *to reduce inappropriate behavior.*

Teaching topics

- Contacting Narcotics Anonymous
- Using coping strategies
- Managing stress

Other substance abuse disorders

Other substance abuse disorders include all patterns of abuse excluding alcohol and cocaine. These disorders have a great deal in common, though symptoms vary depending on the abused substance.

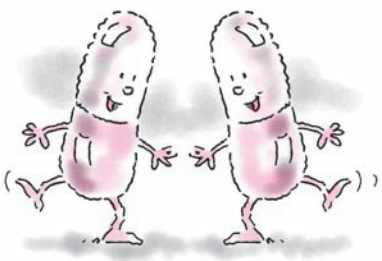
CONTRIBUTING FACTORS

- Familial tendency
- Gender (females have an increased likelihood of abusing prescription drugs; males generally have an increased likelihood of dependence)
- History of abuse, depression, or anxiety
- Influence of nationality and ethnicity
- Personality disorders

DATA COLLECTION FINDINGS

- Attempts to avoid anxiety and other emotions
- Attempts to avoid conscious feelings of guilt and anger
- Attempts to meet needs by influencing others
- Blaming others for problems
- Development of a biological or psychological need for a substance
- Dysfunctional anger
- Feelings of grandiosity
- Impulsiveness
- Manipulation and deceit
- Need for immediate gratification
- Pattern of negative interactions
- Possible malnutrition

During a psychiatric evaluation, always check for drug or alcohol use, which can produce symptoms that mimic those of mental illness.



- Symptoms of withdrawal
- Use of denial and rationalization to explain consequences of behavior

DIAGNOSTIC FINDINGS

- A drug screening is positive for the abused substance.

NURSING DIAGNOSES

- Ineffective health maintenance
- Imbalanced nutrition: Less than body requirements
- Risk for other-directed violence

TREATMENT

- Behavior modification
- Employee assistance programs
- Family counseling
- Group therapy
- Halfway houses
- Individual therapy
- Informal social support
- Self-help groups

Drug therapy

- Clonidine (Catapres) for opiate withdrawal symptoms
- Methadone maintenance for opiate addiction detoxification

INTERVENTIONS AND RATIONALES

- Ensure a safe, quiet environment free from stimuli *to provide a therapeutic setting and to minimize withdrawal symptoms.*
- Monitor for withdrawal symptoms, such as delirium tremens, seizures, anxiety, elevated blood pressure, nausea, and vomiting, *to provide the most comfortable environment possible.*
- Evaluate the patient for polysubstance abuse *to plan appropriate interventions.*
- Help the patient understand the consequences of his substance abuse *to assist recovery.*
- Provide measures to induce sleep *to help the patient manage the discomfort of withdrawal.*
- Encourage the patient to vent his fear and anger *so he can begin the healing process.*

Teaching topics

- Contacting addiction support agencies
- Learning healthy coping mechanisms

Pump up on practice questions

1. The nurse is talking to a client about amphetamines, cocaine, and caffeine. How would the nurse classify these substances?

1. Opiates
2. Analgesics
3. Stimulants
4. Depressants

Answer: 3. Amphetamines, cocaine, and caffeine are stimulants. Stimulation isn't a chief effect of drugs in the other three categories.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

2. The nurse is caring for a client who has a history of alcohol abuse. Why would the client act as if he didn't have a problem?

1. The client has never taken the CAGE questionnaire.
2. Denial is a defense mechanism commonly used by alcoholics.
3. His thought processes are distorted.
4. Alcohol is inexpensive.

Answer: 2. Denial is a defense mechanism commonly used by alcoholics. The CAGE questionnaire is a direct method of discovering whether the client is a substance abuser, but the client is likely to deny the problem regardless of whether he's familiar with this assessment tool. Distorted thought processes

and the cost of alcohol are less likely to have an impact on the client's use of denial.
Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

3. The nurse is caring for a client who exhibits pinpoint pupils as well as decreased blood pressure, pulse, respirations, and temperature. These symptoms may be a sign of intoxication with which substance?
1. Opiate
2. Amphetamine
3. Cannabis
4. Alcohol

Answer: 1. Opiates, such as morphine and heroin, cause these changes. Amphetamines dilate pupils. Cannabis intoxication causes tachycardia, dry mouth, and increased appetite. Alcohol intoxication causes unsteady gait, lack of coordination, nystagmus, and flushed face.
Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

4. The nurse is caring for a client in a substance abuse clinic. The client tells the nurse he needs an increased amount of heroin to produce the same effect that he experienced a number of weeks ago using a smaller amount. How would the nurse define this condition?
1. Tolerance
2. Dependence
3. Withdrawal delirium
4. Compulsion

Answer: 1. Tolerance occurs when an increased amount of a substance is required to produce the same effect. Dependence is a physiologic dependence on a substance. Withdrawal delirium occurs when cessation of a substance produces physiologic symptoms. Compulsion refers to the need to complete an unwanted repetitive act.
Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

5. The nurse is interviewing a client who's currently under the influence of a controlled substance and shows signs of becoming agitated. What should the nurse do?
1. Use confrontation.
2. Express disgust with the client's behavior.
3. Be aware of how to contact hospital security.
4. Communicate a scolding attitude to intimidate the client.

Answer: 3. The nurse, for her own protection, should be aware of how to contact hospital security and other assisting personnel. The other options may escalate the client's agitation.
Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

6. Which common substances is the client most likely to inhale to become intoxicated?
1. Glue, cleaning solutions, and insecticides
2. Glue, nail polish remover, and aerosols
3. Paint thinners, insecticides, and spray paint
4. Cleaning solutions, insecticides, and spray paint

Answer: 2. Glue, nail polish remover, aerosols, paint thinners, and cleaning solutions are inhalants used for a "high." Insecticide inhalation would likely cause illness, and inhaling a spray paint would color the person's face, an obvious detriment.
Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

7. The nurse is caring for a client with a history of substance abuse. Depending on the substance abused, what might treatment include?

1. Antabuse or methadone
2. Morphine
3. Demerol
4. Lithium

Answer: 1. Antabuse assists in recovery from alcoholism; methadone maintenance is used for opiate abusers. Morphine and Demerol are controlled substances and aren't used in substance abuse treatment. Lithium is used to treat bipolar disorder.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

8. The nurse is using the CAGE questionnaire as a screening tool for alcohol problems. What do these initials represent?

1. Cut down, Annoyed, Guilty, Eye-opener
2. Consumed, Angry, Gastritis, Esophageal varices
3. Cancer, Alcoholic liver, Gastric ulcer, Erosive gastritis
4. Cunning, Anger, Guilt, Excess

Answer: 1. CAGE stands for "Have you felt the need to Cut down on your drinking? Have you ever been Annoyed by criticism of your drinking? Have you felt Guilty about your drinking? Have you felt the need for an Eye-opener in the morning?"

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

9. The nurse is administering disulfiram (Antabuse) to a client with a history of alcohol abuse. Before the client receives therapy, which action is he required to do?

1. Be committed to attending Alcoholics Anonymous (AA) meetings weekly
2. Admit to himself and another person that he's an alcoholic
3. Remain alcohol-free for 6 hours
4. Remain alcohol-free for 12 hours

Answer: 4. The client must be alcohol-free for 12 hours before initiating disulfiram therapy. Attending AA and acknowledging alcoholism aren't necessary before the therapy.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

10. A client with a history of alcoholism returns to the hospital 3 hours later than the time specified on his day pass. His breath smells of alcohol and his gait is unsteady. What should the nurse say?

1. "Why are you 3 hours late?"
2. "How much did you drink tonight? Drinking is against the rules."
3. "I'm disappointed that you weren't responsible with your day pass."
4. "Please go to bed now. We'll talk in the morning."

Answer: 4. The patient can best discuss his behavior when he's no longer under the influence of alcohol. Option 1 encourages the patient to invent excuses. Options 2 and 3 are judgmental and discourage open communication.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

19 Dissociative disorders

In this chapter, you'll review:

- basic facts about dissociative disorders
- tests used to diagnose dissociative disorders
- common dissociative disorders.

Brush up on key concepts

A patient with a **dissociative disorder** experiences a disruption in the usual relationship between memory, identity, consciousness, and perceptions. This disturbance may occur suddenly or appear gradually. Typically, dissociation is a mechanism used to protect the self and gain relief from overwhelming anxiety.

At any time, you can review the major points of each disorder by consulting the *Cheat sheet* on page 438.

Polish up on patient care

Common dissociative disorders include depersonalization disorder, dissociative amnesia, and dissociative identity disorder.

Depersonalization disorder

With depersonalization disorder, the patient may feel like a detached observer, passively watching his mental or physical activity as if in a dream. The onset of depersonalization is sudden and the progression of the disorder may be chronic, characterized by remissions and exacerbations.

CONTRIBUTING FACTORS

- History of physical and emotional abuse
- History of substance abuse
- Neurophysiologic predisposition
- Obsessive-compulsive disorder
- Sensory deprivation
- Severe stress, such as military combat, violent crime, or other traumatic events

DATA COLLECTION FINDINGS

- Anxiety symptoms
- Depressive symptoms
- Disturbance in sense of time
- Fear of going insane
- Impaired occupational functioning
- Impaired social functioning
- Low self-esteem
- Persistent or recurring feelings of detachment from mind and body

DIAGNOSTIC FINDINGS

- Standard dissociative disorder tests demonstrate a high degree of dissociation. These tests include:
  - diagnostic drawing series
  - dissociative experience scale
  - dissociative interview schedule
  - structured clinical interview for dissociative disorders.

NURSING DIAGNOSES

- Anxiety
- Posttrauma syndrome
- Ineffective coping

TREATMENT

- Individual psychotherapy

Drug therapy

- Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin)

INTERVENTIONS AND RATIONALES

- Establish a trusting relationship by conveying acceptance and respect *to provide a safe environment for the patient to express distressing feelings.*

Cheat sheet

Dissociative disorders refresher

DEPERSONALIZATION DISORDER

Key signs and symptoms

- Fear of going insane
- Impaired occupational functioning
- Impaired social functioning
- Persistent or recurring feelings of detachment from mind and body

Key test results

- Standard dissociative disorder tests demonstrate a high degree of dissociation. These tests include:
  - diagnostic drawing series
  - dissociative experience scale
  - dissociative interview schedule
  - structured clinical interview for dissociative disorders.

Key treatments

- Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin)

Key interventions

- Encourage the patient to recognize that depersonalization is a defense mechanism used to deal with anxiety and trauma.
- Assist the patient in establishing supportive relationships.

DISSOCIATIVE AMNESIA

Key signs and symptoms

- Altered identity
- Low self-esteem
- No conscious recollection of a traumatic event, yet colors, sounds, sites, or odors of the event may trigger distress or depression
- Sudden onset of amnesia and inability to recall personal information

Key test results

- Standard dissociative disorder tests demonstrate a degree of dissociation. These tests include:
  - diagnostic drawing series
  - dissociative experience scale
  - dissociative interview schedule
  - structured clinical interview for dissociative disorders.

Key treatments

- Individual therapy
- Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan)
- Selective serotonin reuptake inhibitors (SSRIs): paroxetine (Paxil)

Key interventions

- Encourage the patient to verbalize feelings of distress.
- Encourage the patient to recognize that memory loss is a defense mechanism used to deal with anxiety and trauma.

DISSOCIATIVE IDENTITY DISORDER

Key signs and symptoms

- Guilt and shame
- Lack of recall (beyond ordinary forgetfulness)
- Presence of two or more distinct identities or personality states

Key test results

- Standard dissociative disorder tests demonstrate a degree of dissociation. These tests include:
  - diagnostic drawing series
  - dissociative experience scale
  - dissociative interview schedule
  - structured clinical interview for dissociative disorders.
- EEG readings may vary markedly among the different identities.

Key treatments

- Long-term reconstructive psychotherapy
- Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin)
- SSRIs: paroxetine (Paxil)
- Tricyclic antidepressants: imipramine (Tofranil), desipramine (Norpramin)

Key interventions

- Assist the patient in identifying each personality.
- Encourage the patient to identify emotions that occur under duress.

• Encourage the patient to recognize that depersonalization is a defense mechanism used to deal with anxiety and trauma *because the patient needs to first recognize how depersonalization works.*
• Assist the patient in establishing supportive relationships *because social interaction reduces the tendency toward depersonalization.*

Teaching topics
• Identifying effective stress management techniques

Dissociative amnesia

With dissociative amnesia, acute memory loss is triggered by severe psychological stress. The patient may repress disturbing memories or dissociate from anxiety-laden experiences. The patient may not recall important life events in an attempt to avoid traumatic memories. Recovery from dissociative amnesia is common and recurrences are rare.

CONTRIBUTING FACTORS
• Emotional abuse
• Past traumatic event
• Physical abuse
• Sexual abuse

DATA COLLECTION FINDINGS
• Altered identity
• Clinically significant distress or impairment in social functioning
• Depression
• Emotional numbness
• Low self-esteem
• No conscious recollection of a traumatic event, yet colors, sounds, sites, or odors of the event may trigger distress or depression
• Self-mutilation, suicidal or aggressive urges
• Sudden onset of amnesia and inability to recall personal information

DIAGNOSTIC FINDINGS
• Standard dissociative disorder tests demonstrate a degree of dissociation. These tests include:
– diagnostic drawing series
– dissociative experience scale
– dissociative interview schedule
– structured clinical interview for dissociative disorders.

NURSING DIAGNOSES
• Anxiety
• Impaired memory
• Social isolation

TREATMENT
• Hypnosis
• Individual therapy

Drug therapy
• Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan)
• Selective serotonin reuptake inhibitors (SSRIs): paroxetine (Paxil)
• Tricyclic antidepressants: imipramine (Tofranil), desipramine (Norpramin)

INTERVENTIONS AND RATIONALES
• Encourage the patient to verbalize feelings of distress *to help him deal with anxiety before it escalates.*
• Encourage the patient to recognize that memory loss is a defense mechanism used to deal with anxiety and trauma *to help him understand his condition.*

Teaching topics
• Promoting positive coping skills
• Utilizing relaxation techniques

Dissociative identity disorder

With dissociative identity disorder, formerly known as multiple personality disorder, the patient has at least two unique identities. Each identity can have unique behavior patterns and unique memories, though one primary identity is usually associated with the patient's name. The patient may also have traumatic memories that intrude into his awareness. This disorder tends to be chronic and recurrent.

When working with a patient who has a dissociative disorder, remember to keep the focus on the patient—not on the symptoms.

CONTRIBUTING FACTORS

- Emotional, physical, or sexual abuse
- Genetic predisposition
- Lack of nurturing experiences to assist recovery from abuse
- Low self-esteem
- Traumatic experience before age 15

DATA COLLECTION FINDINGS

- Eating disorder
- Guilt and shame
- Hallucinations (auditory and visual)
- Lack of recall (beyond ordinary forgetfulness)
- Low self-esteem
- Posttraumatic symptoms (flashbacks, startle responses, nightmares)
- Presence of two or more distinct identities or personality states
- Recurrent depression
- Sexual dysfunction and difficulty forming intimate relationships
- Sleep disorder
- Somatic pain syndromes
- Substance abuse
- Suicidal tendencies

DIAGNOSTIC FINDINGS

- Standard dissociative disorder tests demonstrate a degree of dissociation. These tests include:
  - diagnostic drawing series
  - dissociative experience scale
  - dissociative interview schedule
  - structured clinical interview for dissociative disorders.
- EEG readings may vary markedly among the different identities.

NURSING DIAGNOSES

- Risk for self-mutilation
- Disturbed personal identity
- Chronic low self-esteem

TREATMENT

- Hypnosis to revisit the trauma
- Implementation of suicide precautions if necessary
- Long-term reconstructive psychotherapy
- Medications, sparingly
- Treatment for eating disorder, sleeping disorder, and sexual dysfunction

Drug therapy

- Benzodiazepines: alprazolam (Xanax), lorazepam (Ativan), clonazepam (Klonopin)
- Monoamine oxidase inhibitors: phenelzine (Nardil), tranylcypromine (Parnate)
- SSRIs: paroxetine (Paxil)
- Tricyclic antidepressants: imipramine (Tofranil), desipramine (Norpramin)

INTERVENTIONS AND RATIONALES

- Establish a trusting relationship *to ensure a therapeutic environment.*
- Assist the patient in recognizing each personality *to work toward integration.*
- Encourage the patient to identify emotions that occur under duress *to demonstrate that extreme emotions are a normal result of stress.*

Teaching topics

- Promoting positive coping skills
- Identifying triggers for personality change

Help psychiatric patients recognize strengths as well as weaknesses to bolster confidence as they begin to cope with trauma.

Pump up on practice questions

1. The nurse is caring for several clients diagnosed with dissociative disorders. Which client has the best chance of a complete recovery and is least likely to experience a recurrence of symptoms?

1. A client with depersonalization disorder
2. A client with dissociative amnesia
3. A client with dissociative identity disorder
4. A client with multiple personality disorder

Answer: 2. A client diagnosed with dissociative amnesia usually experiences complete recovery, and recurrences are rare. A client diagnosed with depersonalization disorder often experiences remissions and exacerbations. Dissociative identity disorder tends to be chronic and recurrent despite extensive treatment. Multiple personality disorder is the former name for dissociative identity disorder.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Knowledge

2. The nurse is caring for a client diagnosed with dissociative amnesia. The client recently experienced a divorce. How should the nurse help the client deal with traumatic memories?

1. Discourage the client from verbalizing feelings because they'll be too traumatic.
2. Force the client to confront her memories about the divorce in a direct, confrontational manner.
3. Tell the client that everything will be all right.
4. Encourage the client to verbalize feelings of distress.

Answer: 4. Encouraging the client to verbalize feelings of distress helps her deal with her anxieties before they escalate. Discouraging the client from verbalizing her feelings may cause anxiety to escalate. Forcing the client to confront her memories will increase her anxiety. Telling the client that everything will be all right offers false reassurance.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

3. The nurse is caring for a client who frequently complains of vague, inconsistent symptoms. Which nursing intervention would be the most appropriate?

1. Screen the client for recent life changes and symptoms of depression, while focusing on physical symptoms.
2. Attempt to minimize physical symptoms, while screening the client for psychological disorders.
3. Exhaust all diagnostic options in ruling out disease before focusing on psychological issues.
4. Refer the client to a psychiatrist.

Answer: 1. It's important not to minimize physical symptoms so that the nurse can demonstrate empathy and establish rapport. The nurse should simultaneously investigate recent life changes and the risk of depression. Although tests and imaging studies may be done in certain cases, review of previous medical records and a physical examination should first be performed to determine the likelihood of physical findings. Referral may be indicated, but not enough information is available.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

4. The nurse is caring for a client who reports feeling "estranged and separated from himself." How would the nurse describe such symptoms?

1. Intoxication
2. Antimotivational syndrome
3. Existentialism
4. Depersonalization

Answer: 4. Depersonalization is characterized by feelings of separateness from oneself. Intoxication is described as feelings of calm, omnipotence, or euphoria. When a relative lack of motivation occurs within an individual, antimotivational syndrome is present. Existentialism is the philosophy that a person finds meaning in life through experiences.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

5. The nurse is caring for a client named Susan who has been diagnosed with dissociative identity disorder. Usually, the client arrives to therapy sessions dressed in a tasteful business suit. One day, the client comes to the clinic dressed in a gold lamé mini-dress and insists that her name is Ruby. How should the nurse respond?

1. Ask the client why she's wearing that ridiculous outfit.
2. Refuse to call the client anything but Susan.
3. Ignore the client's behavior.
4. Help the client explore the characteristics of this newly emerged personality.

Answer: 4. The nurse should help the client explore the characteristics of this newly emerged personality in order to work toward integration. Ridiculing the client's outfit would further decrease the client's self-esteem. Not calling the client by the name she requests would jeopardize the trusting nurse-client relationship. Ignoring the behavior doesn't help the client work toward integration.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

6. The nurse is caring for a client who has a dissociative identity disorder. Which statement would be true about this client?

1. The client has at least two unique identities.
2. The client has only one primary identity.
3. The physician has requested that the client dissociate from his usual medical caregivers and be referred to a psychiatrist.
4. The client is experiencing a gender identity crisis.

Answer: 1. A client with a dissociative identity disorder has at least two unique identities. Gender identity isn't necessarily an issue for clients with this disorder.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Knowledge

7. The nurse is caring for a client who seems to lack spontaneity, has difficulty distinguishing himself from others, and has difficulty distinguishing between internal and external stimuli. The client describes a vague feeling of estrangement. Which statement would describe this client?

1. He's depressed and should be placed on antidepressants.
2. He may have a depersonalization disorder.
3. He may benefit from electroconvulsive therapy.
4. He should be placed on suicide precautions.

Answer: 2. The client has characteristics of a depersonalization disorder. He may also suffer from depression, but antidepressants aren't indicated given the available information. Electroconvulsive therapy wouldn't be appropriate. At this point, the client's behavior doesn't seem suicidal; therefore, such precautions aren't needed.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

8. The nurse is caring for a client who has a depersonalization disorder. Which clear and explicit outcomes should the nurse work toward?

1. Emphasizing strengths, rather than the pathologic condition
2. Focusing on past accomplishments, rather than the current condition
3. Increasing confidence and active participation in planning and implementation of the treatment
4. Eliciting empathetic responses from the client

Answer: 3. Increasing confidence and active participation in planning and implementation of the treatment are measurable outcomes. The active involvement expected of this client will allow for concise documentation of this. The other options are vague and inappropriate.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

9. The nurse is caring for a client who has a dissociative disorder. What should the nurse do to assist the client in goal achievement?

1. Provide opportunities for the client to experience success.
2. Praise the client frequently, whether it's warranted or not.
3. Evaluate components of the client's self-concept.
4. Discuss with the client three categories of behavior commonly associated with an altered self-concept.

Answer: 1. Providing opportunities for the client to experience success would assist him in achieving goals. Unwarranted praise will inevitably cause the client to question the caregiver's sincerity. The other two choices are merely academic exercises and won't assist the client in achieving goals.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

10. The nurse is caring for a client who has a dissociative disorder and is experiencing amnesia. What could have triggered the amnesia?

1. Severe psychosocial stress
2. Short-acting sedation
3. Conscious sedation
4. Syndrome of inappropriate antidiuretic hormone (SIADH)

Answer: 1. Amnesia in the client with a dissociative disorder can be triggered by severe psychosocial stress. Certain pharmacologic agents given for sedation actually have an amnesic effect, but this doesn't qualify as a dissociative disorder. SIADH isn't associated with amnesia.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

20 Sexual disorders

In this chapter, you'll review:

- basic facts about sexual disorders
- common tests used to diagnose sexual disorders
- common treatments for sexual disorders.

Brush up on key concepts

Sexual disorders described in the *Diagnostic and Statistical Manual of Mental Disorders,* Fourth Edition, Text Revision (*DSM-IV-TR*), include **gender identity disorder, paraphilias,** and **sexual dysfunctions.** Gender identity disorder is characterized by an intense and ongoing cross-gender identification. Paraphilias are characterized by an intense, recurring sexual urge centered on inanimate objects or on human suffering and humiliation. Sexual dysfunctions are characterized by a deficiency or loss of desire for sexual activity or by a disturbance in the sexual response cycle.

At any time, you can review the major points of each disorder by consulting the *Cheat sheet* on page 446.

Polish up on patient care

This section discusses care for patients with gender identity disorders, paraphilias, and sexual dysfunctions.

Gender identity disorder

Patients with gender identity disorder want to become or be like the opposite sex and are extremely uncomfortable with their assigned gender roles. This disorder can occur in childhood, adolescence, or adulthood.

CONTRIBUTING FACTORS

- Concurrent paraphilias, especially transvestic fetishism
- Feelings of sexual inadequacy
- Generalized anxiety disorder
- Personality disorders

DATA COLLECTION FINDINGS

- Anxiety
- Attempts to mask or remove sex organs
- Cross-dressing
- Depression
- Disturbance in body image
- Dreams of cross-gender identification
- Fear of abandonment by family and friends
- Feelings of peer ostracism
- Finding one's own genitals "disgusting"
- Ineffective coping strategies
- Persistent distress about sexual orientation
- Preoccupation with appearance
- Self-hatred
- Self-medication such as hormonal therapy
- Strong attraction to stereotypical activities of the opposite sex
- Suicide attempts

DIAGNOSTIC FINDINGS

- Karyotyping for sex chromosomes (not usually indicated) may reveal an abnormality.
- Psychological testing may reveal cross-gender identification or behavior patterns.
- Sex hormones assay (not usually indicated) may reveal an abnormality.

NURSING DIAGNOSES

- Disturbed body image
- Chronic low self-esteem
- Disturbed personal identity

TREATMENT

- Group and individual psychotherapy
- Hormonal therapy
- Sex-reassignment surgery

Cheat sheet

Sexual disorders refresher

GENDER IDENTITY DISORDER

Key signs and symptoms

- Dreams of cross-gender identification
- Finding one's own genitals "disgusting"
- Persistent distress about sexual orientation
- Preoccupation with appearance
- Self-hatred

Key test results

- Psychological testing may reveal cross-gender identification or behavior patterns.

Key treatments

- Group and individual psychotherapy
- Hormonal therapy
- Sex-reassignment surgery

Key interventions

- Demonstrate a nonjudgmental attitude.
- Help the patient to identify positive aspects of himself.

PARAPHILIAS

Key signs and symptoms

- Development of a hobby or change in occupation that makes the paraphilia more accessible
- Recurrent paraphilic fantasies
- Social isolation
- Troubled social or sexual relationships

Key treatments

- Individual therapy

Key interventions

- Demonstrate a nonjudgmental attitude.
- Institute safety precautions as needed according to facility protocol.
- Initiate a discussion about how emotional needs for self-esteem, respect, love, and intimacy influence sexual expression.
- Encourage the patient to identify feelings, such as pleasure, reduced anxiety, increased control, and shame, associated with sexual behavior and fantasies.

SEXUAL DYSFUNCTIONS

Key signs and symptoms

- Anxiety
- Decreased sexual desire (sexual desire disorder)
- Delayed or absent orgasm (orgasmic disorder)
- Depression
- Inability to maintain an erection (sexual arousal disorder)
- Pain with sexual intercourse (sexual pain disorder)
- Premature ejaculation (orgasmic disorder)

Key test results

- Diagnostic tests are used to rule out a physiologic cause for the dysfunction.

Key treatments

- Individual therapy
- Hormone replacement therapy: testosterone (Androderm)
- Sildenafil (Viagra), tadalafil (Cialis), vardenafil (Levitra) for impotence

Key interventions

- Encourage the patient to discuss feelings and perceptions about his sexual dysfunction.
- Teach the patient and his partner alternative ways of expressing their affection.
- Encourage the patient to seek evaluation and therapy from a qualified professional.

INTERVENTIONS AND RATIONALES

- Demonstrate a nonjudgmental attitude *to decrease feelings of low self-esteem.*
- Provide emotional support and empathy as the patient discusses fears and concerns *to help him deal with anxiety.*
- Help the patient to identify positive aspects of himself *to alleviate feelings of shame and distress.*
- Encourage the patient to participate in support groups *so the patient can gain empathy*

from others and find a safe environment to discuss concerns.

Teaching topics

- Knowing treatment options
- Understanding the need for follow-up care

Paraphilias

A paraphilia is defined as a recurrent, intense sexual urge or fantasy, generally involving nonhuman subjects, children, nonconsenting partners, or the degradation, suffering, and humiliation of the patient or partners. The patient may report that the fantasy is always present but that its intensity varies. The disorder tends to be chronic and lifelong but, in adults, both the fantasy and behavior commonly diminish with advancing age. Inappropriate sexual behavior may increase in response to psychological stressors, in relation to other mental disorders, or when opportunity to engage in the paraphilia becomes more available.

Common paraphilias include:

- exhibitionism (exposing genitals and occasionally masturbating in public)
- fetishism (use of an object to become sexually aroused)
- frotteurism (rubbing one's genitals on another nonconsenting person to become aroused)
- pedophilia (sexual activity with a child)
- sexual masochism (being humiliated or feeling pain to become aroused)
- sexual sadism (causing physical or emotional pain to another to become aroused)
- transvestic fetishism (cross-dressing)
- voyeurism (watching others who are nude or engaging in sex to become aroused).

CONTRIBUTING FACTORS

- Childhood incest or sexual abuse
- Concurrent mental disorders
- Emotional trauma
- Gender (more likely in males)
- Personality disorders
- Central nervous system tumors
- Closed head injury
- Neuroendocrine disorders
- Psychosocial stressors
- Lack of knowledge about sex
- Sexual trauma

DATA COLLECTION FINDINGS

- Anxiety
- Depression
- Development of a hobby or change in occupation that makes the paraphilia more accessible
- Disturbance in body image
- Guilt or shame
- Ineffective coping
- Purchase of books, films, or magazines related to the paraphilia
- Recurrent paraphilic fantasies
- Sexual dysfunction
- Signs of multiple paraphilias at the same time
- Social isolation
- Troubled social or sexual relationships

DIAGNOSTIC FINDINGS

- Penile plethysmography testing may measure sexual arousal in response to visual imagery; however, the results of this procedure can be unreliable.

NURSING DIAGNOSES

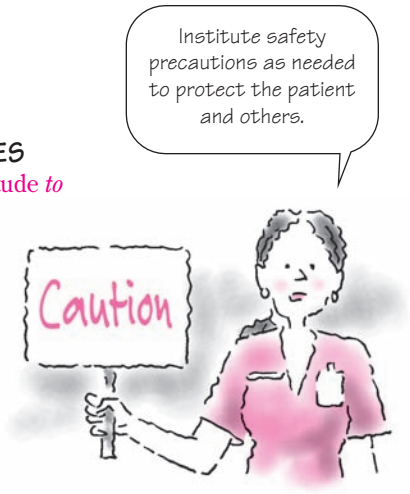
- Ineffective sexuality patterns
- Chronic low self-esteem
- Risk for other-directed violence

TREATMENT

- Behavior therapy
- Cognitive therapy
- Individual therapy

INTERVENTIONS AND RATIONALES

- Demonstrate a nonjudgmental attitude *to decrease feelings of low self-esteem.*
- Institute safety precautions according to facility protocol as needed *to protect the patient and others.*
- Initiate a discussion about how emotional needs for self-esteem, respect, love, and intimacy influence sexual expression *to help the patient understand the disorder.*



• Encourage the patient to identify feelings, such as pleasure, reduced anxiety, increased control, and shame, associated with sexual behavior and fantasies *to provide insight for developing appropriate interventions.*
• Help the patient distinguish between practices that are distressing because they don't conform to social norms or personal values and those that may place him or others in serious emotional, medical, or legal jeopardy *to reinforce the need to stop behaviors that could harm the patient or others.*

Teaching topics
• Knowing treatment options
• Understanding the need for follow-up care
• Contacting Sexaholics Anonymous

Sexual dysfunctions

Sexual dysfunctions are characterized by a disturbance during one or more phases of the sexual response cycle. The most common dysfunctions are:
• orgasmic disorders—The *DSM-IV-TR* lists female orgasmic disorder, male orgasmic disorder, and premature ejaculation. Male and female orgasmic disorders are characterized by a persistent or recurrent delay in or absence of orgasm following a normal sexual excitement phase. Premature ejaculation is marked by persistent and recurrent onset of orgasm and ejaculation with minimal sexual stimulation.
• sexual arousal disorders—These include female sexual arousal disorder and male erectile disorder. With female sexual arousal disorder, the patient has a persistent or recurrent inability to attain or maintain adequate lubrication, swelling, and response of sexual excitement until the completion of sexual activity. In male erectile disorder, the patient has a persistent or recurrent inability to attain or maintain an adequate erection until completion of sexual activity.
• sexual desire disorders—This category includes hypoactive sexual desire disorder and sexual aversion disorder. The key feature of hypoactive sexual desire disorder is a deficiency or absence of sexual fantasies and the desire for sexual activity. The patient usually doesn't initiate sexual activity and may engage in it only reluctantly when it's initiated by the partner. With sexual aversion disorder, the patient has an aversion to and active avoidance of genital sexual contact with a sexual partner.
• sexual dysfunction due to injury, surgery, or a medical condition—Sexual dysfunction may occur as a result of a physiologic problem.
• sexual pain disorders—This category includes dyspareunia and vaginismus. The essential feature of dyspareunia is genital pain associated with sexual intercourse. Most commonly experienced during intercourse, dyspareunia may also occur before or after intercourse. The disorder can occur in both males and females. Vaginismus is recurrent or persistent involuntary contraction of the perineal muscles surrounding the outer third of the vagina when vaginal penetration is attempted. In some patients, even the anticipation of vaginal insertion may result in muscle spasm. The contractions may be mild to severe.
• substance-induced sexual dysfunction—This term is used to describe sexual dysfunction resulting from direct physiologic effects of a substance, such as from drug abuse, medication use, or toxin exposure.

CONTRIBUTING FACTORS
• Anger or hostility
• Depression
• Drugs or alcohol
• Endocrine disorders
• Genital surgery
• Genital trauma
• Infections
• Lifestyle disruptions
• Medications
• Paraphilia
• Pregnancy
• Religious or cultural taboos that reinforce guilt feelings about sex
• Stress

DATA COLLECTION FINDINGS
• Anxiety
• Decreased sexual desire (sexual desire disorder)

- Delayed or absent orgasm (orgasmic disorder)
- Depression
- Disturbance in body image
- Frustration and feelings of being unattractive
- Inability to maintain an erection (sexual arousal disorder)
- Ineffective coping
- Pain with sexual intercourse (sexual pain disorder)
- Poor self-concept
- Premature ejaculation (orgasmic disorder)
- Social isolation

DIAGNOSTIC FINDINGS

- Diagnostic tests are used to rule out a physiologic cause of dysfunction.

NURSING DIAGNOSES

- Impaired social interaction
- Chronic low self-esteem
- Sexual dysfunction

TREATMENT

- Changing medications to decrease symptoms (as appropriate)
- Individual therapy
- Marital or couples therapy
- Penile implant or vacuum pump (for erectile dysfunction)
- Sex therapy
- Treatment of underlying medical condition
- Vaginal dilators
- Vascular surgery (for erectile dysfunction)

Drug therapy

- Hormone replacement therapy: testosterone (Androderm), estradiol (Estrace)
- Sildenafil (Viagra), tadalafil (Cialis), vardenafil (Levitra) for impotence
- Alprostadil (Caverject) intracavernously to induce erection

INTERVENTIONS AND RATIONALES

- Establish a therapeutic relationship with the patient *to provide a safe and comfortable atmosphere for discussing sexual concerns.*
- Encourage the patient to discuss feelings and perceptions about his sexual dysfunction *to help validate his perceptions and reduce emotional distress.*
- Teach the patient and his partner alternative ways of expressing sexual intimacy and affection. *Alternative expressions of intimacy may raise the patient's self-esteem.*
- Encourage the patient to seek evaluation and therapy from a qualified professional *to enable the patient to obtain proper diagnosis and treatment.*

Teaching topics

- Understanding medication use and possible adverse effects.
- Understanding sexual response
- Using alternative sexual positions to promote comfort
- Performing relaxation exercises
- Performing Kegel exercises to improve urethral and vaginal tone
- Contacting self-help groups

Pump up on practice questions

1. The nurse is caring for a client who's experiencing hypoactive sexual desire. How would the nurse classify this condition?

1. Sexual arousal disorder
2. Sexual pain disorder
3. Sexual desire disorder
4. Orgasmic disorder

Answer: 3. Sexual desire disorders include both sexual aversion and hypoactive sexual desire disorder. Sexual arousal disorders include male erectile and female arousal disorders. Examples of sexual pain disorders in-

clude dyspareunia and vaginismus. Orgasmic disorders, such as premature ejaculation, affect both males and females and are characterized by problems relating to orgasm, not desire.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

2. The nurse is caring for a client who was accused of voyeurism by his neighbors. Which term most appropriately describes such behavior?

1. Paraphilia
2. Depersonalization disorder
3. Dissociative fugue
4. Gender identity disorder

Answer: 1. Paraphilia is a general diagnosis that encompasses such disorders as exhibitionism, fetishism, pedophilia, and voyeurism. Depersonalization disorder is characterized by a feeling of detachment or estrangement from oneself. Dissociative fugue is characterized by sudden, unexpected travel away from home, accompanied by an inability to recall one's past. Gender identity disorder is a separate diagnostic category and isn't related to the paraphilias.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

3. The nurse is caring for a female client who's about to begin thrombolytic therapy for treatment of acute myocardial infarction (MI). When the physician questions the client about her last menstrual period, she becomes embarrassed and asks him to leave the room. She then tells the nurse that she underwent sex-reassignment surgery. What would be the nurse's most appropriate response?

1. "I understand your reluctance to tell the physician, but it may have an impact on your treatment."
2. "Based on client confidentiality, I won't tell the physician if you wish."
3. "Your sex change and your hormones have nothing to do with your heart attack."
4. "Tell me about your sexual preference. Are you attracted to men or women?"

Answer: 1. During the history and physical examination of any female client being screened for thrombolytic therapy, the physician must know about the last menstrual period before the MI. Although not an absolute contraindication to thrombolytics, the possibility of pregnancy or menstruation must be documented. According to the ethics of client confidentiality, information may be shared in a professional manner with those who require it for the client's care. Hormones are an important factor in the pathogenesis of MI. Estrogen is cardioprotective, while replacement hormones after a sex change operation can have an impact on how prone a person is to MI. The client's sexual preference is of no consequence in this situation.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

4. A 42-year-old client arrives at her physician's office crying. Her husband of 17 years has asked her for a divorce. She admits that recently she has avoided having sexual intercourse with him. Which response by the nurse would be most appropriate when talking with this client?

1. "Please stop crying so that we can discuss your feelings about the divorce."
2. "Once you have intercourse with him, you'll be able to get your relationship back on track."
3. "I can see how upset you are. Let's sit and talk about how you're feeling."
4. "Find a good lawyer who will look out for your interests, and then you'll feel better."

Answer: 3. This response validates the client's distress and provides her the opportunity to talk about her feelings. Because clients in crisis have difficulty making decisions, the nurse must be directive as well as supportive. Option 1 doesn't provide the client with adequate support. Options 2 and 4 don't acknowledge the client's distress. Moreover, clients in crisis can't think beyond the immediate moment, so discussing long-range plans isn't helpful.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

5. A client describes being under a lot of stress recently because of overwhelming demands from work and home. She has lost interest in sexual intercourse, which is placing a strain on her marriage. Based on this information, from which type of sexual dysfunction does the client suffer?

1. Hypoactive sexual desire disorder
2. Sexual aversion disorder
3. Sexual pain disorder
4. Paraphilia

Answer: 1. Hypoactive sexual desire disorder is characterized by deficiency or absence of desire for sexual activity. Sexual aversion disorder is defined as the active avoidance of genital sexual contact. The client with sexual pain disorder experiences genital pain associated with sexual intercourse. Paraphilia is characterized by recurrent, intense sexual urges or fantasies generally involving nonhuman subjects, children, or nonconsenting partners or the degradation, suffering, and humiliation of the client or his partner.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Knowledge

6. The nurse is caring for a client with type 1 diabetes mellitus who's experiencing erectile disorder related to his medical condition. Which statement is true about this sexual dysfunction?

1. It's unrelated to psychosocial problems.
2. It isn't considered a sexual disorder.
3. It isn't likely to cause infertility.
4. It can have an impact on the client's psychosocial well-being.

Answer: 4. Any general medical condition that impairs sexual function has the ability to impact the client's psychosocial well-being as well as the ability to conceive. Regardless of the cause, sexual dysfunction is considered to be a disorder.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

7. A client is diagnosed with erectile disorder. Which drug may be beneficial in treating a client with this disorder?

1. Methyldopa
2. Vardenafil (Levitra)
3. Benazepril (Lotensin)
4. Clonidine (Catapres)

Answer: 2. Vardenafil is indicated for erectile disorder. Methyldopa, benazepril, and clonidine are antihypertensive agents that can cause erectile disorder.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Analysis

8. The nurse is caring for a male client awaiting sex-reassignment surgery. When interacting with this client, it's important that the nurse:

1. discourage the client from undergoing the procedure.
2. demonstrate a nonjudgmental attitude.
3. discuss with the client the option of undergoing hypnosis as an alternative to the surgery.
4. tell the client that his life will be less complicated and more peaceful after the surgery is complete.

Answer: 2. When caring for a client with gender identity disorder, the nurse should demonstrate a nonjudgmental attitude. It's the client's needs and feelings that matter most, not the nurse's opinions. The nurse shouldn't discourage the client's decision to go ahead with the procedure. Hypnosis isn't a treatment for gender identity disorder, and it isn't appropriate for the nurse to suggest alternate treatments to the client. Telling the client his life will be less complicated and more peaceful after surgery offers false reassurance.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

9. Which of the following are examples of paraphilias?

1. Sexual masochism, transvestic fetishism, voyeurism
2. Transvestic fetishism, voyeurism, orgasmic disorders
3. Pedophilia, exhibitionism, orgasmic disorders
4. Dyspareunia, vaginismus, sexual sadism

Answer: 1. All the choices presented in option 1 are paraphilias. Dyspareunia, vaginismus, and orgasmic disorders aren't types of paraphilias.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

10. A 14-year-old male client who prefers to dress in female clothing is brought to the psychiatric crisis room by his mother. The client's mother states, "He's always dressing in female clothing. There must be something wrong with him." Which of the following responses from the nurse is most appropriate?

1. "Your son will be evaluated shortly."
2. "I will explain to your son that his behavior isn't appropriate."
3. "I see you're upset. Would you like to talk?"
4. "You're being judgmental. There's nothing wrong with a boy wearing female clothing."

Answer: 3. Acknowledging the mother's feelings and offering her an opportunity to verbalize her concerns provides a forum for open communication. Telling the client's mother that her son will be evaluated shortly doesn't address the mother's concerns. Telling the client that his behavior is inappropriate isn't therapeutic. The nurse shouldn't offer an opinion regarding whether the client's behavior is acceptable.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

21 Eating disorders

In this chapter, you'll review:

- basic facts about eating disorders
- common tests used to diagnose eating disorders
- patient care for anorexia nervosa and bulimia nervosa.

Brush up on key concepts

Eating disorders are characterized by severe disturbances in eating behaviors. The two most common disorders, anorexia nervosa and bulimia nervosa, put the patient at risk for severe cardiovascular and GI complications and can ultimately result in death.

Patients with these disorders exhibit severe disturbances in body image and self-perception. Their behavior may include self-starvation, binge eating, and purging. The causes of eating disorders aren't fully understood.

At any time, you can review the major points of each disorder by consulting the *Cheat sheet* on page 454.

Polish up on patient care

Here's a review of anorexia nervosa and bulimia nervosa, the two most common eating disorders.

Anorexia nervosa

With anorexia nervosa, the patient deliberately starves herself or engages in binge eating and purging. A patient with anorexia nervosa always views herself as overweight no matter how low her actual weight is. A key clinical finding is a refusal to sustain weight at or above minimum requirements for the patient's age and height. If left untreated, anorexia nervosa may cause the patient's death.

CONTRIBUTING FACTORS

- Age (most prominent in adolescents)
- Distorted body image
- Gender (primarily affects females)
- Genetic predisposition
- Low self-esteem
- Neurochemical changes
- Poor family relations
- Poor self-esteem
- Preoccupation with weight and dieting
- Sexual abuse

DATA COLLECTION FINDINGS

- Amenorrhea, fatigue, loss of libido, infertility
- Body image disturbance
- Cognitive distortions, such as overgeneralization, dichotomous thinking, or ideas of reference
- Compulsive behavior, especially exercising
- Decreased blood volume, evidenced by lowered blood pressure and orthostatic hypotension
- Dependence on others for self-worth
- Electrolyte imbalance, evidenced by muscle weakness, seizures, or arrhythmias
- Emaciated appearance
- GI complications, such as constipation or laxative dependence
- Guilt associated with eating
- Impaired decision making
- Lanugo
- Laxative or diuretic abuse
- Need to achieve and please others
- Obsessive rituals concerning food
- Overly compliant attitude
- Perfectionist attitude
- Refusal to eat

DIAGNOSTIC FINDINGS

- Eating Attitude Test suggests an eating disorder.

Cheat sheet

Eating disorders refresher

ANOREXIA NERVOSA

Key signs and symptoms

- Decreased blood volume, evidenced by lowered blood pressure and orthostatic hypotension
- Electrolyte imbalance, evidenced by muscle weakness, seizures, or arrhythmias
- Emaciated appearance
- Need to achieve and please others
- Obsessive rituals concerning food
- Refusal to eat

Key test results

- Eating Attitude Test suggests eating disorder.
- Electrocardiogram reveals nonspecific ST-segment changes and a prolonged PR interval.
- Laboratory tests show elevated blood urea nitrogen level and electrolyte imbalances.
- Female patients exhibit low estrogen levels.
- Male patients exhibit low serum testosterone levels.

Key treatments

- Individual therapy
- Nutritional counseling
- Antianxiety agents: lorazepam (Ativan), alprazolam (Xanax)
- Antidepressants: amitriptyline (Elavil), imipramine (Tofranil)
- Selective serotonin reuptake inhibitors (SSRIs): paroxetine (Paxil), fluoxetine (Prozac)

Key interventions

- Contract for specific amount of food to be eaten at each meal.
- Provide one-on-one support before, during, and after meals.
- Prevent the patient from using the bathroom for 2 hours after eating.
- Help the patient identify coping mechanisms for dealing with anxiety.
- Weigh the patient once or twice a week at the same time of day using the same scale.
- Help the patient understand the anorectic cycle.

BULIMIA NERVOSA

Key signs and symptoms

- Alternating episodes of binge eating and purging
- Constant preoccupation with food
- Disruptions in interpersonal relationships
- Eroded tooth enamel
- Extreme need for acceptance and approval
- Irregular menses
- Russell's sign (bruised knuckles due to induced vomiting)
- Sporadic, excessive exercise

Key test results

- Beck Depression Inventory may reveal depression.
- Eating Attitude Test suggests eating disorder.
- Metabolic acidosis may occur from diarrhea caused by enemas and excessive laxative use.
- Metabolic alkalosis may occur from frequent vomiting.

Key treatments

- Cognitive therapy to identify triggers for binge eating and purging.
- SSRIs: paroxetine (Paxil), fluoxetine (Prozac)

Key interventions

- Explain the purpose of a nutritional contract.
- Avoid power struggles about food.
- Prevent the patient from using the bathroom for 2 hours after eating.
- Provide one-on-one support before, during, and after meals.
- Weigh the patient once or twice per week at the same time of day using the same scale.
- Help the patient identify the cause of the disorder.
- Point out cognitive distortions.

I can use the *Cheat sheet* to study while I get my exercise!

• Electrocardiogram reveals nonspecific ST-segment changes and a prolonged PR interval.

• Laboratory tests show elevated blood urea nitrogen level and electrolyte imbalances.
• Female patients exhibit low estrogen levels.
• Leukopenia and mild anemia are apparent.

• Male patients exhibit low serum testosterone levels.
• Thyroid hormone levels are low.

NURSING DIAGNOSES
• Imbalanced nutrition: Less than body requirements
• Disturbed body image
• Chronic low self-esteem

TREATMENT
• Behavioral modification
• Group and family therapy
• Individual therapy
• Nutritional counseling

Drug therapy
• Antianxiety agents: lorazepam (Ativan), alprazolam (Xanax)
• Antidepressants: amitriptyline (Elavil), imipramine (Tofranil)
• Selective serotonin reuptake inhibitors (SSRIs): paroxetine (Paxil), fluoxetine (Prozac)

INTERVENTIONS AND RATIONALES
• Contract for a specific amount of food to be eaten at each meal *to avoid conflict between staff members and the patient.*
• Provide one-on-one support before, during, and after meals *to foster a strong nurse-patient relationship and to ensure that the patient is eating.*
• Prevent the patient from using the bathroom for 2 hours after eating *to break the purging cycle.*
• Encourage verbal expression of feelings *to foster open communication about body image.*
• Help the patient identify coping mechanisms for dealing with anxiety *to promote coping techniques.*
• Weigh the patient once or twice per week at the same time of day using the same scale, and be aware of artificial means of increasing weight such as putting heavy objects in pockets *to accurately monitor weight.*
• Help the patient identify and understand the anorectic cycle *to prevent future anorectic behavior.*
• Discuss the patient's perception of her appearance. Explain that she has a right to think of herself as beautiful regardless of how she compares with others *to build self-esteem.*
• Discuss the patient's progress with her *to increase awareness of achievements and promote continued effort.*

Teaching topics
• Needing gradual weight gain
• Seeking nutritional support measures
• Knowing treatment options
• Seeking support services and community resources

Bulimia nervosa

Bulimia is characterized by episodic binge eating, followed by purging in the form of vomiting. The patient may also use laxatives, enemas, diuretics, or syrup of ipecac. The patient's weight may remain normal or close to normal. The severity of the disorder depends on the frequency of the binge and purge cycle as well as physical complications. The patient usually views food as a source of comfort.

CONTRIBUTING FACTORS
• History of sexual abuse
• Low self-esteem
• Neurochemical changes
• Poor family relations

DATA COLLECTION FINDINGS
• Alternating episodes of binge eating and purging
• Anxiety
• Avoidance of conflict
• Cognitive distortions, as in anorexia nervosa
• Constant preoccupation with food
• Dental abnormalities such as eroded tooth enamel
• Disruptions in interpersonal relationships
• Dissatisfaction with body image
• Extreme need for acceptance and approval
• Feelings of helplessness
• Focus on changing a specific body part
• Frequent lies and excuses to explain behavior
• Guilt and self-disgust
• Irregular menses
• Perfectionist attitude

- Parotid and salivary gland swelling
- Pharyngitis
- Physiologic problems as in anorexia nervosa (amenorrhea, fatigue, loss of libido, infertility, electrolyte imbalance, GI complications)
- Possible use of amphetamines or other drugs to control hunger
- Problems caused by frequent vomiting
- Repression of anger and frustration
- Russell's sign (bruised knuckles due to induced vomiting)
- Sporadic, excessive exercise

DIAGNOSTIC FINDINGS

- Beck Depression Inventory may reveal depression.
- Eating Attitude Test suggests an eating disorder.
- Metabolic acidosis may occur from diarrhea caused by enemas and excessive laxative use.
- Metabolic alkalosis (the most common metabolic complication) may occur from frequent vomiting.

NURSING DIAGNOSES

- Imbalanced nutrition: Less than body requirements
- Anxiety
- Powerlessness

TREATMENT

- Cognitive therapy to identify triggers for binge eating and purging
- Family therapy

Drug therapy

- SSRIs: paroxetine (Paxil), fluoxetine (Prozac)

Note: Drug therapy is most effective when combined with cognitive therapy.

INTERVENTIONS AND RATIONALES

- Explain the purpose of a nutritional contract *to encourage a dietary change without initiating argument or struggle.*
- Avoid power struggles about food *to keep the focus on establishing and maintaining a positive self-image and self-esteem.*
- Prevent the patient from using the bathroom for 2 hours after eating *to help the patient avoid purging behavior.*
- Provide one-on-one support before, during, and after meals *to monitor and assist the patient with eating.*
- Encourage the patient to express her feelings *to facilitate conversation and promote understanding.*
- Weigh the patient once or twice per week at the same time of day using the same scale *to monitor weight.* Be aware of artificial means of increasing weight such as putting heavy objects in pockets.
- Help the patient identify the cause of the disorder *to help her gain understanding and work toward wellness.*
- Point out cognitive distortions *to help identify sources of the problem.*
- Discuss the patient's perception of her appearance. Explain that she has a right to think of herself as beautiful regardless of how she compares with others *to build self-esteem.*
- Discuss the patient's progress with her *to increase awareness of achievements and promote continued effort.*

Teaching topics

- Needing to gain weight gradually
- Knowing treatment options
- Seeking support services and community resources

Pump up on practice questions

1. The nurse is caring for a client who's deliberately starving herself to become as thin as possible. What's the appropriate diagnosis for this client?

1. Anorexia nervosa
2. Eating disorder
3. Bulimia nervosa
4. Genu valgum

Answer: 1. The scenario describes anorexia nervosa. The term *eating disorder* encompasses both anorexia nervosa and bulimia nervosa. Bulimia nervosa is episodic binge eating and purging. Genu valgum is the medical term for "knock knees."

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

2. The nurse is monitoring a client diagnosed with anorexia nervosa. In addition to monitoring the client's eating, the nurse should perform which action after meals?

1. Weigh the client.
2. Prevent the client from using the bathroom for 2 hours after eating.
3. Tell the client to lie down for 2 hours after eating.
4. Instruct the client to get plenty of exercise.

Answer: 2. After observing the client while she eats, the nurse should prevent the client from using the bathroom for at least 2 hours to break the purging cycle. The client should be weighed once or twice per week but not after a meal has been consumed. Exercise should be restricted until the client has shown adequate weight gain, and then it should be encouraged in moderation. It isn't necessary for the client to lie down for 2 hours after eating.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

3. The nurse is caring for a client who has been binge eating. Which description of the client's behavior is most appropriate?

1. The client has been slowly consuming a large amount of food over 3 hours.
2. The client has been rapidly consuming a large amount of food.
3. The client became extremely hungry and then consumed a large amount of food.
4. The client is extremely thin but still highly concerned about her weight.

Answer: 2. Binge eating is the rapid consumption of a large amount of food over a given period. Hunger doesn't directly affect binge eating associated with mental health disorders. Bulimic people aren't necessarily thin; in fact, they're usually of normal body size and, in many cases, slightly overweight before onset of the disorder.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

4. The nurse is caring for a client with bulimia. What physical findings would the nurse expect?

1. Parotid and salivary gland swelling, pharyngitis
2. Facial ecchymoses, bruised knuckles, and excessive torso fat stores
3. Depression, parotid gland swelling
4. Depression, bruised knuckles

Answer: 1. All findings listed, except excessive torso fat, are characteristic of bulimic clients. Depression, however, is a psychosocial—not a physical—finding.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

5. The nurse is caring for a client diagnosed with bulimia and notices Russell's sign. What finding did the nurse observe?

1. Dental enamel erosions
2. Facial ecchymoses
3. Pharyngitis
4. Bruised knuckles

Answer: 4. Bulimic clients commonly have bruised knuckles due to self-induced vomiting. This is called Russell's sign.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

6. The nurse is caring for a client who has bulimia. What would be the most common metabolic complication for this client?

1. Metabolic alkalosis
2. Respiratory alkalosis
3. Respiratory acidosis
4. Metabolic acidosis

Answer: 1. With repeated emesis, the client loses stomach acids, thus becoming alkalotic. Respiratory pH disturbances aren't directly related to bulimia.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

7. The nurse is caring for a client who has bulimia. Which treatment option is most effective?

1. Antidepressants
2. Cognitive therapy
3. Antidepressants and cognitive therapy
4. Total parenteral nutrition and antidepressants

Answer: 3. The combined approach of antidepressants and cognitive therapy has been effective, even when clients don't present with depression. Total parenteral nutrition isn't indicated.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

8. The nurse is caring for several clients who have eating disorders. Based on appearance, how would the nurse distinguish bulimic clients from anorectic clients?

1. By their teeth
2. By body size and weight
3. By looking for Mallory-Weiss tears
4. The clients are indistinguishable upon physical examination

Answer: 2. Behaviors of the anorectic client and the bulimic client are commonly similar, especially because both implement rituals to lose weight; however, the bulimic client tends to eat much more, because of the binge episodes, and therefore can be of near-normal weight. Not all persons with the purge disorder have loss of enamel on teeth, especially if the disorder has developed recently. Mallory-Weiss tears are small tears in the esophageal mucosa caused by forceful vomiting, but they aren't always present in bulimic clients.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

9. The nurse is caring for a bulimic client and an anorectic client. What cognitive characteristics would be similar in these clients?

1. Perfectionism, preoccupation with food
2. Relaxed personality, preoccupation with food
3. No similarities
4. Preoccupation with exercise

Answer: 1. Cognitive distortions are similar in both disorders and includes an attitude of perfectionism and a preoccupation with food. Rarely do people with eating disorders have relaxed personalities. The anorectic client is more likely than the bulimic client to overexercise for weight control.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

10. The nurse is caring for a client who has an eating disorder. Which nursing interventions would be appropriate for this client?

1. Weigh the client once or twice per week, and contract for amount of food to be eaten.
2. Weigh the client daily, and allow the client to use the bathroom one-half hour after eating.
3. Provide one-on-one support before meals.
4. Contract amount of food to be eaten, and weigh the client twice daily.

Answer: 1. Weighing the client more often than once or twice per week reinforces the the client's excessive emphasis on weight. Contracting for a specific amount of food to be eaten at each meal encourages dietary change without conflict. The client shouldn't be allowed to use the bathroom for at least 2 hours after eating without supervision. One-on-one support for the client must be undertaken before, during, and after meals—not just before meals.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

Pump up on more practice questions

1. The nurse is caring for a client who's sarcastic and critical and often expresses feelings that are the opposite of what he's actually feeling. This client is exhibiting which type of behavior?

1. Passive
2. Aggressive
3. Passive-aggressive
4. Assertive

Answer: 3. A passive-aggressive person is often sarcastic and critical and expresses feelings that are the opposite of what he actually feels. He defends his rights through resistance. The goal is to dominate through retaliation. Passive behavior is characterized by denying one's own rights to please others. Aggressive behavior is characterized by trying to violate the rights of others and control them through humiliation. Assertive behavior is characterized by honest, direct assertion of one's rights through effective communication.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

2. The nurse is teaching a client about the antidepressant drug fluoxetine (Prozac). Which statement is true of this drug?

1. The therapeutic effect may not be seen for 3 to 4 weeks.
2. Fluoxetine doesn't cause orthostatic hypotension.
3. Fluoxetine should be stopped immediately if adverse reactions occur.
4. The client should avoid exposure to the sun because of photosensitivity reactions.

Answer: 1. Effects of fluoxetine may not be seen for 3 to 4 weeks after the initiation of therapy. Clients taking fluoxetine should be warned to move from a sitting to a standing position very slowly because of the risk of orthostatic hypotension. Fluoxetine shouldn't be stopped abruptly by the client unless advised by the physician. Fluoxetine doesn't cause photosensitivity.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Knowledge

Feel like taking a swing at these 30 practice questions on psychiatric care? Go for it!

3. The nurse is teaching a client receiving a monoamine oxidase inhibitor (MAOI) about his drug therapy. The client demonstrates understanding by expressing the need to avoid tyramine-containing foods and stating that even moderate amounts of tyramine must be avoided to prevent hypertensive crisis. The nurse asks the patient to list specific tyramine-containing foods. The client would be correct in naming which of the following foods?

1. Swiss cheese
2. Cream cheese
3. Milk
4. Ice cream

Answer: 1. Fermented, aged, or smoked foods tend to be high in tyramine and should be avoided. Cream cheese, milk, and ice cream are unfermented milk products that may be taken with MAOIs without incident.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

4. When caring for a client who's receiving lithium, the nurse should monitor the client for which adverse effect?

1. Hypertension
2. Fine hand tremors
3. Weight loss
4. Fluid retention

Answer: 2. Fine hand tremors are an adverse effect of lithium therapy that may require a dosage adjustment. Other adverse effects include hypotension, weight gain, polyuria, and dehydration. Hypertension, weight loss, and fluid retention aren't adverse effects associated with lithium therapy.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Knowledge

5. A client on antipsychotic drugs begins to exhibit bizarre facial and tongue movements. Based on these findings, the client is most likely exhibiting signs and symptoms of which disorder?

1. Akinesia
2. Pseudoparkinsonism
3. Tardive dyskinesia
4. Oculogyric crisis

Answer: 3. Clients who are on long-term antipsychotic therapy are at risk for tardive dyskinesia, which causes bizarre facial and tongue movements. Symptoms are potentially irreversible. Pseudoparkinsonism may also occur in clients on antipsychotic drugs; signs and symptoms include drooling and a shuffling gait. Akinesia causes symptoms much like those of pseudoparkinsonism. Both are extrapyramidal adverse effects. Oculogyric crisis is uncontrolled rolling back of the eyes, which sometimes occurs in epidemic encephalitis or postencephalitic parkinsonism.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

6. Electroconvulsive therapy (ECT) is most effective in treating which disorder?

1. Schizophrenia
2. Major depression
3. Dissociative disorder
4. Seizure disorder

Answer: 2. ECT is most effective in clients with major depression, especially those with associated psychosis. Treatment is initiated only after drug therapy has been unsuccessful. ECT is sometimes effective in inducing remission in clients with schizophrenia. ECT isn't effective in treating dissociative disorder or seizure disorder. Brief seizure activity occurs during ECT.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Knowledge

7. When preparing the client and his family for ECT, the nurse should alert them about which adverse effect?

1. Permanent memory loss
2. Temporary memory loss
3. Brain damage
4. Increased intracranial pressure

Answer: 2. Temporary memory loss and confusion commonly occur in clients who have undergone ECT. These effects may last for weeks or months. Permanent memory loss, brain damage, and increased intracranial pressure aren't adverse effects of ECT.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

8. Which nursing diagnosis would be most appropriate for a client who has undergone the full course of ECT?

1. *Impaired verbal communication related to the effects of ECT*
2. *Noncompliance related to knowledge deficit*
3. *Disturbed thought processes related to adverse effects of ECT*
4. *Fear related to the unknown*

Answer: 3. Because memory loss is a common adverse effect of ECT, disturbed thought processes is the most appropriate nursing diagnosis for this client. Impaired verbal communication isn't an effect of ECT. Noncompliance isn't an appropriate diagnosis for a client who has undergone a full course of therapy. Fear related to the unknown would be an appropriate diagnosis for the client before ECT.

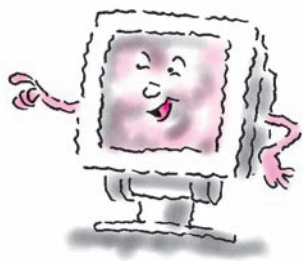
Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

9. Which nursing intervention is most appropriate when planning care for a client with anorexia nervosa?

1. Have the client weigh herself and record her weight.
2. Have the client record her food intake herself after she has eaten.
3. Remain with the client during mealtimes and observe her for 2 hours after eating.
4. Recommend that the client not eat snacks so that she'll be able to eat at mealtime.

Answer: 3. Clients with eating disorders require supervision during and after meals to ensure that the client eats and doesn't try to vomit after eating. The client may record her weight, but the nurse must be present to weigh the client to ensure that the weight is recorded accurately. The client may record her intake but the nurse must be present during the meal to ensure that the intake is recorded correctly. The nurse should leave snacks for the client so food is always available.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application



10. The nurse is evaluating an elderly client for dementia. Which of the following is a primary symptom of dementia?

1. Psychosis
2. Memory loss
3. Neurosis
4. Loss of impulse control

Answer: 2. Memory loss is the primary symptom of dementia. Loss of short-term memory (retaining new information) is more common, but long-term memory (recollection of events that occurred in the past) may also be affected. Psychosis, neurosis, and loss of impulse control aren't symptoms of dementia.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

11. Which intervention by the nurse takes top priority when caring for a client with dementia?

1. Providing foods that are easy to eat
2. Providing the opportunity for rest and sleep
3. Keeping the incontinent client clean and dry
4. Creating a safe environment

Answer: 4. Client safety takes top priority when caring for the client with dementia. Providing foods that are easy to eat, providing rest and sleep, and keeping the incontinent client clean and dry are all important when caring for the client with dementia, but client safety takes top priority.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

12. The nurse is caring for a client with alcohol dependence. When talking to the client about his treatment options, the nurse states that the most effective treatment for alcohol dependence is:

1. attending Alcoholics Anonymous (AA).
2. psychotherapy.
3. limiting alcohol consumption to one drink each day.
4. total abstinence.

Answer: 4. Total abstinence is the most effective treatment for alcohol dependence. Psychotherapy and AA are effective ways to help the client maintain total abstinence.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

13. An alcohol-dependent client is admitted for evaluation of depression. Because the client has no access to alcohol, the nurse should observe for which early signs and symptoms of alcohol withdrawal?

1. Hypotension and agitation
2. Seizures and nausea
3. Anxiety, nausea, and insomnia
4. Violent behavior and tachycardia

Answer: 3. Initial signs and symptoms of alcohol withdrawal include anxiety, nausea, tachycardia, fever, agitation, and insomnia. As symptoms progress, the client may experience hallucinations, increased blood pressure, excessive sweating, and seizures. If untreated, this syndrome can cause serious medical complications, such as pneumonia, fluid and electrolyte imbalance, and dehydration. Hypotension and violent behavior aren't early signs and symptoms of alcohol withdrawal.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

14. Which of the following is a true statement about cocaine?

1. Cocaine is sometimes prescribed for weight control.
2. Cocaine can only be inhaled or injected.
3. Effects of cocaine last for 1 to 8 hours.
4. Cocaine is occasionally used as a local anesthetic.

Answer: 4. Cocaine is occasionally used as an anesthetic before nasal surgery. It isn't prescribed for weight control. Individuals who abuse cocaine may inject it I.V., inhale it, or smoke it. Cocaine's duration of action is 15 minutes to 2 hours.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Knowledge

15. A client with a history of alcohol abuse successfully completes a few days of abstinence. The client may benefit from which drug that interferes with the metabolism of the alcohol?

1. Chlordiazepoxide (Librium)
2. Diazepam (Valium)
3. Disulfiram (Antabuse)
4. Sertraline (Zoloft)

Answer: 3. Disulfiram interferes with alcohol metabolism, causing the client to experience a throbbing headache, tachycardia, tachypnea, and sweating within 5 to 15 minutes of alcohol consumption. Nausea and vomiting may follow within an hour. Chlordiazepoxide and diazepam are antianxiety drugs that are sometimes used to ease the client through the withdrawal process. Sertraline is indicated for the treatment of depression.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Knowledge

16. The nurse is caring for a client with Wernicke's encephalopathy. When developing a teaching plan for the client and his family, the nurse should stress the importance of including which vitamin in his diet?

1. Niacin
2. Riboflavin
3. Ascorbic acid
4. Thiamine

Answer: 4. Wernicke's encephalopathy, a neurologic disorder seen in clients with chronic alcohol abuse, results from thiamine deficiency. The client should be encouraged to eat a diet rich in thiamine. Niacin, riboflavin, and ascorbic acid deficiencies aren't implicated in Wernicke's encephalopathy.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

17. A client with alcohol dependence has completed a rehabilitation program and now attends AA meetings three times per week. Which statement by the client best reflects an understanding of AA's philosophy?

1. "I have to attend these meetings until I can control my drinking."
2. "The organization will see that I get therapy if I begin to drink again."
3. "AA will help me remain sober."
4. "AA will help me find shelter and a job."

Answer: 3. AA is a self-help organization that helps attendees maintain sobriety through mutual support. Total abstinence is the most effective treatment for alcohol abuse. Social drinking isn't possible for the alcoholic. AA doesn't provide therapy, shelter, or jobs.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

18. The nurse is interviewing a client admitted to the facility with a diagnosis of schizophrenia. The client states, "I run apple, train, grass, window." This response by the client is known as:

1. echopraxia.
2. a word salad.
3. flight of ideas.
4. a neologism.

Answer: 2. A word salad is an illogical word grouping. Echopraxia is an involuntary repetition of movements. Flight of ideas is a rapid succession of unrelated ideas. Neologisms are bizarre words that have meaning only to the client.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Knowledge

19. The nurse is caring for a client who exhibits magical thinking. Which best describes magical thinking?

1. Strong positive and negative feelings that cause conflict
2. Returning to earlier developmental stage
3. Meaningless repetition of words
4. The belief that thoughts or wishes can control other people or events

Answer: 4. When a client exhibits magical thinking, he believes that his thoughts or wishes can control others or events. For example, the client may believe that through wishing he can make a plane fall from the sky. Ambivalence is the coexistence of positive and negative thoughts. Returning to an earlier stage of development is termed regression. A meaningless repetition of words is called echolalia.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

20. A client tells the nurse that he can't eat because his food has been poisoned. This statement is an indication of which of the following?

1. Paranoia
2. Delusion of persecution
3. Hallucination
4. Illusion

Answer: 1. Paranoia is described as extreme suspicion of others and their intentions. Delusions of persecution are feelings that others intend harm or persecution. A hallucination is a false sensory perception associated with real external stimuli. Illusions are misperceptions of real external stimuli.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

21. A client tells the nurse that a voice keeps telling him to crawl on his hands and knees like a dog. Which response by the nurse is the most appropriate for this client?

1. "They're just imaginary voices and they'll go away."
2. "If it makes you feel better, do what the voices tell you."
3. "I don't hear them, but I understand that you do."
4. "Even though I don't hear the voices, I understand that you do."

Answer: 4. By telling the client that she doesn't hear the voices, the nurse lets the client know that the voices aren't real to her. The nurse follows with a validation of the client's statement that opens a line of communication and encourages the client to talk about his hallucinations. Options 1 and 2 are nontherapeutic communications that invalidate the client's statement. By using the words "they" and "them" in describing the voices, the nurse is reinforcing the client's perception that they actually exist.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

22. During the admission process, a client who has a panic disorder begins to hyperventilate and says, "I'm going to die if I don't get out of here right now!" Which response by the nurse would be best?

1. "Just calm down. You're getting overly anxious."
2. "What do you think is causing your panic attack?"
3. "You can rest alone in your room until you feel better."
4. "You're having a panic attack. I'll stay here with you."

Answer: 4. During a panic attack, the nurse's best approach is to orient the client to what's

happening and provide reassurance that the client won't be left alone. The client's anxiety level is likely to increase—and the panic attack is likely to continue—if the client is told to calm down, asked the reasons for the attack, or left alone.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

23. A client is admitted to the hospital in the manic phase of bipolar disorder. When placing a diet order for the client, which foods would be most appropriate?

1. A bowl of soup, crackers, and a dish of peaches
2. A cheese sandwich, carrot sticks, fresh grapes, and cookies
3. Roast chicken, mashed potatoes, and peas
4. A tuna sandwich, an apple, and a dish of ice cream

Answer: 2. The client may have a difficult time sitting long enough to eat his meal; therefore, finger foods that can be eaten easily are most appropriate. The other foods require the client to sit and eat, a task that he'll be unable to perform at this time.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

24. A client with a history of panic attacks seeks to increase social interaction. Each time the client tries to go to the day room, she begins to perspire and becomes short of breath. Which action by the nurse will help ease the client's feelings of panic?

1. Have other clients volunteer to accompany the client.
2. Tell the client she has to overcome her fear.
3. Allow the client to stay in her room.
4. Walk with the client and stay with her while she's in the day room.

Answer: 4. The client may find security in the presence of a trusted person. Her fears are very real and she'll need the emotional support of caring professionals, not other clients, to overcome them. Telling the client she has to overcome her fears minimizes her feelings. Allowing the client to stay in her room doesn't help her overcome her feelings of panic.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

25. During the night, a 50-year-old client with posttraumatic stress disorder wakens shaking and saying that someone is trying to smother him. What's the appropriate response for the nurse in this situation?

1. "It was a bad dream. You're safe. I'll stay here with you until you go back to sleep."
2. "We can talk about it tomorrow. Try to see if you can get back to sleep."
3. "It was only a dream. There's nothing to be frightened about."
4. "I'll call the physician and see whether I can get you medication to help you go back to sleep."

Answer: 1. It's important to help the client feel safe. Staying with him until he can sleep again or listening to him if he wants to talk is the most appropriate action for the nurse to take in this situation. Talking about the dream in the morning won't comfort the client when he's most upset. Stating that it was only a dream trivializes his experience. Calling the physician for a sleeping aid doesn't help the client cope with stress.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

26. A 45-year-old client complains of constant dizziness and weakness. The client has been referred to specialists for evaluation. All tests have been negative. The physician has concluded that the client has a somatic disorder. How should the nurse deal with this client?

1. Review the test results with the client so she understands there's nothing physically wrong with her.
2. Tell the client that if she develops more outside interests she won't focus on her physical symptoms so much.
3. Accept the fact that the physical complaints are real to the client.
4. Ignore the client's complaints.

Answer: 3. The nurse should accept the client's problem despite the fact that it isn't organic. To deny the client's physical complaints is nontherapeutic and prevents the development of a trusting, therapeutic relationship.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

27. The nurse is caring for a client recently diagnosed with borderline personality disorder. Which characteristic is most notable in a client with this disorder?

1. Changes actions quickly and has an intense affect
2. Does a poor job on things that he doesn't like to do
3. Avoids responsibilities by saying that he forgot
4. Resents useful suggestions

Answer: 1. A client with borderline personality disorder can change actions within a matter of minutes, hours, or days and commonly exhibits an intense affective tone such as anger. The other responses are characteristics of passive-aggressive personality disorder.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Knowledge

28. The nurse is performing an admission interview with a client who exhibits signs of antisocial personality disorder. Which behavior pattern is most characteristic of this disorder?

1. The client expresses feelings of being deceived.
2. The client displays hostility toward others.
3. The client displays a general disregard for the rights and feelings of others.
4. The client is suspicious of his friends and relatives.

Answer: 3. The client with antisocial personality disorder exhibits a general disregard for the rights and feelings of others. The other three characteristics are behavior patterns of paranoid personality disorder.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Knowledge

29. A client with borderline personality disorder has been asked to spend 1 hour in his room. The client asks the nurse for permission to go to another client's room to borrow a book. What behavior pattern is this client demonstrating?

1. Manipulation
2. Rationalizing
3. Impulsivity
4. Distancing

Answer: 1. Manipulation is a technique used by the person with borderline personality to achieve whatever result he wants. Rationaliz-

ing is the substitution of acceptable reasons for the actual reasons motivating behavior. Impulsivity is poor impulse control. Distancing is becoming angry and hostile to keep another at a distance.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Knowledge

30. A male client approaches the nurse and says, "Hey cutie, can you take me outside for a smoke?" The nurse is aware that the client isn't supposed to go out to smoke for another 15 minutes. Which response by the nurse is most therapeutic?

1. "Sure, I'm not busy right now."
2. "You can ask the technician. I'm busy right now."
3. "You'll be able to smoke in 15 minutes. Calling me cutie is disrespectful."
4. "You know the rules. It isn't time yet for you to go out to smoke."

Answer: 3. The client's behavior indicates that he has difficulty adhering to limits and respecting boundaries. The nurse must place limits on the client's manipulative behavior. Taking the client outside for a smoke is inappropriate because the nurse is allowing the client to manipulate her. Referring the client to the technician is incorrect because the nurse isn't addressing the client's manipulative behavior. Option 4 is an abrupt response that may cause the client to act defensively.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

Part IV Maternal-neonatal care

22 Antepartum care

In this chapter, you'll review:

- basics of antepartum care
- antepartum tests and procedures
- common antepartum disorders and complications.

Brush up on key concepts

Antepartum care refers to care of a mother before childbirth. Knowledge of the physiologic changes that accompany pregnancy and of fetal development is essential to understanding patient care during the antepartum period.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 472 to 474.

Normal antepartum period

Nursing care during the normal antepartum period includes taking a thorough maternal history, performing a complete physical examination, and educating the patient about antepartum health.

SIGNS AND SYMPTOMS OF PREGNANCY

The patient may experience presumptive, probable, or positive signs of pregnancy.

Could be

Presumptive signs of pregnancy include:

- amenorrhea or slight, painless spotting of unknown cause in early gestation
- breast enlargement and tenderness
- fatigue
- increased skin pigmentation
- nausea and vomiting
- quickening (first recognizable movement of fetus)
- urinary frequency and urgency.

Probably is

Probable signs of pregnancy include:

- ballottement (passive fetal movement in response to tapping of the lower portion of the uterus or cervix)
- Braxton Hicks contractions (painless uterine contractions that occur throughout pregnancy)
- Chadwick's sign (color of the vaginal walls changes from normal light pink to deep violet)
- Goodell's sign (softening of the cervix)
- Hegar's sign (softening of the lower uterine segment) may be present at 6 to 8 weeks' gestation
- positive pregnancy test results
- abdominal enlargement.

Definitely is

Positive signs of pregnancy include:

- detection of fetal heartbeat by electronic doppler (by 10 to 12 weeks' gestation)
- detection of fetal heartbeat by fetoscope (by 17 to 20 weeks' gestation)
- detection of fetal movements (after 16 weeks' gestation)
- ultrasonography finding of the fetus (as early as 6 weeks' gestation).

PHYSIOLOGIC ADAPTATIONS

Here's a review of how body systems adapt to pregnancy.

My ever changin' heart

Cardiovascular system changes include:

- cardiac hypertrophy from increased blood volume and cardiac output
- displacement of the heart upward and to the left from pressure on the diaphragm
- progressive increase in blood volume, peaking in the third trimester at 40% to 50% of levels before pregnancy

(Text continues on page 474.)

Cheat sheet

Antepartum care refresher

ACQUIRED IMMUNODEFICIENCY SYNDROME

Key signs and symptoms

- Diarrhea
- Fatigue
- Kaposi's sarcoma
- Mild flulike symptoms
- Opportunistic infections, such as toxoplasmosis, oral and vaginal candidiasis, herpes simplex, *Pneumocystis carinii,* and *Candida* esophagitis
- Weight loss

Key test results

- $CD4^+$ T-cell level is less than 200 cells/µl.
- Enzyme-linked immunosorbent assay shows positive human immunodeficiency virus antibody titer.
- Western blot test is positive.

Key treatments

- If patient is newly diagnosed, zidovudine (Retrovir) or didanosine (Videx) treatment initiated between weeks 14 and 34 of gestation

Key interventions

- Determine whether the patient will be able to care for her infant after delivery.

ADOLESCENT PREGNANCY

Key signs and symptoms

- Denial of pregnancy, which may deter the patient from seeking medical attention early in pregnancy

Key test results

- Pregnancy test is positive.

Key treatments

- Diet with caloric intake that supports the growing adolescent and her developing fetus

Key interventions

- Monitor the patient's weight gain.
- Advise the patient of her options, including terminating the pregnancy, continuing the pregnancy and giving up the infant for adoption, and continuing the pregnancy and keeping the infant.

DIABETES MELLITUS

Key signs and symptoms

- Glycosuria
- Ketonuria
- Polyuria

Key test results

Gestational diabetes is diagnosed if the patient has two or more of the following results:

- Fasting blood sugar level equals or exceeds 95 mg/dl
- Three-hour glucose tolerance test reveals 1-hour level at or above 180 mg/dl
- Three-hour glucose tolerance test reveals 2-hour level at or above 155 mg/dl
- Three-hour glucose tolerance test reveals 3-hour level at or above 140 mg/dl.

Key treatments

- 1,800- to 2,200-calorie diet divided into three meals and three snacks; diet should also include low fat and cholesterol and high fiber
- Administration of insulin or glyburide (DiaBeta) after the first trimester

Key interventions

- Encourage adherence to dietary regulations.
- Encourage the patient to exercise moderately.
- Prepare the patient for antepartum fetal surveillance testing, including oxytocin challenge testing, nipple stimulation stress testing, amniotic fluid index, biophysical profile, and nonstress test.

ECTOPIC PREGNANCY

Key signs and symptoms

- Irregular vaginal bleeding and dull abdominal pain on the affected side early in pregnancy
- Positive Cullen's sign (bluish discoloration around the umbilicus)
- Rupture of tubes, causing sudden and severe abdominal pain, syncope, and referred shoulder pain as the abdomen fills with blood

Key test results

- Human chorionic gonadotropin (HCG) titers are abnormally low when compared to a normal pregnancy.

Don't forget, pregnancy itself is NOT a disorder. Effective nursing care usually involves listening to and reassuring healthy mothers.

Antepartum care refresher *(continued)*

ECTOPIC PREGNANCY *(continued)*

Key treatments

- Laparotomy to ligate the bleeding vessels and remove or repair damaged fallopian tube
- If the tube hasn't ruptured, methotrexate (Trexall) followed by leucovorin (Wellcovorin) to stop the trophoblastic cells from growing (therapy continues until negative HCG levels are achieved)

Key interventions

- Monitor for signs of rupturing ectopic pregnancy, such as severe abdominal pain, orthostatic hypotension, tachycardia, and dizziness.
- Maintain I.V. fluid replacement.
- Monitor blood product administration.

HEART DISEASE

Key signs and symptoms

- Crackles at the base of the lungs
- Diastolic murmur at the heart's apex
- Dyspnea
- Fatigue
- Tachycardia

Key test results

- Echocardiography, electrocardiography, and chest X-ray may reveal cardiac abnormalities, arrhythmias, impaired cardiac function, increased workload on the heart, and cardiovascular decompensation.

Key treatments

For class III and class IV disease

- Anticoagulants such as heparin
- Antiarrhythmics, such as digoxin (Lanoxin), procainamide (Pronestyl), and beta-adrenergic blockers
- Thiazide diuretics and furosemide (Lasix) to control heart failure if activity restriction and reduced sodium intake don't prevent it

Key interventions

- Monitor cardiovascular and respiratory status.
- Administer oxygen by nasal cannula or face mask during labor.
- Position the patient on her left side with her head and shoulders elevated during labor.

HYDATIDIFORM MOLE

Key signs and symptoms

- Intermittent or continuous bright red or brownish vaginal bleeding by the 12th week of gestation
- Absence of fetal heart tones

Key test results

- HCG levels are much higher than normal.
- Ultrasound fails to reveal a fetal skeleton.

Key treatments

- Therapeutic abortion (suction and curettage) if a spontaneous abortion doesn't occur
- Weekly monitoring of HCG levels until they remain normal for 3 consecutive weeks
- Periodic follow-up for 1 to 2 years because of increased risk of neoplasm

Key interventions

- Monitor vaginal bleeding.
- Send contents of uterine evacuation to the laboratory for analysis.

HYPEREMESIS GRAVIDARUM

Key signs and symptoms

- Continuous, severe nausea and vomiting
- Dehydration
- Oliguria
- Significant weight loss

Key test results

- Arterial blood gas analysis reveals metabolic alkalosis.
- Hemoglobin level and hematocrit are elevated.
- Serum potassium level reveals hypokalemia.

Key treatments

- Restoration of fluid and electrolyte balance

Key interventions

- Monitor fundal height and the patient's weight.
- Provide small, frequent meals.
- Maintain I.V. fluid replacement and total parenteral nutrition.

HYPERTENSION IN PREGNANCY

Key signs and symptoms

Gestational hypertension

- Systolic blood pressure 140 to 159 mm Hg or diastolic blood pressure 90 to 109 mm Hg
- No proteinuria

Preeclampsia

- Systolic blood pressure ≥ 140 mm Hg or diastolic blood pressure ≥ 90 mm Hg
- Proteinuria
- Weight gain more than 2 lb (0.9 kg) per week
- Headaches, blurred vision, hyperreflexia, nausea, vomiting, irritability, cerebral disturbances, and epigastric pain

(continued)

Antepartum care refresher *(continued)*

HYPERTENSION IN PREGNANCY *(continued)*

• Presence of HELLP syndrome (hemolysis, elevated liver enzymes, and low platelet count)

Key test results

• Blood chemistry reveals increased blood urea nitrogen, creatinine, and uric acid levels and elevated liver function studies

Key treatments

• Bed rest in a left lateral position
• Delivery: with mild preeclampsia, when the fetus is mature and safe induction is possible; with severe preeclampsia, regardless of gestational age
• High-protein diet with restriction of excessively salty foods
• With chronic hypertension: methyldopa or labetalol (Trental)
• With severe preeclampsia: hydralazine (Apresoline) or labetalol (Normodyne) to control blood pressure, betamethasone (Celestone) to accelerate fetal lung maturation, and magnesium sulfate to reduce the amount of acetylcholine produced by motor nerves, thereby preventing seizures

Key interventions

For all patients

• Evaluate the patient for edema and proteinuria.
• Maintain seizure precautions in hospitalized patients.
• Encourage bed rest in a left lateral recumbent position.
• Monitor blood pressure.

For severe preeclampsia

• Monitor maternal blood pressure every 4 hours or more frequently if unstable.
• Be prepared to obtain a blood sample for typing and cross-matching.
• Keep calcium gluconate (antidote to magnesium sulfate) nearby for administration at first sign of magnesium sulfate toxicity (elevated serum levels, decreased deep tendon reflexes, muscle flaccidity, central nervous system depression, and decreased respiratory rate and renal function).

MULTIFETAL PREGNANCY

Key signs and symptoms

• More than one set of fetal heart sounds
• Uterine size greater than expected for dates

Key test results

• Alpha-fetoprotein levels are elevated.
• Ultrasonography is positive for multifetal pregnancy.

Key treatments

• Bed rest if early dilation occurs or at 24 to 28 weeks' gestation
• Biweekly nonstress test to document fetal growth, beginning with the 28th week of gestation
• Increased intake of calories, iron, folate, and vitamins
• Ultrasound examinations monthly to document fetal growth

Key interventions

• Monitor fetal heart sounds.
• Monitor maternal vital signs and weight.
• Monitor cardiovascular and pulmonary status.

PLACENTA PREVIA

Key signs and symptoms

• Painless, bright red vaginal bleeding, especially during the third trimester

Key test results

• Early ultrasound evaluation reveals the placenta implanted in the lower uterine segment.

Key treatments

• Depends on gestational age, when first episode occurs, and amount of bleeding
• If gestational age less than 34 weeks, hospitalizing the patient and restricting her to bed rest to avoid preterm labor
• Surgical intervention by cesarean delivery depending on placental placement and maternal and fetal stability

Key interventions

• Avoid rectal or vaginal examinations unless equipment is available for vaginal and cesarean delivery.

• resting pulse rate fluctuations, with increases ranging from 15 to 20 beats/minute at term
• pulmonic systolic and apical systolic murmurs resulting from decreased blood viscosity and increased blood flow
• increased femoral venous pressure caused by impaired circulation from the lower extremities (resulting from the pressure of the enlarged uterus on the pelvic veins and inferior vena cava), which can lead to supine hypotensive syndrome when the patient is in the supine position.

• increased fibrinogen levels (up to 50% at term) from hormonal influences
• increased levels of blood coagulation factors VII, IX, and X, leading to a hypercoagulable state
• increase of about 33% in total red blood cell (RBC) volume in patients taking iron supplements
• increase of about 50% in plasma volume
• hematocrit (HCT) decrease of about 7%
• increase of 12% to 15% in total hemoglobin (Hb) level; this is less than the overall plasma volume increase, thus reducing Hb concentration and leading to physiologic anemia of pregnancy
• leukocyte production equal to or slightly greater than blood volume increase (average leukocyte count is 10,000 to 11,000/µl; peaks at 25,000/µl during labor, possibly through an estrogen-related mechanism).

Cravings and more

GI system changes include:
• gum swelling from increased estrogen levels; gums may be spongy and bleed easily
• lateral and posterior displacement of the intestines
• superior and lateral displacement of the stomach
• delayed intestinal motility and gastric and gallbladder emptying time from smooth-muscle relaxation caused by high placental progesterone levels, causing heartburn
• nausea and vomiting (usually subside after the first trimester)
• hemorrhoids late in pregnancy from venous pressure
• constipation from increased progesterone levels, resulting in increased water absorption from the colon
• displacement of the appendix from McBurney's point (making diagnosis of appendicitis difficult)
• bile saturation with cholesterol and bile stasis due to progesterone's smooth-muscle relaxation effect, sometimes leading to gallstone formation.

Hormonal changes

Endocrine system changes include:
• increased basal metabolic rate (up 25% at term) caused by demands of the fetus and uterus and by increased oxygen consumption
• increased iodine metabolism from slight hyperplasia of the thyroid caused by increased estrogen levels
• slight hyperparathyroidism from increased requirement for calcium and vitamin D
• elevated plasma parathyroid hormone levels, peaking between 15 and 35 weeks' gestation
• enlarged pituitary gland
• increased production of prolactin by the pituitary gland late in pregnancy
• increased estrogen levels and hypertrophy of the adrenal cortex
• increased cortisol levels to regulate protein and carbohydrate metabolism
• possibly decreased maternal blood glucose levels
• decreased insulin production early in pregnancy
• increased production of estrogen, progesterone, and human chorionic somatomammotropin by the placenta and increased levels of maternal cortisol, which reduce the mother's ability to use insulin, thus ensuring an adequate glucose supply for the fetus and placenta.

Altered breathing

Respiratory system changes include:
• increased vascularization of the respiratory tract caused by increased estrogen levels
• shortening of the lungs caused by the enlarging uterus
• upward displacement of the diaphragm by the uterus, causing dyspnea
• increased tidal volume, causing slight hyperventilation
• increased chest circumference (by about 2⅜″ [6 cm])
• altered breathing, with abdominal breathing replacing thoracic breathing as pregnancy progresses
• slight increase (2 breaths/minute) in respiratory rate
• lowered threshold for carbon dioxide due to increased levels of progesterone.

What causes weight gain in pregnancy?

These factors are responsible for the weight gain that occurs during pregnancy:
- fetus (7.5 lb [3.4 kg])
- placenta and membranes (1.5 lb [0.7 kg])
- amniotic fluid (2 lb [0.9 kg])
- uterus (2.5 lb [1.1 kg])
- breasts (3 lb [1.4 kg])
- blood volume (2 to 4 lb [0.9 to 1.8 kg])
- extravascular fluid and fat reserves (4 to 9 lb [1.8 to 4.1 kg])

Everything increases

Metabolic system changes include:
- increased water retention caused by higher levels of steroidal sex hormones, decreased serum protein levels, and increased intracapillary pressure and permeability
- increased levels of serum lipids, lipoproteins, and cholesterol
- increased iron requirements caused by fetal demands
- increased carbohydrate needs
- increased protein retention from hyperplasia and hypertrophy of maternal tissues
- weight gain of 25 to 35 lb (11.3 to 16 kg) (see *What causes weight gain in pregnancy?*).

Is it getting hot in here?

Integumentary system changes include:
- hyperactive sweat and sebaceous glands
- changing pigmentation from the increase of melanocyte-stimulating hormone caused by increased estrogen and progesterone levels (darkened line from symphysis pubis to umbilicus known as linea nigra)
  - darkened nipples, areola, cervix, vagina, and vulva
  - pigmentary changes on nose, cheeks, and forehead known as facial chloasma
- striae gravidarum, commonly known as stretch marks, caused by weight gain and enlarged uterus.

Time to go (often)

Changes to the genitourinary system include:
- dilated ureters and renal pelvis caused by progesterone and pressure from the enlarging uterus, increasing the risk of urinary tract infection
- increased glomerular filtration rate (GFR) and renal plasma flow (RPF) early in pregnancy; elevated GFR until delivery, but a near-normal RPF by term
- increased clearance of urea and creatinine from increased renal function
- decreased blood urea and nonprotein nitrogen values from increased renal function
- glucosuria from increased glomerular filtration without an increase in tubular reabsorptive capacity
- decreased bladder tone, causing urinary urgency and frequency
- increased sodium retention from hormonal influences
- increased dimensions of uterus
- hypertrophied uterine muscle cells (5 to 10 times normal size)
- increased vascularity, edema, hypertrophy, and hyperplasia of the cervical glands
- increased vaginal secretions with a pH of 3.5 to 6.0
- discontinued ovulation and maturation of new follicles
- thickening of vaginal mucosa, loosening of vaginal connective tissue, and hypertrophy of small-muscle cells. (See *Estimating delivery dates and gestational age*.)

Not just pickles and ice cream

Nutritional needs also change during pregnancy. For example:
- Calorie requirements during pregnancy exceed prepregnancy needs by 300 calories/day (from 2,100 to 2,400 kcal/day).
- Protein requirements during pregnancy exceed prepregnancy needs by 30 g/day (from 46 to 76 g/day).
- Intake of all vitamins should increase, and a prenatal vitamin is recommended.
- Folic acid intake is particularly important to help prevent fetal anomalies such as neural tube defect. Intake should be increased from

Memory jogger

For pregnant patients, remember 3, 12, 12:

Maternal weight gain is commonly estimated at 3, 12, and 12 pounds for the first, second, and third trimesters.

Estimating delivery dates and gestational age

- Nägele's rule determines the estimated date of delivery by subtracting 3 months from the first day of the last menses and adding 7 days; for example, October 5 − 3 months = July 5 + 7 days = July 12.
- Quickening is described as light fluttering fetal movement felt by the mother and is usually felt between 16 and 22 weeks' gestation.
- Fetal heart sounds can be detected with a Doppler ultrasound at 10 to 12 weeks' gestation and can be auscultated with a fetoscope at 16 to 20 weeks'.
- Fetal crown-to-rump measurements, determined by ultrasonography, can be used to assess the fetus's age until the head can be defined.
- Biparietal diameter is the widest transverse diameter of the fetal head. Measurements can be made by about 12 to 13 weeks' gestation.
- McDonald's rule uses fundal height in centimeters to determine the duration of pregnancy in weeks. To use this rule, place a tape measure at the symphysis pubis and measure up and over the fundus. Fundal height in centimeters × ⅞ = duration of pregnancy in weeks.

400 to 800 mg/day. Dietary sources of folic acid include green, leafy vegetables and whole-grain breads.
- Intake of all minerals, especially iron, should be increased. (See *Battling discomforts of pregnancy*, page 478.)
- Intake of fiber and fluid should be increased.

Fetal development and structures

Structures unique to the fetus include fetal membranes, the umbilical cord, the placenta, and amniotic fluid.

His and her cells

Intrauterine development begins with **gametogenesis,** the production of specialized sex cells called gametes.
- The male gamete (spermatozoon) is produced in the seminiferous tubules of the testes during spermatogenesis.
- The female gamete (ovum) is produced in the graafian follicle of the ovary during oogenesis.
- As gametes mature, the number of chromosomes they contain is halved (through meiosis) from 46 to 23.

The moment of truth

Conception, or fertilization, occurs with the fusion of a spermatozoon and an ovum (oocyte) in the ampulla of the fallopian tube.
- The fertilized egg is called a **zygote.**
- The diploid number of chromosomes (a pair of each chromosome; 44 autosomes and 2 sex chromosomes) is restored when the zygote is formed.
- A male zygote is formed if the ovum is fertilized by a spermatozoon carrying a Y chromosome.
- A female zygote is formed if the ovum is fertilized by a spermatozoon carrying an X chromosome.

A place to stay

Implantation occurs when the cellular wall of the blastocyst (trophoblast) implants itself in the endometrium of the anterior or posterior fundal region, about 7 to 9 days after fertilization.
- Primary villi appear within weeks after implantation.
- After implantation, the endometrium is called the decidua.

The beginning of the placenta

During **placental formation,** chorionic villi invade the decidua and become the fetal portion of the future placenta. By the 4th week of gesta-

Attending to the patient's increased nutritional needs can help prevent complications. Nutritional care is especially important for pregnant adolescents.

Battling discomforts of pregnancy

Education plays an important role in helping the patient deal with discomforts.

FIRST-TRIMESTER DISCOMFORTS

Nausea and vomiting

Symptoms may occur at any time during pregnancy but are most prevalent during the first trimester. Teach the patient to avoid greasy, highly seasoned foods; to eat small, frequent meals; and to eat dry toast or crackers before arising in the morning. Instruct the patient to rise slowly from a lying or sitting position.

Nasal stuffiness, discharge, or obstruction

Advise the patient to use a cool-mist vaporizer.

Breast enlargement and tenderness

Tell the patient to wear a well-fitting support bra.

Urinary frequency and urgency

Instruct the patient to decrease fluid intake in the evening to prevent nocturia; to avoid caffeine-containing fluids; and to respond to the urge to void immediately to prevent bladder distention and urinary stasis. Also teach the patient how to perform Kegel exercises, and tell her to promptly report signs of urinary tract infections.

Fatigue

Tell the patient to rest periodically throughout the day and to get at least 8 hours of sleep each night.

Increased leukorrhea

Advise the patient to bathe daily and wear absorbent cotton underwear.

SECOND- AND THIRD-TRIMESTER DISCOMFORTS

Heartburn

Encourage the patient to eat small, frequent meals; avoid fatty or fried foods; remain upright for at least 1 hour after eating; and use antacids that don't contain sodium bicarbonate.

Constipation

Encourage the patient to exercise daily, increase fluid and dietary fiber intake, and maintain regular elimination patterns.

Hemorrhoids

Tell the patient to avoid constipation, prolonged standing, and constrictive clothing, and advise her to use topical ointments, warm soaks, and anesthetic ointments to relieve symptoms.

Backache

Teach the patient how to use proper body mechanics and maintain good posture. Also tell her to avoid wearing high heels.

Leg cramps

Instruct the patient to increase calcium and phosphorus intake, frequently rest with legs elevated, wear warm clothing and, during a leg cramp, pull the toes up toward the leg while pressing down on the knee.

Shortness of breath

Encourage the patient to maintain proper posture, especially when standing, and to sleep in semi-Fowler's position.

Ankle edema

Advise the patient to wear loose-fitting garments, elevate the legs during rest periods, and ensure dorsiflexion of the feet if standing or sitting for prolonged periods.

Insomnia

Encourage the patient to use relaxation techniques. Tell her to lie on her left side, using pillows to support her legs and abdomen.

tion, a normal fetus begins to show noticeable signs of growth.

Fetal linings

Two fetal membranes are unique to the fetus:

- The **chorion** is the fetal membrane closest to the uterine wall; it gives rise to the placenta.
- The **amnion** is the thin, tough, inner fetal membrane that lines the amniotic sac.

Construction under way

Embryonic germ layers generate these fetal tissues:

- The **ectoderm** generates the epidermis, nervous system, pituitary gland, salivary

glands, optic lens, lining of the lower portion of the anal canal, hair, and tooth enamel.
• The **endoderm** generates the epithelial lining of the larynx, trachea, bladder, urethra, prostate gland, auditory canal, liver, pancreas, and alimentary canal.
• The **mesoderm** generates the connective and supporting tissues; the blood and vascular system; the musculature; teeth (except enamel); mesothelial lining of the pericardial, pleural, and peritoneal cavities; and kidneys and ureters.

The lifeline

The **umbilical cord** serves as the lifeline from the embryo to the placenta. At term, it measures from 20″ to 22″ (51 to 56 cm) in length and about ¾″ (2 cm) in diameter. The umbilical cord contains two arteries, one vein, and Wharton's jelly (which prevents kinking of the cord in utero). Blood flows through the cord at about 400 ml/minute.

Red on the outside, gray on the inside

The **placenta,** weighing about 1 to 1¼ lb (454 to 567 g) and measuring from 6″ to 10″ (15 to 25 cm) in diameter, contains 15 to 20 subdivisions called cotyledons and is 1″ to 1¼″ (2.5 to 3 cm) thick at term. Rough in texture, the placenta appears red on the maternal surface and shiny and gray on the fetal surface. The placenta:
• functions as a transport mechanism between the mother and the fetus
• has a life span and function that depends on oxygen consumption and maternal circulation; circulation to the fetus and placenta improves when the mother lies on her left side
• receives maternal oxygen by way of diffusion
• produces hormones, including human chorionic gonadotropin, human placental lactogen, gonadotropin-releasing hormone, thyrotropin-releasing factor, corticotropin, estrogen, and progesterone
• supplies the fetus with carbohydrates, water, fats, protein, minerals, and inorganic salts
• carries end products of fetal metabolism to the maternal circulation for excretion
• transfers passive immunity by way of maternal antibodies.

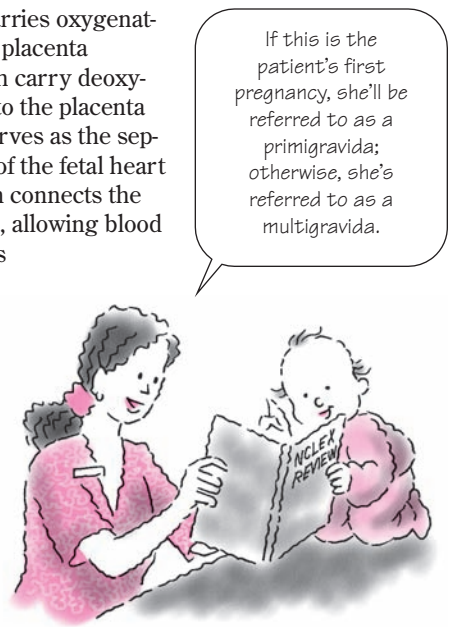
Fetal protection

The **amniotic fluid** prevents heat loss, preserves constant fetal body temperature, cushions the fetus, and facilitates fetal growth and development. Amniotic fluid is replaced every 3 hours.

At term, the uterus contains 800 to 1,200 ml of amniotic fluid, which is clear and yellowish and has a specific gravity of 1.007 to 1.025 and a pH of 7.0 to 7.25. Maternal serum provides amniotic fluid in early gestation, with increasing amounts derived from fetal urine late in gestation. Amniotic fluid contains:
• albumin
• bilirubin
• creatinine
• enzymes
• fat
• lanugo
• lecithin
• leukocytes
• sphingomyelin
• urea.

Blood movers

Fetal circulation structures include:
• one umbilical vein, which carries oxygenated blood to the fetus from the placenta
• two umbilical arteries, which carry deoxygenated blood from the fetus to the placenta
• the foramen ovale, which serves as the septal opening between the atria of the fetal heart
• the ductus arteriosus, which connects the pulmonary artery to the aorta, allowing blood to shunt around the fetal lungs
• the ductus venosus, which carries oxygenated blood from the umbilical vein to the inferior vena cava, bypassing the liver.



Keep abreast of diagnostic tests

Here's a brief review of tests performed as part of antepartum care.

The routine

These routine laboratory tests can confirm pregnancy and reveal maternal complications:

- **blood type, Rh, and abnormal antibodies** to identify the fetus at risk for erythroblastosis fetalis or hyperbilirubinemia
- **immunologic tests** such as rubella titer (antibodies) to determine immunity to rubella, rapid plasma reagin to detect untreated syphilis, hepatitis B surface antigen to detect hepatitis B, and human immunodeficiency virus (HIV) antibodies to detect HIV infection
- **urine tests** to detect urinary tract infection and to measure human chorionic gonadotropin (HCG) to confirm pregnancy
- **hematologic studies,** in which blood samples are used to analyze and measure RBCs, white blood cells (WBCs), erythrocyte sedimentation rate, platelets, Hb, and HCT
- **coagulation studies,** in which a blood sample is used to analyze and measure prothrombin time (PT), partial thromboplastin time (PTT), and international normalized ratio (INR)
- **genital cultures,** such as a gonorrhea smear and chlamydia test, to detect sexually transmitted disease
- **Papanicolaou (Pap) test** to screen for cervical cancer
- **triple screen** between 15 and 20 weeks' gestation to identify a fetus at increased risk for Down syndrome and neural tube defect
- **alpha-fetoprotein,** which involves using a blood sample to measure alpha-fetoprotein levels (high maternal serum levels may suggest fetal neural tube defects, such as spina bifida and anencephaly).

After amniocentesis, monitor the patient for hemorrhage, infection, premature labor, and amnionitis.

Check your fluid?

Amniocentesis may be performed after the 14th week of gestation, when amniotic fluid is sufficient and the uterus has moved into the abdominal cavity. This procedure involves transabdominal insertion of a spinal needle into the uterus to aspirate amniotic fluid. This procedure helps determine:

- gestational age by way of a lecithin-sphingomyelin ratio
- fetal lung maturity by analyzing lecithin-sphingomyelin ratio, two key components of surfactant
- creatinine levels.

Amniocentesis is performed to diagnose genetic disorders, such as chromosomal aberrations, sex-linked disorders, inborn errors of metabolism, and neural tube defect. It may also be performed to diagnose and evaluate isoimmune disorders, including Rh sensitization and ABO blood type incompatibility.

Nursing actions

Before the procedure

- Make sure informed, written consent is obtained.

After the procedure

- Monitor the fetal heart rate and uterine activity with an external fetal monitor for several hours.
- Monitor for maternal hemorrhage, infection, premature labor, fetal hemorrhage, and amnionitis.
- Administer Rh_0(D) immune globulin (Rho[D] IGIM)to Rh-negative mothers to prevent fetal isoimmunization.

Tissue sample

Chorionic villi sampling can be performed as early as the eighth week of gestation. It involves removal and analysis of a small tissue specimen from the fetal portion of the placenta. This test helps determine the genetic makeup of the fetus, providing earlier diagnosis and allowing earlier and safer abortion if the fetus carries the risk of spontaneous abortion, infection, hematoma, fetal limb defects, and intrauterine death.

Nursing actions

After the procedure

- Administer RhI[G] to Rh-negative mothers to prevent sensitization.
- Monitor the fetal heart rate and uterine activity with an external fetal monitor for several hours.

Sound picture

Ultrasonography, a painless, noninvasive procedure, uses ultrasonic waves reflected by tissues of different densities to visualize deep structures of the body. Reflected signals are then amplified and processed to produce a visual display, providing immediate results without harm to fetus or mother. It may be performed vaginally, if necessary. Ultrasound can detect fetal death, malformation, or malpresentation; placental abnormalities; multiple gestation; and hydramnios or oligohydramnios. It's used to monitor fetal growth and estimate gestational age.

Nursing actions

Before the procedure

- Instruct the patient to drink a glass of water every 15 minutes, beginning 1½ hours before the procedure.
- Instruct the patient not to void until immediately after the procedure.
- If the vaginal approach is necessary, instruct the patient to void before the procedure and to avoid fluids.

Stress-free

The **nonstress test** (NST) is used to detect fetal heart accelerations in response to fetal movement. This noninvasive test provides simple, inexpensive, immediate results without contraindications or complications. It may be indicated for a patient at risk for uteroplacental insufficiency or for altered fetal movements.

The NST can be performed between 32 and 34 weeks' gestation. A nonreactive test result indicates the possibility of fetal hypoxia, fetal sleep cycle, or the effects of drugs. The results may be inconclusive if the patient is extremely obese.

Nursing actions

Before the procedure

- Explain the process to the patient.
- Advise the patient to eat a snack before testing.

Contraction action

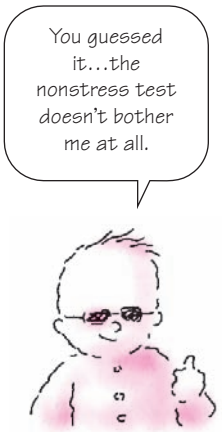
The **oxytocin challenge test** (OCT) evaluates fetal ability to withstand an oxytocin-induced contraction. This test, given after a nonreactive NST result, requires I.V. administration of oxytocin in increasing doses every 15 to 20 minutes until three high-quality uterine contractions are obtained within 10 minutes.

The OCT is performed on a patient at risk for uteroplacental insufficiency or fetal compromise from diabetes, heart disease, hypertension, or renal disease or on a patient with a history of stillbirth. The OCT isn't indicated for those with previous classic cesarean delivery or third-trimester bleeding or for those at high risk for preterm labor.

Nursing actions

During and after the procedure

- Monitor fetal heart rate and maternal contractions.



Breast test

The **nipple stimulation stress test** induces contractions by activating sensory receptors in the areola, triggering the release of oxytocin by the posterior pituitary gland. The receptors are activated by rolling the nipple manually or by applying a warm washcloth. This test has the same reactive pattern as the reactive NST result.

Nursing actions

During and after the procedure

- Monitor fetal heart rate and uterine contractions on external fetal monitor.

Good vibrations

The **vibroacoustic stimulation** test uses vibration and sound to induce fetal reactivity during an NST. Vibration is produced by an artificial larynx or a fetal acoustic stimulator (over the fetus's head for 1 to 5 seconds). This test is noninvasive, quick, and convenient.

Nursing actions

During and after the procedure

- Monitor fetal heart rate.

Six profiles in one

The **biophysical profile** assesses four to six parameters—fetal breathing movements, body movements, muscle tone, amniotic fluid volume, heart rate reactivity, and placental

grade—using real-time ultrasound. This test is noninvasive and quick and can detect central nervous system (CNS) depression. A score of 8 to 10 indicates fetal well-being.

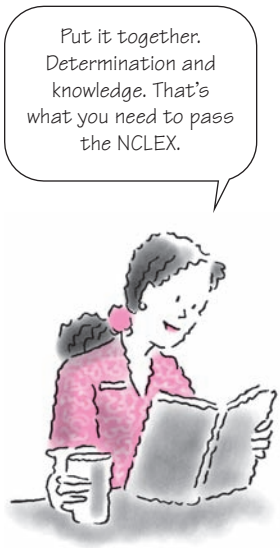
Nursing actions

During and after the procedure

• Monitor fetal heart rate.

How does the flow go?

Fetal blood flow studies use umbilical or uterine Doppler velocimetry to evaluate vascular resistance, especially in patients with hypertension, diabetes, isoimmunization, or lupus. These studies are useful when congenital anomalies or cardiac arrhythmias are suspected.



Nursing actions

Before and during the procedure

• Before the procedure, obtain a baseline fetal heart rate.

• During the procedure, continue to monitor the patient and the fetus for signs of problems, such as changes in vital signs or fetal heart rate or continuation of uterine contractions.

Risky business

Percutaneous umbilical blood sampling (PUBS) is an invasive procedure that involves inserting a spinal needle into the umbilical cord to obtain fetal blood samples or to transfuse blood to the fetus in utero.

Usually performed during the second or third trimester, PUBS is indicated when the fetus is at risk for congenital and chromosomal abnormalities, congenital infection, or anemia. It carries a 1% to 2% risk of fetal loss.

Nursing actions

During and after the procedure

• Monitor fetal and maternal status throughout the procedure.

• Administer RhI[G] to an Rh-negative mother after PUBS to prevent sensitization.

Every kick counts

Fetal movement count identifies the presence and frequency of fetal movement. Normally, fetal movement occurs about 280 times per day. Decreased movement may indicate fetal compromise.

Nursing actions

• Teach the patient to record fetal movement for 30 minutes three times per day.

• Instruct the patient to report fewer than 10 movements in 2 hours.

Catch up on complications

Potential antepartum complications and accompanying conditions include acquired immunodeficiency syndrome (AIDS), adolescent pregnancy, diabetes mellitus, ectopic pregnancy, heart disease, hydatidiform mole, hyperemesis gravidarum, hypertension in pregnancy, multifetal pregnancy, and placenta previa.

Acquired immunodeficiency syndrome

A female patient may be first identified as positive for HIV antibodies during pregnancy or when the neonate's HIV status is identified. Because of the effects of pregnancy on immunosuppression, the progression from HIV infection to full-blown AIDS may be expedited during pregnancy.

CAUSES

• Exposure to HIV through blood transfusions, contaminated needles, or handling of blood

• Exposure to semen or vaginal secretions containing HIV

DATA COLLECTION FINDINGS

• Diarrhea

• Fatigue

• HIV-associated dementia

• Kaposi's sarcoma

• Mild flulike symptoms

• Opportunistic infections, such as toxoplasmosis, oral and vaginal candidiasis, herpes

simplex, *Pneumocystis carinii,* and *Candida* esophagitis
• Weight loss

DIAGNOSTIC FINDINGS
• Blood chemistry shows increased transaminase, alkaline phosphatase, and gamma globulin level and decreased albumin level.
• $CD4^+$ T-cell level is less than 200 cells/µl.
• Enzyme-linked immunosorbent assay shows positive HIV antibody titer.
• Hematology shows decreased WBC, RBC, and platelet counts.
• Western blot test is positive.

NURSING DIAGNOSES
• Ineffective protection
• Anxiety
• Ineffective coping

TREATMENT
• Care during pregnancy and delivery same as that for any other patient with HIV
• If patient is newly diagnosed, zidovudine (Retrovir)or didanosine (Videx) treatment is typically initiated between weeks 14 and 34 of gestation
• Fetus monitored closely; serial ultrasounds performed to identify intrauterine growth restrictions; NST performed weekly after 32 weeks

INTERVENTIONS AND RATIONALES
• Provide routine care for patients with AIDS.
• Monitor for fever, chest tightness, and shortness of breath *to evaluate for possible recurrent acute pneumonia or pulmonary tuberculosis, which may indicate AIDS.*
• Provide emotional support to the patient and her family *to allay the patient's fears.*
• Determine whether the patient will be able to care for her infant after delivery *to evaluate the need for additional support services.*

Teaching topics
• Knowing treatment options
• Preventing the spread of infection
• Decreasing risk of transmission to the fetus by avoiding unsafe sex practices, avoiding breast-feeding, or discontinuing I.V. drug use
• Counseling the patient to help her decide whether to terminate the pregnancy

Adolescent pregnancy

A teenage mother is at risk for such complications as hypertension in pregnancy, cephalopelvic disproportion, anemia, and nutritional deficiencies. Teenagers also have a high incidence of sexually transmitted diseases (STDs), posing a concern for both the mother and the neonate.

Infants born to teenage mothers are at risk for such complications as prematurity and low birth weight.

CONTRIBUTING FACTORS
• Desire to gain love, adulthood, and independence through pregnancy
• Fear of reporting sexual activity to parents
• High level of adolescent sexual activity
• Lack of appropriate role models
• Limited access to contraceptives
• Low level of education correlated with incorrect use of contraceptives
• Sporadic use of contraceptives
• Naiveté about ability to become pregnant

DATA COLLECTION FINDINGS
• Amenorrhea
• Denial of pregnancy, which may deter the patient from seeking medical attention early in pregnancy

DIAGNOSTIC FINDINGS
• Pregnancy test is positive.
• Ultrasound confirms presence of fetus.

NURSING DIAGNOSES
• Deficient knowledge (pregnancy and care options)
• Imbalanced nutrition: Less than body requirements
• Interrupted family processes

TREATMENT
• Diet with caloric intake sufficient to support the growing adolescent and her developing fetus
• Prenatal care

Drug therapy
- Antibiotics for STDs, if necessary
- Prenatal vitamins

INTERVENTIONS AND RATIONALES
- Monitor the patient's weight gain *to determine nutritional deficiencies.*
- Collect data on the patient's knowledge of her pregnancy *to determine need for further teaching.*
- Collect data about the patient's family and available support *to determine need for referrals.*
- Provide nutritional support and encouragement *to promote well-being of mother and fetus.*
- Stress the importance of attending scheduled prenatal appointments *to promote well-being of mother and fetus.*
- Advise the patient of her options, including terminating the pregnancy, continuing the pregnancy and giving up the infant for adoption, and continuing the pregnancy and keeping the infant, *to promote informed decision making.*
- Allow the patient to express her feelings about her pregnancy and herself *to promote mental and emotional well-being.*

Teaching topics
- Encouraging attendance at prenatal and birthing classes and infant care classes
- Recognizing the importance of prenatal care

Diabetes mellitus

With gestational diabetes mellitus, the patient's pancreas, stressed by the normal adaptations to pregnancy, can't meet the increased demands for insulin.

A patient may have preexisting diabetes or may develop gestational diabetes while she's pregnant. Gestational diabetes is associated with an increased risk of congenital anomalies, hydramnios, macrosomia, hypertension in pregnancy, spontaneous abortion, and fetal death. Additionally, the infant of a patient with diabetes is at risk for developing sacral agenesis, a congenital anomaly characterized by incomplete formation of the vertebral column.

The patient with gestational diabetes has an increased risk of developing diabetes mellitus.

RISK FACTORS
- Family history of diabetes
- Gestational diabetes during previous pregnancies
- Maternal age older than 25
- Obesity

DATA COLLECTION FINDINGS
- Glycosuria
- Ketonuria
- Polyuria
- Possible monilial infection (vaginal yeast infection)
- Possible urinary tract infection

DIAGNOSTIC FINDINGS
Gestational diabetes is diagnosed if the patient has two or more of the following results:
- Fasting blood sugar level equals or exceeds 95 mg/dl
- Three-hour glucose tolerance test reveals 1-hour level at or above 180 mg/dl
- Three-hour glucose tolerance test reveals 2-hour level at or above 155 mg/dl
- Three-hour glucose tolerance test reveals 3-hour level at or above 140 mg/dl.

NURSING DIAGNOSES
- Imbalanced nutrition: More than body requirements
- Risk for injury
- Ineffective coping

TREATMENT
- 1,800- to 2,200-calorie diet, divided into three meals and three snacks that should also include low fat and cholesterol and high fiber
- Administration of insulin or glyburide (DiaBeta) after the first trimester
- Other oral antidiabetic agents contraindicated because of adverse effects on the fetus

INTERVENTIONS AND RATIONALES
- Encourage adherence to dietary regulations *to maintain euglycemia.*

• Encourage the patient to exercise moderately *to reduce blood glucose levels and decrease the need for insulin.*
• Prepare the patient for antepartum fetal surveillance testing, including OCT, nipple stimulation stress testing, amniotic fluid index, biophysical profile, and NST, *to evaluate fetal well-being.*
• Encourage the patient to verbalize her feelings *to allay her fears.*
• Provide emotional support *to reduce anxiety.*

Teaching topics

• Performing serum glucose monitoring and insulin regulation and administration
• Performing fetal "kick counts" to monitor fetal well-being during the third trimester
• Learning about normal pregnancy care and concerns
• Recognizing the signs and symptoms of hyperglycemia and hypoglycemia

Ectopic pregnancy

Ectopic pregnancy is the implantation of the fertilized ovum outside the uterine cavity. Most commonly, ectopic pregnancy occurs in a fallopian tube; other sites include the cervix, ovary, and abdominal cavity. It's the second most frequent cause of vaginal bleeding early in pregnancy.

CAUSES

• Hormonal factors
• Malformed fallopian tubes
• Ovulation induction drugs
• Progestin-only oral contraceptives
• Tubal atony
• Tubal damage from pelvic inflammatory disease
• Tubal damage from previous pelvic or tubal surgery
• Tubal spasms
• Use of intrauterine devices

DATA COLLECTION FINDINGS

• Falling blood pressure
• Irregular vaginal bleeding and dull abdominal pain on affected side early in pregnancy
• Nausea and vomiting
• Positive Cullen's sign (bluish discoloration around the umbilicus)
• Rapid, thready pulse
• Rupture of tubes, causing sudden and severe abdominal pain, syncope, and referred shoulder pain as the abdomen fills with blood
• Shock with profuse hemorrhage
• Shoulder pain

Severe abdominal pain, orthostatic hypotension, tachycardia, and dizziness may indicate a rupturing ectopic pregnancy.

DIAGNOSTIC FINDINGS

• HCG titers are abnormally low when compared to a normal pregnancy.
• Ultrasound is positive for ruptured tube and collective pelvic fluid.
• Vaginal examination reveals a palpable tender mass in Douglas' cul-de-sac.

NURSING DIAGNOSES

• Deficient fluid volume
• Risk for infection
• Acute pain

TREATMENT

• Laparotomy to ligate the bleeding vessels and remove or repair damaged fallopian tube
• Transfusion therapy: packed RBCs (if bleeding is uncontrolled)

Drug therapy

• If the tube hasn't ruptured, methotrexate (Trexall) followed by leucovorin (Wellcovorin) to stop the trophoblastic cells from growing (therapy continues until negative HCG levels are achieved)

INTERVENTIONS AND RATIONALES

• Monitor vital signs and intake and output *to identify intense blood loss and shock.*
• Monitor for severe abdominal pain, orthostatic hypotension, tachycardia, and dizziness, *which may indicate rupturing ectopic pregnancy.*
• Maintain I.V. fluid replacement *to compensate for blood loss.*
• Monitor blood product administration *to detect adverse reactions.*
• Administer RhI[G] *to combat isoimmunization in the patient who's Rh-negative.*
• Provide routine preoperative and postoperative care *if surgical intervention is necessary.*

• Provide emotional support *for parents grieving over the loss of the pregnancy.*

Teaching topics

• Reporting adverse effects of methotrexate therapy, such as nausea, mouth ulceration, abdominal discomfort, and altered liver enzyme levels
• Knowing the importance of follow-up medical care

Heart disease

Heart disease occurs in about 1% of pregnant patients. Pregnancy may reveal an underlying heart condition that previously produced no symptoms, or it may aggravate a known heart condition. A patient with heart disease is at greatest risk when blood volume peaks between the 28th and 32nd week of gestation.

Successful delivery of a healthy baby depends on the type and extent of the disease. Decreased placental perfusion may lead to intrauterine growth retardation, fetal distress, and prematurity.

Pregnant patients with heart disease are graded at a level of I to IV.

CAUSES

• Regurgitation, which permits blood to leak through an incompletely closed valve, thereby increasing workload on heart chambers on either side of the affected valve
• Valvular stenosis, which decreases blood flow through a valve, increasing workload on heart chambers located before the stenotic valve

DATA COLLECTION FINDINGS

• Cough
• Crackles at the base of the lungs
• Diastolic murmur at the heart's apex
• Dyspnea
• Fatigue
• Hemoptysis
• Nocturnal cough
• Orthopnea
• Pitting edema
• Tachycardia

DIAGNOSTIC FINDINGS

• Echocardiography, electrocardiography, and chest X-ray may reveal cardiac abnormalities, arrhythmias, impaired cardiac function, increased workload on the heart, and cardiovascular decompensation.

NURSING DIAGNOSES

• Activity intolerance
• Excess fluid volume
• Decreased cardiac output

TREATMENT

Class I and Class II

• Sodium restriction
• Antibiotics: ampicillin (Omnipen-N), gentamicin (Gentak) to prevent bacterial endocarditis

Class III and Class IV

• Anticoagulant: heparin
• Antiarrhythmics: digoxin (Lanoxin), procainamide (Pronestyl), beta-adrenergic blockers
• Antibiotics: ampicillin, gentamicin to prevent bacterial endocarditis
• Thiazide diuretics and furosemide (Lasix) to control heart failure if activity restriction and reduced sodium intake don't prevent it

INTERVENTIONS AND RATIONALES

• Monitor maternal and fetal vital signs *to determine maternal and fetal well-being.*
• Monitor cardiovascular and respiratory status *to detect signs of maternal cardiac decompensation (tachycardia, tachypnea, moist crackles, exhaustion).*
• Administer anticoagulants, antiarrhythmics, antibiotics, and diuretics, as prescribed, *to achieve therapeutic regimens.*
• Encourage the patient to monitor her calorie intake *to avoid excessive weight gain.*
• Encourage the patient to limit her physical activity according to her ability and symptoms *to avoid overexertion.*
• Encourage the patient to get 8 to 10 hours of sleep each night *to ensure adequate rest.*
• Monitor I.V. fluid intake and output *to maintain proper fluid levels.*

• Administer oxygen by nasal cannula or face mask during labor *to maintain fetal oxygenation.*
• Position the patient on her left side with her head and shoulders elevated during labor *to prevent supine hypotension syndrome.*
• Continue to monitor the patient during the postpartum period *to detect signs of cardiac decompensation, even if distress is absent during pregnancy and labor.*

Teaching topics
• Achieving a healthy diet
• Following anticoagulant therapy appropriately
• Avoiding infection
• Recognizing signs and symptoms of heart failure
• Receiving adequate rest

Hydatidiform mole

Also known as *gestational trophoblastic disease,* a hydatidiform mole is a developmental anomaly of the placenta that converts the chorionic villi into a mass of clear vesicles (hydatid vesicles). There are two types:
• *complete mole*, in which there's neither an embryo nor an amniotic sac
• *partial mole*, in which there's an embryo (usually with multiple abnormalities) and an amniotic sac.

CAUSES
• Possibly poor maternal nutrition or a defective ovum

DATA COLLECTION FINDINGS
• Disproportionate enlargement of the uterus
• Excessive nausea and vomiting
• Intermittent or continuous bright red or brownish vaginal bleeding by the 12th week of gestation
• Absence of fetal heart sounds
• Passage of clear, fluid-filled vesicles along with vaginal bleeding
• Symptoms of hypertension in pregnancy before the 20th week of gestation

DIAGNOSTIC FINDINGS
• HCG levels are extremely high for early pregnancy.
• Ultrasonography fails to reveal a fetal skeleton.

NURSING DIAGNOSES
• Deficient fluid volume
• Grieving
• Acute pain

TREATMENT
• Therapeutic abortion (suction and curettage) if a spontaneous abortion doesn't occur to prevent choriocarcinoma
• Pelvic examinations and chest X-rays at regular intervals
• Weekly monitoring of HCG levels until they remain normal for 3 consecutive weeks
• Periodic follow-up for 1 to 2 years because of increased risk of neoplasm

Drug therapy
• Methotrexate (Trexall) prophylactically (the drug of choice for choriocarcinoma)

INTERVENTIONS AND RATIONALES
• Monitor and record vital signs and intake and output *to detect changes that may indicate complications.*
• Provide emotional support for the grieving couple *to demonstrate concern and understanding for the patient and family.*
• Monitor vaginal bleeding *to detect hemorrhage.*
• Send contents of uterine evacuation to the laboratory for analysis *to evaluate the presence of hydatid vesicles.*
• Advise the patient to avoid pregnancy until HCG levels are normal (may take up to 2 years) *to avoid future complications.*
• Administer Rh_0(D) immunoglobulin to combat isoimmunization in the patient who's Rh-negative.

Teaching topics
• Dealing with an uncertain obstetric and medical future
• Managing birth control to avoid pregnancy

Hyperemesis gravidarum

Hyperemesis gravidarum is persistent, uncontrolled vomiting that begins in the first weeks of pregnancy and may continue throughout pregnancy. Unlike "morning sickness," hyperemesis can have serious complications, including severe weight loss, dehydration, and electrolyte imbalance.

CAUSES

- Gonadotropin production
- Psychological factors
- Trophoblastic activity

DATA COLLECTION FINDINGS

- Continuous, severe nausea and vomiting
- Dehydration
- Dry skin and mucous membranes
- Jaundice
- Nonelastic skin turgor
- Oliguria
- Significant weight loss

DIAGNOSTIC FINDINGS

- Arterial blood gas analysis reveals metabolic alkalosis.
- Hb level and HCT are elevated.
- Serum potassium level reveals hypokalemia.
- Urine ketone levels are elevated.
- Urine specific gravity is increased.

NURSING DIAGNOSES

- Imbalanced nutrition: Less than body requirements
- Deficient fluid volume
- Acute pain

TREATMENT

- Total parenteral nutrition (TPN)
- Restoration of fluid and electrolyte balance and acid-base balance

Drug therapy

- Antiemetics, as necessary, for vomiting

INTERVENTIONS AND RATIONALES

- Monitor vital signs and fluid intake and output *to evaluate for fluid volume deficit.*
- Obtain blood samples and urine specimens *for laboratory tests, including Hb level, HCT, urinalysis, and electrolyte levels.*
- Monitor fundal height and the patient's weight *to detect complications.*
- Provide small, frequent meals *to maintain adequate nutrition.*
- Maintain I.V. fluid replacement and TPN *to reduce fluid deficits and pH imbalances.*
- Provide emotional support *to help the patient cope with her condition.*

Teaching topics

- Recognizing triggers of nausea and vomiting
- Using salt on foods to replace sodium lost by vomiting

Hypertension in pregnancy

Hypertensive disorders in pregnancy are a major cause of maternal, fetal, and neonatal morbidity and mortality. Hypertension in pregnancy is classified into four major disorders: chronic hypertension, gestational hypertension, preeclampsia, and chronic hypertension with superimposed preeclampsia. The hypertensive patient is at risk for cerebral hemorrhage, circulatory collapse, heart failure, hepatic rupture, and renal failure. If delivery occurs before term, fetal health may be compromised because of hypoxia, acidosis, and immaturity.

RISK FACTORS FOR PREECLAMPSIA

- Adolescent mother
- Diabetes mellitus
- Familial tendency
- First pregnancy
- Hydramnios
- Hydrops fetalis
- Hypertension
- Interpregnancy interval less than 2 years or more than 10 years
- Malnutrition
- Maternal age older than 35
- Multifetal pregnancy
- Obesity (Body mass index ≥ 35)
- Renal disease

DATA COLLECTION FINDINGS

Unless chronic, hypertension usually appears between the 20th and 24th weeks of gestation and disappears within 42 days after delivery.

Chronic hypertension

- BP >140 mmHg systolic or 90 mmHg diastolic prior to pregnancy or before 20 weeks' gestation
- Persists >12 weeks postpartum

Gestational hypertension

- Systolic blood pressure 140 to 159 mm Hg or diastolic blood pressure 90 to 109 mm Hg
- No proteinuria

Preeclampsia

- Systolic blood pressure ≥ 140 mm Hg or diastolic blood pressure ≥ 90 mm Hg
- Proteinuria
- Weight gain more than 2 lb (0.9 kg) per week
- Decreased urine output
- Headaches, blurred vision, hyperreflexia, nausea, vomiting, irritability, cerebral disturbances, seizures, and epigastric pain
- Presence of HELLP syndrome (hemolysis, elevated liver enzymes, and low platelet count)

Chronic hypertension with superimposed preeclampsia

- Worsening hypertension
- New onset proteinuria after 20 weeks in a woman with known hypertension

DIAGNOSTIC FINDINGS

- Blood chemistry may reveal increased blood urea nitrogen, creatinine, and uric acid levels and elevated liver function studies.
- With preeclampsia and chronic hypertension with superimposed preeclampsia, hematology may reveal thrombocytopenia (HELLP syndrome).

NURSING DIAGNOSES

- Activity intolerance
- Excess fluid volume
- Risk for injury

TREATMENT

Chronic hypertension and gestational hypertension

- Frequent fetal and maternal assessment
- Lifestyle modifications

Preeclampsia and chronic hypertension with superimposed preeclampsia

- Bed rest in a left lateral position
- Delivery: with mild preeclampsia, when the fetus is mature and safe induction is possible; with severe preeclampsia, regardless of gestational age
- High-protein diet with restriction of excessively salty foods

Drug therapy

- With chronic hypertension: methyldopa or labetalol (Trandate).
- With severe preeclampsia: hydralazine (Apresoline) or labetalol (Normodyne) to control blood pressure, betamethasone (Celestone) to accelerate fetal lung maturation, and magnesium sulfate to reduce the amount of acetylcholine produced by motor nerves, thereby preventing seizures

INTERVENTIONS AND RATIONALES

For all patients

- Evaluate for edema and proteinuria, *which may indicate a worsening condition.*
- Evaluate neurologic status *to detect early signs of deterioration, which might suggest a worsening condition.*
- Monitor daily weight *to identify sodium and water retention.*
- Maintain seizure precautions in hospitalized patients *to ensure patient safety.*
- Promote bed rest in a left lateral recumbent position *to improve uterine and renal profusion.*
- Monitor blood pressure *to evaluate the effectiveness of treatment.*
- Monitor fetal heart rate continuously during labor *to evaluate fetal well-being.*

For patients with severe preeclampsia

- Monitor maternal blood pressure every 4 hours or more frequently if unstable *to assess for abnormalities.*
- Maintain I.V. fluids as prescribed. *I.V. fluids are restricted to 60 to 150 ml/hour in the preeclamptic patient in labor.*

Memory jogger

Some women who develop preeclampsia also develop **HELLP** syndrome, so be alert if you notice the following signs:

Hemolysis

Elevated **L**iver enzyme levels

Low **P**latelet count.

• Obtain blood samples for complete blood count, platelet count, and liver function studies and to determine serum levels of blood urea nitrogen, creatinine, and fibrin degradation products *to detect complications.*
• Be prepared to obtain a blood sample for typing and crossmatching *because the patient is at risk for developing placenta previa.*
• Obtain urine specimens to determine urine protein levels and specific gravity, and perform 24-hour urine collection for protein and creatinine, as ordered, *to evaluate renal function.*
• Monitor urine output *to evaluate fluid balance.*
• Keep calcium gluconate (antidote to magnesium sulfate) nearby *to administer at first sign of magnesium sulfate toxicity* (elevated serum levels, decreased deep tendon reflexes, muscle flaccidity, CNS depression, and decreased respiratory rate and renal function).
• Promote relaxation *to reduce fatigue.*
• Encourage the patient to verbalize her feelings *to allay anxiety.*
• Provide a quiet environment *to help prevent complications.*

Multifetal pregnancy

A multifetal pregnancy, also known as *multiple gestation,* occurs when two or more embryos or fetuses exist simultaneously. Multifetal pregnancies are formed as follows:
• Single-ovum (monozygotic, identical) twins usually have one chorion, one placenta, two amnions, and two umbilical cords and are of the same sex.
• Double-ova (dizygotic, nonidentical) twins have two chorions, two placentas, two amnions, and two umbilical cords and may be of the same or different sex.
• Multifetal pregnancies of three or more fetuses may be single-ovum conceptions, multiple-ova conceptions, or a combination of both.

CAUSES
• In vitro fertilization
• Family history
• Gamete intrafallopian tube transfer
• Ovulation stimulation with such drugs as clomiphene (Clomid)

DATA COLLECTION FINDINGS
• More than one set of fetal heart sounds
• Uterine size greater than expected for dates

DIAGNOSTIC FINDINGS
• Alpha-fetoprotein levels are elevated.
• Ultrasonography is positive for multifetal pregnancy.

NURSING DIAGNOSES
• Anxiety
• Deficient knowledge (pregnancy)
• Risk for injury

TREATMENT
• Activity as tolerated with increased rest periods
• Bed rest if early dilation occurs or at 24 to 28 weeks' gestation to improve uterine blood flow and, possibly, increase birth weight of the fetuses
• Biweekly NST to document fetal growth, beginning with the 28th week of gestation
• Increased intake of calories, iron, folate, and vitamins
• Prenatal visits every 2 weeks, increasing to weekly between 24 and 28 weeks' gestation; cervical examinations performed at each visit to check for premature dilation
• Ultrasound examinations monthly to document fetal growth

INTERVENTIONS AND RATIONALES
• Monitor fetal heart sounds *to evaluate fetal well-being.*
• Monitor maternal vital signs and weight *to evaluate maternal well-being.*
• Monitor cardiovascular and pulmonary status *to detect signs of hypertension in pregnancy.*
• Ensure adequate nutrition and increased intake of folate, calories, vitamins, and iron *to ensure adequate weight gain.*
• Encourage the patient to take frequent rest periods, especially during the third trimester, or to maintain bed rest, if indicated, *to prevent fatigue.*
• Provide emotional support and encouragement *to reduce anxiety.*

• Advise the patient to return for ultrasound examination and NST as scheduled *to evaluate fetal well-being.*

Teaching topics

• Notifying health care provider immediately if signs of premature labor occur
• Refraining from coitus during the third trimester

Placenta previa

With placenta previa, the placenta is implanted in the lower uterine segment (low implantation). The placenta can occlude the cervix partially or totally.

RISK FACTORS

• Maternal age older than 35
• Multiple pregnancies
• Placental villi torn from the uterine wall as the lower uterine segment contracts and dilates in the third trimester
• Smoking or cocaine use during pregnancy
• Uterine fibroid tumors
• Uterine scars from surgery
• Uterine sinuses exposed at the placental site and bleeding

DATA COLLECTION FINDINGS

• Painless, bright red vaginal bleeding, especially during the third trimester (possibly increasing with each successive incident)

DIAGNOSTIC FINDINGS

• Early ultrasound evaluation reveals the placenta implanted in the lower uterine segment.

NURSING DIAGNOSES

• Fear
• Deficient fluid volume
• Risk for injury

TREATMENT

• Depends on gestational age, when first episode occurs, and amount of bleeding
• If gestational age less than 34 weeks, hospitalizing the patient and restricting her to bed rest to avoid preterm labor
• Administering supplemental iron if anemia is present
• Restricting maternal activities (for example, no lifting heavy objects, long-distance travel, or sexual intercourse)
• Transfusion of packed RBCs if Hb level and HCT are low
• Treatment of choice: surgical intervention (by cesarean delivery), depending on placental placement and maternal and fetal stability

INTERVENTIONS AND RATIONALES

• Monitor maternal vital signs, including uterine activity, *to evaluate maternal well-being.*
• Monitor for vaginal bleeding *to estimate blood loss.*
• Monitor for signs of infection; *patients with placenta previa are at increased risk for infection.*
• Monitor fetal heart rate, using electronic fetal monitoring, *to detect complications.*
• Avoid rectal or vaginal examinations unless equipment is available for vaginal and cesarean delivery *to avoid stimulating uterine activity.*
• Obtain blood samples for HCT, Hb level, PT, INR, PTT, fibrinogen level, platelet count, and typing and crossmatching *to evaluate for complications.*
• Provide routine preoperative and postoperative care if cesarean delivery is performed *to ensure the patient's well-being.*
• Monitor for postpartum hemorrhage *because patients with placenta previa are more likely to hemorrhage.*
• Provide emotional support *to reduce anxiety.*
• Maintain I.V. fluids as ordered *to reduce fluid loss.*
• Be prepared to administer betamethasone (Celestone) *to increase fetal lung maturity if preterm labor can't be halted.*

Teaching topics

• Limiting activity
• Reporting increased bleeding immediately
• Knowing of possible need for preterm delivery

Pump up on practice questions

1. The caloric increase in nutritional requirements during pregnancy for a client of normal weight is:

1. 300 kcal.
2. 400 kcal.
3. 500 kcal.
4. 1,000 kcal.

Answer: 1. The recommended daily allowance (RDA) of kilocalories during pregnancy is 300 kcal greater than the RDA before pregnancy for clients of normal weight. The amount recommended for underweight women may be more than 300 kcal. The RDA of kilocalories during lactation is 500 kcal more than the RDA before pregnancy. An additional 1,000 kcal leads to excess weight gain.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

2. During prenatal screening of a client with diabetes, the nurse should keep in mind that the client is at increased risk for:

1. Rh incompatibility.
2. placenta previa.
3. hyperemesis.
4. stillbirth.

Answer: 4. Clients with diabetes are at increased risk for intrauterine fetal death after 36 weeks' gestation. This factor must be weighed against the risks of delivery before 37 weeks and prematurity. The risk of Rh incompatibility, placenta previa, or hyperemesis isn't increased in the diabetic client.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

3. Which finding is considered normal during the antepartum period of pregnancy?

1. Resting pulse rate fluctuations ranging from 15 to 20 beats/minute
2. Slight decrease in respiratory rate
3. Altered breathing pattern with thoracic breathing replacing abdominal breathing
4. HCT increase of about 7%

Answer: 1. Cardiovascular system changes associated with pregnancy lead to resting pulse rate fluctuation with increases ranging from 15 to 20 beats/minute at term. Other pregnancy-related changes include a slight increase (2 breaths/minute) in respiratory rate; altered breathing pattern with abdominal breathing replacing thoracic breathing as pregnancy progresses; and a decrease in HCT of about 7%.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

4. A client comes to the clinic for her 12-week pregnancy checkup. The client asks the nurse when she should begin to feel her baby move. Which response by the nurse is best?

1. "You should have already felt it move."
2. "Typically women feel their baby move for the first time when they're 20 weeks pregnant."
3. "You'll probably feel your baby move after your 16th week of pregnancy."
4. "Each person experiences the baby's first movement at a different time throughout their pregnancy."

Answer: 3. Although each client does detect fetal movement at a different time, it's typically experienced just after the 16th week. If movement isn't detected around this time, problems with the pregnancy may exist.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

5. A pregnant client who's positive for HIV asks the nurse about drug therapy. The nurse should tell the client to expect to:

1. start taking zidovudine (Retrovir) between the 14th and 34th weeks.
2. delay taking zidovudine until after the fetus is born.
3. delay taking zidovudine until the third trimester.
4. delay giving zidovudine to the neonate until age 6 months.

Answer: 1. Zidovudine treatment should be initiated between weeks 14 and 34 of gestation. By taking zidovudine throughout pregnancy and labor, the risk of transmission to the fetus is significantly decreased. Zidovudine therapy in the neonate should be started immediately.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Knowledge

6. Which medication promotes fetal lung maturity in cases of preterm labor?

1. Terbutaline (Brethine)
2. Betamethasone (Celestone)
3. Co-trimoxazole (Bactrim)
4. Clarithromycin (Biaxin)

Answer: 2. Preterm labor raises concerns about the fetus's respiratory potential. Therefore, betamethasone is used to stimulate the development of surfactant in the lung. Terbutaline is a beta-adrenergic agonist used to treat preterm labor. Co-trimoxazole is a sulfonamide commonly used to treat urinary tract infections, and clarithromycin is an antibiotic used to treat upper respiratory tract infections.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

7. A multigravida client in her 38th week of gestation has come to the emergency department complaining of vaginal bleeding. She tells the nurse that she has recently inhaled crack cocaine. The nurse's top priority is to assess the client for:

1. placenta previa.
2. placenta accreta.
3. malnutrition.
4. hypotension.

Answer: 1. The use of crack cocaine during pregnancy is associated with placenta previa, along with hypertension, stroke, tachycardia, hemorrhage, low birth weight, and preterm neonates. Crack cocaine isn't associated with placenta accreta (unusually deep attachment of the placenta to the uterine myometrium) or hypotension. Although malnutrition may exist, it isn't life-threatening at this point.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

8. A multigravida client in her 39th week of gestation is diagnosed with hypertension in pregnancy and HELLP syndrome. The nurse's top priority is to check the client's:

1. WBC count.
2. blood glucose levels.
3. serum iron levels.
4. platelet count.

Answer: 4. Clients diagnosed with HELLP syndrome have hemolysis of RBCs, elevated liver enzyme levels, and a low platelet count, so the nurse should check the client's platelet count. This syndrome can lead to disseminated intravascular coagulation or hemorrhage. Monitoring the client's WBC count, blood glucose levels, and serum iron levels isn't a priority for clients diagnosed with HELLP syndrome.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

9. Which finding is considered a probable sign of pregnancy?

1. Braxton Hicks contractions
2. Nausea
3. Breast enlargement
4. Amenorrhea

Answer: 1. Braxton Hicks contractions, painless uterine contractions that occur throughout pregnancy, are a probable sign of pregnancy. Nausea, breast enlargement, and amenorrhea are presumptive signs.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

10. During her first clinic visit, a client reports that her last menses began on September 12. Based on Nägele's rule, what's the client's estimated date of delivery?

1. June 1
2. June 19
3. July 10
4. July 29

Answer: 2. The estimated date of delivery is June 19. To calculate it, start with the first day of the last menses (September 12), subtract 3 months (June 12), then add 7 days (June 19).

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

23 Intrapartum care

In this chapter, you'll review:

- components and stages of labor
- how to perform maternal and fetal evaluations
- common complications of labor and delivery, such as preterm labor and prolapsed umbilical cord
- patient care for such situations as preterm labor and cesarean birth.

Brush up on key concepts

Intrapartum care refers to care of the patient during labor. In this section, you'll find a brief review of the signs and symptoms that indicate the onset of labor, the patient's physiologic and psychosocial responses to labor, basic obstetric procedures, and methods of monitoring the patient and fetus.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 496 to 498.

Components of labor

The three major components of labor are the passage, the passenger, and the power. These components must work together for labor to progress normally.

Long and winding road

Passage refers to the maternal pelvis and soft tissues, the passageway through which the fetus exits the body. This area is affected by the shape of the inlet, structure of the pelvis, and pelvic diameters.

Memory jogger

To remember the three key components of labor, think of the 3 Ps:

Passage

Passenger

Power.

Coach or first class?

Passenger refers to the fetus and its ability to move through the passage. This ability is affected by such fetal features as:

- the skull
- the lie (relationship of the long axis [spine] of the fetus to the long axis of the mother)
- presentation (portion of the fetus that enters the pelvic passageway first)
- position (relationship of the presenting part of the fetus to the front, back, and sides of the maternal pelvis).

Attitude refers to the fetal head's ability to flex or extend 45 degrees and rotate 180 degrees, allowing its smallest diameters to move down the birth canal and pass through the maternal pelvis. Pressure exerted by the maternal pelvis and birth canal during labor and delivery causes the sutures of the skull to allow the cranial bones to shift, resulting in molding of the fetal head.

What kind of engine?

Power refers to uterine contractions, which cause complete cervical effacement (thinning) and dilation (expansion).

Along for the ride

Other factors that affect labor are:

- accomplishment of the tasks of pregnancy
- coping mechanisms
- mother's ability to bear down (voluntary use of abdominal muscles to push during the second stage of labor)
- past experiences
- placental positioning
- preparation for childbirth
- psychological readiness
- support systems.

Let's get this show on the road

Preliminary signs that indicate the onset of labor include:

- lightening, or fetal descent into the pelvis, which usually occurs 2 to 3 weeks before term in a primiparous patient and later or during labor in a multiparous patient
- Braxton Hicks contractions, which can occur irregularly and intermittently throughout pregnancy and may become uncomfortable and produce false labor
- cervical changes, including softening, effacement, and slight dilation several days before the initiation of labor

(Text continues on page 499.)

Cheat sheet

Intrapartum care refresher

ABRUPTIO PLACENTAE

Key signs and symptoms

- Acute abdominal pain and rigid abdomen
- Hemorrhage with dark red vaginal bleeding

Key test results

- Ultrasonography locates the placenta and may reveal a clot or hematoma

Key treatments

- Transfusion: packed red blood cells (RBCs), platelets, and fresh frozen plasma if necessary
- Cesarean delivery

Key interventions

- Avoid pelvic or vaginal examinations and enemas.
- Monitor administration of packed RBCs, platelets, or fresh frozen plasma.
- Position the patient in a left lateral recumbent position.

AMNIOTIC FLUID EMBOLISM

Key signs and symptoms

- Cyanosis and chest pain
- Tachypnea and sudden dyspnea

Key test results

- Electronic fetal monitor reveals fetal distress (during the intrapartum period).
- Arterial blood gas results (ABG) reveal hypoxemia.

Key treatments

- Oxygen therapy: face mask, cannula, or endotracheal (ET) intubation and mechanical ventilation if respiratory arrest occurs
- Cardiopulmonary resuscitation (CPR) if patient is apneic and pulseless
- Emergency delivery using forceps or by cesarean birth

Key interventions

- Monitor respiratory and cardiovascular status.
- Monitor fetal heart rate (FHR).
- Perform CPR if necessary.
- Assist with immediate delivery of neonate.

DISSEMINATED INTRAVASCULAR COAGULATION

Key signs and symptoms

- Abnormal bleeding (petechiae, hematomas, ecchymosis, cutaneous oozing)
- Oliguria

Key test results

- Coagulation studies reveal decreased fibrinogen level, positive D-dimer test specific for disseminated intravascular coagulation, prolonged prothrombin time (PT), and prolonged partial thromboplastin time (PTT).
- Hematology studies reveal decreased platelet count.

Key treatments

- Transfusion therapy: packed RBCs, fresh frozen plasma, platelets, and cryoprecipitate
- Treatment of the underlying condition
- Immediate delivery of the fetus

Key interventions

- Monitor cardiovascular, respiratory, neurologic, GI, and renal status.
- Monitor vital signs frequently.
- Closely monitor intake and output.
- Monitor patient closely for signs and symptoms of a transfusion reaction.
- Monitor the results of serial blood studies.

DYSTOCIA

Key signs and symptoms

- Arrested descent
- Hypotonic contractions

Key test results

- Ultrasonography shows fetal position or malformation.

Key treatments

- Delivery of the fetus by cesarean birth if labor fails to progress and mother or fetus show signs of compromise
- Oxytocic agent: oxytocin (Pitocin) if contractions are ineffective

Key interventions

- Monitor vital signs.
- Assist the patient to a left side-lying position.

Intrapartum care refresher *(continued)*

DYSTOCIA *(continued)*

• Monitor the effectiveness of oxytocin therapy and watch for complications.

EMERGENCY BIRTH

Key signs and symptoms

For prolapsed umbilical cord

• Cord visible at the vaginal opening
• Variable decelerations or bradycardia noted on fetal monitor strip

For uterine rupture

• Abdominal pain and tenderness, especially at the peak of a contraction, or the feeling that "something ripped"
• Excessive external bleeding
• Late decelerations, reduced FHR variability, tachycardia and bradycardia, cessation of FHR
• Palpation of the fetus outside the uterus

For amniotic fluid embolism

• Chest pain
• Coughing with pink, frothy sputum
• Increasing restlessness and anxiety
• Sudden dyspnea
• Tachypnea

Key test results

For prolapsed umbilical cord

• Ultrasonography confirms that the cord is prolapsed.

For uterine rupture

• Ultrasonography may reveal the absence of the amniotic cavity within the uterus.

For amniotic fluid embolism

• ABG analysis reveals hypoxemia.

Key treatments

• Administration of oxygen by nasal cannula or mask (ET intubation and mechanical ventilation may be necessary in the case of amniotic fluid embolism)
• Emergency cesarean delivery

Key interventions

• Monitor maternal vital signs, pulse oximetry, and intake and output as well as FHR.
• Administer maternal oxygen by cannula or mask at 8 to 10 L/minute.
• Maintain I.V. fluid replacement.
• Place the patient in left lateral recumbent position.
• Obtain blood samples to determine hematocrit (HCT), hemoglobin (Hb) level, PT and PTT, fibrinogen level, and platelet count and to type and crossmatch blood.
• Monitor administration of blood products as necessary.
• Prepare the patient and her family for the possibility of cesarean delivery.

FETAL DISTRESS

Key signs and symptoms

• Change in FHR

Key test results

• Fetal scalp blood sampling reveals acidosis.

Key treatments

• Supplemental oxygen by face mask, typically at 6 to 8 L/minute
• I.V. fluid administration
• Emergent fetal delivery by cesarean birth

Key interventions

• Monitor FHR, fetal activity, and fetal heart variability.
• Assist the patient to a left side-lying position.

INVERTED UTERUS

Key signs and symptoms

• Large, sudden gush of blood from the vagina
• Severe uterine pain

Key test results

• Hematology tests reveal decreased Hb levels and HCT.

Key treatments

• Fluid resuscitation with I.V. fluids and blood products
• Supplemental oxygen administration
• Immediate manual replacement of the uterus
• Possible emergency hysterectomy
• Tocolytic agent: terbutaline (Brethine)

Key interventions

• Administer supplemental oxygen.
• Monitor vital signs frequently.
• Closely monitor intake and output.

LACERATION

Key signs and symptoms

• Increased vaginal bleeding after delivery of placenta

Key test results

• Hematology studies may reveal decreased levels of Hb and HCT.

Key treatments

• Laceration repair
• Analgesics: ibuprofen (Motrin), acetaminophen and oxycodone (Percocet), acetaminophen (Tylenol)

Key interventions

• Monitor vital signs, including temperature.
• Monitor laceration site for signs of infection.

(continued)

Intrapartum care refresher *(continued)*

PRECIPITATE LABOR

Key signs and symptoms

- Cervical dilation greater than 5 cm/hour in a nulliparous woman; more than 10 cm/hour in a multiparous woman

Key test results

- There are no key test results specific to this complication.

Key treatments

- Controlled delivery to prevent maternal and fetal injury

Key interventions

- Monitor FHR and variability.

PREMATURE RUPTURE OF MEMBRANES

Key signs and symptoms

- Blood-tinged amniotic fluid gushing or leaking from the vagina
- Uterine tenderness

Key test results

- Nitrazine test is positive, indicating possible ruptured membranes.
- Vaginal probe ultrasonography allows detection of amniotic sac tear or rupture.

Key treatments

- Hospitalization to monitor for maternal fever and leukocytosis and fetal tachycardia if pregnancy is between 28 and 34 weeks. If infection is confirmed, labor must be induced.
- Oxytocic agent: oxytocin (Pitocin) for labor induction if term pregnancy and labor doesn't result with 24 hours after membrane rupture

Key interventions

- Monitor for signs of infection or fetal distress.
- Administer antibiotics as prescribed.
- Encourage the patient to express her feelings and concerns.

PRETERM LABOR

Key signs and symptoms

- Feeling of pelvic pressure or abdominal tightening
- Increased vaginal discharge
- Intestinal cramping
- Uterine contractions that result in cervical dilation and effacement

Key test results

- Electronic fetal monitoring confirms uterine contractions.
- Vaginal examination confirms cervical effacement and dilation.

Key treatments

- Betamethasone (Celestone) administered I.M. at regular intervals over 48 hours to increase fetal lung maturity in a fetus expected to be delivered preterm
- Magnesium sulfate to maintain uterine relaxation
- Tocolytic agents, such as terbutaline (Brethine) and ritodrine (Yutopar), to inhibit uterine contractions

Key interventions

- Monitor maternal vital signs, contractions, and FHR every 15 minutes during tocolytic therapy (otherwise, provide continuous fetal monitoring).
- Monitor for maternal adverse reactions to terbutaline or ritodrine.
- Monitor for magnesium sulfate toxicity, and make sure calcium gluconate is available.

PROLAPSED UMBILICAL CORD

Key signs and symptoms

- Cord visible at the vaginal opening
- Variable decelerations or bradycardia noted on fetal monitor strip

Key test results

- Ultrasonography may reveal the cord as the presenting part.

Key treatments

- Immediate delivery of the fetus

Key interventions

- Place the patient in Trendelenburg's position (position the woman's hips higher than her head in a knee-to-chest position).
- Monitor FHR and variability.

UTERINE RUPTURE

Key signs and symptoms

- Abdominal pain and tenderness, especially at the peak of a contraction, or the feeling that "something ripped"
- Late decelerations, reduced FHR variability, tachycardia and bradycardia, cessation of FHR

Key test results

- Hematology tests reveal decreased levels of Hb and HCT.

Key treatments

- Fluid resuscitation: I.V. fluids and blood products via rapid infusion
- Surgery to remove the fetus and repair the tear or hysterectomy if necessary
- Oxytocic agent: oxytocin (Pitocin) to help contract the uterus

Key interventions

- Monitor vital signs frequently.
- Prepare patient for immediate surgery.

• bloody show as the mucus plug is expelled from the cervix
• increase in clear vaginal secretions
• rupture of membranes, occurring before the onset of labor in about 12% of patients and within 24 hours for about 80% of patients
• a sudden burst of energy before the onset of labor, commonly demonstrated by housecleaning activities and called the nesting instinct. (See *True or False?*)

Evaluating the mother during labor

Here's a review of methods and techniques used to monitor the progress of labor and the mother's condition.

Starting to open

Evaluate **dilation.** The external os opening should increase from 0 to 10 cm.

The thick and thin of it

Evaluate **effacement,** cervical thinning and shortening, which is measured from 0% (thick) to 100% (paper thin).

What's the situation?

Using abdominal palpation (Leopold's maneuvers), determine **fetal position and presentation.** The process consists of four maneuvers.

Palpate the fundus to identify the occupying fetal part: the fetus's head is firm and rounded and moves freely; the breech is softer and less regular and moves with the trunk.

Palpate the abdomen to locate the fetus's back: the back should feel firm, smooth, and convex, whereas the front is soft, irregular, and concave.

Determine the level of descent of the head by grasping the lower portion of the abdomen above the symphysis pubis to identify the fetal part presenting over the inlet; an unengaged head can be rocked from side to side.

True or false?

Use the chart below to help distinguish between true and false labor.

True labor	False labor
Regular contractions	Irregular, brief contractions
Back discomfort that spreads to the abdomen	Discomfort that's localized in the abdomen
Progressive cervical effacement and dilation	No cervical change
Gradually shortened intervals between contractions	No change or irregular change in intervals between contractions
Increased intensity of contractions with ambulation	Contractions that may be relieved with ambulation
Contractions that increase in duration and intensity	Usually no change in duration and intensity of contractions
Usually bloody show	Usually no bloody show

Determine head flexion by moving fingers down both sides of the uterus to assess the descent of the presenting part into the pelvis; greater resistance is met as the fingers move downward on the cephalic prominence (brow) side.

What's the relationship?

Check the **station,** the relationship of the presenting part to the pelvic ischial spines:
• The presenting part is even with the ischial spines at 0 station.
• The presenting part is above the ischial spines at −3, −2, or −1.
• The presenting part is below the ischial spines at +1, +2, or +3.

Thirsty?

Monitor the patient for signs of **dehydration,** such as poor skin turgor, decreased urine output, and dry mucous membranes.

I need a little rest

Use an external pressure transducer to monitor the patient for **tetanic contractions,** sustained prolonged contractions with little rest in-between that reduce oxygen supply to the fetus.

Measuring contractions

Phases of **uterine contractions** include increment (buildup and longest phase), acme (peak of the contraction), and decrement (letting-down phase). Contractions are measured by duration, frequency, and intensity. Here's how to measure each:

- **Duration** is measured from the beginning of the increment of the contraction to the end of the decrement of the contraction and averages 30 seconds early in labor and 60 seconds later in labor.
- **Frequency** is measured from the beginning of one contraction to the beginning of the next and averages 5 to 30 minutes apart early in labor and 2 to 3 minutes apart later in labor.
- **Intensity** is assessed during the acme phase and can be measured with an intrauterine catheter or by palpation; normal resting pressure when using an intrauterine catheter is 5 to 15 mm Hg; pressure increases to 30 to 50 mm Hg during the acme.

All around adaptations

Labor also prompts a series of responses throughout the mother's body, including changes in the cardiovascular, respiratory, and GI systems. (See *Maternal responses to labor.*)

Evaluating the fetus during labor

Evaluation of uterine contractions and fetal heart rate (FHR) during labor involves external and internal monitoring.

Heart check

FHR can be monitored either intermittently with a handheld device or continuously with a fetal monitor.

Pressure check

Contraction frequency and intensity is monitored externally with a **tocotransducer.** This pressure-sensitive device records uterine motion during contractions.

From the inside out

Internal electronic fetal monitoring can evaluate fetal status during labor more accu-

Maternal responses to labor

During labor, the mother undergoes physiologic changes.

CARDIOVASCULAR SYSTEM
- Increased intrathoracic pressure during pushing in the second stage
- Increased peripheral resistance during contractions, which elevates blood pressure and decreases pulse rate
- Increased cardiac output

FLUID AND ELECTROLYTE BALANCE
- Increased water loss from diaphoresis and hyperventilation
- Increased evaporative water volume from increased respiratory rate

RESPIRATORY SYSTEM
- Increased oxygen consumption
- Increased respiratory rate

HEMATOPOIETIC SYSTEM
- Increased plasma fibrinogen level and leukocyte count
- Decreased blood coagulation time and blood glucose levels

GI SYSTEM
- Decreased gastric motility and absorption
- Prolonged gastric emptying time

RENAL SYSTEM
- Forward and upward displacement of the bladder base at engagement
- Possibly proteinuria from muscle breakdown
- Possibly impaired blood and lymph drainage from the bladder base, resulting from edema caused by the presenting fetal part
- Decreased bladder sensation if epidural anesthetic has been administered

rately than external methods. A spiral electrode attached to the presenting fetal part provides the baseline FHR and allows evaluation of FHR variability.

Intense info

To determine the true intensity of contractions, a **pressure-sensitive catheter** is inserted into the uterine cavity alongside the fetus.

Stages of labor

The labor process is divided into four stages, ranging from the onset of true labor, through delivery of the fetus and placenta, to the first hour after delivery.

FIRST STAGE

The first stage is measured from the onset of true labor to complete dilation of the cervix. This period lasts from 6 to 18 hours in a primiparous patient and from 2 to 10 hours in a multiparous patient. There are three phases of stage one.

This is getting exciting

During the **latent phase,** the cervix is dilated 0 to 3 cm, contractions are irregular, and the patient may experience anticipation, excitement, or apprehension. Cervical effacement is almost complete.

This is getting serious

During the **active phase,** the cervix is dilated 4 to 7 cm. Cervical effacement is complete. Contractions are about 5 to 8 minutes apart and last 45 to 60 seconds with moderate to strong intensity. During this phase, the patient becomes serious and concerned about the progress of labor; she may ask for pain medication or use breathing techniques. If membranes haven't ruptured spontaneously, amniotomy may be performed.

Whole lotta shakin' going on

During the **transitional phase,** the cervix is dilated 8 to 10 cm. Contractions are about 1 to 2 minutes apart and last 60 to 90 seconds with strong intensity. During this phase, the patient may lose control, thrash in bed, groan, or cry out.

SECOND STAGE

The second stage of labor extends from complete dilation to delivery. This stage lasts an average of 40 minutes (20 contractions) for the primiparous patient and 20 minutes (10 contractions) for the multiparous patient. It may last longer if the patient has had epidural anesthesia.

The patient may become exhausted and dehydrated as she moves from coping with contractions to actively pushing. During this stage, the fetus is moved along the birth canal by the mechanisms of labor described here.

A brief engagement

The fetus's head is considered to be **engaged** when the biparietal diameter passes the pelvic inlet.

Going down

The movement of the presenting part through the pelvis is called **descent.**

Flex that chin

During **flexion,** the head flexes so that the chin moves closer to the chest.

Head rotation I

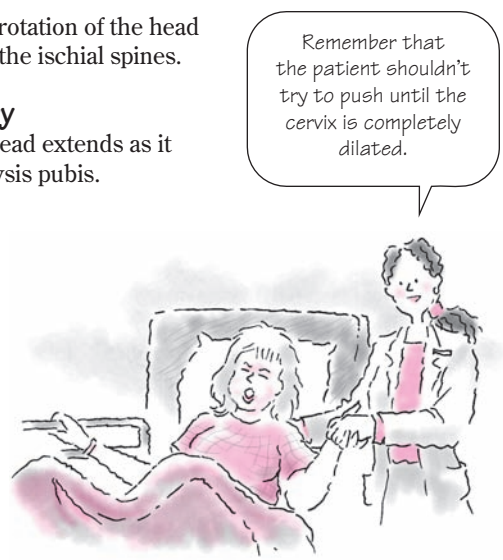
Internal rotation is the rotation of the head in order to pass through the ischial spines.

Stretch as you go by

Extension is when the head extends as it passes under the symphysis pubis.

Head rotation II

External rotation involves the external rotation of the head as the shoulders rotate to the anteroposterior position in the pelvis.



Helping to promote maternal-neonatal bonding is a key nursing responsibility in the first hour after delivery.

Nursing care during labor and delivery

Nursing actions include interventions that correspond to all stages of labor as well as those that apply only to certain stages.

CARE DURING ALL STAGES OF LABOR

- Monitor and record vital signs, I.V. fluid intake, and urine output.
- Provide emotional support to the patient and her coach.
- Evaluate the need for pain medication and the effectiveness of pain-relief measures.
- Maintain sterile technique and standard precautions.
- Maintain the patient's comfort by offering mouth care, ice chips, and a change of bed linen.
- Explain the purpose of all nursing actions and medical equipment.

CARE DURING FIRST AND SECOND STAGES

- Monitor the frequency, duration, and intensity of contractions.
- Monitor fetal heart rate (FHR) during and between contractions, and report changes.
- Observe for rupture of membranes, noting the time, color, odor, amount, and consistency of amniotic fluid.
- Watch for signs of hypotensive supine syndrome; if blood pressure falls, position the patient on the left side and report changes immediately.
- During the second stage, observe the perineum for show and bulging.

CARE DURING FIRST, SECOND, AND THIRD STAGES

- Assist with breathing techniques.
- Encourage rest between contractions.

CARE DURING THE FOURTH STAGE

- Monitor lochia and the location and consistency of the fundus.
- Encourage bonding.
- Initiate breast-feeding.

THIRD STAGE

The third stage of labor extends from delivery of the neonate to expulsion of the placenta and lasts from 5 to 30 minutes.

Pain, then placenta

During this period, the patient typically focuses on the neonate's condition. The patient may experience discomfort from uterine contractions before expelling the placenta.

FOURTH STAGE

The fourth stage of labor is the 1 to 4 hours after delivery, when the primary activity is the promotion of maternal-neonatal bonding.

For a review of nursing actions during the delivery process, see *Nursing care during labor and delivery*.

Pain relief during labor and delivery

Pain relief is an important element of patient care during labor and delivery. Pain relief during labor includes nonpharmacologic methods, analgesics, and general and regional anesthetics.

Just relax

Relaxation techniques may be effective.

Just rub it

Effleurage, a light abdominal stroking with the fingertips in a circular motion, is effective for mild to moderate discomfort.

Hey, look over here

Distraction can divert attention from mild discomfort early in labor. Focal point imaging and music are sometimes effective diversions.

Breathing, breathing, breathing

Three patterns of controlled chest breathing, called **Lamaze breathing,** are used primarily during the active and transitional phases of labor.

Ancient pain relief

The stimulation of key trigger points with needles (**acupuncture**) or finger pressure (**acupressure**) can reduce pain and enhance energy flow.

Pain relief but not without risk

Opioids such as nalbuphine (Nubain) can be used to relieve pain. If an opioid is given within 2 hours of delivery, it can cause neonatal respiratory depression, hypotonia, and lethargy.

Knockout drops

General anesthetics can be administered I.V. or through inhalation, resulting in unconsciousness. General anesthetics should be used only if regional anesthetics are contraindicated or in a rapidly developing emergency.

I.V. anesthetics, which are usually reserved for patients with massive blood loss, include:

- thiopental (Pentothal)
- ketamine (Ketalar).

Inhalation anesthetics include:

- nitrous oxide
- isoflurane (Forane)
- halothane (Fluothane).

Less pain but still awake

Lumbar epidural anesthesia requires an injection of medication into the epidural space in the lumbar region, leaving the patient awake and cooperative. An epidural provides analgesia for the first and second stages of labor and anesthesia for delivery without adverse fetal effects. Hypotension is uncommon, but its incidence increases if the patient doesn't receive a proper fluid load before the procedure. Epidural anesthesia may decrease the woman's urge to push.

Urgent cases

Spinal anesthesia involves an injection of medication into the cerebrospinal fluid in the spinal canal. Because of its rapid onset, spinal anesthesia is useful for urgent cesarean deliveries.

Delivery relief

Local infiltration involves an injection of anesthetic into the perineal nerves. It offers no relief from discomfort during labor but relieves pain during delivery.

Pain blocker I

A **pudendal block** involves blockage of the pudendal nerve. This procedure is used only for delivery.

Pain blocker II

A **paracervical block** involves the blockage of nerves in the peridural space at the sacral hiatus, which provides analgesia for the first and second stages of labor and anesthesia for delivery. This procedure increases the risk of forceps delivery.

Keep abreast of diagnostic tests

The key diagnostic test in the intrapartum period is fetal blood sampling.

Scratch the scalp

Fetal blood sampling is a method of monitoring fetal blood pH when indefinite or suspicious FHR patterns occur. The blood sample is usually taken from the scalp but may also be taken from the presenting part if the fetus is in a breech presentation. Fetal blood sampling requires that:

- membranes be ruptured
- the cervix be dilated 2 to 3 cm
- the presenting part be no higher than −2 station.

A pH of 7.25 or higher is normal, 7.20 to 7.24 is preacidotic, and lower than 7.20 constitutes severe acidosis.

Nursing actions

- After the procedure, observe the FHR and observe the patient for vaginal bleeding, which may indicate fetal scalp bleeding.

Catch up on complications

Some potential intrapartum complications are abruptio placentae, amniotic fluid embolism, disseminated intravascular coagulation (DIC), dystocia, fetal distress, inverted uterus, laceration, precipitate labor, premature rupture of membranes, prolapsed umbilical cord, and uterine rupture.

Abruptio placentae

Abruptio placentae refers to premature separation of the placenta from the uterine wall after 20 to 24 weeks of gestation. It may occur as late as the first or second stage of labor. Placental separation is measured by degree (from grades 0 to 3) to determine the fetal and maternal outcome.

Perinatal mortality depends on the degree of placental separation and fetal level of maturity. Most serious complications stem from hypoxia, prematurity, and anemia. The maternal mortality rate is about 6% and depends on the severity of bleeding, the presence of coagulation defects, hypofibrinogenemia, and the time lapse between placental separation and delivery.

CAUSES

- Abdominal trauma
- Cocaine use
- Decreased blood flow to the placenta
- Hydramnios
- Multifetal pregnancy
- Other risk factors (low serum folic acid levels, vascular or renal disease, hypertension in pregnancy)
- Uteroplacental insufficiency

DATA COLLECTION FINDINGS

- Acute abdominal pain
- Frequent, low-amplitude contractions (noted with external fetal monitor)
- Hemorrhage, either concealed or apparent, with dark red vaginal bleeding
- Rigid abdomen
- Shock

DIAGNOSTIC FINDINGS

- Ultrasonography locates the placenta and may reveal a clot or hematoma.
- Coagulation studies may show evidence of DIC—increased partial thromboplastin time (PTT) and prothrombin time (PT), elevated level of fibrinogen degradation products, and decreased fibrinogen level.
- Hematology may reveal decreased platelet count if DIC is present.

NURSING DIAGNOSES

- Anxiety
- Deficient fluid volume
- Ineffective tissue perfusion: Cardiopulmonary

TREATMENT

- Transfusion: packed red blood cells (RBCs), platelets, and fresh frozen plasma if necessary
- Cesarean delivery

INTERVENTIONS AND RATIONALES

- Monitor maternal vital signs, FHR, uterine contractions, and vaginal bleeding *to evaluate maternal and fetal well-being.*
- Monitor fluid and electrolyte balance *to evaluate renal function.*
- Avoid pelvic or vaginal examinations and enemas *to prevent further placental disruption.*
- Monitor administration of packed RBCs, platelets, or fresh frozen plasma *to detect adverse reactions.*
- Provide oxygen by mask *to minimize fetal hypoxia.*
- Position the patient in a left lateral recumbent position *to help relieve pressure on the vena cava from an enlarged uterus, which could further compromise fetal circulation.*
- Provide emotional support *to allay patient anxiety.*

Teaching topics

- Understanding the treatment plan

Amniotic fluid embolism

With amniotic fluid embolism, amniotic fluid escapes into the maternal circulation because of a defect in the membranes after rupture or partial abruptio placentae. During labor (or in the postpartum period), solid particles such as skin cells enter the maternal circulation and reach the lungs as small emboli, forcing a massive pulmonary embolism.

CAUSES
- Oxytocin (Pitocin) administration
- Abruptio placentae
- Polyhydramnios

DATA COLLECTION FINDINGS
- Chest pain
- Coughing with pink, frothy sputum
- Cyanosis
- Hemorrhage
- Increasing restlessness and anxiety
- Shock disproportionate to blood loss
- Sudden dyspnea
- Tachypnea

DIAGNOSTIC FINDINGS
- Electronic fetal monitor reveals fetal distress (during the intrapartum period).
- Arterial blood gas (ABG) results reveal hypoxemia.
- Coagulation studies may reveal DIC.

NURSING DIAGNOSES
- Decreased cardiac output
- Impaired gas exchange
- Ineffective breathing pattern

TREATMENT
- Oxygen therapy: face mask, cannula, or endotracheal (ET) intubation and mechanical ventilation if respiratory arrest occurs
- Cardiopulmonary resuscitation (CPR) if patient is apneic and pulseless
- Emergency delivery using forceps or by cesarean birth
- Blood transfusion if signs of DIC are present
- Fluid replacement

Drug therapy
- Anticoagulant: heparin

INTERVENTIONS AND RATIONALES
- Monitor and record vital signs *to watch for tachycardia and tachypnea, which may indicate hypoxemia.*
- Monitor respiratory and cardiovascular status *to detect early signs of compromise.*
- Monitor FHR to detect fetal distress.
- Administer oxygen as prescribed *to improve oxygenation.*
- Perform CPR, if necessary, *to restore breathing and circulation.*
- Monitor and record intake and output *to detect deficient fluid volume.*
- Assist with immediate delivery of neonate *to prevent fetal compromise.*
- Assist with ET intubation and mechanical ventilation, if necessary, *to maintain pulmonary function.*

Teaching topics
- Explaining the disorder and treatment options to the patient and her family

In amniotic fluid embolism, amniotic fluid escapes into the maternal circulation. It's an emergency situation that can require cardiopulmonary resuscitation.

Disseminated intravascular coagulation

DIC refers to increased production of prothrombin, platelets, and other coagulation factors, leading to widespread thrombus formation, depletion of clotting factors, and hemorrhage.

CAUSES
- Abruptio placentae
- Amniotic fluid embolism
- Retained dead fetus

DATA COLLECTION FINDINGS
- Abnormal bleeding (petechiae, hematomas, ecchymosis, cutaneous oozing)
- Nausea
- Oliguria
- Severe muscle, back, and abdominal pain
- Shock
- Vomiting

DIAGNOSTIC FINDINGS
- Coagulation studies reveal decreased fibrinogen level, positive D-dimer test specific for DIC, and prolonged PT and PTT.
- Hematology studies reveal decreased platelet count.

NURSING DIAGNOSES
- Risk for deficient fluid volume
- Ineffective tissue perfusion: Peripheral
- Decreased cardiac output

TREATMENT
- Transfusion therapy: packed RBCs, fresh frozen plasma, platelets, and cryoprecipitate
- Supplemental oxygen
- Treatment of underlying condition
- Immediate delivery of the fetus

Drug therapy
- Anticoagulant: heparin

INTERVENTIONS AND RATIONALES
- Monitor cardiovascular, respiratory, neurologic, GI, and renal status *to detect early signs of complications.*
- Monitor vital signs frequently *to detect signs of shock (increased tachycardia and hypotension).*
- Closely monitor intake and output *to detect signs of hypovolemia.*
- Enforce complete bed rest *to protect the patient from injury.*
- Monitor the patient closely for signs and symptoms of a transfusion reaction. Notify the doctor immediately if signs or symptoms occur. Follow your facility's policy for transfusion reactions should any occur. *Immediate intervention prevents life-threatening complications.*
- Administer oxygen *to meet the body's increased oxygen demands.*
- Monitor the results of serial blood studies *to help guide the treatment plan.*
- Check all I.V. and venipuncture sites frequently for bleeding. Apply pressure to injection sites for at least 10 minutes. Alert other personnel to the patient's tendency to hemorrhage. *These measures help to prevent hemorrhage.*

Teaching topics
- Explaining the disorder and treatment options to the patient and her family
- Bleeding prevention

Dystocia

Dystocia is long, difficult, or abnormal labor. It's estimated that approximately 10% of women experience dystocia during the first stage of labor when the fetus assumes the vertex position.

CAUSES
- Contracted pelvis
- Obstructive tumors in the mother
- Malposition or malformation of the fetus
- Hypertonic uterine patterns
- Hypotonic uterine patterns

DATA COLLECTION FINDINGS
- Arrested descent
- Hypertonic contractions
- Hypotonic contractions
- Prolonged active phase
- Prolonged deceleration phase
- Protracted latent phase
- Uncoordinated contractions

DIAGNOSTIC FINDINGS
- Ultrasonography shows fetal position or malformation.

NURSING DIAGNOSES
- Acute pain
- Deficient fluid volume
- Fear

TREATMENT
- I.V. fluid administration
- Delivery of the fetus by cesarean birth if labor fails to progress and mother or fetus show signs of compromise

Drug therapy
- Oxytocic agent: oxytocin (Pitocin) if contractions are ineffective

INTERVENTIONS AND RATIONALES

- Monitor vital signs *to detect early signs of compromise.*
- Provide emotional support and encouragement *to help alleviate fear and anxiety.*
- Assist the patient to a left side-lying position *to increase comfort and to relieve pressure on the vena cava from an enlarged uterus, which could compromise fetal circulation.*
- Encourage the patient *to void every 2 hours to keep the bladder empty.*
- Monitor the effectiveness of oxytocin therapy and watch for complications *to ensure prompt intervention if complications occur.*

Teaching topics

- Explaining the treatment plan

Fetal distress

Fetal distress refers to fetal compromise that results in a stressful and potentially lethal condition.

CAUSES

- Fetal hypoxia
- Prolapsed umbilical cord
- Unfavorable uterine environment
- Moderate to severe Rh factor isoimmunization

DATA COLLECTION FINDINGS

- Change in FHR

DIAGNOSTIC FINDINGS

- Fetal scalp blood sampling reveals acidosis.

NURSING DIAGNOSES

- Anxiety
- Fear
- Ineffective tissue perfusion: Cardiopulmonary

TREATMENT

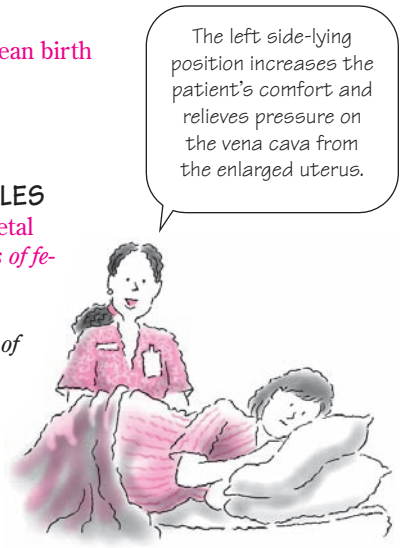
- Supplemental oxygen by face mask, typically at 6 to 8 L/minute
- Amnioinfusion if the fetus exhibits variable deceleration not relieved by oxygen, positioning, or discontinuation of oxytocin (Pitocin) infusion (see *Understanding amnioinfusion*)
- I.V. fluid administration
- Emergent fetal delivery by cesarean birth

Drug therapy

- Discontinuing oxytocin infusion

INTERVENTIONS AND RATIONALES

- Monitor FHR, fetal activity, and fetal heart variability *to detect early signs of fetal compromise.*
- Monitor maternal vital signs and pulse oximetry *to detect early signs of compromise.*
- Notify the doctor immediately of signs of compromise *to ensure prompt treatment.*
- Monitor intake and output *to detect early signs of deficient fluid volume.*
- Assist the patient to a left side-lying position *to relieve pressure on the vena cava from an enlarged uterus, which could compromise fetal circulation.*



Teaching topics

- Explaining the treatment plan

Inverted uterus

An inverted uterus can occur during delivery of the placenta. The inversion can be partial or total.

CAUSES

- Excessive cord traction
- Excessive fundal pressure

DATA COLLECTION FINDINGS

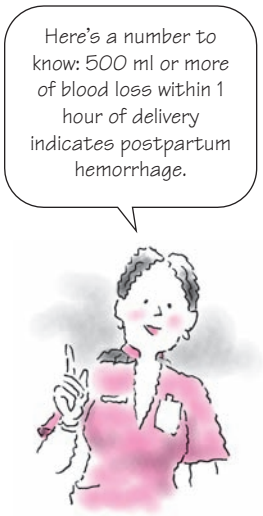
- Large, sudden gush of blood from the vagina
- Signs of blood loss, such as hypotension, dizziness, paleness, and diaphoresis, which can progress to shock if blood loss continues unchecked for more than a few minutes
- Inability to palpate the fundus
- Severe uterine pain
- Uterine mass within the vaginal canal

Understanding amnioinfusion

Amnioinfusion is the replacement of amniotic fluid volume through intrauterine infusion of a saline solution, using a pressure catheter. This procedure is indicated for the treatment of repetitive variable decelerations not alleviated by maternal position change and oxygen administration.

Amnioinfusion relieves umbilical cord compression in such conditions as:

- oligohydramnios associated with postmaturity
- intrauterine growth retardation
- premature rupture of membranes.



DIAGNOSTIC FINDINGS
• Hematology tests reveal decreased hemoglobin (Hb) levels and hematocrit (HCT).

NURSING DIAGNOSES
• Acute pain
• Deficient fluid volume
• Ineffective tissue perfusion: Cardiopulmonary

TREATMENT
• Fluid resuscitation with I.V. fluids and blood products
• Supplemental oxygen administration
• Immediate manual replacement of the uterus
• Possible emergency hysterectomy

Drug therapy
• Vasodilator: nitroglycerin to relax the uterus
• Tocolytic agent: terbutaline (Brethine)
• Oxytocic agent: oxytocin (Pitocin) after replacing the uterus to aid contraction
• Antibiotics to prevent infection because the uterus was exposed

INTERVENTIONS AND RATIONALES
• Administer supplemental oxygen *to meet increased oxygen demand.*
• Monitor vital signs frequently *to detect early signs of shock.*
• Closely monitor intake and output *to detect signs of deficient fluid volume.*
• Be prepared to administer CPR if the patient's heart fails from sudden blood loss *to restore circulation and breathing.*
• During the recovery phase, evaluate the uterus for firmness, height, and position *to detect complications.*
• Provide emotional support to the patient and her family *to help allay fears and anxiety.*

Teaching topics
• Explaining the treatment plan

Laceration

Laceration refers to tears in the perineum, vagina, or cervix from the stretching of tissues during delivery. Lacerations are classified as first, second, third, or fourth degree.


First-degree laceration involves the vaginal mucosa and the skin of the perineum and fourchette.


Second-degree laceration involves the vagina, perineal skin, fascia, levator ani muscle, and perineal body.


Third-degree laceration involves the entire perineum and the external anal sphincter.


Fourth-degree laceration involves the entire perineum and rectal sphincter and portions of the rectal mucosa.

CAUSES
• Large infant size
• Instruments used to facilitate birth
• Position of the fetus

DATA COLLECTION FINDINGS
• Increased vaginal bleeding after delivery of placenta

DIAGNOSTIC FINDINGS
• Hematology studies may reveal decreased levels of Hb and HCT.

NURSING DIAGNOSES
• Acute pain
• Deficient fluid volume
• Fear

TREATMENT
• Laceration repair
• Cold application followed by heat application
• Sitz bath

Drug therapy
• Antibiotics may be necessary in some cases
• Analgesics: ibuprofen (Motrin), acetaminophen and oxycodone (Percocet), acetaminophen (Tylenol)
• Stool softener: docusate sodium (Colace)

INTERVENTIONS AND RATIONALES

- Monitor vital signs, including temperature, *to detect early signs of infection.*
- Monitor laceration site for signs of infection *to ensure prompt treatment interventions.*
- Provide maternal support and explain procedures *to allay anxiety.*
- Refrain from taking rectal temperature or administering suppositories or enemas to a patient with a third- or fourth-degree laceration *to prevent trauma to repaired laceration site.*
- Apply cold packs for 24 hours, followed by heat packs and sitz baths for the next 12 hours, *to promote comfort and healing.*

Teaching topics

- Explaining the treatment plan
- Perineal care

Precipitate labor

Precipitate labor occurs when uterine contractions are so strong that the woman delivers with only a few rapidly occurring contractions. It's commonly defined as labor completed within less than 3 hours. Such rapid labor may occur with multiparity. It may also follow induction of labor by oxytocin (Pitocin) or an amniotomy.

CAUSES

- Lack of maternal tissue resistance to the passage of the fetus
- Oxytocin administration
- Amniotomy

DATA COLLECTION FINDINGS

- Cervical dilation greater than 5 cm/hour in a nulliparous woman; more than 10 cm/hour in a multiparous woman

DIAGNOSTIC FINDINGS

- There are no diagnostic test findings specific to this complication.

NURSING DIAGNOSES

- Anxiety
- Fear
- Risk for injury

TREATMENT

- Nonpharmacologic measures for pain control
- Controlled delivery to prevent maternal and fetal injury

Drug therapy

- Tocolytic agent: terbutaline (Brethine) to reduce the force and frequency of contractions

INTERVENTIONS AND RATIONALES

- Monitor FHR and variability *to detect early signs of fetal distress.*
- Monitor infusion of tocolytic drug *to detect early signs of adverse reactions.*
- Institute nonpharmacologic measures *to control pain, such as breathing exercises and distraction.*
- Provide emotional support *to allay anxiety and fear.*

Teaching topics

- Explaining the treatment plan

Premature rupture of membranes

With premature rupture of membranes, rupture occurs 1 or more hours before the onset of labor. Chorioamnionitis may occur if the time between rupture of membranes and onset of labor is longer than 24 hours.

CAUSES AND CONTRIBUTING FACTORS

- Cause is unknown; however, malpresentation and a contracted pelvis commonly accompany the rupture
- Lack of proper prenatal care
- Poor nutrition and hygiene
- Maternal smoking
- Incompetent cervix
- Increased uterine tension from hydramnios or multiple gestation
- Reduced amniotic membrane tensile strength
- Uterine infection

Umbilical cord prolapse is an emergency that requires prompt action to save the fetus.

DATA COLLECTION FINDINGS
- Fetal tachycardia
- Blood-tinged amniotic fluid gushing or leaking from the vagina
- Foul-smelling amniotic fluid if infection is present
- Maternal fever
- Uterine tenderness

DIAGNOSTIC FINDINGS
- Nitrazine test is positive, indicating possible ruptured membranes.
- Hematology studies may reveal an elevated white blood cell count if infection is present.
- Vaginal probe ultrasonography allows detection of amniotic sac tear or rupture.
- Amniotic fluid culture and sensitivity identifies the causative organism of infection.

NURSING DIAGNOSES
- Anxiety
- Risk for infection
- Risk for injury

TREATMENT
- Hospitalization to monitor for maternal fever and leukocytosis and fetal tachycardia if pregnancy is between 28 and 34 weeks. If infection is confirmed, labor must be induced.
- Cesarean delivery if labor induction fails

Drug therapy
- Oxytocic agent: oxytocin (Pitocin) for labor induction if term pregnancy and labor doesn't result with 24 hours after membrane rupture
- Antibiotics according to culture and sensitivity results if infection is present

INTERVENTIONS AND RATIONALES
- Monitor for signs of infection or fetal distress *to avoid treatment delay.*
- Administer antibiotics as prescribed *to treat infection and prevent complications.*
- Encourage the patient to express her feelings and concerns *to allay her anxiety.*
- Monitor intake and output closely *to quickly identify signs of deficient fluid volume.*
- Evaluate patient for adverse reactions to oxytocin *to prevent complications.*

Teaching topics
- Explaining the complication and treatment plan

Prolapsed umbilical cord

A prolapsed umbilical cord occurs when the umbilical cord descends into the vagina before the presenting fetal part.

CAUSES
- Premature rupture of membranes
- Fetal presentation other than cephalic
- Placenta previa
- Intrauterine tumors that prevent the presenting part from engaging
- Small fetus
- Cephalopelvic disproportion that prevents firm engagement
- Hydramnios
- Multiple gestation

DATA COLLECTION FINDINGS
- Cord palpable during vaginal examination
- Cord visible at the vaginal opening
- Variable decelerations or bradycardia noted on fetal monitor strip

DIAGNOSTIC FINDINGS
- Ultrasonography may reveal the cord as the presenting part.

NURSING DIAGNOSES
- Anxiety
- Risk for injury
- Risk for suffocation

TREATMENT
- Supplemental oxygen therapy at 10 L/minute by face mask
- Immediate delivery of the fetus

Drug therapy
- Tocolytic agent: terbutaline (Brethine) may be used to reduce the force and frequency of contractions

INTERVENTIONS AND RATIONALES

- Place the patient in Trendelenburg's position (position the woman's hips higher than her head in a knee-to-chest position) *to relieve pressure on the umbilical cord and restore blood flow to the fetus.*
- Administer supplemental oxygen *to help meet increased oxygen demands of the mother and fetus.*
- Apply warm saline-moistened towels to the protruding cord *to prevent drying and retard cooling of the cord.*
- Monitor FHR and variability *to detect early signs of fetal distress.*
- Assist with immediate delivery of the fetus *to prevent fetal death.*

Uterine rupture

Uterine rupture occurs when the uterus undergoes more strain than it can bear. Without emergency intervention, maternal and fetal death may occur.

CAUSES

- Prolonged labor
- Previous cesarean delivery
- Faulty presentation
- Induction of labor with oxytocin
- Previous uterine surgery
- Multiple gestation
- Obstructed labor
- Trauma

DATA COLLECTION FINDINGS

- Abdominal pain and tenderness, especially at the peak of a contraction, or the feeling that "something ripped"
- Cessation of uterine contractions
- Chest pain or pain on inspiration
- Excessive external bleeding
- Hypovolemic shock caused by hemorrhage
- Late decelerations, reduced FHR variability, tachycardia and bradycardia, cessation of FHR
- Palpation of the fetus outside the uterus
- Pathological retraction ring (indentation apparent across abdomen and over the uterus)

DIAGNOSTIC FINDINGS

Diagnostic testing may not be possible in light of the life-threatening situation.

- Hematology tests reveal decreased levels of Hb and HCT.

NURSING DIAGNOSES

- Acute pain
- Deficient fluid volume
- Ineffective tissue perfusion: Cardiopulmonary

TREATMENT

- Fluid resuscitation: I.V. fluids and blood products via rapid infusion
- Supplemental oxygen therapy, which may include ET intubation and mechanical ventilation
- Surgery to remove the fetus and repair the tear or hysterectomy if necessary

Drug therapy

- Oxytocic agent: oxytocin (Pitocin) to help contract the uterus

INTERVENTIONS AND RATIONALES

- Monitor vital signs frequently *to detect signs of shock.*
- Prepare the patient for immediate surgery *to avoid life-threatening treatment delay.*
- Administer supplemental oxygen *to meet increased oxygen demands.*
- Monitor I.V. fluid administration *to detect early signs of infiltration.*
- Closely monitor intake and output *to detect early signs of deficient fluid volume.*
- Monitor cardiovascular, neurologic, and renal status *to detect early signs of compromise.*
- Expect the parents to go through a grieving process for the loss of this child (if applicable) and the inability to have other children. *Grieving is necessary to promote the healing process.*

Teaching topics

- Explaining the treatment plan
- Postoperative care
- Availability of grief counseling

Emergency birth and preterm labor

Emergency birth and preterm labor are two examples of conditions requiring nursing care that may occur during the intrapartum period.

Emergency birth

Emergency delivery of the fetus may become necessary when the well-being of the mother or fetus is in jeopardy. Causes may include a prolapsed umbilical cord, uterine rupture, or amniotic fluid embolism.

Note the most common complications requiring emergency birth: prolapsed umbilical cord, uterine rupture, and amniotic fluid embolism.

CAUSES

Contributing factors vary for each emergency birth situation.

Prolapsed umbilical cord

- Fetus at high fetal station
- Hydramnios (excess of amniotic fluid)
- Multifetal pregnancy
- Small fetus or breech presentation
- Transverse lie

Uterine rupture

- Blunt abdominal trauma
- High parity with thin uterine wall
- Intense uterine contractions (natural or oxytocin-induced), especially with fetopelvic disproportion
- Previous uterine surgery

Amniotic fluid embolism

- Fetal particulate matter (skin, hair, vernix, cells, meconium) in the fluid that obstructs the maternal pulmonary vessels

DATA COLLECTION FINDINGS

Data collection findings vary for each emergency birth situation.

Prolapsed umbilical cord

- Cord palpable during vaginal examination
- Cord visible at the vaginal opening
- Variable decelerations or bradycardia noted on fetal monitor strip

Uterine rupture

- Abdominal pain and tenderness, especially at the peak of a contraction, or the feeling that "something ripped"
- Cessation of uterine contractions
- Chest pain or pain on inspiration
- Excessive external bleeding
- Hypovolemic shock caused by hemorrhage
- Late decelerations, reduced FHR variability, tachycardia and bradycardia, cessation of FHR
- Palpation of the fetus outside the uterus

Amniotic fluid embolism

- Chest pain
- Coughing with pink, frothy sputum
- Cyanosis
- Hemorrhage
- Increasing restlessness and anxiety
- Shock disproportionate to blood loss
- Sudden dyspnea
- Tachypnea

DIAGNOSTIC FINDINGS

Prolapsed umbilical cord

- Ultrasonography confirms that the cord is prolapsed.

Uterine rupture

- Urinalysis can detect gross hematuria.
- Ultrasonography may reveal the absence of the amniotic cavity within the uterus.

Amniotic fluid embolism

- ABG analysis reveals hypoxemia.
- Hematology reveals thrombocytopenia, decreased fibrinogen level and platelet count, prolonged PT, and a PTT consistent with DIC.

NURSING DIAGNOSES

- Ineffective coping
- Acute pain
- Risk for infection

TREATMENT

- Administration of I.V. fluid
- Administration of oxygen by nasal cannula or mask (ET intubation and mechanical ventilation may be necessary in the case of amniotic fluid embolism)

Cesarean delivery

Cesarean delivery is the planned or emergency removal of the neonate from the uterus through an abdominal incision. A midline and vertical (classic) incision, allowing easy access to the fetus, is usually used in emergency situations. A low-segment, transverse, or Pfannenstiel's (bikini) incision is usually chosen in a planned cesarean birth.

NURSING ACTIONS

- Provide emotional support and reassurance to the patient and her family, including reassurance about the well-being of the fetus.
- Monitor fetal heart rate and maternal vital signs and intake and output.
- Monitor uterine contractions and labor progress, when appropriate.
- Obtain blood samples for hematocrit, hemoglobin level, prothrombin and partial thromboplastin times, fibrinogen level, platelet count, and typing and crossmatching.
- Maintain I.V. fluid replacement as necessary.
- Prepare the patient for surgery, including shaving of the abdomen and perineal area as necessary.
- Insert an indwelling urinary catheter as ordered.
- Provide preoperative teaching as necessary.
- Administer preoperative sedation as ordered.
- Provide immediate postoperative care.

- For uterine rupture, placing the patient in left lateral recumbent position
- For uterine rupture, emergency hysterectomy
- Emergency cesarean delivery (see *Cesarean delivery*)
- Possible transfusion of packed RBCs, fresh frozen plasma, or platelets

INTERVENTIONS AND RATIONALES

- Monitor maternal vital signs, pulse oximetry and intake and output and FHR *to detect complications.*
- Administer maternal oxygen by cannula or mask at 8 to 10 L/minute *to maintain uteroplacental oxygenation.*
- Maintain I.V. fluid replacement *to replace volume loss.*
- Place the patient in a left lateral recumbent position *to relieve pressure on the vena cava due to an enlarged uterus, which would compromise fetal circulation.*
- Provide emotional support and reassurance to the patient *to allay fears and reduce anxiety.*
- Obtain blood samples to determine HCT, Hb level, PT and PTT, fibrinogen level, and platelet count and to type and crossmatch blood *to establish baseline values.*
- Monitor blood product administration as necessary *to replace volume loss.*
- Prepare the patient and her family for the possibility of cesarean delivery *to reduce anxiety.*

Teaching topics

- Learning about procedures
- Understanding preoperative instruction
- Using breathing techniques

Preterm labor

Preterm labor, also known as *premature labor,* occurs before the end of the 37th week of gestation. Preterm labor can place both the mother and the fetus at high risk.

CAUSES AND RISK FACTORS

Causes and risk factors of preterm labor can be maternal or fetal.

Maternal causes

- Abdominal surgery or trauma
- Cardiovascular and renal disease
- Dehydration
- Diabetes mellitus
- Incompetent cervix
- Infection
- Placental abnormalities
- Hypertension in pregnancy
- Premature rupture of membranes

Therapeutic communication is key during emergency birth situations. The patient and her family rely on you for support, reassurance, and information.

Fetal causes
- Hydramnios
- Infection
- Multifetal pregnancy

DATA COLLECTION FINDINGS
- Feeling of pelvic pressure or abdominal tightening
- Increased vaginal discharge
- Intestinal cramping
- Menstrual-like cramps
- Pain or discomfort in vulva or thighs
- Persistent, low, dull backache
- Uterine contractions that result in cervical dilation and effacement
- Vaginal spotting

DIAGNOSTIC FINDINGS
- Electronic fetal monitoring confirms uterine contractions.
- Vaginal examination confirms cervical effacement and dilation.

NURSING DIAGNOSES
- Anxiety
- Deficient knowledge (treatment plan)
- Risk for injury

TREATMENT
- Suppression of preterm labor (if fetal membranes are intact, there's no evidence of bleeding, the well-being of the fetus and mother isn't in jeopardy, cervical effacement is no more than 50%, and cervical dilation is less than 4 cm)

Drug therapy
- Antibiotics according to organism sensitivity if urinary tract infection is present
- Betamethasone (Celestone) administered I.M. at regular intervals over 48 hours to increase fetal lung maturity in a fetus expected to be delivered preterm
- Nifedipine (Procardia), a calcium channel blocker, to decrease the production of calcium, a substance associated with the initiation of labor; adverse maternal effects include dizziness, nausea, bradycardia, and flushing
- Indomethacin (Indocin) to decrease the production of prostaglandins and lipid compounds associated with the initiation of labor; adverse maternal effects include nausea, vomiting, and dyspepsia; premature closure of the fetus's ductus arteriosus can occur if indomethacin is given before 32 weeks' gestation
- Magnesium sulfate to prevent a reflux of calcium into the myometrial cells, thereby maintaining a relaxed uterus
- Tocolytic agents, such as terbutaline (Brethine) and ritodrine (Yutopar), to inhibit uterine contractions; maternal adverse effects include tachycardia, hypoglycemia, hypokalemia, hypotension, and nervousness

INTERVENTIONS AND RATIONALES
- Monitor maternal vital signs, contractions, and FHR every 15 minutes during tocolytic therapy (otherwise, provide continuous fetal monitoring) *to monitor maternal and fetal well-being.*
- Monitor the mother's respiratory status *to detect pulmonary edema, an adverse effect associated with tocolytic therapy.*
- Monitor for maternal adverse reactions to terbutaline or ritodrine *to detect possible tachycardia, diarrhea, nervousness, tremors, nausea, vomiting, headache, hyperglycemia, hypoglycemia, hypokalemia, or pulmonary edema.*
- Notify the doctor if the maternal pulse rate exceeds 120 beats/minute or the FHR exceeds 180 beats/minute *to expedite medical evaluation of maternal and fetal status.*
- Provide emotional support to the mother *to ease anxiety and establish a therapeutic relationship.*
- Place the patient in the lateral position *to increase placental perfusion.*
- Monitor for magnesium sulfate toxicity, which causes central nervous system (CNS) depression in the mother and fetus, and make sure calcium gluconate is available *to reverse these effects.*

Teaching topics
- Following instructions for ongoing tocolytic therapy if appropriate

Pump up on practice questions

1. A client in the 28th week of gestation comes to the emergency department because she thinks that she's in labor. To confirm a diagnosis of preterm labor, the nurse would expect the physical examination to reveal:

1. irregular uterine contractions with no cervical dilation.
2. painful contractions with no cervical dilation.
3. regular uterine contractions with cervical dilation.
4. regular uterine contractions with no cervical dilation.

Answer: 3. Regular uterine contractions (every 10 minutes or more) along with cervical dilation before 36 weeks' gestation or rupture of fluids indicates preterm labor. Uterine contractions without cervical dilation don't indicate preterm labor.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

2. A client in the active phase of labor has a reactive fetal monitor strip and has been encouraged to walk. When she returns to bed for a monitor check, she complains of an urge to push. The nurse notes that the amniotic membranes have ruptured and she can visualize the umbilical cord. What should the nurse do next?

1. Put the client in a knee-to-chest position.
2. Call the physician or midwife.
3. Push down on the uterine fundus.
4. Arrange for fetal blood sampling to assess for fetal acidosis.

Answer: 1. The knee-to-chest position gets the weight off the baby and umbilical cord, which would prevent blood flow. Calling the physician or midwife and arranging for blood sampling are important, but they have a lower priority than getting the baby off the cord. Pushing down on the fundus would increase the danger by further compromising blood flow.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

3. A client is attempting to deliver vaginally despite the fact that her previous delivery was by cesarean delivery. Her contractions are 2 to 3 minutes apart, lasting from 75 to 100 seconds. Suddenly, the client complains of intense abdominal pain, and the fetal monitor stops picking up contractions. The nurse recognizes that which event may have occurred?

1. Abruptio placentae
2. Prolapsed cord
3. Partial placenta previa
4. Complete uterine rupture

Answer: 4. With complete uterine rupture, the client would feel a sharp pain in the lower abdomen and contractions would cease. FHR would also cease within a few minutes. Uterine irritability would continue to be indicated by the fetal heart monitor tracing with abruptio placentae. With a prolapsed cord, contrac-

tions would continue and there would be no pain from the prolapse itself. There would be vaginal bleeding with a partial placenta previa, but no pain outside of the expected pain of contractions.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

4. A client with gravida 3 para 2 (three pregnancies and two children) at 40 weeks' gestation is admitted with spontaneous contractions. The physician performs an amniotomy to augment her labor. The priority nursing action is to:

1. explain the rationale for the amniotomy to the client.
2. monitor fetal heart tones after the amniotomy.
3. ambulate the client to strengthen the contraction pattern.
4. position the client in a lithotomy position to administer perineal care.

Answer: 2. The nurse should first monitor fetal heart tones. After an amniotomy is performed, the umbilical cord may be washed down below the presenting part and cause umbilical cord compression, which would be indicated by variable deceleration on the fetal heart tracing. An explanation of the rationale for amniotomy would be given before the procedure. The nurse would ambulate the client only if the presenting part were engaged. The nurse would provide perineal care after assessing the fetal response to the amniotomy.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

5. The nurse can consider the fetus's head to be engaged when:

1. the presenting part moves through the pelvis.
2. the fetal head rotates to pass through the ischial spines.
3. the fetal head extends as it passes under the symphysis pubis.
4. the biparietal diameter passes the pelvic inlet.

Answer: 4. The fetus's head is considered engaged when the biparietal diameter passes the pelvic inlet. The presenting part moving through the pelvis is called descent. Rotation of the head to pass through the ischial spines is called internal rotation. Extension of the head as it passes under the symphysis pubis is called extension.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

6. A client is experiencing true labor when her contraction pattern shows:

1. occasional irregular contractions.
2. irregular contractions that increase in intensity.
3. regular contractions that remain the same.
4. regular contractions that increase in frequency and duration as well as intensity.

Answer: 4. Regular contractions that increase in frequency and duration as well as intensity

indicate true labor. The other choices don't describe the contraction pattern of true labor.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

7. A client is admitted to the hospital with contractions that are about 1 to 2 minutes apart and last for 60 seconds. Vaginal examination reveals that her cervix is dilated 8 cm. The client is in which stage of labor?

1. The latent phase
2. The active phase
3. The third stage
4. The transitional phase

Answer: 4. The client is in the transitional phase of labor. This phase of labor is characterized by cervical dilation of 8 to 10 cm and contractions that are about 1 to 2 minutes apart and last for 60 to 90 seconds with strong intensity. In the latent phase, the cervix is dilated 0 to 3 cm and contractions are irregular. During the active phase, the cervix is dilated 4 to 7 cm, and contractions are about 5 to 8 minutes apart and last 45 to 60 seconds with moderate to strong intensity. The third stage of labor extends from delivery of the neonate to expulsion of the placenta and lasts from 5 to 30 minutes.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

8. A client in the second stage of labor experiences rupture of the membranes. The most appropriate intervention by the nurse is to:

1. obtain the client's vital signs immediately.
2. evaluate for prolapsed cord and monitor FHR.
3. administer oxygen through a face mask at 6 to 10 L/minute.
4. position the client on her left side.

Answer: 2. The nurse should immediately check for prolapsed cord and monitor FHR. When the membranes rupture, the cord may become compressed between the fetus and maternal cervix or pelvis, thus compromising fetoplacental perfusion. It isn't necessary to monitor maternal vital signs, administer oxygen, or position the client on her left side when the client's membranes rupture.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

9. During labor, a primigravida client receives epidural anesthesia. The nurse assists in monitoring maternal and fetal status. Which finding suggests an adverse reaction to the anesthesia?

1. Increased variability
2. Maternal hypotension
3. Fetal tachycardia
4. Anuria

Answer: 2. As the epidural anesthetic spreads through the spinal canal, it may produce hypotensive crisis, which is characterized by

maternal hypotension, decreased beat-to-beat variability, and fetal bradycardia. Although the client may experience some postpartum urine retention, anuria isn't associated with epidural anesthesia.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

10. A client is receiving magnesium sulfate to help suppress preterm labor. The nurse should watch for which sign of magnesium toxicity?

1. Headache
2. Loss of deep tendon reflexes
3. Palpitations
4. Dyspepsia

Answer: 2. Magnesium toxicity causes signs of CNS depression, such as loss of deep tendon reflexes, paralysis, respiratory depression, drowsiness, lethargy, blurred vision, slurred speech, and confusion. Headache may be an adverse effect of calcium channel blockers, which are sometimes used to treat preterm labor. Palpitations are an adverse effect of terbutaline (Brethine) and ritodrine (Yutopar), which are also used to treat preterm labor. Dyspepsia may occur as an adverse effect of indomethacin (Indocin), a prostaglandin synthetase inhibitor used to suppress preterm labor.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

24 Postpartum care

In this chapter, you'll review:

- physiologic and psychological changes that occur immediately after pregnancy
- postpartum assessment
- how to care for postpartum complications.

Brush up on key concepts

A mother undergoes both physiologic and psychological changes after delivery. Understanding these changes is essential to providing safe, effective patient care.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on page 520.

Physiologic changes after delivery

Here's a brief review of body system changes that occur immediately after delivery.

Circulation gyration

In the **vascular system,** blood volume decreases and hematocrit (HCT) increases after vaginal delivery. Excessive activation of blood-clotting factors also occurs. Blood volume returns to prenatal levels within 3 weeks.

Reproductive regeneration

In the **reproductive system,** uterine involution occurs rapidly immediately after delivery. Progesterone production ceases until the patient's first ovulation. Endometrial regeneration begins after 6 weeks. The cervical opening is permanently altered from a circle to a jagged slit.

Hungry for hard work

GI system changes include:

- increased hunger after labor and delivery
- delayed bowel movement from decreased intestinal muscle tone and perineal discomfort
- increased thirst from fluids lost during labor and delivery.

Increasing capacity

Genitourinary system changes include:

- increased urine output during the first 24 hours after delivery due to increased glomerular filtration rate and a drop in progesterone levels
- increased bladder capacity
- proteinuria caused by the catalytic process of involution (in 50% of women)
- decreased bladder-filling sensation caused by swollen and bruised tissues
- return of dilated ureters and renal pelvis to prepregnancy size after 6 weeks.

Hormone readjustment

In the **endocrine system,** thyroid function and the production of anterior pituitary gonadotropic hormones is increased. Simultaneously, the production of other hormones, including estrogen, aldosterone, progesterone, human chorionic gonadotropin, corticoids, and ketosteroids, decreases.

Psychological changes after pregnancy

More than 50% of women experience transient mood alterations immediately after pregnancy. This mood change is called **postpartum depression,** or the "baby blues," and signs and symptoms include sadness, crying, fatigue, and low self-esteem. Possible causes include hormonal changes, genetic predisposition, and adjustment to an altered role and self-concept.

Teach the patient that mood swings and bouts of depression are normal postpartum responses; they typically occur during the

Cheat sheet

Postpartum care refresher

MASTITIS

Key signs and symptoms

- Chills
- Localized area of redness and inflammation
- Temperature of 101.1° F (38.4° C) or higher

Key test results

- Culture of purulent discharge may test positive for *Staphylococcus aureus.*

Key treatments

- Incision and drainage if abscess occurs
- Moist heat application
- Pumping breasts every 2 to 4 hours to preserve breast-feeding ability if abscess occurs
- Analgesics: acetaminophen (Tylenol), ibuprofen (Advil)
- Antibiotics: cephalexin (Keftab), cefaclor (Ceclor), clindamycin (Cleocin)

Key interventions

- Administer antibiotic therapy.
- Apply moist heat.

POSTPARTUM HEMORRHAGE

Key signs and symptoms

- Blood loss greater than 500 ml within a 24-hour period; may occur up to 6 weeks after delivery
- Signs of shock (tachycardia, hypotension, oliguria)
- Uterine atony

Key test results

- Hematology studies show decreased hemoglobin and hematocrit levels, low fibrinogen level, and decreased partial thromboplastin time.

Key treatments

- Bimanual compression of the uterus and dilatation and curettage to remove clots
- I.V. replacement of fluids and blood
- Parenteral administration of methylergonovine (Methergine)
- Rapid I.V. infusion of dilute oxytocin (Pitocin)

Key interventions

- Massage the fundus and express clots from the uterus.
- Perform a pad count.
- Monitor the fundus for location.
- Monitor I.V. infusion of dilute oxytocin.

PSYCHOLOGICAL MALADAPTATION

Key signs and symptoms

- Inability to stop crying
- Increased anxiety about self and infant's health
- Overall feeling of sadness
- Unwillingness to be left alone

Key treatments

- Counseling for the patient and family at risk
- Psychotherapy for the patient
- Antidepressants: imipramine (Tofranil), nortriptyline (Pamelor)

Key interventions

- Obtain a health history during the antepartum period to determine risk of postpartum depression.
- Evaluate the patient's support systems.
- Evaluate maternal-infant bonding.
- Provide emotional support and encouragement.

PUERPERAL INFECTION

Key signs and symptoms

- Abdominal pain and tenderness
- Purulent, foul-smelling lochia
- Tachycardia

Key test results

- A complete blood count may show an elevated white blood cell count in the upper ranges of normal (more than 30,000/µl) for the postpartum period.
- Cultures of the blood or the endocervical and uterine cavities may reveal the causative organism.

Key treatments

- Broad-spectrum I.V. antibiotic therapy unless a causative organism is identified

Key interventions

- Monitor vital signs every 4 hours.
- Place the patient in Fowler's position.
- Maintain I.V. fluid administration as ordered.
- Administer antibiotics as prescribed.

first 3 weeks after delivery and subside within 1 to 10 days.

Maternal behavior after delivery is divided into three phases:

- taking-in phase
- taking-hold phase
- letting-go phase.

What have I gotten myself into?

During the **taking-in phase** (1 to 2 days after delivery), the mother is passive and dependent, directing energy toward herself instead of toward her infant. She may relive her labor and delivery experience to integrate the process into her life and may have difficulty making decisions.

Getting to know you

During the **taking-hold phase** (about 2 to 7 days after delivery), the mother has more energy and begins to act independently and initiate self-care activities. Although she may express a lack of confidence in her abilities, she accepts responsibility for her neonate and becomes receptive to infant care and patient teaching about self-care activities.

Assuming the role

During the **letting-go phase** (about 7 days after delivery), the mother begins to readjust to family members, assuming the mother role and the responsibility that comes with it. She relinquishes the infant she has imagined during her pregnancy and accepts her real infant as an entity separate from herself.

Keep abreast of postpartum data collection

The period immediately after labor and delivery is crucial to good postpartum nursing care. An understanding of normal and abnormal data collection findings is essential.

Monitor, monitor, monitor

The patient's respiratory rate should return to normal after delivery. Other findings are listed below.

- The patient's temperature may be elevated to 100.4° F (38° C) from dehydration and the exertion of labor.
- Blood pressure is usually normal within 24 hours of delivery.
- Bradycardia of 50 to 70 beats/minute is common during the first 6 to 10 days after delivery because of reductions in cardiac strain, stroke volume, and the vascular bed.

Nursing actions

- Monitor vital signs every 15 minutes for the first 1 to 2 hours, then every 4 hours for the first 24 hours, and then during every shift.

Fundal features

Check the tone and location of the **fundus** (the uppermost portion of the uterus) every 15 minutes for the first 1 to 2 hours after delivery and then during every shift. The involuting uterus should be at the midline. The fundus is usually:

- midway between the umbilicus and symphysis 1 to 2 hours after delivery
- 1 cm above or at the level of the umbilicus 12 hours after delivery
- 3 cm below the umbilicus by the third day after delivery
- firm to the touch.

The fundus will continue to descend about 1 cm/day until it isn't palpable above the symphysis (about 9 days after delivery). The uterus shrinks to its prepregnancy size 5 to 6 weeks after delivery.

A firm uterus helps control postpartum bleeding by clamping down on uterine blood vessels. The doctor may prescribe oxytocin (Pitocin), ergonovine (Ergotrate), or methylergonovine (Methergine) to maintain uterine firmness. (See *Fundal evaluation and massage,* page 522.)

Nursing actions

- Massage a boggy (soft) fundus gently; if the fundus doesn't respond, use a firmer touch.
- Be aware that the uterus may relax if overstimulated by massage or medications.

Memory jogger

To remember what to assess in the postpartum patient, remember **BUBBLE**:

Breasts
Uterus
Bowels
Bonding
Lochia
Episiotomy.

Stepping up

Fundal evaluation and massage

WHY YOU DO IT

Fundal evaluation is done to check the progress of the uterus after birth, including uterine size, firmness, and descent. Fundal massage helps to maintain or stimulate uterine contractions, which are essential in preventing postpartum hemorrhage.

Evaluation and massage should be performed every 15 minutes for the 1st hour after delivery, every 30 minutes for the next 2 hours, every hour for the next 4 hours, and then every 4 hours for the first postpartum day.

HOW YOU DO IT

- Explain the procedure to the patient and answer any questions. Provide privacy.
- Place the patient in the supine position or with her head slightly elevated.
- Expose the abdomen and perineum.
- Gently compress the uterus between your hands to evaluate firmness and position in relation to the umbilicus (in fingerbreadths or centimeters).
- If the fundus seems soft and boggy, massage it gently in a circular motion until it's firm.
- Observe lochia flow during massage.
- Document the patient's position, firmness of the fundus, and the response to massage (if performed).

- Suspect a distended bladder if the uterus isn't firm at the midline. A distended bladder can impede the downward descent of the uterus by pushing it upward and, possibly, to the side.
- Evaluate maternal-infant bonding by observing how the mother responds to her neonate.
- Evaluate for excessive vaginal bleeding.

Discharge diagnosis

Lochia is the discharge from the sloughing of the uterine decidua.

- **Lochia rubra** is the vaginal discharge that occurs for the first 2 to 3 days after delivery; it has a fleshy odor and is bloody with small clots.
- **Lochia serosa** refers to the vaginal discharge that occurs during days 3 through 9; it is pinkish or brown with a serosanguineous consistency and fleshy odor.
- **Lochia alba** is a yellow to white discharge that usually begins about 10 days after delivery; it may last from 2 to 6 weeks.

Some lochia characteristics may indicate the need for further intervention:

- Foul-smelling lochia may indicate an infection.
- Continuous seepage of bright red blood may indicate a cervical or vaginal laceration.
- Lochia that saturates a sanitary pad within 45 minutes usually indicates an abnormally heavy flow.
- Lochia may diminish after a cesarean delivery.
- Numerous large clots should be evaluated further; they may interfere with involution.
- Lochia may be scant but should never be absent; absence may indicate postpartum infection.

Nursing actions

Collect data on the lochia during every shift, and note its color, amount, odor, and consistency.

Breast check

Collect data on the size and shape of the patient's **breasts** every shift, noting reddened areas, tenderness, and engorgement. Check the nipples for cracking, fissures, and soreness.

Nursing actions

• Advise the patient to wear a support bra to maintain shape and enhance comfort.
• Tell the patient that she can relieve discomfort from engorged breasts by wearing a support bra, applying ice packs, and taking prescribed medications.
• If the patient is breast-feeding, advise her that she can relieve breast engorgement by applying warm compresses, and expressing milk manually.
• Explain that nipples should be washed with plain water and allowed to air dry. Soap and towel drying dries out nipples, causing cracking.

Elimination examination

Evaluate the patient's **elimination** patterns. The patient should void within the first 6 to 8 hours after delivery. Check for a distended bladder, which can interfere with elimination and increase the risk of hemorrhage within the first few hours after delivery.

Nursing actions

• Pour warm water over the perineum to help stimulate voiding.
• Insert a urinary catheter if the patient can't void.
• Encourage the patient to have a bowel movement within 1 to 2 days after delivery to avoid constipation.
• Apply required ice packs or analgesic preparations to the patient with hemorrhoids.
• Encourage the patient to increase her fluid and fiber intake.
• Alleviate maternal anxieties regarding pain from or damage to the episiotomy site.
• Administer laxatives, stool softeners, suppositories, or enemas as needed.
• Avoid rectal temperatures and enemas in patients who have a fourth-degree laceration.
• Encourage ambulation.

Evaluating episiotomy

The site of **episiotomy** (surgical incision into the perineum and vagina) should be assessed every shift to evaluate healing, noting erythema, intactness of stitches, edema, and any odor or drainage. Twenty-four hours after delivery, the edges of an episiotomy are usually sealed.

Nursing actions

• Administer medications to relieve discomfort from the episiotomy, uterine contractions, incisional pain, or engorged breasts as prescribed. Medications may include analgesics, stool softeners and laxatives, or oxytocic agents.

Teaching topics

• Changing perineal pads frequently, removing from front to back
• Reporting lochia with a foul odor, heavy flow, or clots
• Showering daily to relieve discomfort of normal postpartum diaphoresis
• Following instructions on sexual activity and contraception
• Performing Kegel exercises to help strengthen the pubococcygeal muscles
• Requesting assistance getting out of bed the first several times after delivery to minimize dizziness and fainting from medications, blood loss, and decreased fluid intake
• Sitting with legs elevated for 30 minutes if lochia increases or lochia rubra returns, either of which may indicate excessive activity; notify the doctor if excessive vaginal discharge persists
• Increasing protein and caloric intake to restore body tissues (if breast-feeding, increasing daily caloric intake by 200 kcal over the pregnancy requirement of 2,400 kcal)
• Relieving perineal discomfort from an episiotomy by using ice packs (for the first 8 to 12 hours to minimize edema); spray peri bottles; sitz baths; anesthetic sprays, creams, and pads; and prescribed pain medications

Catch up on complications

Potential postpartum complications include mastitis, postpartum hemorrhage, psychological maladaptation, and puerperal infection.

Mastitis

Mastitis is an infection of the lactating breast. It most commonly occurs during the second and third weeks after birth but can occur at any time.

CAUSES
- *Staphylococcus aureus* (the most common causative pathogen)

RISK FACTORS
- Altered immune response
- Constriction from a bra that's too tight (may interfere with complete emptying of the breast)
- Engorgement and stasis of milk (usually precede mastitis)
- Injury to nipple, such as a crack or blister, which may allow causative organism to enter

DATA COLLECTION FINDINGS
- Aching muscles
- Chills
- Edema and breast heaviness
- Fatigue
- Headache
- Localized area of redness and inflammation
- Malaise
- Purulent drainage
- Temperature of 101.1° F (38.4° C) or higher

DIAGNOSTIC FINDINGS
- Culture of the purulent discharge may test positive for the *S. aureus* bacteria.

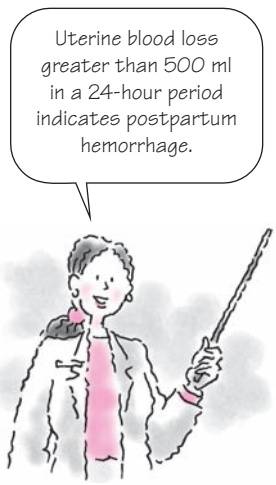
NURSING DIAGNOSES
- Ineffective coping
- Acute pain
- Situational low self-esteem

TREATMENT
- Incision and drainage if abscess occurs
- Moist heat application
- Pumping breasts every 2 to 4 hours to preserve breast-feeding ability if abscess occurs

Drug therapy
- Analgesics: acetaminophen (Tylenol), ibuprofen (Advil)
- Antibiotics: cephalexin (Keftab), cefaclor (Ceclor), clindamycin (Cleocin)

INTERVENTIONS AND RATIONALES
- Monitor vital signs *to detect complications.*
- Administer antibiotic therapy *to treat infection.*
- Apply moist heat *to increase circulation and reduce inflammation and edema.*
- Encourage patient to breast-feed on the unaffected side before the affected side; breast-feeding should be stopped and pumping initiated if an abscess occurs *to ensure emptying of the unaffected breast.*

Teaching topics
- Positioning the infant during breast-feeding to avoid trauma to the nipples and milk stasis
- Avoiding bras that are too tight and may restrict the flow of milk
- Breast-feeding every 2 to 3 hours and completely emptying the breasts
- Changing nipple shields as soon as they become wet to prevent infection
- Using a breast pump and discarding milk if breast abscess has developed



Postpartum hemorrhage

Postpartum hemorrhage is maternal blood loss from the uterus greater than 500 ml within a 24-hour period. It can occur immediately after delivery (within the first 24 hours) or later (during the remaining days of the 6-week puerperium).

CAUSES
- Administration of magnesium sulfate
- Cesarean birth
- Clotting disorders
- Disseminated intravascular coagulation
- Forceps delivery
- General anesthesia
- Low implantation of placenta or placenta previa
- Multiparity
- Overdistention of uterus (multifetal pregnancy, hydramnios, large infant)
- Perineal laceration
- Precipitate labor or delivery

- Previous postpartum hemorrhage
- Previous uterine surgery
- Prolonged labor
- Retained placental fragments
- Soft, boggy uterus, indicating relaxed uterine tone
- Subinvolution of the uterus
- Urinary bladder distention
- Use of tocolytic drugs

DATA COLLECTION FINDINGS

- Blood loss greater than 500 ml within a 24-hour period; may occur up to 6 weeks after delivery
- Perineal lacerations
- Retained placental fragments
- Signs of shock (tachycardia, hypotension, oliguria)
- Uterine atony

DIAGNOSTIC FINDINGS

- Hematology studies show decreased hemoglobin and HCT levels, a low fibrinogen level, and decreased partial thromboplastin time.

NURSING DIAGNOSES

- Ineffective tissue perfusion: Peripheral
- Deficient fluid volume
- Risk for infection

TREATMENT

- Bimanual compression of the uterus and dilatation and curettage to remove clots
- I.V. replacement of fluids and blood
- Abdominal hysterectomy if other interventions fail to control blood loss
- Urinary catheterization to empty the bladder

Drug therapy

- Parenteral administration of methylergonovine (Methergine)
- Rapid I.V. infusion of dilute oxytocin (Pitocin)

INTERVENTIONS AND RATIONALES

- Monitor vital signs *to detect complications.*
- Massage the fundus, and express clots from the uterus *to increase uterine contraction and tone.*
- Perform a pad count *to estimate the amount of vaginal bleeding.*
- Monitor lochia, including amount, color, and odor, *to detect infection.*
- Monitor the fundus for location *to check for uterine displacement.*
- Monitor I.V. infusion of dilute oxytocin as ordered *to increase uterine contraction and tone.*
- Administer methylergonovine as ordered *to increase uterine contraction and tone.*
- Monitor blood products and I.V. fluids as prescribed *to replace volume loss.*
- Provide emotional support *to help alleviate fears and anxiety.*
- Advise the patient to get assistance with ambulation *to prevent injury.*

Teaching topics

- Learning about surgical procedures if appropriate
- Reporting changes in vaginal bleeding

Psychological maladaptation

Known as *postpartum depression,* psychological maladaptation is depression of a significant depth and duration after childbirth. Many postpartum patients experience some level of mood swings; psychological maladaptation refers to depression that lasts longer than 2 weeks, indicating a serious problem.

CAUSES AND RISK FACTORS

- Difficult pregnancy, labor, or delivery
- Neonatal complications
- History of depression
- Hormonal shifts as estrogen and progesterone levels decline
- Lack of support from family and friends
- Lack of self-esteem
- Stress in the home or work
- Troubled childhood

DATA COLLECTION FINDINGS

- Extreme fatigue
- Inability to make decisions
- Inability to stop crying
- Increased anxiety about self and infant's health

• Overall feeling of sadness
• Postpartum psychosis (hallucinations, delusions, potential for suicide or homicide)
• Psychosomatic symptoms (nausea, vomiting, diarrhea)
• Unwillingness to be left alone

DIAGNOSTIC FINDINGS
• No specific test findings (rather, diagnosis based on signs and symptoms)

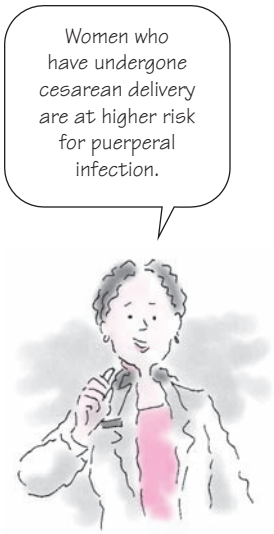
NURSING DIAGNOSES
• Fatigue
• Ineffective coping
• Social isolation

TREATMENT
• Counseling for the patient and family at risk
• Group therapy
• Psychotherapy

Drug therapy
• Antidepressants: imipramine (Tofranil), nortriptyline (Pamelor)

INTERVENTIONS AND RATIONALES
• Obtain a health history during the antepartum period *to determine whether the patient is at risk for postpartum depression.*
• Collect data on the patient's support systems *to evaluate the need for additional help.*
• Collect data on maternal-infant bonding *to evaluate for signs of depression.*
• Provide emotional support and encouragement *to reduce anxiety.*
• Notify a skilled professional if you observe psychotic symptoms in the patient *to obtain necessary treatment.*

Teaching topics
• Understanding that continued depression may require psychiatric counseling
• Understanding how to meet her own physical and emotional needs



Puerperal infection

Puerperal infection occurs after childbirth in 2% to 5% of all women who have vaginal deliveries and in 15% to 20% of those who have cesarean deliveries. Puerperal infection affects the uterus and structures above it and is one of the leading causes of maternal death.

CAUSES AND RISK FACTORS
• Catheterization
• Cesarean delivery
• Colonization of lower genital tract with pathogenic organisms, such as group B streptococci, *Chlamydia trachomatis, Staphylococcus aureus, Escherichia coli*, and *Gardnerella vaginalis*
• Episiotomy
• Forceps delivery
• Excessive number of vaginal examinations
• Intrauterine fetal monitoring
• Laceration
• History of previous infection
• Low socioeconomic status
• Medical conditions such as diabetes mellitus
• Poor general health
• Poor nutrition
• Prolonged labor
• Premature rupture of membranes
• Retained placental fragments
• Trauma

DATA COLLECTION FINDINGS
• Abdominal pain and tenderness
• Anorexia
• Chills
• Fever
• Lethargy
• Malaise
• Purulent, foul-smelling lochia
• Subinvolution of the uterus
• Tachycardia
• Uterine cramping

DIAGNOSTIC FINDINGS
• A catheterized urine specimen may reveal the causative organism.
• A complete blood count may show an elevated white blood cell count in the upper ranges of normal (more than 30,000/µl) for the postpartum period.
• Cultures of the blood or of the endocervical and uterine cavities may reveal the causative organism.

NURSING DIAGNOSES

- Acute pain
- Risk for infection
- Social isolation

TREATMENT

- Administration of I.V. fluids (if hydration is needed)

Drug therapy

- Broad-spectrum I.V. antibiotic therapy, unless a causative organism is identified

INTERVENTIONS AND RATIONALES

- Monitor vital signs every 4 hours *to detect complications.*
- Place the patient in Fowler's position *to facilitate drainage of lochia.*
- Administer pain medication as ordered *to relieve pain and discomfort.*
- Provide emotional support and reassurance *to ease anxiety.*
- Maintain I.V. fluid administration as ordered *to replace volume loss.*
- Administer antibiotics as prescribed *to fight infection.*

Teaching topics

- Recognizing signs and symptoms of a worsening condition, such as nausea, vomiting, absent bowel sounds, abdominal distention, and severe abdominal pain

Pump up on practice questions

1. When checking a postpartum client for uterine bleeding, the nurse finds the fundus to be boggy. After fundal massage by the nurse, the physician prescribes 0.2 mg of methylergonovine (Methergine) by mouth. What should the nurse tell the client?

1. "Methergine is commonly used to help the uterus contract so that the bleeding will decrease. You may experience more cramping as your uterus becomes firmer."
2. "You'll probably take this medication until you're discharged from the hospital. Every patient usually needs to take this medication."
3. "If your blood pressure is low, you won't be able to take this medication; I'll establish a new I.V. line so I can start Pitocin again."
4. "Most people don't experience additional pain or cramping from taking this medication."

Answer: 1. Methylergonovine, an ergot alkaloid, is commonly given to stimulate sustained uterine contraction. It allows the uterus to remain contracted and firm, thus decreasing postpartum bleeding. Abdominal cramping, which may become painful, is a common adverse effect. Methylergonovine is discontinued when the lochia flow has decreased or the client complains of severe cramping. Clients may need only a few doses of methylergonovine to keep the uterus contracted.

Methylergonovine is contraindicated in clients with high—not low—blood pressure.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

2. The nurse is providing care for a postpartum client. Which conditions would place this client at greater risk for a postpartum hemorrhage?

1. Hypertension
2. Severe pain
3. Placenta previa
4. Uterine infection

Answer: 3. The client with placenta previa is at greatest risk for postpartum hemorrhage. In placenta previa, the lower uterine segment doesn't contract as well as the fundal part of the uterus; therefore, more bleeding occurs. Hypertension, severe pain, and uterine infection don't place the client at increased risk for postpartum hemorrhage.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

3. A client has delivered twins. What's the most important intervention for the nurse to perform?

1. Check fundal tone and lochia flow.
2. Apply a cold pack to the perineal area.
3. Administer analgesics as ordered.
4. Encourage voiding by offering the bedpan.

Answer: 1. Women who experience a twin delivery have a higher risk of postpartum hemorrhage due to overdistention of the uterus, which causes uterine atony. Checking fundal tone and lochia flow helps to determine the risk of hemorrhage. Applying cold packs to the perineum, administering analgesics as ordered, and offering the bedpan are all significant nursing interventions; however, detecting and preventing postpartum hemorrhage is most important.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

4. Which is a normal physiologic response in the early postpartum period?

1. Urinary urgency and dysuria
2. Rapid diuresis
3. Decrease in blood pressure
4. Increased motility of the GI system

Answer: 2. In the early postpartum period there's an increase in the glomerular filtration rate and a drop in progesterone levels, which result in rapid diuresis. There should be no urinary urgency, although a woman may be anxious about voiding. There's minimal change in blood pressure following childbirth and a residual decrease in GI motility.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

5. During the third postpartum day, which finding would the nurse be most likely to find in the client?

1. She's interested in learning more about neonate care.
2. She talks a lot about her birth experience.
3. She sleeps whenever the baby isn't present.
4. She requests help in choosing a name for the baby.

Answer: 1. The second to seventh days of postpartum care are the "taking-hold" phase, in which the new mother strives for independence and is eager for her baby. Options 2, 3, and 4 describe the "taking-in phase" in which the mother relives her birth experience.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Analysis

6. Which circumstance is most likely to cause uterine atony, leading to postpartum hemorrhage?

1. Cervical and vaginal tears
2. Endometritis
3. Urine retention
4. Hypertension

Answer: 3. Urine retention is most likely to cause uterine atony and subsequent postpartum hemorrhage. Urine retention causes a distended bladder to displace the uterus above the umbilicus and to the side, which prevents the uterus from contracting. The uterus needs to remain contracted if bleeding is to stay within normal limits. Cervical and vaginal tears can cause postpartum hemorrhage, but in the postpartum period a full bladder is the most common cause of uterine bleeding. Endometritis, an infection of the inner lining of the endometrium, and maternal hypertension don't cause postpartum hemorrhage.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

7. When checking a client's episiotomy, the nurse should be especially careful to observe:

1. location.
2. discharge and odor.
3. edema and approximation.
4. subinvolution.

Answer: 3. An episiotomy should be checked for edema and approximation of incision. An edematous perineum causes more tension of the suture line and increases pain. Although the sutures may be difficult to visualize, the suture line should be intact. Episiotomy location is important, but it isn't as important as the presence of edema. Discharge and odor refer to an evaluation of lochia. Subinvolution refers to the complete return of the uterus to its prepregnancy size and shape.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

8. While performing a routine fundal evaluation, the nurse finds that the client's fundus is boggy. What should the nurse do first?

1. Call the physician.
2. Massage the fundus.
3. Assess lochia flow.
4. Obtain an order for methylergonovine (Methergine).

Answer: 2. The nurse should begin to massage the uterus so that it will be stimulated to contract. Lochia flow can be checked while the uterus is being massaged. The nurse shouldn't leave the client to call the physician. If the fundus remains boggy and the uterus continues to bleed, the nurse should use the call button to ask another nurse to call the physician. Methylergonovine may be prescribed if needed.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

9. Which type of lochia should the nurse expect to find in a client who's 2 days postpartum?

1. Foul-smelling
2. Serosa
3. Alba
4. Rubra

Answer: 4. Lochia rubra lasts about 4 days and is followed by lochia serosa, which extends through the seventh day, and then lochia alba, which occurs during the second and third postpartum weeks. Foul-smelling lochia is a sign of infection.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

10. A client treated with magnesium sulfate during labor is now on the postpartum unit. The nurse should be aware that the client is at risk for which of the following complication of magnesium sulfate therapy?

1. Hypotension
2. Uterine infection
3. Postpartum hemorrhage
4. Postpartum depression

Answer: 3. Because magnesium sulfate produces a smooth-muscle depressive effect, the uterus should be checked for uterine atony. The uterus may be unable to maintain a firm tone, thus increasing the risk of postpartum hemorrhage. Magnesium sulfate does decrease blood pressure, but it's considered more of an anticonvulsant than an antihypertensive. Uterine infection and postpartum depression aren't associated with magnesium sulfate therapy.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Comprehension

25 Neonatal care

In this chapter, you'll review:

- neonatal adaptations to extrauterine life
- initial and ongoing neonatal assessment
- common neonatal disorders.

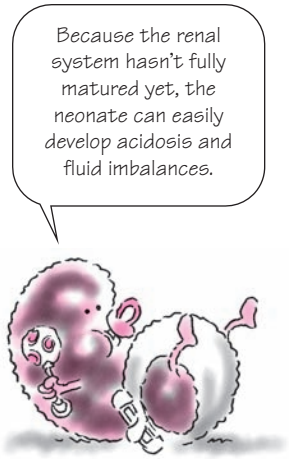
Brush up on key concepts

A neonate experiences many changes as he adapts to life outside the uterus. Knowledge of these changes and of the normal physiologic characteristics of the neonate provides the basis for normal neonatal care.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 532 and 533.

Adaptations to extrauterine life

Here's a review of how the neonate's body systems change.



Heart seals

The **cardiovascular system** changes from the very first breath, which expands the neonate's lungs and decreases pulmonary vascular resistance. Clamping the umbilical cord increases systemic vascular resistance and left atrial pressure, which functionally closes the foramen ovale (fibrosis may take from several weeks to a year).

Every breath you take

The **respiratory system** also begins to change with the first breath. The neonate's breathing is a reflex triggered in response to noise, light, and temperature and pressure changes. Air immediately replaces the fluid that filled the lungs before birth.

A delicate balance

Renal system function doesn't fully mature until after the 1st year of life; as a result, the neonate has a minimal range of chemical balance and safety. The neonate's limited ability to excrete drugs, coupled with excessive neonatal fluid loss, can rapidly lead to acidosis and fluid imbalances.

Digestive difficulties

The **GI system** also isn't fully developed because normal bacteria aren't present in the neonate's GI tract. The lower intestine contains meconium at birth; the first meconium (sterile, greenish black, and viscous) usually passes within 24 hours. Some aspects of GI development include:

- audible bowel sounds 1 hour after birth
- uncoordinated peristaltic activity in the esophagus for the first few days of life
- a limited ability to digest fats because amylase and lipase are absent at birth
- frequent regurgitation because of an immature cardiac sphincter.

Bun from the oven

Changes in neonatal **thermogenesis** depend on environment. In an optimal environment, the neonate can produce sufficient heat, but rapid heat loss may occur in a suboptimal thermal environment.

Disease control

The neonatal **immune system** depends largely on three immunoglobulins: immunoglobulin (Ig) G, IgM, and IgA. IgG (detected in the fetus at the 3rd month of gestation) is a placentally transferred immunoglobulin, providing antibodies to bacterial and viral agents. The infant synthesizes its own IgG during the first 3 months of life, thus compensating for concurrent catabolism of maternal antibodies. By the 20th week of gestation, the fetus synthesizes IgM, which is undetectable at birth because it doesn't cross the placenta.

(Text continues on page 534.)

Cheat sheet

Neonatal care refresher

FETAL ALCOHOL SYNDROME

Key signs and symptoms

- Difficulty establishing respirations
- Lethargy
- Opisthotonos
- Seizures

Key test result

- Chest X-ray may reveal congenital heart defect.

Key treatments

- Swaddling
- I.V. phenobarbital

Key interventions

- Provide a stimulus-free environment for the neonate; darken the room, if necessary.
- Provide gavage feedings, if necessary.

HUMAN IMMUNODEFICIENCY VIRUS (HIV)

Key signs and symptoms

- Produces no symptoms at birth

Key test results

- Test interpretation is problematic because most neonates with an HIV-positive mother test positive at birth. Uninfected neonates lose this maternal antibody between 8 and 15 months, and infected neonates remain seropositive. Therefore, testing should be repeated at age 15 months.

Key treatments

- Antimicrobial therapy to treat opportunistic infections
- Zidovudine (Retrovir) administration based on the neonate's lymphocyte count

Key interventions

- Monitor cardiovascular and respiratory status.
- Keep the umbilical stump meticulously clean.
- Maintain standard precautions.

HYPOTHERMIA

Key signs and symptoms

- Kicking and crying (a mechanism used to increase the metabolic rate to produce body heat)
- Core body temperature lower than 97.7° F (36.5° C)

Key test results

- Arterial blood gas (ABG) analysis shows hypoxemia.
- Blood glucose level reveals hypoglycemia.

Key treatment

- Radiant warmer

Key interventions

- Dry the neonate immediately after delivery.
- Allow the mother to hold the neonate skin to skin.
- Monitor vital signs every 15 to 30 minutes.
- Provide a knitted cap for the neonate.
- Place the neonate in a radiant warmer.

NEONATAL DRUG DEPENDENCY

Key signs and symptoms

- High-pitched cry
- Irritability
- Jitteriness
- Poor sleeping pattern
- Tremors

Key treatments

- Gavage feedings, if necessary
- Paregoric and phenobarbital (Barbita) to treat withdrawal symptoms; methadone shouldn't be given to neonates because of its addictive nature

Key interventions

- Monitor cardiovascular status.
- Use tight swaddling for comfort.
- Place the neonate in a dark, quiet environment.
- Encourage use of a pacifier (in cases of heroin withdrawal).

Neonatal care refresher *(continued)*

• Be prepared to administer gavage feedings (in cases of methadone withdrawal).
• Maintain fluid and electrolyte balance.

NEONATAL INFECTIONS

Key signs and symptoms

• Feeding pattern changes, such as poor sucking or decreased intake
• Sternal retractions
• Subtle, nonspecific behavioral changes, such as lethargy or hypotonia
• Temperature instability

Key test results

• Blood and urine cultures are positive for the causative organism, most commonly gram-positive beta-hemolytic streptococci and the gram-negative *Escherichia coli, Aerobacter, Proteus,* and *Klebsiella.*
• Complete blood count shows an increased white blood cell count.

Key treatments

• I.V. therapy to provide adequate hydration
• Antibiotic therapy: broad-spectrum until causative organism is identified and then specific antibiotic

Key interventions

• Monitor cardiovascular and respiratory status.
• Administer broad-spectrum antibiotics before culture results are received and specific antibiotic therapy after results are received.

NEONATAL JAUNDICE

Key signs and symptoms

• Jaundice
• Lethargy

Key test result

• Bilirubin levels exceed 12 mg/dl in premature or term neonates.

Key treatments

• Increased fluid intake
• Phototherapy

Key interventions

• Monitor neurologic status.
• Monitor serum bilirubin levels.
• Initiate and maintain phototherapy (provide eye protection while under phototherapy lights and remove eye shields promptly when removed from the phototherapy lights).

RESPIRATORY DISTRESS SYNDROME

Key signs and symptoms

• Cyanosis and pallor
• Expiratory grunting
• Fine crackles and diminished breath sounds
• Seesaw respirations
• Sternal, substernal, and intracostal retractions
• Tachypnea (more than 60 breaths/minute)

Key test results

• ABG analysis reveals respiratory acidosis.
• Chest X-rays reveal bilateral diffuse reticulogranular density.

Key treatments

• Endotracheal (ET) intubation and mechanical ventilation
• Nutrition supplements (total parenteral nutrition [TPN] or enteral feedings if possible)
• Surfactant replacement by way of ET tube
• Temperature regulation with a radiant warmer

Key interventions

• Monitor cardiovascular, respiratory, and neurologic status.
• Monitor vital signs.
• Maintain ventilatory support status.
• Administer medications, including ET surfactant as prescribed.
• Provide adequate nutrition through enteral feedings, if possible, or TPN.

TRACHEOESOPHAGEAL FISTULA

Key signs and symptoms

• Difficulty feeding, such as choking or aspiration; cyanosis during feeding
• Signs of respiratory distress

Key test result

• Abdominal X-ray shows the fistula and a gas-free abdomen.

Key treatments

• Emergency surgical intervention to prevent pneumonia, dehydration, and fluid and electrolyte imbalances
• Maintenance of patent airway

Key interventions

• Monitor cardiovascular, respiratory, and GI status.
• Place the neonate in high Fowler's position.
• Keep a laryngoscope and ET tube at bedside.
• Provide the neonate with a pacifier.
• Provide gastrostomy tube feedings postoperatively.

High levels of IgM in the neonate indicate a nonspecific infection. Secretory IgA (which limits bacterial growth in the GI tract) is found in colostrum and breast milk.

Poietic license

In the neonatal **hematopoietic system,** blood volume accounts for 80 to 85 ml/kg of body weight. The neonate experiences prolonged coagulation time after birth because maternal stores of vitamin K become depleted and the neonate's immature liver can't produce enough to maintain adequate levels.

Nervous energy

The full-term neonate's **neurologic system** should produce equal strength and symmetry in responses and reflexes. Diminished or absent reflexes may indicate a serious neurologic problem, and asymmetrical responses may indicate trauma during birth, including nerve damage, paralysis, or fracture. Some neonatal reflexes gradually weaken and disappear during the early months.

Liver concerns

Increased serum levels of unconjugated bilirubin from increased red blood cell (RBC) lysis, altered bilirubin conjugation, or increased bilirubin reabsorption from the GI tract may cause jaundice—a major complication for the neonatal hepatic system. Physiologic jaundice appears after the first 24 hours of extrauterine life; pathologic jaundice is evident at birth or within the first 24 hours of extrauterine life; and breast milk jaundice appears after the 1st week of extrauterine life when physiologic jaundice is declining.

Keep abreast of neonatal data collection

Neonatal data collection includes initial and ongoing data collection as well as a thorough physical examination.

First things first

Initial neonatal data collection involves detecting abnormalities and keeping accurate records.

Nursing actions

- Ensure a proper airway by suctioning, and administer oxygen as needed.
- Dry the neonate under the warmer while keeping the head lower than the trunk (to promote drainage of secretions).
- Apply a cord clamp, and monitor the neonate for abnormal bleeding from the cord; check the number of cord vessels.
- Observe the neonate for voiding and meconium; document the first void and stools.
- Check the neonate for gross abnormalities and clinical manifestations of suspected abnormalities.
- Continue to collect data on the neonate by using the Apgar score criteria even after the 5-minute score is received. (See *Apgar scoring.*)
- Obtain clear footprints and fingerprints (the neonate's footprints are kept on a record that includes the mother's fingerprints).
- Apply identification bands with matching numbers to the mother (one band) and neonate (two bands) before they leave the delivery room.
- Promote bonding between the mother and neonate.

Keep on keepin' on

Ongoing neonatal physical data collection include observing and recording vital signs and administering prescribed medications.

Nursing actions

- Monitor the neonate's vital signs.
- Take the first temperature by the rectal route to determine whether the rectum is patent. Temperatures obtained by this route must be done gently to prevent injury to the rectal mucosa.
- Take the apical pulse for 60 seconds (normal rate is 120 to 160 beats/minute).
- Count respirations with a stethoscope for 60 seconds (normal rate is 30 to 60 breaths/minute).

Apgar scoring

The Apgar scoring system provides a way to evaluate the neonate's cardiopulmonary and neurologic status. An Apgar score is obtained at 1 and 5 minutes after birth and repeated every 5 minutes until the infant stabilizes. A score of 8 to 10 indicates that the neonate is in no apparent distress; a score below 8 indicates that resuscitative measures may be needed.

Sign	0	1	2
Heart rate	Absent	Less than 100 beats/minute	Greater than 100 beats/minute
Respiratory effort	Absent	Slow, irregular	Good crying
Muscle tone	Flaccid	Some flexion of extremities	Active motion
Reflex irritability	None	Grimace	Vigorous cry
Color	Pale, blue	Body pink, blue extremities	Completely pink

- Measure and record blood pressure (normal reading ranges from 60/40 mm Hg to 90/45 mm Hg).
- Measure and record the neonate's vital statistics (weight, length, and head and chest circumference).
- Complete a gestational age evaluation.
- Administer prescribed medications such as vitamin K (AquaMEPHYTON), which is a prophylactic against transient deficiency of coagulation factors II, VII, IX, and X.
- Administer erythromycin ointment (Ilotycin), the drug of choice for neonatal eye prophylaxis, to prevent damage and blindness from conjunctivitis caused by *Neisseria gonorrhoeae* and *Chlamydia;* treatment is required by law.
- Administer first hepatitis B vaccine within 12 hours after birth.
- Perform laboratory tests.
- Monitor glucose levels and hematocrit.

Neonatal physical examination

The neonate should receive a thorough visual and physical examination of each body part. The following is a brief review of normal and abnormal neonatal physiology.

Heads up

The neonate's head is about one-fourth of body size. The term **molding** refers to the shaping of the fetal head as it adapts to the shape of the birth canal. This is a normal occurrence with most births. The heads of most neonates return to their normal shape within 3 days after delivery.

Cranial complications that can occur include:

- cephalohematoma—blood collects between the skull and the periosteum; may occur on one or both sides of the head but doesn't cross the suture lines.
- caput succedaneum—swelling in the soft tissues of the scalp, which can extend across the suture lines

Closing time

The neonatal skull has two **fontanels:** a diamond-shaped anterior fontanel and a triangular-shaped posterior fontanel. The anterior fontanel is located at the juncture of the frontal and parietal bones, measures 1⅛″ to 1⅝″ (3 to 4 cm) long and ¾″ to 1⅛″ (2 to 3 cm) wide, and closes in about 18 months. The posterior fontanel is located at the juncture of the occipital and parietal bones, measures about ¾″ across, and closes in 8 to 12 weeks. The fontanels:

- should feel soft to the touch
- shouldn't be depressed—a depressed fontanel indicates dehydration
- shouldn't bulge—bulging fontanels require immediate attention, as they may indicate increased intracranial pressure.

Jeepers peepers

- The neonate's eyes are usually blue or gray because of scleral thinness. Permanent eye color is established within 3 to 12 months.
- Lacrimal glands are immature at birth, resulting in tearless crying for up to 2 months.
- The neonate may demonstrate transient strabismus.
- Doll's eye reflex (when the head is rotated laterally, the eyes deviate in the opposite direction) may persist for about 10 days.
- Subconjunctival hemorrhages may appear from vascular tension changes during birth.

Nose only

Because infants are obligatory nose breathers for the first few months of life, nasal passages must be kept clear to ensure adequate respiration. Neonates instinctively sneeze to remove obstruction.

Dry mouth

The neonate's mouth usually has scant saliva and pink lips. Epstein's pearls (pearly, white, pinpoint papules) may be found on the gums or hard palate, and precocious teeth may also be apparent.

Sound check

The neonate's ears are characterized by incurving of the pinna and cartilage deposition. The top of the ear should be above or parallel to an imaginary line from the inner to the outer canthus of the eye. Low-set ears are associated with several syndromes, including chromosomal abnormalities.

The neonate should respond to sudden sounds by increasing his heart and respiratory rates.

Flexi-neck

The neonate's neck is typically short and weak with deep folds of skin.

Flexi-chest

The neonatal chest is characterized by a cylindrical thorax and flexible ribs. Breast engorgement from maternal hormones may be apparent, and supernumerary nipples may be located below and medially to the true nipples.

Nice abs

The neonatal abdomen is usually cylindrical with some protrusion. A scaphoid appearance indicates diaphragmatic hernia. The umbilical cord is white and gelatinous with two arteries and one vein and begins to dry within 1 to 2 hours after delivery.

I'll show you mine…

Characteristics of a male neonate's genitalia include rugae on the scrotum and testes descended into the scrotum. The urinary meatus is located in one of three places:

- at the penile tip (normal)
- on the dorsal surface (epispadias)
- on the ventral surface (hypospadias).

In the female neonate, the labia majora cover the labia minora and clitoris, vaginal discharge from maternal hormones appears, and the hymenal tag is present.

Extreme measures

All neonates are bowlegged and have flat feet. Some neonates may have abnormal extremities. They may be polydactyl (more than five digits on an extremity) or syndactyl (two or more digits fused together).

Soldier straight

The neonatal spine should be straight and flat, and the anus should be patent without

any fissure. Dimpling at the base of the spine is commonly associated with spina bifida.

Baby-smooth skin

The skin of a neonate can indicate many conditions—some quite normal and others requiring more serious attention. Data collection findings include:

- acrocyanosis (cyanosis of the hands and feet), which results from high levels of hemoglobin and vasomotor instability during the first week of life
- milia (clogged sebaceous glands) on the nose or chin
- lanugo (fine, downy hair) appearing after 20 weeks of gestation on the entire body except the palms and soles
- vernix caseosa (a white, cheesy protective coating composed of desquamated epithelial cells and sebum)
- erythema toxicum neonatorum (a transient, maculopapular rash)
- telangiectasia (flat, reddened vascular areas) appearing on the neck, upper eyelid, or upper lip
- port-wine stain (nevus flammeus), a capillary angioma located below the dermis and commonly found on the face
- strawberry hemangioma (nevus vasculosus), a capillary angioma located in the dermal and subdermal skin layers indicated by a rough, raised, sharply demarcated birthmark
- Mongolian spot, an area of bluish skin discoloration sometimes found in Blacks, Native Americans, and neonates of Mediterranean descent.

Reflections on reflexes

Normal neonates display a number of reflexes, which include:

- sucking: sucking motion begins when a nipple is placed in the neonate's mouth
- Moro's: when lifted above the crib and suddenly lowered, the arms and legs symmetrically extend and then abduct while the fingers spread to form a "C"
- rooting: when the cheek is stroked, the neonate turns his head in the direction of the stroke
- tonic neck (fencing position): when the neonate's head is turned while the neonate is lying supine, the extremities on the same side straighten while those on the opposite side flex
- Babinski's: when the sole on the side of the small toe is stroked, the neonate's toes fan upward
- palmar grasp: when a finger is placed in each of the neonate's hands, the neonate's fingers grasp tightly enough to be pulled to a sitting position
- dancing: when held upright with the feet touching a flat surface, the neonate exhibits dancing or stepping movements
- startle: a loud noise such as a hand clap elicits neonatal arm abduction and elbow flexion; the neonate's hands stay clenched
- trunk incurvature: when a finger is run laterally down the neonate's spine, the trunk flexes and the pelvis swings toward the stimulated side.

Catch up on complications

Potential neonatal complications and disorders include fetal alcohol syndrome, human immunodeficiency virus, hypothermia, drug dependency, infections, jaundice, respiratory distress syndrome, and tracheoesophageal fistula.

Fetal alcohol syndrome

Fetal alcohol syndrome (FAS) results from a mother's chronic or periodic intake of alcohol during pregnancy. The degree of alcohol consumption necessary to cause the syndrome varies. Because alcohol crosses the placenta in the same concentration as is present in the maternal bloodstream, alcohol consumption (particularly binge drinking) is especially dangerous during critical periods of organogenesis. The fetal liver isn't mature enough to detoxify alcohol.

Prevention point: Administering zidovudine to an HIV-positive pregnant woman significantly reduces the risk of transmission to the neonate.

CAUSES
• Risk of teratogenic effects increases proportionally with daily alcohol intake; FAS has been detected in neonates of even moderate drinkers (1 to 2 oz of alcohol daily)

DATA COLLECTION FINDINGS
• Abdominal distention
• Difficulty establishing respirations
• Facial anomalies (microcephaly, microophthalmia, maxillary hypoplasia, short palpebral fissures)
• Irritability
• Lethargy
• Opisthotonos
• Seizures
• Sleep disturbances (either always awake or always asleep, depending on the mother's alcohol level close to birth)
• Tremulousness
• Weak sucking reflex

DIAGNOSTIC FINDINGS
• Chest X-ray may reveal congenital heart defect.

NURSING DIAGNOSES
• Imbalanced nutrition: Less than body requirements
• Delayed growth and development
• Risk for impaired parenting

TREATMENT
• Swaddling

Drug therapy
• I.V. phenobarbital (to control hyperactivity and irritability)

INTERVENTIONS AND RATIONALES
• Refer mother to alcohol treatment center *for ongoing support and rehabilitation.*
• Provide a stimulus-free environment for the neonate; darken the room if necessary *to minimize stimuli.*
• Provide gavage feedings as necessary *to ensure adequate nutrition for the infant.*

Teaching topics
• Avoiding alcohol during pregnancy

Human immunodeficiency virus

A mother can transmit the human immunodeficiency virus (HIV) to her fetus transplacentally at various gestational ages—perinatally through maternal blood and bodily fluids—and postnatally through breast milk. Administration of zidovudine to HIV-positive pregnant women significantly reduces the risk of transmission to the fetus.

CAUSES
• Transmission of the virus to the fetus or neonate from an HIV-positive mother

DATA COLLECTION FINDINGS
• Produces no symptoms (at birth)
• Opportunistic infections (may appear between ages 3 and 6 months)

DIAGNOSTIC FINDINGS
• Test interpretation is problematic because most neonates with an HIV-positive mother test positive at birth. Uninfected neonates lose this maternal antibody between 8 and 15 months, and infected neonates remain seropositive. Therefore, testing should be repeated at age 15 months.
• HIV-DNA polymerase chain reaction or viral cultures for HIV should be performed at birth and again between ages 1 and 2 months.

NURSING DIAGNOSES
• Imbalanced nutrition: Less than body requirements
• Ineffective protection
• Risk for infection

TREATMENT
• I.V. fluid administration
• Nutritional supplements to prevent weight loss

Drug therapies
• Antimicrobial therapy to treat opportunistic infections
• Routine immunizations with killed viruses, except the varicella vaccines

• Zidovudine (Retrovir): recommended during the first 6 weeks of life to prevent perinatal transmission
• Combination therapy: recommended when HIV infection is confirmed; therapy should include zidovudine combined with lamivudine (Epivir) or didanosine (Videx); or lamivudine combined with didanosine

INTERVENTIONS AND RATIONALES

• Monitor the neonate's cardiovascular and respiratory status *to detect complications.*
• Monitor vital signs and fluid intake and output *to evaluate for dehydration.*
• Monitor fluid and electrolyte status *to guide fluid and electrolyte replacement therapy.*
• Keep the umbilical stump meticulously clean *to prevent opportunistic infection.*
• Maintain standard precautions *to prevent the spread of infection.*
• Assist with blood sample and urine specimen collection *to prevent the spread of infection.*
• Administer medications as indicated *to treat infection and improve immune function.*
• Provide emotional support to the family *to allay anxiety*
• Monitor the neonate for signs of opportunistic infection *to prevent treatment delay.*

Teaching topics

• Providing the child with all necessary immunizations

Hypothermia

A neonate's temperature is about 99° F (37.2° C) at birth. Inside the womb, the fetus was confined in an environment where the temperature was constant. At birth, this temperature can fall rapidly.

CAUSES

• Cold temperature in delivery environment
• Heat loss due to evaporation, conduction, radiation, or convection
• Immature temperature-regulating system
• Inability to conserve heat due to little subcutaneous fat

DATA COLLECTION FINDINGS

• Kicking and crying (a mechanism to increase the metabolic rate to produce body heat)
• Core body temperature lower than 97.7° F (36.5° C)

DIAGNOSTIC FINDINGS

• Arterial blood gas (ABG) analysis shows hypoxemia.
• Blood glucose level reveals hypoglycemia.

NURSING DIAGNOSES

• Hypothermia
• Ineffective thermoregulation
• Risk for impaired parent-infant attachment

TREATMENT

• Radiant warmer

INTERVENTIONS AND RATIONALES

• Dry the neonate immediately *to prevent heat loss.*
• Wrap the neonate in a warm blanket *to help stabilize body temperature.*
• Allow the mother to hold the neonate skin to skin *to provide warmth.*
• Monitor vital signs every 15 to 30 minutes *to detect temperature fluctuations and complications.*
• Provide a knitted cap for the neonate *to prevent heat loss through the head.*
• Place the neonate in a radiant warmer *to maintain thermoregulation.*

Teaching topics

• Stressing infant-parent bonding (see *Teaching neonatal care to parents,* page 540)

Neonatal drug dependency

Neonates born to drug-addicted mothers are at risk for preterm birth, aspiration pneumonia, meconium-stained fluid, and meconium aspiration. Drug-dependent neonates also may experience withdrawal from such substances as heroin and cocaine.

CAUSES

• History of drug addiction in the mother

Advice from the experts

Teaching neonatal care to parents

Here are some topics to include when teaching parents about caring for their neonate.

CORD CARE

With every diaper change, wipe the umbilical cord with alcohol, especially around the base. Report any odor, discharge, or signs of skin irritation around the cord. Fold the diaper below the cord until the cord falls off after 7 to 10 days.

CUT CARE

Gently clean the circumcised penis with water, and apply fresh petroleum gauze with each diaper change. Loosen the petroleum gauze stuck to the penis by pouring warm water over the area. Don't remove yellow discharge that covers the glans after circumcision; this is part of normal healing. Report any foul-smelling, purulent discharge promptly. Apply diapers loosely until the circumcision heals after about 5 days.

If the plastibell method of circumcision was used, leave the plastic ring in place until it falls off on its own, typically in 5 to 8 days. No special dressing is applied and bathing and diapering are performed normally.

UNCUT CARE

Don't retract the foreskin when washing the uncircumcised penis because the foreskin is adhered to the glans.

POTTY PATTERNS

Become familiar with the neonate's voiding and elimination patterns:

- The neonate's first stools are called meconium; they are odorless, dark green, and thick.
- Transitional stools occur about 2 to 3 days after the ingestion of milk; they are greenish brown and thinner than meconium.
- The stools change to pasty yellow and pungent (bottle-fed neonate) or loose yellow and sweet-smelling (breast-fed neonate) by the fourth day.
- Change diapers before and after every feeding; expose the neonate's buttocks to the air and light several times a day for about 20 minutes to treat diaper rash; apply ointment to minimize contact with urine and feces.

BATH TIME

Give the neonate sponge baths until the cord falls off; then wash the neonate in a tub containing 3″ to 4″ (7.5 to 10 cm) of warm water.

MEALTIME AT THE BREAST

Initiate breast-feeding as soon as possible after delivery, and then feed the neonate on demand. Follow these guidelines:

- Position the neonate's mouth slightly differently at each feeding to reduce irritation at one site.
- Burp the neonate before switching to the other breast.
- Insert the little finger into a corner of the neonate's mouth to separate the neonate from the nipple.
- Experiment with various breast-feeding positions.
- Perform thorough breast care to promote cleanliness and comfort.
- Follow a diet that ensures adequate nutrition for the mother and neonate (drink at least four 8-oz glasses of fluid daily, increase caloric intake by 200 kcal over the pregnancy requirement of 2,400 kcal, avoid foods that cause irritability, gas, or diarrhea).
- Consult the doctor before taking any medication.
- Know that ingested substances (caffeine, alcohol, and medications) can pass into breast milk.

MEALTIME WITH THE BOTTLE

Follow the pediatrician's instructions for preparing and feeding with formula. Follow these guidelines:

- Feed the neonate in an upright position, and keep the nipple full of formula to minimize air swallowing.
- Burp the neonate after each ounce of formula or more frequently if the neonate spits up.

SAFETY SEATS

Make sure parents understand the importance of using child safety seats. Instruct them to place the neonate in the back seat facing to the rear until the neonate is over 20 lb (9 kg) and older than 1 year.

DATA COLLECTION FINDINGS

- Diarrhea
- Frequent sneezing and yawning
- High-pitched cry
- Hyperactive reflexes
- Increased tendon reflexes
- Irritability
- Jitteriness
- Poor feeding habits
- Poor sleeping pattern

- Tremors
- Inconsolable
- Vigorous sucking on hands
- Withdrawal symptoms (depend on the length of maternal addiction, the drug ingested, and the time of last ingestion before delivery; usually appear within 24 hours of delivery)

DIAGNOSTIC FINDINGS

- Drug screen reveals agent abused by mother

NURSING DIAGNOSES

- Imbalanced nutrition: Less than body requirements
- Risk for deficient fluid volume
- Risk for injury

TREATMENT

- Gavage feedings, if necessary
- I.V. therapy to maintain hydration

Drug therapy

- Clonidine (Catapres), Diazepam (Valium), paregoric, and phenobarbital (Barbita) to treat withdrawal symptoms; methadone shouldn't be given to neonates because of its addictive nature

INTERVENTIONS AND RATIONALES

- Monitor cardiovascular status *to detect cardiovascular compromise.*
- Monitor vital signs and fluid intake and output *to detect complications.*
- Encourage the mother to hold the neonate *to promote maternal-infant bonding.*
- Use tight swaddling *for comfort.*
- Place the neonate in a dark, quiet room *to provide a stimulus-free environment.*
- Encourage the use of a pacifier *to meet sucking needs* (in cases of heroin withdrawal).
- Be prepared to administer gavage feeding *because of the neonate's poor sucking reflex* (in cases of methadone withdrawal).
- Maintain fluid and electrolyte balance *to replace fluid loss.*
- Monitor bilirubin levels and evaluate for jaundice (in cases of methadone withdrawal) *to detect liver damage.*

Teaching topics

- Avoiding breast-feeding

Neonatal infections

A neonate may contract an infection before, during, or after delivery. Maternal IgM doesn't cross the placenta, and IgA requires time to reach optimum levels after birth, limiting the neonate's immune response. Dysmaturity caused by intrauterine growth retardation, preterm birth, or postterm birth can further compromise the neonate's immune system and predispose him to infection.

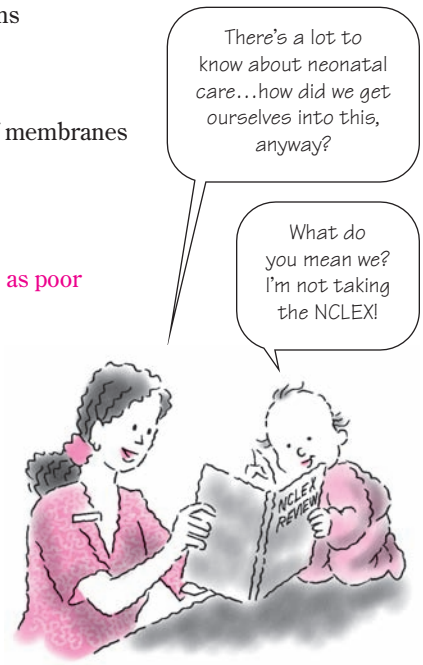
Sepsis is one of the most significant causes of neonatal morbidity and mortality. Toxoplasmosis, syphilis, rubella, cytomegalovirus, and herpes are common perinatal infections known to affect neonates. Beta-hemolytic streptococci infection may occur as a result of contact with the maternal genital tract during labor and delivery.

CAUSES

- Chorioamnionitis
- Low birth weight or premature birth
- Maternal substance abuse
- Maternal urinary tract infections
- Meconium aspiration
- Nosocomial infection
- Premature labor
- Prolonged maternal rupture of membranes

DATA COLLECTION FINDINGS

- Abdominal distention
- Apnea
- Feeding pattern changes, such as poor sucking or decreased intake
- Hyperbilirubinemia
- Pallor
- Petechiae
- Poor weight gain
- Sternal retractions
- Subtle, nonspecific behavioral changes, such as lethargy or hypotonia
- Tachycardia
- Temperature instability
- Vomiting
- Diarrhea



DIAGNOSTIC FINDINGS
- Blood and urine cultures are positive for the causative organism, most commonly gram-positive beta-hemolytic streptococci and the gram-negative *Escherichia coli, Aerobacter, Proteus,* and *Klebsiella.*
- Blood chemistry shows increased direct bilirubin levels.
- Complete blood count (CBC) shows an increased white blood cell (WBC) count.
- Lumbar puncture is positive for causative organisms.

NURSING DIAGNOSES
- Imbalanced nutrition: Less than body requirements
- Hypothermia
- Risk for deficient fluid volume

TREATMENT
- Gastric aspiration
- I.V. therapy to provide adequate hydration

Drug therapy
- Antibiotic therapy: broad-spectrum until the causative organism is identified and then specific antibiotic

INTERVENTIONS AND RATIONALES
- Monitor cardiovascular and respiratory status *to detect complications.*
- Monitor vital signs *to detect complications.*
- Monitor fluid and electrolyte status *to determine the need for fluid replacement.*
- Initiate and maintain respiratory support as needed *to maintain respiratory filtration.*
- Administer broad-spectrum antibiotics before culture results are received and specific antibiotic therapy after results are received *to treat infection.*
- Provide the family with reassurance and support *to reduce anxiety.*
- Provide the neonate with physiologic supportive care *to maintain a neutral thermal environment.*
- Maintain I.V. therapy as ordered *to replace fluid loss.*
- Obtain blood samples and urine specimens *to evaluate antibiotic therapy efficacy.*

Teaching topics
- Knowing the importance of continuing drug therapy for the duration prescribed
- Preventing infection

Neonatal jaundice

Also called *hyperbilirubinemia,* neonatal jaundice is characterized by a bilirubin level that:
- exceeds 6 mg/dl within the first 24 hours after delivery
- remains elevated beyond 7 days (in a full-term neonate)
- remains elevated for 10 days (in a premature neonate).

The neonate's bilirubin levels rise as bilirubin production exceeds the liver's capacity to metabolize it. Unbound, unconjugated bilirubin can easily cross the blood-brain barrier, leading to kernicterus (an encephalopathy).

CAUSES
- Absence of intestinal flora needed for bilirubin passage in the bowel
- Enclosed hemorrhage
- Erythroblastosis fetalis (hemolytic disease of the neonate)
- Hypoglycemia
- Hypothermia
- Impaired hepatic functioning
- Neonatal asphyxia (respiratory failure in the neonate)
- Polycythemia
- Prematurity
- Reduced bowel motility and delayed meconium passage
- Sepsis

DATA COLLECTION FINDINGS
- Decreased reflexes
- High-pitched crying
- Jaundice
- Lethargy
- Opisthotonos
- Seizures

DIAGNOSTIC FINDINGS
- Bilirubin levels exceed 12 mg/dl in premature or term neonates.

• Conjugated (direct) bilirubin levels exceed 2 mg/dl.
• Bilirubin levels rise by more than 5 mg/day.

NURSING DIAGNOSES
• Impaired parenting
• Deficient fluid volume
• Risk for injury

TREATMENT
• Exchange transfusion to remove maternal antibodies and sensitized RBCs if phototherapy fails.
• Increased fluid intake
• Phototherapy (preferred treatment)
• Treatment for anemia if jaundice is caused by hemolytic disease

INTERVENTIONS AND RATIONALES
• Monitor neurologic status *to detect signs of encephalopathy, which indicates the potential for permanent damage.*
• Maintain a neutral thermal environment *to prevent hypothermia.*
• Monitor serum bilirubin levels *to determine increased or decreased levels of bilirubin.*
• Initiate and maintain phototherapy (provide eye protection while the neonate is under phototherapy lights, and remove eye shields promptly when he's removed from the phototherapy lights) *to prevent complications.*
• Allow time for maternal-neonate bonding and interaction during phototherapy *to promote bonding.*
• Keep the neonate's anal area clean and dry. *Frequent, greenish stools result from bilirubin excretion and can lead to skin irritations.*
• Provide the parents with support, reassurance, and encouragement *to reduce anxiety.*

Teaching topics
• Encouraging frequent feedings to maintain adequate caloric intake and hydration and to facilitate excretion of wastes

Respiratory distress syndrome

Respiratory distress syndrome occurs most often in preterm neonates of diabetic mothers, and neonates delivered by cesarean births. In respiratory distress syndrome, a hyaline-like membrane lines the terminal bronchioles, alveolar ducts, and alveoli, preventing exchange of oxygen and carbon dioxide.

CAUSES
• Inability to maintain alveolar stability
• Low level or absence of surfactant

DATA COLLECTION FINDINGS
• Cyanosis and pallor
• Expiratory grunting
• Fine crackles and diminished breath sounds
• Hypothermia
• Nasal flaring
• Respiratory acidosis
• Seesaw respirations
• Sternal, substernal, and intracostal retractions
• Tachypnea (more than 60 breaths/minute)

DIAGNOSTIC FINDINGS
• ABG analysis reveals respiratory acidosis.
• Chest X-rays reveal bilateral diffuse reticulogranular density.

NURSING DIAGNOSES
• Imbalanced nutrition: Less than body requirements
• Ineffective tissue perfusion: Cardiopulmonary
• Impaired gas exchange

TREATMENT
• Acid-base balance maintenance
• Endotracheal (ET) intubation and mechanical ventilation
• Nutrition supplements (total parenteral nutrition [TPN] or enteral feedings if possible)
• Surfactant replacement by way of ET tube
• Temperature regulation with a radiant warmer

Drug therapy

• Indomethacin (Indocin) to promote closure of ductus arteriosus (a fetal blood vessel connecting the left pulmonary artery to the descending aorta)

INTERVENTIONS AND RATIONALES

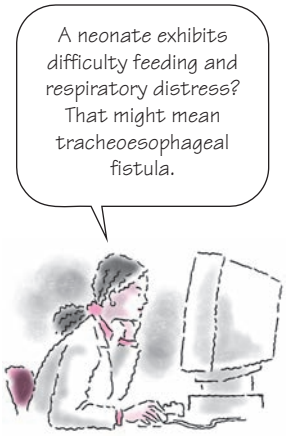
• Monitor cardiovascular, respiratory, and neurologic status *to detect respiratory distress.*
• Monitor vital signs *to observe for changes.*
• Maintain ventilatory support status *to maintain air supply.*
• Administer medications, including ET surfactant, as prescribed *to improve respiratory function.*
• Evaluate hydration status *to determine fluid loss.*
• Maintain I.V. therapy *to maintain fluid levels.*
• Provide adequate nutrition through enteral feedings, if possible, or TPN *to provide adequate nutrition.*
• Maintain thermoregulation *to reduce cold stress.*
• Obtain blood samples as necessary *to detect complications.*

Teaching topics

• Promoting maternal-neonatal bonding

Tracheoesophageal fistula

Tracheoesophageal fistula is a congenital anomaly in which the esophagus and trachea don't separate normally. Most commonly, the esophagus ends in a blind pouch, with the trachea communicating by a fistula with the lower esophagus and stomach.



CAUSES

• Abnormal development of the trachea and esophagus during the embryonic period

DATA COLLECTION FINDINGS

• Difficulty feeding, such as choking or aspiration; cyanosis during feeding
• Difficulty passing a nasogastric tube
• Excessive mucus secretions
• History of maternal polyhydramnios (because fetus can't swallow amniotic fluid)
• Signs of respiratory distress (tachypnea, cyanosis, sternal and substernal retractions)

DIAGNOSTIC FINDINGS

• Abdominal X-ray shows the fistula and a gas-free abdomen.
• Bronchoscopy shows a blind pouch.

NURSING DIAGNOSES

• Imbalanced nutrition: Less than body requirements
• Impaired gas exchange
• Risk for aspiration

TREATMENT

• Emergency surgical intervention to prevent pneumonia, dehydration, and fluid and electrolyte imbalances
• Gastrostomy tube placement
• Maintenance of patent airway

Drug therapy

• Antibiotics (as prophylaxis for aspiration pneumonia)

INTERVENTIONS AND RATIONALES

• Monitor cardiovascular, respiratory, and GI status *to detect complications.*
• Monitor vital signs, fluid intake and output, and transcutaneous blood oxygen tension *to determine fluid replacement needs.*
• Place the neonate in high Fowler's position *to prevent aspiration of gastric contents.*
• Keep a laryngoscope and ET tube at bedside *in case extreme edema causes obstruction.*
• Provide frequent shallow suctioning for very short periods *to maintain airway patency.*
• Provide the neonate with a pacifier *to meet sucking needs.*
• Provide gastrostomy tube feedings postoperatively *to maintain nutrition.*
• Maintain I.V. fluid therapy *to replace fluid volume.*

Teaching topics

• Promoting maternal-neonatal bonding

Pump up on practice questions

1. A neonate weighing 1,503 g is born at 32 weeks' gestation. During data collection 12 hours after birth, the nurse notices these signs and symptoms: hyperactivity, persistent shrill cry, frequent yawning and sneezing, and jitteriness. These symptoms indicate:

1. sepsis.
2. hepatitis.
3. drug dependence.
4. hypoglycemia.

Answer: 3. These classic symptoms of drug dependency usually appear within the first 24 hours after birth. Sepsis is indicated by temperature instability and tachycardia. Hepatitis will manifest itself as jaundice. Hypothermia, muscle twitching, diaphoresis, and respiratory distress may be signs of hypoglycemia.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

2. Which is a preferred treatment for neonatal jaundice?

1. Exchange transfusion
2. Phototherapy
3. Observing and monitoring bilirubin levels
4. Stool softener

Answer: 2. The preferred treatment for neonatal jaundice is phototherapy. Exchange transfusion is performed when the bilirubin levels rapidly rise despite the use of phototherapy or hydration. Neonates with high bilirubin levels shouldn't just be observed; intervention is necessary. Stool softeners aren't a part of medical management for neonatal jaundice.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

3. The nurse is collecting data on a 4-hour-old neonate. Which finding would be a cause of concern?

1. Anterior fontanel is ¾″ (1.9 cm) wide, head is molded, and sutures are overriding.
2. Hands and feet are cyanotic, abdomen is rounded, and the neonate hasn't voided or passed meconium.
3. Color is dusky, axillary temperature is 97° F (36.1° C), and the neonate is spitting up excessive mucus.
4. Irregular abdominal respirations and intermittent tremors in the extremities.

Answer: 3. Skin color is expected to be pink-tinged or ruddy, saliva should be scant, and the normal axillary temperature ranges from 97.7° to 98.6° F (36.5° to 37° C). Overriding sutures and molding, when present, may persist for a few days. Acrocyanosis may be present for 2 to 6 hours. The neonate would be expected to pass meconium and void within 24 hours. Neonatal tremors are common in a full-term neonate; however, they must be evaluated to differentiate them from seizures.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

4. Which neonate is at greatest risk for developing respiratory distress syndrome?

1. A neonate with a history of intrauterine growth retardation
2. A neonate born at less than 35 weeks' gestation
3. A neonate whose mother experienced prolonged rupture of membranes
4. A neonate born at 38 weeks' gestation

Answer: 2. Respiratory distress syndrome is predominantly seen in premature neonates; the more premature the neonate, the more severe the disease. Intrauterine growth retardation and prolonged rupture of membranes are unlikely to be associated with development of respiratory distress syndrome. A 38-week gestation neonate usually has mature lungs and isn't at risk for respiratory distress syndrome.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

5. Which infection can be acquired by the neonate during labor and delivery?

1. Group B streptococci
2. Rubella
3. Hepatitis
4. Syphilis

Answer: 1. Group B streptococci may contaminate the maternal genital tract during labor and delivery. Rubella is acquired in utero. Hepatitis is a postnatal infection. Syphilis is also acquired in utero.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

6. The nurse collects data on a neonate's respiratory rate at 46 breaths/minute 6 hours after birth. Respirations are shallow, with periods of apnea lasting up to 5 seconds. Which action should the nurse take next?

1. Attach an apnea monitor.
2. Continue routine monitoring.
3. Follow respiratory arrest protocol.
4. Call the pediatrician immediately to report findings.

Answer: 2. The normal respiratory rate is 30 to 60 breaths/minute. Attaching the apnea monitor, following respiratory arrest protocol, and notifying the pediatrician of findings aren't necessary because the listed findings are normal respiratory patterns in neonates.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

7. Which statement is true?

1. Binge drinking is less detrimental to the fetus than low-level chronic drinking.
2. The mother's blood alcohol level is greater than that of the fetus.
3. The fetus can stay inebriated for many days.
4. Fetal blood alcohol levels drop off quickly.

Answer: 3. The fetal liver isn't mature enough to detoxify the alcohol. Binge drinking is more detrimental to the fetus than chronic low-level drinking for this reason as well. Alcohol goes directly from mother to fetus at

the same level of concentration. High fetal blood alcohol levels stay that way for a long time.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

8. The best way to prevent FAS is for a pregnant woman to:

1. only drink on social occasions.
2. stop drinking once she becomes pregnant.
3. decrease alcohol intake while attempting to become pregnant.
4. abstain from drinking before becoming pregnant and during the entire pregnancy.

Answer: 4. The best prevention is to abstain from alcohol before and during pregnancy. Decreasing alcohol intake may not prevent intrauterine growth retardation. Social drinking can have adverse effects on an unborn child. Because the fetus can be damaged before the mother realizes that she's pregnant, stopping drinking once the pregnancy becomes known may not prevent FAS.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Analysis

9. A baby girl delivered at 38-weeks' gestation weighs 2,325 grams (5 lb, 2 oz) and is having difficulty maintaining body temperature. Which nursing intervention would best prevent cold stress?

1. Immediately after birth, dry the neonate and place her under a radiant heater for 2 hours.
2. Administer oxygen for the first 30 minutes after birth.
3. Decrease integumentary stimulation after birth.
4. Maintain the environmental temperature at a constant level.

Answer: 1. Drying the neonate and placing her in a radiant warmer helps prevent loss of body heat. Administering oxygen and decreasing integumentary circulation would have no effect in preventing cold stress. Maintaining environmental temperature wouldn't prevent loss of heat via conduction, evaporation, or convection.

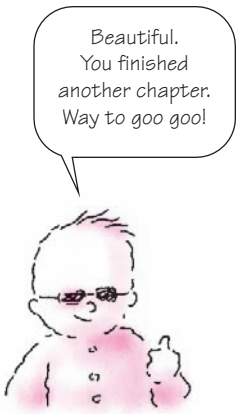
Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

10. The nurse is caring for a drug-dependent neonate. Which intervention should the nurse perform?

1. Limit sensory stimulation of the neonate.
2. Cluster activities.
3. Wrap the neonate loosely in blankets.
4. Increase environmental stimuli.

Answer: 1. Limiting sensory stimulation allows for extensive rest periods. The nurse may want to modulate sensory input as tolerated by the neonate. The neonate needs to be swaddled tightly in a flexed position. Increasing environmental stimuli may exacerbate irritability and restlessness.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application



Pump up on more practice questions

1. The nurse is collecting data on a neonate with tracheoesophageal fistula. Which finding should the nurse expect to encounter?

1. Increase in saliva
2. Gastric tube easily passed
3. Feeding without difficulty
4. Normal chest X-ray

Answer: 1. The neonate's inability to swallow saliva leads to an increase in saliva. The other options aren't likely findings in tracheoesophageal fistula. The neonate is unable to pass a gastric tube. During feedings, the neonate is at risk for choking and cyanosis. Pulmonary infiltrates, lobar collapse, and atelectasis frequently appear on the chest X-ray.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

2. A client is scheduled for amniocentesis. When preparing her for the procedure, the nurse should:

1. ask her to void.
2. instruct her to drink 1 qt (1 L) of fluid.
3. prepare her for I.V. anesthesia.
4. place her on her left side.

Answer: 1. To prepare a client for amniocentesis, the nurse should ask the client to empty her bladder to reduce the risk of bladder perforation. The nurse may instruct the client to drink 1 qt of fluid to fill the bladder before transabdominal ultrasound (unless ultrasound is done before amniocentesis to locate the placenta). I.V. anesthesia isn't given for amniocentesis. The client should be supine during the procedure; afterward, she should be placed on her left side to avoid supine hypotension, promote venous return, and ensure adequate cardiac output.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

3. Six hours after birth, a neonate is transferred to the nursery. The nurse is planning interventions to prevent hypothermia. What's a common source of radiant heat loss?

1. Low room humidity
2. Cold weight scale
3. Cool incubator walls
4. Cool room temperature

Answer: 3. Common sources of radiant heat loss include cool incubator walls and windows. Low room humidity promotes evaporative heat loss. When the skin directly contacts a cooler object, such as a cold weight scale, conductive heat loss may occur. A cool room temperature may lead to convective heat loss.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

4. A client is in her 25th week of pregnancy. Which procedure is used to detect fetal anomalies?

1. Amniocentesis
2. Chorionic villi sampling
3. Fetoscopy
4. Ultrasound

Answer: 4. Ultrasound is performed between 18 and 40 weeks' gestation to identify normal fetal growth and detect fetal anomalies and other problems. Amniocentesis is done during the third trimester to determine fetal lung maturity. Chorionic villi sampling is performed at 8 to 12 weeks' gestation to detect genetic disease. Fetoscopy is done at about 18 weeks' gestation to observe the fetus directly and obtain a skin specimen or blood sample.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

5. Which nursing intervention has priority when feeding a neonate with a cleft lip or palate?

1. Directing the flow of milk in the center of the mouth
2. Providing frequent, small feedings
3. Avoiding breast-feeding
4. Infrequent burping

Answer: 2. Frequent, small feedings help to prevent fatigue and frustration in the neonate. The flow of milk should be directed to the side of the mouth. Breast-feeding may be possible. These neonates need frequent burping because of the large amount of air swallowed while feeding.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

6. During a physical examination, a client in her 32nd week of pregnancy becomes pale, dizzy, and light-headed while supine. Which intervention takes priority?

1. Turning the client onto her left side
2. Asking the client to breathe deeply
3. Listening to fetal heart tones
4. Measuring the client's blood pressure

Answer: 1. As the uterus enlarges, pressure on the inferior vena cava increases, compromising venous return and causing blood pressure to drop. This may lead to syncope and other symptoms when the client is supine. Turning the client onto her left side relieves pressure on the vena cava, restoring normal venous return and blood pressure. Deep breathing wouldn't relieve this client's symptoms. Listening to fetal heart tones and measuring the client's blood pressure don't provide relevant information.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Comprehension

7. A client has meconium-stained amniotic fluid. The fetal monitoring strip shows fetal bradycardia. Fetal blood sampling indicates a pH of 7.12. Based on these findings, which nursing intervention is called for?

1. Administer oxygen as prescribed.
2. Prepare for cesarean delivery.
3. Reposition the client.
4. Start I.V. oxytocin infusion as prescribed.

Answer: 2. Fetal blood pH of 7.19 or lower signals severe fetal acidosis; meconium-stained amniotic fluid and bradycardia are additional signs of fetal distress that warrant cesarean delivery. Oxygen administration and client repositioning may improve uteroplacental perfusion but are only temporary measures. Oxytocin administration increases contractions, exacerbating fetal stress.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

8. Which phase of uterine contractions is described as the letting-down phase?

1. Increment
2. Decrement
3. Acme
4. Variability

Answer: 2. Decrement is the letting-down phase of uterine contractions. Increment refers to the building-up phase, and acme is the peak of the contraction. Variability refers to the normal variation in the heart rate, caused by continuous interplay of the parasympathetic and sympathetic nervous systems.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

9. Which diagnostic procedure will best determine whether a client in labor has spontaneous rupture of amniotic membranes?

1. CBC
2. Fern test
3. Urinalysis
4. Vaginal examination

Answer: 2. A fern test indicates spontaneous rupture of amniotic membranes. The name of this test refers to the microscopic fernlike pattern produced by sodium chloride crystallization in dried amniotic fluid, which indicates the presence of ruptured amniotic membranes. A CBC might indicate infection (if WBCs are increased), but it won't indicate whether the amniotic sac has ruptured. Urinalysis doesn't test for the presence of amniotic fluid. A vaginal examination may determine whether the membranes have ruptured but isn't conclusive.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Analysis

10. A client is admitted to the hospital in preterm labor. To halt her uterine contractions, the nurse expects to administer:

1. magnesium sulfate.
2. dinoprostone (Cervidil).
3. ergonovine (Ergotrate).
4. terbutaline (Brethine).

Answer: 4. Terbutaline, a beta$_2$-receptor agonist, is used to inhibit preterm uterine contractions. Magnesium sulfate is used to treat hypertension in pregnancy. Dinoprostone is used to induce fetal expulsion and promote cervical dilation and softening. Ergonovine is used to stop uterine blood flow, for example, in hemorrhage.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Comprehension

11. The nurse reviews the history of a postpartum client. Which factor most strongly indicates that this client is at risk for experiencing afterpains?

1. The client delivered at 39 weeks' gestation.
2. The client smokes cigarettes.
3. The client has decided to bottle-feed her neonate.
4. The client is a gravida 6, para 5.

Answer: 4. In a multiparous client, decreased uterine muscle tone leads to alternating relaxation and contraction during uterine involution; this, in turn, causes afterpains. A gestation of 39 weeks and a history of cigarette smoking don't contribute directly to afterpains. A bottle-feeding client may experience afterpains from lack of oxytocin release, which stimulates the uterus to contract and thus enhances involution. The mere decision to bottle-feed doesn't cause afterpains.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Analysis

12. The nurse is collecting data on a client who gave birth yesterday. Where should the nurse expect to find the top of the client's fundus?

1. One fingerbreadth above the umbilicus
2. One fingerbreadth below the umbilicus
3. At the level of the umbilicus
4. Below the symphysis pubis

Answer: 2. After a client gives birth, the height of her fundus should decrease about one fingerbreadth (about 1 cm) each day. So by the end of the first postpartum day, the fundus should be one fingerbreadth below the umbilicus. Immediately after birth, it should be at the level of the umbilicus; 10 days after birth, it should be below the symphysis pubis.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

13. Cervical effacement and dilation aren't progressing in a client in labor. The physician orders I.V. administration of oxytocin (Pitocin). Why should the nurse monitor the client's fluid intake and output closely during oxytocin administration?

1. Oxytocin causes water intoxication.
2. Oxytocin causes excessive thirst.
3. Oxytocin is toxic to the kidneys.
4. Oxytocin has a diuretic effect.

Answer: 1. The nurse should monitor fluid intake and output because prolonged oxytocin infusion may cause severe water intoxication, leading to seizure, coma, and death. Excessive thirst results from the work of labor and limited oral fluid intake, not oxytocin. Oxytocin has no nephrotoxic or diuretic effects; in fact, it produces an antidiuretic effect.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Knowledge

14. The nurse is reviewing laboratory results for a postpartum client. What happens to the level of human chorionic gonadotropin (HCG) during the postpartum period?

1. The circulating HCG level remains high for 2 to 4 weeks.
2. The serum HCG level diminishes over 6 weeks.
3. Circulating HCG disappears within 24 hours.
4. The serum HCG level remains high until the client's next pregnancy.

Answer: 3. Circulating HCG disappears within 8 to 24 hours after delivery in both lactating and nonlactating clients.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

15. A client has been in labor for 6 hours, and her contractions are occurring every 2 minutes and lasting 80 seconds. She's diaphoretic, restless, and irritable and tells the nurse that she "can't take it anymore." In which stage or phase of labor is the client?

1. Transitional phase
2. Latent phase
3. Second stage
4. Third stage

Answer: 1. During the transitional phase, cervical dilation is between 8 and 10 cm and contractions occur every 1 to 2 minutes, last 60 to 90 seconds, and are strongly intense. Also during this phase, the client may feel overwhelmed and unable to continue with labor, become irritable and restless, groan or cry

out, and experience diaphoresis and, possibly, nausea and vomiting. In the latent phase of the first stage, contractions are mild to moderate and irregular. The second stage of labor begins with full cervical dilation and ends with the delivery of the neonate. The third stage begins immediately after delivery.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

16. The nurse is collecting data on a client who's resting comfortably 4 hours after delivery. Which finding is considered normal?

1. A thready pulse
2. An irregular pulse
3. Tachycardia
4. Bradycardia

Answer: 4. During the client's first postpartum rest or sleep, which usually occurs 2 to 4 hours after delivery, the heart rate typically decreases, possibly slowing to 50 beats/minute (bradycardia). This probably results from supine positioning and such normal physiologic phenomena as the postpartum rise in stroke volume and a reduction in vascular bed size. An irregular or thready pulse is never normal. Tachycardia may indicate excessive blood loss, especially if accompanied by a thready pulse and other signs, such as pallor, an increased respiratory rate, and diaphoresis.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

17. The nurse should advise the pregnant client to use which body position to enhance cardiac output and renal function?

1. Right lateral
2. Left lateral
3. Supine
4. Semi-Fowler's

Answer: 2. The left lateral position shifts the enlarged uterus away from the vena cava and aorta, enhancing cardiac output, kidney perfusion, and kidney function. The right lateral and semi-Fowler's positions don't alleviate pressure of the enlarged uterus on the vena cava. The supine position reduces sodium and water excretion because the enlarged uterus compresses the vena cava and aorta; this decreases cardiac output, leading to decreased renal blood flow, which in turn impairs kidney function.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

18. The nurse is preparing a postpartum client for discharge. The nurse should instruct her to report:

1. scant lochia alba 2 to 3 weeks after delivery.
2. a temperature of 99.7° F (37.6° C) for 24 hours or more.
3. breast tenderness that's relieved by analgesics.
4. a red, warm, painful area in the breast.

Answer: 4. Signs of postpartum complications include a red, warm, painful area in either breast; heavy vaginal bleeding or passage of clots or tissue fragments; and a temperature of 100.2° F (37.9° C) or higher for 24 hours or longer. Scant lochia alba 2 to 3 weeks after delivery, a temperature of 99.7° F for 24 hours or longer, and breast tenderness that's relieved by analgesics are normal postpartum findings.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

19. Just after delivery, rectal measurement reveals the neonate's temperature to be 96.1° F (35.6° C). What should the nurse do?

1. Rewarm the neonate gradually.
2. Rewarm the neonate rapidly.
3. Observe the neonate at least hourly.
4. Notify the physician when the neonate's temperature is normal.

Answer: 1. A neonate with a rectal temperature of 96.1° F is experiencing cold stress. To correct cold stress while avoiding hyperthermia and its complications, the nurse should rewarm the neonate gradually, observing closely and checking vital signs every 15 to 30 minutes. Rapid rewarming may cause hyperthermia. Hourly observation isn't frequent enough because cold stress increases oxygen, calorie, and fat expenditure, putting the neonate at risk for anabolic metabolism and, possibly, metabolic acidosis. A neonate with cold stress requires intervention; the nurse should notify the physician of the problem as soon as it's identified.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Comprehension

20. When does the postpartum client begin to accept the neonate as a separate individual?

1. Letting-go phase
2. Taking-hold phase
3. Dependent phase
4. Taking-in phase

Answer: 1. Rubin identified three phases during which a woman adapts to the maternal role. During the letting-go (independent) phase, the client begins to accept the neonate as an individual who's separate from herself. During the taking-in (dependent) phase, which usually lasts 1 to 2 days after delivery, the client usually is exhausted and dependent on others, focusing on her own needs. During the taking-hold (dependent-independent) phase, which may last from 3 days to 8 weeks, the client vacillates between seeking nurturing and acceptance for herself and seeking to resume an independent role.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Knowledge

21. A neonate is born at 32 weeks' gestation to a mother who has admitted to using heroin. Which neonatal evaluation takes priority?

1. Auscultation of breath sounds for signs of pulmonary problems
2. Careful observation of respiratory effort because of the neonate's prematurity
3. Evaluation for signs of drug withdrawal
4. Observation for jaundice

Answer: 3. After delivery, a neonate born to a substance abuser may exhibit signs of drug withdrawal, such as irritability, poor feeding, and continual crying. Auscultating breath sounds, observing respiratory effort, and observing for jaundice are appropriate assessments for *any* neonate, not just the neonate of a substance abuser.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Comprehension

22. The nurse is assisting with developing a teaching plan for a client who's about to be discharged after delivering a hydatidiform molar pregnancy. Which expected outcome takes highest priority?

1. Client states that she may attempt another pregnancy after 3 months of follow-up care.
2. Client schedules her first follow-up Papanicolaou (Pap) test and gynecologic examination for 6 months after discharge.
3. Client states that she won't attempt another pregnancy until her HCG level rises.
4. Client uses a reliable contraceptive method until her follow-up care is complete in 1 year and her HCG level is negative.

Answer: 4. After a hydatidiform molar pregnancy, the client should receive follow-up care, including regular HCG testing, for 1 year because of the risk of developing chorionic carcinoma. After removal of a hydatidiform mole, the HCG level gradually falls to a negative reading unless chorionic carcinoma is developing, in which case the HCG level rises. A Pap test isn't an effective indicator of a hydatidiform molar pregnancy.

A follow-up examination would be scheduled within weeks of the client's discharge. The client must not become pregnant during follow-up care because pregnancy causes the HCG level to rise, making it indistinguishable from this early sign of chorionic carcinoma.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

23. A client expresses concern that her 3-hour-old neonate is difficult to awaken. The nurse explains that this behavior indicates:

1. a physiologic abnormality.
2. probable hypoglycemia.
3. normal progression into the sleep cycle.
4. normal progression into a period of neonatal reactivity.

Answer: 3. Three hours after birth, the neonate is typically difficult to awaken. This finding suggests normal progression into the sleep cycle. During this period, the neonate shows minimal response to external stimuli. Hypoglycemia is characterized by irregular respirations, apnea, and tremors. Periods of neonatal reactivity are characterized by alertness and attentiveness.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

24. The nurse has just finished teaching a postpartum client about breast-feeding her neonate. Which statement is the best indicator that the client knows how to avoid breast engorgement?

1. "I'll apply warm, moist compresses to my breasts."
2. "I'll breast-feed every 1½ to 3 hours."
3. "I'll use an electric breast pump."
4. "I'll wear a bra 24 hours a day."

Answer: 2. Because frequent breast-feeding keeps the breasts relatively empty and increases circulation, it helps remove fluid that may lead to engorgement. Applying warm compresses to the breasts increases circulation and decreases inflammation and edema; it's used to treat, not prevent, breast engorgement. An electric breast pump usually isn't used if the neonate can breast-feed frequently. Although a bra supports the breasts, it can't prevent engorgement.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

25. A client expresses concern that her 2-day-old breast-feeding neonate isn't getting enough to eat. The nurse should teach the client that breast-feeding is effective if:

1. the neonate voids once or twice every 24 hours.
2. the neonate breast-feeds four times in 24 hours.
3. the neonate loses 10% to 15% of birth weight within the first 2 days after birth.
4. the neonate latches onto the areola and swallows audibly.

Answer: 4. Breast-feeding is effective if the infant latches onto the mother's areola properly and if swallowing is audible. A breast-feeding neonate should void at least six to eight times per day and should breast-feed every 2 to 3 hours. Over the first few days after birth, an acceptable weight loss is 5% to 10% of the birth weight.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

26. A client who used heroin during her pregnancy delivers a neonate. When collecting data on the neonate, the nurse expects to find:

1. lethargy 2 days after birth.
2. irritability and poor sucking.
3. a flattened nose, small eyes, and thin lips.
4. congenital defects such as limb anomalies.

Answer: 2. Neonates of heroin-addicted mothers are physically dependent on the drug and experience withdrawal when the drug is no longer supplied. Signs of heroin withdrawal include irritability, poor sucking, and restlessness. Lethargy isn't associated with neonatal heroin addiction. A flattened nose, small eyes, and thin lips are seen in infants with FAS. Heroin use during pregnancy hasn't been linked to specific congenital anomalies.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

27. When collecting data on a neonate 1 hour after delivery, the nurse measures an axillary temperature of 95.8° F (35.4° C), an apical pulse of 110 beats/minute, and a respiratory rate of 64 breaths/minute. Which nursing diagnosis takes highest priority?

1. Hypothermia related to heat loss
2. Impaired parenting related to the addition of a new family member
3. Risk for deficient fluid volume related to insensible fluid losses
4. Risk for infection related to transition to the extrauterine environment

Answer: 1. The neonate's temperature should range from 96° to 97.7° F (35.6° to 36.5° C), and the respiratory rate should be less than 60 breaths/minute. (The respiratory rate increases as hypothermia develops.) Because this neonate's temperature is below normal and because cold stress can lead to respiratory distress and hypoglycemia, hypothermia related to heat loss takes highest priority. The other options may be appropriate but don't take precedence over hypothermia, a potentially life-threatening condition.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

28. A neonate must receive an eye preparation to prevent ophthalmia neonatorum. How should the nurse administer this preparation?

1. By avoiding holding the eyelid open during medication instillation
2. By letting the medication drip onto the surface of the eye
3. By positioning the neonate so that his head remains still
4. By holding the neonate in the football position

Answer: 3. After positioning the neonate securely so that the head remains still, the nurse should hold the eyelid open and instill the medication into the conjunctival sac. Holding the neonate in the football position doesn't secure the head.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Application

29. The nurse places a neonate with hyperbilirubinemia under a phototherapy lamp. The goal of phototherapy is:

1. to prevent hypothermia.
2. to promote respiratory stability.
3. to decrease the serum conjugated bilirubin level.
4. to decrease the serum unconjugated bilirubin level.

Answer: 4. The goal of phototherapy is to reduce the serum unconjugated bilirubin level because a high level may lead to bilirubin encephalopathy (kernicterus). Phototherapy doesn't prevent hypothermia or promote respiratory stability. It has no effect on conjugated bilirubin, a water-soluble substance excreted easily in urine and stools.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

30. The nurse collects data on a 1-day-old neonate. Which finding indicates that the neonate's oxygen needs aren't being adequately met?

1. Respiratory rate of 54 breaths/minute
2. Abdominal breathing
3. Nasal flaring
4. Acrocyanosis

Answer: 3. Signs of respiratory distress include nasal flaring, a respiratory rate above 60 breaths/minute, labored respirations, grunting, generalized cyanosis, and retractions. Abdominal breathing is a normal finding in neonates. Acrocyanosis (a bluish tinge to the hands and feet) is normal on the first day after birth.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

Part V Care of the child

26 Growth & development

In this chapter, you'll review:

- key concepts of growth and development
- major developmental milestones
- important aspects of care.

Brush up on key concepts

Growth and development are fundamental concepts in pediatric nursing. Each developmental stage presents unique patient care challenges in such areas as nutrition, language, safety education, medication administration, and pain management.

You can review the major points of this chapter by consulting the *Cheat sheet* on page 560.

An infant's developmental milestones

A child is considered an infant from the time he's born until age 1. During this time, development is marked by five major periods:

- the neonatal period (up to 28 days)
- 1 to 4 months
- 5 to 6 months
- 7 to 9 months
- 10 to 12 months.

NEONATAL PERIOD

The neonatal period covers the time from birth to 28 days old.

Reflexes reign

During this period, you'll note these findings:

- Head and chest circumferences are approximately equal.
- Behavior is under reflex control.
- Extremities are flexed.
- Vision is poor (the neonate fixates momentarily on light).
- Hearing and touch are well developed.
- When prone, the neonate can lift his head slightly off the bed.

Beat, blood, breath

- Normal pulse rate ranges from 110 to 160 beats/minute.
- Normal blood pressure is 65/40 to 78/52 mm Hg.
- Normal respiratory rate is 32 to 60 breaths/minute.
- Respirations are irregular and from the abdomen.
- The neonate is an obligate nose breather.

Hot and cold

- Temperature regulation is poor.

1 TO 4 MONTHS

At age 3 months, the most primitive reflexes begin to disappear, except for the protective and postural reflexes (blink, parachute, cough, swallow, and gag reflexes), which remain for life. The infant reaches out voluntarily but is uncoordinated.

Heads up

During this period, the posterior fontanel closes. In addition, the infant:

- begins to hold up his head
- begins to put his hand to his mouth
- develops binocular vision
- cries to express needs
- smiles (the instinctual smile appears at 2 months and the social smile at 3 months)
- laughs in response to the environment (at 4 months).

5 TO 6 MONTHS

At 5 to 6 months, birth weight doubles. In addition, the infant:

- rolls over from his stomach to his back
- cries when his parent leaves

Cheat sheet

Growth & development refresher

INFANT (BIRTH TO AGE 1)

Neonatal period

- All behavior is under reflex control; extremities are flexed.
- Normal pulse rate ranges from 110 to 160 beats/minute.
- Normal blood pressure is 65/40 to 78/52 mm Hg.
- Normal respiratory rate is 32 to 60 breaths/minute. Respirations are irregular and from the abdomen; the neonate is an obligate nose breather.
- Temperature regulation is poor.

1 to 4 months

- The posterior fontanel closes.
- The infant begins to hold up his head.
- The infant cries to express needs.

5 to 6 months

- The infant rolls over from his stomach to his back.
- The infant cries when his parent leaves.

7 to 9 months

- Fear of strangers appears to peak during the 8th month.
- The infant sits alone with assistance.
- The infant creeps on hands and knees with belly off floor.
- The infant verbalizes all vowels and most consonants but speaks no intelligible words.

10 to 12 months

- The infant holds onto furniture while walking (cruising) at age 10 months, walks with support at age 11 months, and stands alone and takes first steps at age 12 months.
- The infant says "mama" and "dada" and responds to own name at age 10 months; can say about five words, but understands many more.

TODDLER (AGES 1 TO 3)

- Normal pulse rate is 70 to 110 beats/minute.
- Normal blood pressure is 90/55 to 105/70 mm Hg.
- Normal respiratory rate is 20 to 30 breaths/minute.
- Separation anxiety arises.
- The child is toilet-trained; day dryness is achieved between ages 18 months and 3 years and night dryness between ages 2 and 5.

PRESCHOOL CHILD (AGES 3 TO 5)

- Normal pulse rate ranges from 90 to 100 beats/minute.
- Normal blood pressure ranges from 85/60 to 90/70 mm Hg.
- Normal respiratory rate is 20 to 25 breaths/minute.
- The child may express fear of animal noises, new experiences, and the dark.

SCHOOL-AGE CHILD (AGES 5 TO 12)

- Normal pulse rate ranges from 75 to 115 beats/minute.
- Normal blood pressure ranges from 106/69 to 117/76 mm Hg.
- Normal respiratory rate ranges from 20 to 25 breaths/minute.
- Accidents are a major cause of death and disability during this period.
- The child plays with peers, develops a first true friendship, and develops a sense of belonging, cooperation, and compromise.
- The child learns to read and spell.

ADOLESCENT (AGES 12 TO 18)

- The adolescent experiences puberty-related changes in body structure and psychosocial adjustment.
- Vital signs approach adult values
- Peers influence behavior and values.

Advice from the experts

Infants and nutrition

Here's a rundown of primary nutrition guidelines for a child's first year of life:

- Begin with formula or breast milk; give no more than 30 oz (887 ml) of formula each day.
- Iron supplements may be necessary after 4 months.
- No solid foods should be given for the first 4 to 6 months.
- Provide rice cereal as the first solid food, followed by any other cereal except wheat.
- Yellow and green vegetables may be given at 8 to 9 months.
- Provide noncitrus fruits at 6½ to 8 months, followed by citrus fruits late in the 1st year.
- Give junior foods or soft table foods after 9 months.

- attempts to crawl when prone
- voluntarily grasps and releases objects.

7 TO 9 MONTHS

At 7 to 9 months, the infant can self-feed crackers and a bottle. When physically and emotionally ready, the infant can be weaned. The infant understands the word "no." Efforts to enforce discipline are appropriate at this time. Fear of strangers appears to peak during the eighth month. Attempts to evaluate breath and heart sounds should be made while the mother holds the infant.

Sit, creep, and prespeak

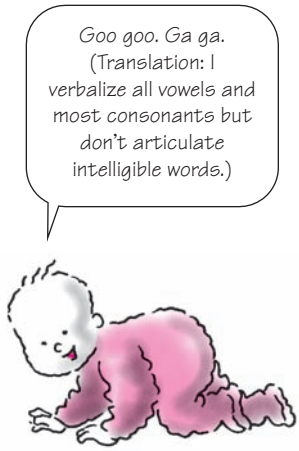
In addition, the infant:

- sits alone with assistance
- creeps on hands and knees with belly off floor
- verbalizes all vowels and most consonants but doesn't articulate intelligible words.

10 TO 12 MONTHS

At 10 to 12 months, birth weight triples, and birth length increases about 50%. The anterior fontanel normally closes between ages 9 and 18 months. In addition, the infant:

- may walk while holding onto furniture (cruising) at age 10 months
- walks with support at age 11 months, and stands alone and takes first steps at age 12 months
- says "mama" and "dada" and responds to own name at age 10 months
- can say about five words, but understands many more
- is ready to be weaned from the bottle and breast (see *Infants and nutrition*).



Toddler developmental milestones

The toddler period includes ages 1 to 3. This is a slow growth period with a weight gain of 4 to 9 lb (2 to 4 kg) over 2 years.

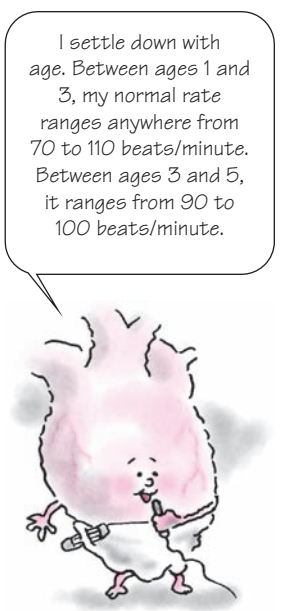
Beat, blood, breath

- Normal pulse rate is 70 to 110 beats/minute.
- Normal blood pressure is 90/55 to 105/70 mm Hg.
- Normal respiratory rate is 20 to 30 breaths/minute.

Me, myself, and I

The toddler exhibits the following behavioral and psychological characteristics:

- egocentricity
- frequent temper tantrums, especially when confronted with the conflict of achieving autonomy and relinquishing dependence on others
- follows the parent wherever he or she goes
- experiences separation anxiety
- lacks the concept of sharing



• prefers solitary play and has little interaction with others; this progresses to parallel play (toddler plays alongside but not with another child).

Look, Ma

The toddler:
• plants his feet wide apart and walks by age 15 months
• climbs stairs at 21 months, runs and jumps by age 2, and rides a tricycle by age 3
• uses at least 400 words as well as two- to three-word phrases and comprehends many more (by age 2)
• uses about 11,000 words (by age 3)
• undergoes toilet training; day dryness should be achieved between ages 18 months and 3 years and night dryness between ages 2 and 5.

Preschool developmental milestones

The preschool period encompasses ages 3 to 5. Slow growth continues during this period. Birth length doubles by age 4.

Beat, blood, breath

• Normal pulse rate ranges from 90 to 100 beats/minute.
• Normal blood pressure ranges from 85/60 to 90/70 mm Hg.
• Normal respiratory rate is 20 to 25 breaths/minute.

Fear factor

The child may begin to express fear. Anticipate the child's fear of mutilation of his body, animal noises, new experiences, and the dark. Provide adhesive bandages for cuts because the child may fear losing blood. Using dolls for role-playing may reduce the preschool child's anxiety.

Playtime progress

The child:
• exhibits parallel play, associative play, group play in activities with few or no rules, and independent play accompanied by sharing or talking
• develops a body image
• may count but not understand what numbers mean
• may recognize some letters of the alphabet
• dresses without help but may be unable to tie shoes
• speaks in grammatically correct, complete sentences
• gets along without parents for short periods.

School-age developmental milestones

The school-age years are defined as ages 5 to 12.

Beat, blood, breath

• Normal pulse rate ranges from 75 to 115 beats/minute.
• Normal blood pressure ranges from 106/69 to 117/76 mm Hg.
• Normal respiratory rate ranges from 20 to 25 breaths/minute.

Watch out

• Accidents are a major cause of death and disability during this period.
• Height increases about 2″ (5 cm) a year, and weight doubles between ages 6 and 12.
• The first primary tooth is displaced by a permanent tooth at age 6, and permanent teeth erupt by age 12, except for final molars.
• Vision matures by age 6.

Best friends forever

The child:
• engages in cooperative play
• plays with peers, develops a first true friendship, and develops a sense of belonging, cooperation, and compromise
• develops concepts of time and place, cause and effect, reversibility, conversation, and numbers
• learns to read and spell
• engages in fantasy play and daydreaming.

Adolescent developmental milestones

Ages 12 to 18 encompass the adolescent period. Adolescence is a period of rapid growth characterized by puberty-related changes in body structure and psychosocial adjustment.

What's happening to me?

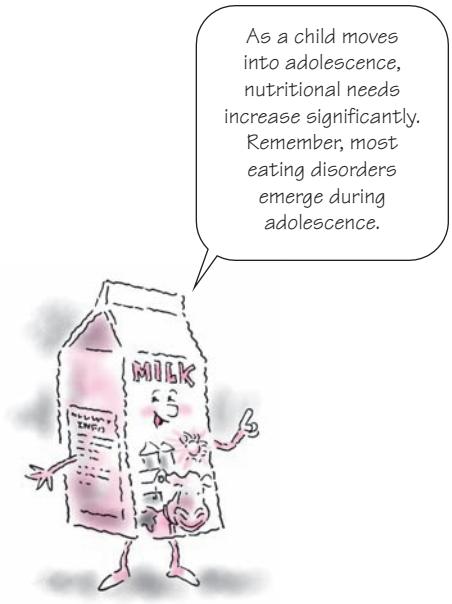
During adolescence, these changes are noted:

- Vital signs approach adult levels.
- Peers influence behavior and values.
- Nutritional needs increase significantly.

Ch..ch..changes

Other milestones in adolescent development include:

- increased ability to engage in abstract thinking and to analyze, synthesize, and use logic
- increased attraction to the opposite sex (or same sex)
- breast development in females (the first sign of puberty; begins at about age 9 with the bud stage)
- the onset of menses in females (between ages 8 and 16; possibly irregular initially)
- testicular enlargement in males (the first sign of puberty).



Pump up on practice questions

1. A parent brings a 19-month-old toddler to the clinic for a well-child checkup. When palpating the toddler's fontanels, the nurse would expect to find:

1. closed anterior fontanel and open posterior fontanel.
2. open anterior fontanel and closed posterior fontanel.
3. closed anterior and posterior fontanels.
4. open anterior and posterior fontanels.

Answer: 3. By age 18 months, the anterior and posterior fontanels should be closed. The diamond-shaped anterior fontanel normally closes between ages 9 and 18 months. The triangular posterior fontanel normally closes between ages 2 and 3 months.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

2. The nurse is instructing a mother about the nutritional needs of her full-term, breast-feeding infant, age 2 months. Which response shows that the mother understands the infant's dietary needs?

1. "We won't start any new foods now."
2. "We'll start the baby on skim milk."
3. "We'll introduce cereal into the diet now."
4. "We should add new fruits to the diet one at a time."

Answer: 1. Because breast milk provides all the nutrients that a full-term infant needs for

the first 6 months, the parents shouldn't introduce new foods into the infant's diet at this point. They shouldn't provide skim milk because it doesn't have sufficient fat for infant growth. The parents also shouldn't provide solid foods, such as cereal and fruit, before age 6 months because the infant's GI tract doesn't tolerate them well.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

3. What's the first sign of sexual maturation that the nurse may observe during care of an adolescent girl?

1. Onset of menstruation
2. Breast development
3. Appearance of pubic hair
4. Appearance of axillary hair

Answer: 2. The first sign of sexual maturation in females is the development of breast buds (elevation of the nipples and areolae). Then sexual development progresses, causing the appearance of pubic hair and axillary hair and the onset of menstruation.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

4. A preschooler is admitted to the hospital the day before scheduled surgery. This is the child's first hospitalization. Which action will best help reduce the child's anxiety about the upcoming surgery?

1. Begin preoperative teaching immediately.
2. Describe preoperative and postoperative procedures in detail.
3. Give the child dolls and medical equipment to play out the experience.
4. Explain that the child will be put to sleep during surgery and won't feel anything.

Answer: 3. By playing with medical equipment and acting out the experience with dolls, the preschooler can begin to reduce anxiety. The nurse should schedule teaching shortly before surgery because preschoolers have little concept of time and because a delay between teaching and surgery may increase anxiety by giving the child time to worry. Detailed explanations are inappropriate for this developmental stage and may promote anxiety. The nurse should avoid such phrases as "put to sleep" because they might have a negative meaning to the child.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

6. The nurse is teaching a mother who plans to discontinue breast-feeding after 3 months. The nurse should advise her to include which food in her infant's diet?

1. Iron-rich formula and baby food
2. Whole milk and baby food
3. Skim milk and baby food
4. Iron-rich formula only

Answer: 4. The American Academy of Pediatrics recommends that infants at age 3 months should receive iron-rich formula and that they shouldn't receive solid food—even baby food—until they're between age 4 and 6 months. The Academy doesn't recommend whole milk until age 12 months or skim milk until after age 2 years.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

7. A mother tells the nurse that her 22-month-old child says "no" to everything. When scolded, the toddler becomes angry and starts crying loudly, but then immediately wants to be held. What is the best interpretation of this behavior?

1. The toddler isn't effectively coping with stress.
2. The toddler's need for affection isn't being met.
3. This is normal behavior for a 2-year-old child.
4. This behavior suggests the need for counseling.

Answer: 3. Because toddlers are confronted with the conflict of achieving autonomy, yet relinquishing the much-enjoyed dependence on the affection of others, their negativism is a necessary assertion of self-control. Therefore, this behavior is a normal part of the child's growth and development. Nothing about the behavior indicates that the child is under stress, isn't receiving sufficient affection, or requires counseling.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

8. Which observation signals the onset of puberty in male adolescents?

1. Appearance of pubic hair
2. Appearance of axillary hair
3. Testicular enlargement
4. Nocturnal emissions

Answer: 3. Testicular enlargement signifies the onset of puberty in the male adolescent. Then sexual development progresses, causing the appearance of pubic hair and axillary hair and the onset of nocturnal emissions.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

9. Which teaching topic should take priority when talking with the parents of a school-age child?

1. Accident prevention
2. Keeping a night light on to allay fears
3. Normalcy of fears about body integrity
4. Encouraging the child to dress without help

Answer: 1. Accidents are the major cause of death and disability during the school-age years. Therefore accident prevention should take priority when teaching parents of school-age children. Preschool children are afraid of the dark, have fears concerning body integrity, and should be encouraged to dress without help (with the exception of tying shoes), but none of these should take priority over accident prevention.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

10. A mother brings her infant to the pediatrician's office for his 2-week-old checkup. The nurse is evaluating whether the mother has understood patient teaching points discussed during a previous visit. Which statement indicates that further teaching is needed?

1. "I don't understand why my baby doesn't look at me."
2. "I know I should keep my baby's nasal passages clear."
3. "I should limit my baby's exposure during bath time."
4. "I should cover my baby's head when he's wet or cold."

Answer: 1. Further teaching is indicated if the mother states that she doesn't understand why her 2-week-old infant doesn't look at her. The infant at this period of development has poor vision, is only able to fixate on light momentarily, and can't distinguish objects. The 2-week-old infant should have his nasal passages kept clear because he's an obligate nose breather; he should have limited exposure at bath time; and he should have his head covered when he's wet or cold.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Analysis

27 Cardiovascular system

In this chapter, you'll review:

- basics of the pediatric cardiovascular system
- tests used to diagnose pediatric cardiovascular disorders
- common pediatric cardiovascular disorders.

Brush up on key concepts

The cardiovascular system consists of the heart and central and peripheral blood vessels. A child's cardiovascular system closely resembles that of an adult. The system's main functions are to pump and circulate blood throughout the body.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on page 568.

Shunt stunt

A child may have congenital heart defects that impair the movement of blood between the heart's chambers. For example, some congenital heart defects cause a **left-to-right shunt,** in which increased pressure on the left side of the heart forces blood back to the right side. This can lead to tissue hypertrophy on the right side and increased blood flow to the lungs.

Open late

The blood vessels surrounding the heart also may suffer congenital defects. Soon after birth, the ductus arteriosus (located between the aorta and the pulmonary artery) normally closes. If it doesn't, the infant may experience **patent ductus arteriosus,** in which blood shunts from the aorta to the pulmonary artery. If a large patent ductus arteriosus remains uncorrected, pressure within the pulmonary arteries may increase dramatically and cause blood to flow from the right side of the heart to the left, eventually leading to heart failure.

Keep abreast of diagnostic tests

Some important tests used to diagnose cardiovascular disorders include cardiac catheterization and echocardiography.

Cardiac cath

With **cardiac catheterization,** a catheter is inserted into an artery or vein (in the arm or leg) and advanced to the heart. This procedure is used to:

- evaluate ventricular function
- evaluate anatomic abnormalities
- measure heart pressures
- measure the blood's oxygen saturation level.

Nursing actions

Before the procedure

- Describe the sensations the child will experience.
- Determine the child's height and weight.
- Check the child's color, pulse rate, blood pressure, and temperature of extremities.
- Locate and mark the child's peripheral pulses.
- Check the child's activity level.
- Prepare the child according to the child's developmental level; for example, doll play and hospital play may help ease anxiety in a preschool-age child.
- Make a security object, such as a teddy bear or toy, available.

After the procedure

- Keep the affected extremity immobile after catheterization to prevent hemorrhage.
- Keep the catheter site clean and dry and monitor for hematoma formation.

Cheat sheet

Pediatric cardiovascular refresher

INCREASED PULMONARY BLOOD FLOW DEFECTS AND OBSTRUCTIONS TO BLOOD FLOW FROM THE VENTRICLES

Key signs and symptoms

- Congested cough
- Diaphoresis
- Fatigue
- Machinelike heart murmur (in patent ductus arteriosus)
- Mild cyanosis (if the condition leads to right-sided heart failure)
- Respiratory distress
- Tachycardia
- Tachypnea

Key test result

- Chest X-ray results, echocardiography, and cardiac catheterization confirm type of heart defect.

Key treatments

- Surgical repair
- Digoxin (Lanoxin)
- Diuretic such as furosemide (Lasix)

Key interventions

- Monitor vital signs, pulse oximetry, and intake and output.
- Monitor cardiovascular and respiratory status.
- Take apical pulse for 1 minute before giving digoxin. (Bradycardia is considered to be a pulse below 100 beats/minute in infants.)
- Monitor fluid status.

DECREASED PULMONARY BLOOD FLOW AND MIXED BLOOD FLOW DEFECTS

Key signs and symptoms

- Clubbing
- Crouching position assumed frequently
- Cyanosis
- History of inadequate feeding
- Irritability
- Tachycardia
- Tachypnea

Key test results

- Arterial blood gas analysis shows diminished arterial oxygen saturation.
- Complete blood count shows polycythemia.

Key treatments

- For transposition of the great vessels or arteries: corrective surgery to redirect blood flow
- For tetralogy of Fallot: complete repair or palliative treatment
- For hypoplastic left-heart syndrome: surgery to restructure the heart or heart transplantation
- For truncus arteriosus: surgery to recreate the pulmonary trunk and repair the ventricular septal defect

Key interventions

- Monitor cardiovascular and respiratory status.
- Monitor vital signs, pulse oximetry, and intake and output.
- Administer prophylactic antibiotics.

RHEUMATIC FEVER

Key signs and symptoms

- Carditis
- Chorea
- Erythema marginatum (temporary, disk-shaped, nonpruritic, reddened macules that fade in the center, leaving raised margins)
- Polyarthritis
- Subcutaneous nodules

Key test results

- Erythrocyte sedimentation rate is increased.
- Electrocardiogram shows prolonged PR interval.

Key treatments

- Bed rest until the sedimentation rate normalizes
- Penicillin to prevent additional damage from future attacks

Key intervention

- Monitor vital signs and intake and output.

• Compare postcatheterization data collection findings to precatheterization baseline data, comparing all four extremities.
• Ensure adequate intake (I.V. and oral) to compensate for blood loss during the procedure, nothing-by-mouth status, and diuretic action of some dyes used.

Heart mapping

Echocardiography is a noninvasive test used to evaluate the size, shape, and motion of cardiac structures by recording the echoes of ultrasonic waves beamed through the chest onto those structures.

Nursing action

• Explain to the child and parents that the child may have to lie on his left side, inhale and exhale slowly, or hold his breath at intervals during the test.

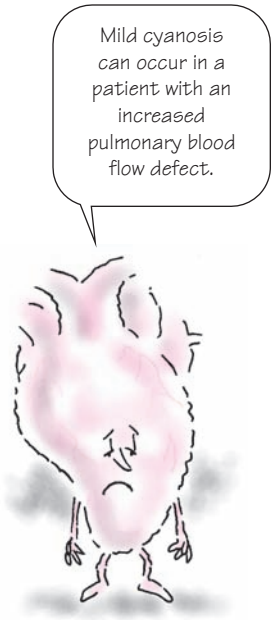
Polish up on patient care

Potential cardiovascular disorders in pediatric patients include congenital heart defects and rheumatic fever. Congenital heart defects are further categorized by how they affect blood flow. Types of congenital heart defects include:
• increased pulmonary blood flow
• obstructions to blood flow from the ventricles
• decreased pulmonary blood flow
• mixed blood flow. (See *From high to low.*)

Increased pulmonary blood flow defects and obstructions to blood flow from the ventricles

With increased pulmonary blood flow defects, blood is usually shunted from the left (oxygenated) side to right (unoxygenated) side of the heart. Specific types include:
• **atrial septal defect**—a defect stemming from a patent foramen ovale or the failure of a septum to develop completely between the atria
• **patent ductus arteriosus**—a defect resulting from the failure of the ductus to close, causing shunting of blood to the pulmonary artery
• **ventricular septal defect**—a defect occurring when the ventricular septum fails to complete its formation between the ventricles, resulting in a left-to-right shunt.

With obstructions to blood flow from the ventricles, blood leaving the ventricles runs into an area of anatomic narrowing, which obstructs blood flow. Types include:
• **aortic stenosis**—a narrowing or fusion of the aortic valves, interfering with left ventricular outflow
• **coarctation of the aorta**—a narrowing of the aortic arch, usually distal to the ductus arteriosus beyond the left subclavian artery
• **pulmonary artery stenosis**—a narrowing or fusing of valve leaflets at the entrance of the pulmonary artery, interfering with right ventricular outflow



From high to low

When cardiac anomalies involve communication—movement of blood through a common opening—between chambers, blood flows from areas of high pressure to areas of low pressure. For example, a left-to-right shunt may result when increased pressure on the left side of the heart causes increased blood flow to the right.

DEFECTS THAT DON'T INVOLVE CHAMBERS

With defects that don't involve the cardiac chambers, blood can also flow from high-pressure to low-pressure areas. In patent ductus arteriosus, for instance, the ductus arteriosus (located between the aorta and pulmonary artery) remains open after birth. This causes blood to shunt from the aorta to the pulmonary artery.

Chest X-ray, echocardiography, and cardiac catheterization distinguish the various heart defects.

CAUSES

- Defects between structures that inhibit blood flow to the system or alter pulmonary resistance
- Defects in the septa that lead to left-to-right shunt

DATA COLLECTION FINDINGS

- Blood pressure lower in legs and higher in arms (with coarctation of the aorta)
- Congested cough
- Diaphoresis
- Fatigue
- Frequent respiratory infections
- Full, bounding pulses (with patent ductus arteriosus)
- Machinelike heart murmur (in patent ductus arteriosus)
- Mild cyanosis (if the condition leads to right-sided heart failure)
- Poor growth and development due to increased energy expenditure for breathing
- Respiratory distress
- Tachycardia
- Tachypnea

DIAGNOSTIC FINDINGS

Chest X-ray results, echocardiography, and cardiac catheterization confirm type of heart defect.

- With **aortic stenosis,** the chest X-ray shows left ventricular hypertrophy and prominent pulmonary vasculature. Cardiac catheterization helps determine the degree of shunting and extent of pulmonary vascular disease.
- With **atrial septal defect,** the chest X-ray shows an enlarged right atrium and ventricle and prominent pulmonary vasculature. Cardiac catheterization shows right atrial blood that's more oxygenated than superior vena cava blood. It also helps determine the degree of shunting and extent of pulmonary vascular disease.
- With **coarctation of the aorta,** the chest X-ray shows left ventricular hypertrophy, wide ascending and descending aorta, and prominent collateral circulation. Cardiac catheterization shows affected collateral circulation and pressures in the right and left ventricles.
- With **patent ductus arteriosus,** the chest X-ray shows prominent pulmonary vasculature and enlargement of the left ventricle and aorta. Cardiac catheterization helps determine the extent of pulmonary vascular disease and shows an oxygen content higher in the pulmonary artery than in the right ventricle.
- With **pulmonary artery stenosis,** the chest X-ray shows right ventricular hypertrophy. Cardiac catheterization provides evidence of the degree of shunting.
- With **ventricular septal defect,** the chest X-ray may be normal for small defects or show cardiomegaly with a large left atrium and ventricle. With a large defect, the chest X-ray may show prominent pulmonary vasculature. Cardiac catheterization helps determine the size and exact location of ventricular septal defect and the degree of shunting.

NURSING DIAGNOSES

- Anxiety
- Decreased cardiac output
- Impaired gas exchange

TREATMENT

- **Aortic stenosis:** surgery (valvulotomy or commissurotomy)
- **Atrial septal defect:** surgery to patch the hole; mild defects may close spontaneously or be corrected by cardiac catheterization using a septal occluder
- **Coarctation of the aorta:** balloon angioplasty, anastomosis, or surgical resection to relieve the constriction of the aorta
- **Patent ductus arteriosus:** ligation of the patent ductus arteriosus in closed-heart operation
- **Pulmonary artery stenosis:** open-heart surgery to separate the pulmonary valve leaflets or balloon angioplasty to dilate the valve
- **Ventricular septal defect:** pulmonary artery banding to prevent heart failure and permanent correction with a patch later when heart is larger (spontaneous closure of the ventricular septal defect may occur in some children by age 3)

Drug therapy

- Cardiac glycoside: digoxin (Lanoxin)
- Diuretic: furosemide (Lasix)

• Indomethacin (Indocin) to achieve pharmacologic closure (in patent ductus arteriosus)
• Prophylactic antibiotics to prevent endocarditis

INTERVENTIONS AND RATIONALES

• Monitor vital signs, pulse oximetry, and intake and output *to evaluate renal function and detect changes.*
• Monitor cardiovascular and respiratory status *to detect early signs of decompensation.*
• Take apical pulse for 1 minute before giving digoxin and hold the drug if the heart rate is below 100 beats/minute (bradycardia in infants is a heart rate below 100 beats/minute) *to prevent toxicity.*
• Monitor fluid status, enforcing fluid restrictions as appropriate *to prevent fluid overload.*
• Weigh the child daily *to determine fluid overload or deficit.*
• Organize physical care and anticipate the child's needs *to reduce the child's oxygen demands.*
• Give the child high-calorie, easy-to-chew, and easy-to-digest foods *to maintain adequate nutrition and decrease oxygen demands.*
• Maintain normal body temperature *to prevent cold stress.*
• Raise the head of the bed or place the infant in an infant car seat *to ease breathing.*

Teaching topics

• Preparing the child and parents for the sights and sounds of the intensive care unit

Decreased pulmonary blood flow and mixed blood flow defects

Decreased pulmonary blood flow and mixed blood flow defects result in either unoxygenated blood or a mixture of oxygenated and unoxygenated blood being shunted through the cardiovascular system. This shunting can lead to left-sided heart failure, decreased oxygen supply to the body, and the development of collateral circulation.

An example of a decreased blood flow defect is tetralogy of Fallot, which consists of pulmonary artery stenosis, ventricular septal defect, hypertrophy of the right ventricle, and an overriding aorta.

Mixed blood flow defects include:
• **transposition of the great vessels or arteries**—a defect in which the aorta arises from the right ventricle and the pulmonary artery arises from the left ventricle
• **hypoplastic left-heart syndrome**—a defect consisting of aortic valve atresia, mitral atresia or stenosis, diminutive or absent left ventricle, and severe hypoplasia of the ascending aorta and aortic arch
• **truncus arteriosus**—a defect in which there's incomplete division of the common great vessel.

CAUSES

• Any condition that increases pulmonary vascular resistance
• Structural defects

DATA COLLECTION FINDINGS

• Clubbing
• Crouching position assumed frequently
• Cyanosis
• History of inadequate feeding
• Increasing cyanosis as the foramen ovale or ductus arteriosus closes (in transposition of the great vessels), leading to loss of consciousness, also known as a tet spell (in tetralogy of Fallot)
• Increasing dyspnea, cyanosis, and tachypnea during the first few days after birth; without treatment, heart failure after closure of the ductus (in hypoplastic left-heart syndrome)
• Irritability
• Tachycardia
• Tachypnea

DIAGNOSTIC FINDINGS

• Arterial blood gas analysis shows diminished arterial oxygen saturation.
• Cardiac catheterization results confirm the diagnosis through visualization of defects and measurement of oxygen saturation level.
• Complete blood count (CBC) shows polycythemia. (Hypoxia stimulates the body to increase red blood cell [RBC] production.)

NURSING DIAGNOSES

• Impaired gas exchange

To prevent toxicity, remember to take an apical pulse for 1 minute before giving digoxin. You're checking for bradycardia, which in infants is a rate below 100 beats/minute.

Memory jogger

When a child has a cyanotic heart defect, check for the **four Cs:**

Cyanosis, especially increasing with crying

Crabbiness or irritability

Clubbing of digits

Crouching, or squatting, which increases systemic venous return, shunts blood from the extremities to the head and trunk, and decreases cyanosis.

Infants with decreased pulmonary blood flow defects have less energy for sucking; use a preemie nipple.

- Anxiety
- Decreased cardiac output

TREATMENT

For transposition of the great vessels or arteries, several therapies are possible, including:

- corrective surgery to redirect blood flow by switching the position of the major blood vessels; performed around age 1
- palliative surgery to provide communication between the chambers.

For tetralogy of Fallot, the doctor can use:

- complete repair or palliative treatment during the 1st year to increase blood flow to the lungs by bypassing pulmonic stenosis (Blalock-Taussig anastomosis of the right pulmonary artery to the right subclavian artery)
- oxygen therapy
- repair of ventricular septal defect and stenosis (may be done in stages).

For hypoplastic left-heart syndrome, the doctor may perform:

- heart transplant
- Norwood procedure, a two-stage procedure that involves restructuring the heart followed by a procedure to provide blood flow to the lungs, and the bidirectional Glenn shunt or modified Fontan procedure.

For truncus arteriosis, several options include:

- medical management of heart failure
- surgical recreation of the pulmonary trunk
- corrective surgery to repair ventricular septal defect.

Drug therapy

- Morphine during tet spell
- Prophylactic propranolol (Inderal)
- Prostaglandin E to keep the ductus arteriosus patent

INTERVENTIONS AND RATIONALES

- Monitor cardiovascular and respiratory status *to detect early signs of compromise.*
- Monitor vital signs and pulse oximetry *to detect hypoxia*
- Monitor intake and output *to evaluate renal status.*
- Provide oxygen when necessary *to compensate for impaired oxygen exchange.*
- Anticipate needs and prevent distress *to decrease oxygen demands on the child.*
- Use a preemie nipple *to decrease the energy needed for sucking.*
- Provide adequate hydration *to prevent sequelae of polycythemia.*
- Administer prophylactic antibiotics *to prevent endocarditis.*
- Administer morphine during tet spells *to decrease associated infundibular spasm.*
- Provide thorough skin care *to prevent skin breakdown.*
- Prepare the child and parents for cardiac catheterization *to decrease anxiety.*

Teaching topics

- Preparing the child and parents for the sights and sounds of the intensive care unit
- Explaining the difference between palliative and corrective procedures

In rheumatic fever, antibodies manufactured to combat streptococci react and produce lesions at specific tissue sites, especially in the heart and joints.

Rheumatic fever

Rheumatic fever is an inflammatory disease of childhood. It first occurs 1 to 6 weeks after a group A beta-hemolytic streptococcal infection and may recur. Rheumatic fever results in antigen-antibody complexes that ultimately destroy heart tissue.

Rheumatic heart disease refers to the cardiac effects of rheumatic fever and includes pancarditis (inflammation of the heart muscle, heart lining, and sac around the heart) during the early acute phase and chronic heart valve disease later.

CAUSES

- Production of antibodies against group A beta-hemolytic *Streptococcus*
- Untreated group A beta-hemolytic *Streptococcus* infection (1% to 5% of children infected with *Streptococcus* develop rheumatic fever.)

DATA COLLECTION FINDINGS

The Jones criteria for determining major rheumatic fever include:

- carditis
- chorea
- erythema marginatum (temporary, disk-shaped, nonpruritic, reddened macules that fade in the center, leaving raised margins)
- polyarthritis

• subcutaneous nodules.

The Jones criteria for determining minor rheumatic fever include:
• arthralgia
• evidence of a *Streptococcus* infection
• fever
• history of rheumatic fever.

DIAGNOSTIC FINDINGS
• Antistreptolysin-O titer is elevated.
• Erythrocyte sedimentation rate is increased.
• Electrocardiogram shows prolonged PR interval.

NURSING DIAGNOSES
• Decreased cardiac output
• Impaired gas exchange
• Imbalanced nutrition: Less than body requirements

TREATMENT
• Bed rest during fever and until the sedimentation rate returns to normal

Drug therapy
• Aspirin for arthritis pain
• Penicillin to prevent additional damage from future attacks (taken until age 21 or for 5 years after the attack, whichever is longer)
• Steroids for severe carditis

INTERVENTIONS AND RATIONALES
• Monitor vital signs and intake and output *to detect fluid volume overload or deficit.*
• Institute safety measures for chorea; maintain a calm environment, reduce stimulation, avoid the use of forks or glass, and assist in walking *to prevent injury.*

• Provide appropriate passive stimulation *to maintain growth and development.*
• Provide emotional support for long-term convalescence *to help relieve anxiety.*
• Use sterile technique in dressing changes and standard precautions *to prevent reinfection.*

Teaching topics
• Understanding the need to inform health care providers of existing medical conditions
• Recognizing the signs and symptoms of aspirin toxicity (tinnitus, bruising, bleeding gums)

Pump up on practice questions

1. A pediatric client returns to his room after a cardiac catheterization. Which nursing intervention is most appropriate?

1. Maintain the client on bed rest with no further activity restrictions.
2. Maintain the client on bed rest with the affected extremity immobilized.
3. Allow the client to get out of bed to go to the bathroom, if necessary.
4. Allow the client to sit in a chair with the affected extremity immobilized.

Answer: 2. The pediatric client should be maintained on bed rest with the affected extremity immobilized after cardiac catheterization to prevent hemorrhage. Allowing the client to move the affected extremity while on bed rest, allowing the client bathroom privileges, or allowing the client to sit in a chair with the affected extremity immobilized places the client at risk for hemorrhage.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

2. A pediatric client is scheduled for echocardiography. The nurse is providing teaching to the client's mother. Which statement about echocardiography indicates the need for further teaching?

1. "I'm glad my child won't have an I.V. catheter inserted for this procedure."
2. "I'm glad my child won't need to have dye injected into him before the procedure."
3. "How am I ever going to explain to my son that he can't have anything to eat before the test?"
4. "I know my child may need to lie on his left side and breathe in and out slowly during the procedure."

Answer: 3. Echocardiography is a noninvasive procedure used to evaluate the size, shape, and motion of various cardiac structures. Therefore, it isn't necessary for the client to have nothing by mouth, have an I.V. catheter inserted, or dye injected, as would be the case with a cardiac catheterization. The child may need to lie on his left side and inhale and exhale slowly during the procedure.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

3. An infant with a ventricular septal defect is receiving digoxin (Lanoxin). Which intervention by the nurse is most appropriate before digoxin administration?

1. Take the infant's blood pressure.
2. Check the infant's respiratory rate for 1 minute.
3. Check the infant's radial pulse for 1 minute.
4. Check the infant's apical pulse for 1 minute.

Answer: 4. Before administering digoxin, the nurse should check the infant's apical pulse for 1 minute. Checking the blood pressure and respiratory rate isn't necessary before digoxin administration because the medication doesn't affect these parameters. Checking the radial pulse may be inaccurate.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Knowledge

4. The nurse checks an infant's apical pulse before digoxin administration and finds that the pulse rate is 90 beats/minute. Which action is most appropriate for the nurse?

1. Withhold the digoxin, and notify the physician.
2. Administer the digoxin, and notify the physician.
3. Administer the digoxin, and document the infant's pulse rate.
4. Withhold the digoxin, and document the infant's pulse rate.

Answer: 1. The nurse should withhold the digoxin and notify the physician because an apical pulse below 100 beats/minute in an infant is considered bradycardic. The nurse should also document her findings and interventions in the medical record. Administering the drug to the infant already bradycardic could further decrease his heart rate and compromise his status. Withholding the drug and not notifying the physician could compromise the existing treatment plan.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

5. A pediatric client has been diagnosed with rheumatic fever. Which statement by the mother indicates an effective understanding of rheumatic fever?

1. "I should avoid giving my child aspirin for the arthritic pain."
2. "It's very upsetting that my child must take penicillin until he's 21 years old."
3. "I need to wear a gown, gloves, and mask to stay in my child's room."
4. "I don't know how I'll be able to keep my child away from his sister when he gets home."

Answer: 2. Rheumatic fever is an acquired autoimmune-complex disorder that occurs 1 to 3 weeks after an infection of group A beta-hemolytic streptococci, in many cases as a result of strep throat that hasn't been treated with antibiotics. To prevent additional heart damage from future attacks, the child must take penicillin or another antibiotic until the age of 21 or for 5 years after the attack, whichever is longer. Rheumatic fever isn't contagious, so isolation precautions aren't necessary.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

6. The nurse is caring for a pediatric client with a decreased pulmonary blood flow heart defect. Which sign would the nurse expect to observe?

1. Cyanosis, hypertension, clubbing, and lethargy
2. Cyanosis, hypotension, crouching, and lethargy
3. Cyanosis, crabbiness, clubbing, and crouching
4. Cyanosis, confusion, clonus, and crouching

Answer: 3. The pediatric client with a decreased pulmonary blood flow heart defect has cyanosis along with crabbiness (irritability), clubbing of the digits, and crouching or squatting. The client with a decreased pulmonary blood flow defect doesn't typically have hypertension, lethargy, confusion, or clonus.

Client needs category: Physiological integrity

Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

7. The nurse is caring for an infant with tetralogy of Fallot. Which drug should the nurse anticipate administering during a tet spell?

1. Propranolol (Inderal)
2. Morphine
3. Meperidine (Demerol)
4. Furosemide (Lasix)

Answer: 2. The nurse should anticipate administering morphine during a tet spell to decrease the associated infundibular spasm. Propranolol may be administered as a preventive measure in an infant with tetralogy of Fallot but isn't administered during a tet spell. Furosemide and meperidine aren't appropriate agents for an infant experiencing a tet spell.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Kowledge

8. An infant is diagnosed with patent ductus arteriosus. Which drug may be administered in hopes of achieving pharmacologic closure of the defect?

1. Digoxin (Lanoxin)
2. Prednisone
3. Furosemide (Lasix)
4. Indomethacin (Indocin)

Answer: 4. Indomethacin is administered to an infant with patent ductus arteriosus in hopes of closing the defect. Digoxin and furosemide may be used to treat the symptoms associated with patent ductus arteriosus but they don't achieve closure. Prednisone isn't used to treat the condition.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Comprehension

9. An infant, age 2 months, has a tentative diagnosis of congenital heart defect. The nurse notes that the infant has a pulse rate of 168 beats/minute and respiratory rate of 72 breaths/minute. In which position should the nurse place the infant?

1. Upright in an infant seat
2. Lying on the back
3. Lying on the abdomen
4. Sitting in high Fowler's position

Answer: 1. Because these signs suggest development of respiratory distress, the nurse should position the infant with the head elevated at a 45-degree angle to promote maximum chest expansion. This can be accomplished by placing the infant in an infant seat. Placing an infant flat on the back or abdomen or in high Fowler's position could increase respiratory distress by preventing maximum chest expansion.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

10. An infant client with a decreased pulmonary blood flow or mixed blood flow heart defect has blood drawn for a CBC, revealing an elevated RBC count. Which condition do these findings indicate?

1. Anemia
2. Dehydration
3. Jaundice
4. Hypoxia compensation

Answer: 4. A decreased pulmonary blood flow or mixed blood flow heart defect alters blood flow through the heart and lungs, which produces hypoxia. To compensate for this, the body increases the oxygen-carrying capacity by increasing RBC production, which causes the hemoglobin (Hb) level and hematocrit (HCT) to increase. The Hb level and HCT typically are decreased in anemia. Altered electrolyte levels and other laboratory values provide better evidence of dehydration. An elevated Hb level and HCT aren't associated with jaundice.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

28 Respiratory system

In this chapter, you'll review:

- parts of the respiratory system and their functions
- differences between the pediatric respiratory system and the adult system
- tests used to diagnose respiratory disorders
- common respiratory disorders.

Brush up on key concepts

The primary function of the respiratory system is to distribute air to the alveoli in the lungs, where gas exchange takes place. Gas exchange includes:

- the addition of oxygen to pulmonary capillary blood
- the removal of carbon dioxide from pulmonary capillary blood.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 578 and 579.

Upper and lower

The parts of the respiratory system include the **upper airway** and the **lower airway.** The upper airway includes:

- nasopharynx
- oropharynx
- larynx.

The lower airway includes:

- trachea
- bronchi
- bronchioles
- alveoli.

Take a deep breath

Breathing delivers inspired gas to the lower respiratory tract and alveoli. Contraction and relaxation of the respiratory muscles move air into and out of the lungs. Here are some important aspects of the breathing process:

- **Ventilation** begins with the contraction of the inspiratory muscles: The diaphragm (the major muscle of respiration) descends while the external intercostal muscles move the rib cage upward and outward.
- Air then enters the lungs in response to the pressure gradient between the atmosphere and the lungs.
- The lungs adhere to the chest wall and diaphragm because of the vacuum created by negative pleural pressure.
- As the thorax expands, the lungs also expand, causing a decrease in pressure in the lungs.
- The accessory muscles of inspiration, which include the scalene and sternocleidomastoid muscles, raise the clavicles, upper ribs, and sternum.
- To reach the capillary lumen, oxygen diffuses from the alveoli across the alveolocapillary membrane into the blood.
- Normal expiration is passive; the inspiratory muscles cease to contract, and the elastic recoil of the lungs causes the lungs to contract.
- These actions increase the pressure in the lungs above atmospheric pressure, moving air from the lungs to the atmosphere.

Air system under construction

A **child's respiratory tract** differs anatomically from an adult's in ways that predispose the child to many respiratory problems:

- Lungs aren't fully developed at birth.
- Alveoli continue to grow and increase in size through age 8.
- Until age 5, a child's respiratory tract has a narrower lumen than an adult's; the narrow airway makes the young child prone to airway obstruction and respiratory distress from inflammation, mucus secretion, or a foreign body.
- Elastic connective tissue becomes more abundant with age in the peripheral part of the lung.
- A child's respiratory rate decreases as body size increases.

Cheat sheet

Pediatric respiratory refresher

ASTHMA

Key signs and symptoms

- Diaphoresis
- Dyspnea
- Prolonged expiration with an expiratory wheeze; in severe distress, inspiratory wheeze
- Unequal or decreased breath sounds
- Use of accessory muscles

Key test results

- Oxygen saturation via pulse oximetry may show decreased oxygen saturation.
- Arterial blood gas measurement may show increased partial pressure of arterial carbon dioxide from respiratory acidosis.

Key treatments

- Bronchodilator: albuterol (Proventil)
- Chromone derivative: cromolyn (Intal)

Key interventions

- Monitor respiratory and cardiovascular status.
- Monitor vital signs.

During an acute attack

- Allow the child to sit upright to ease breathing; provide moist oxygen, if necessary.
- Monitor for alterations in vital signs (especially cardiac stimulation and hypotension).

BRONCHIOLITIS

Key signs and symptoms

- Sternal retractions
- Tachypnea

Key test result

- Bronchial mucus culture shows respiratory syncytial virus.

Key treatments

- Humidified oxygen
- I.V. fluids

Key interventions

- Monitor vital signs and pulse oximetry.
- Monitor respiratory and cardiovascular status.
- Administer humidified oxygen therapy.

BRONCHOPULMONARY DYSPLASIA

Key signs and symptoms

- Crackles, rhonchi, wheezes
- Dyspnea
- Sternal retractions

Key test result

- Chest X-ray reveals pulmonary changes (bronchiolar metaplasia and interstitial fibrosis).

Key treatments

- Chest physiotherapy
- Continued ventilatory support and oxygen
- Bronchodilators such as albuterol (Proventil)

Key interventions

- Monitor respiratory and cardiovascular status.
- Monitor vital signs, pulse oximetry, and intake and output.

CROUP

Key signs and symptoms

- A barking, brassy cough or hoarseness
- Inspiratory stridor with varying degrees of respiratory distress

Key test results

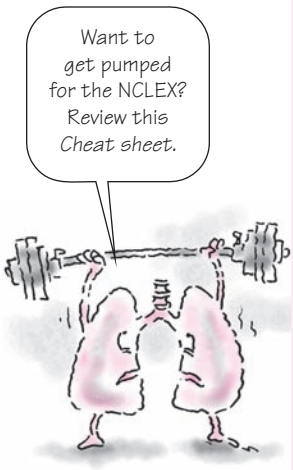
- Laryngoscopy may reveal inflammation and obstruction in epiglottis and laryngeal areas.
- Neck X-ray shows areas of upper airway narrowing and edema in subglottic folds.

Key treatments

- Cool humidification during sleep with a cool mist tent or room humidifier
- Inhaled racemic epinephrine and corticosteroids such as methylprednisolone sodium succinate
- Tracheostomy, oxygen administration

Key interventions

- Monitor vital signs and pulse oximetry.
- Administer oxygen therapy and maintain the child in a cool mist tent, if needed.
- Allow the parent to hold the child.



Pediatric respiratory refresher *(continued)*

CYSTIC FIBROSIS

Key signs and symptoms

- History of a chronic, productive cough and recurrent respiratory infections, often due to *Pseudomonas* infections
- Parents' report of a salty taste on the child's skin

Key test result

- Sweat test using pilocarpine iontophoresis is positive.

Key treatment

- Chest physiotherapy
- Oral pancreatic enzyme replacement

Key interventions

- Monitor respiratory and cardiovascular status.
- Administer pancreatic enzymes with meals and snacks.
- Encourage breathing exercises and perform chest physiotherapy two to four times a day.

EPIGLOTTITIS

Key signs and symptoms

- Difficult and painful swallowing
- Increased drooling
- Restlessness
- Stridor

Key test result

- Lateral neck X-ray shows enlarged epiglottis.

Key treatments

- Emergency endotracheal intubation or a tracheotomy
- Oxygen therapy or cool mist tent
- 10-day course of parenteral antibiotics

Key interventions

- Monitor vital signs and pulse oximetry.
- Monitor respiratory and cardiovascular status.
- Defer inspecting the throat until the arrival of emergency personnel and supplies.

SUDDEN INFANT DEATH SYNDROME (SIDS)

Key sign and symptom

- Death takes place during sleep without noise or struggle

Key test result

- Autopsy is the only way to diagnose SIDS.

Key treatment

- Emotional and other support for the parents

Key interventions

- Let parents touch, hold, and rock the infant.
- Reinforce the fact that the death wasn't the parents' fault.

Keep abreast of diagnostic tests

Here are some important tests used to diagnose respiratory disorders, along with common nursing interventions associated with each test.

Check the gas

Arterial blood gas (ABG) analysis is used to assess the arterial blood for tissue oxygenation, ventilation, and acid-base status.

Nursing actions

- Explain the procedure to the parents and child.
- After the sample is obtained, apply firm pressure to the arterial site for 5 to 10 minutes.
- Keep the sample on ice and transport it immediately to the laboratory.
- Monitor the puncture site for bleeding or hematoma formation.

Great expectorations

A sputum study is a laboratory test that provides a microscopic evaluation of sputum, evaluating it for culture and sensitivity, Gram stain, and acid-fast bacillus.

Nursing actions

- Obtain a specimen first thing in the morning by suctioning or expectoration
- Before sending the specimen to the laboratory, make sure the specimen contains sputum, not saliva.

Oxygen observation

Pulse oximetry is a painless alternative to ABG analysis for measuring oxygen saturation only. This test may be less effective in jaundiced children or those with dark skin.

Nursing actions

- Place the oximeter on a site with adequate circulation such as the finger, toe, or nose.
- Periodically rotate sites to prevent skin breakdown.
- Before performing oximetry, ensure that pulse readings from the site used correlate with the child's heart rate.

Lung function

Pulmonary function tests are used to measure lung volume, flow rates, and compliance. Pulmonary function test results may not be accurate if the young child has trouble following directions.

Nursing actions

- Explain the procedure to the child and his parents.
- Instruct the child and his parents that he should have only a light meal before the test.
- If appropriate, tell the parents that the child shouldn't be around second-hand smoke for 4 to 6 hours before the tests.
- Tell the parents to withhold bronchodilators and intermittent positive-pressure breathing therapy.
- Just before the test, tell the child to void and loosen tight clothing.

Chest check

Chest X-rays show conditions such as atelectasis, pleural effusion, infiltrates, pneumothorax, lesions, mediastinal shifts, and pulmonary edema.

Nursing actions

- Ensure adequate protection by covering the child's gonads and thyroid gland with a lead apron.

Gasp! Asthma typically causes prolonged expiration with an expiratory wheeze. During severe distress, you may also hear an inspiratory wheeze.

Polish up on patient care

Major respiratory disorders in pediatric patients include asthma, bronchiolitis, bronchopulmonary dysplasia, croup, cystic fibrosis, epiglottitis, and sudden infant death syndrome.

For information about special respiratory treatments for pediatric patients, see *Respiratory assistance for children.*

Asthma

Asthma is a reversible, diffuse, obstructive pulmonary disease that produces these effects:

- inflammation of the mucous membranes
- smooth muscle bronchospasm
- increased mucus secretion leading to airway obstruction and air trapping.

CAUSE

- Hyperresponsiveness of the lower airway (may be idiopathic or intrinsic, or caused by a hyperresponsive reaction to an allergen, exercise, or environmental change)

DATA COLLECTION FINDINGS

- Alteration in chest contour from chronic air trapping
- Altered cerebral function
- Chronic cough
- Diaphoresis during prolonged episodes of respiratory distress
- Dyspnea
- Exercise intolerance
- Fatigue and apprehension
- Prolonged expiration with an expiratory wheeze; in severe distress, may hear an inspiratory wheeze
- Unequal or decreased breath sounds
- Use of accessory muscles

DIAGNOSTIC FINDINGS

- Oxygen saturation via pulse oximetry may show decreased oxygen saturation.
- ABG measurement may show increased partial pressure of arterial carbon dioxide from respiratory acidosis.
- Pulmonary function tests show a reduced peak expiratory flow rate.
- Skin test identifies the source of the allergy.
- Sputum analysis rules out respiratory infection.

Respiratory assistance for children

The oxygen tent, the cool mist tent, the nasal cannula, and chest physiotherapy are specialized treatments used in pediatric respiratory disorders. Here are the nursing actions associated with each treatment.

OXYGEN TENT

- Keep the plastic sides down and tucked in; because oxygen is heavier than air, oxygen loss is greater at the bottom of the tent.
- Keep the plastic away from the child's face.
- Prevent the use of toys that produce sparks or friction.
- Frequently assess oxygen concentration.
- To return the child to a tent, put the tent sides down, turn on the oxygen, wait until the oxygen is at the prescribed concentration, and then place the child in the tent.

COOL MIST TENT (CROUP TENT)

- Explain that the cool mist thins mucus, facilitating expectoration.
- Provide the same care as with an oxygen tent.
- Expect the child to be fearful if the mist obscures vision.
- Encourage the use of transitional objects in the tent, except for stuffed toys, which may become damp and promote bacterial growth.
- Keep the child dry by changing bed linens and pajamas frequently.
- Maintain a steady body temperature.
- Teach the parents about cool mist vaporizers for home use; tell them to clean the vaporizers frequently to prevent germs from being sprayed into the air.

NASAL CANNULA

- Remove nasal secretions from the end of tubing frequently.
- Administer saline nose drops or nasal spray to moisten passages.
- Change tubing every 8 hours to prevent infection or necrosis.

CHEST PHYSIOTHERAPY

- Perform at least 30 minutes before meals.
- Use a cupped hand over a covered rib cage for 2 to 5 minutes on the five major positions (upper anterior lobes, upper posterior lobes, lower posterior lobes, and right and left sides) for a maximum of 30 minutes; for infants, preformed rubber percussors are available.
- Avoid these measures during acute bronchoconstriction (such as with asthma) or airway edema (such as with croup) to prevent mucus plugs from loosening and causing airway obstruction.
- Administer aerosol-nebulized medications immediately before percussion and postural drainage.

NURSING DIAGNOSES

- Anxiety
- Impaired gas exchange
- Ineffective airway clearance

TREATMENT

- Chest physiotherapy (once edema has abated)
- Hyposensitization through the use of allergy shots, if appropriate
- Parenteral fluids to thin mucus secretions.
- Oxygen therapy, as tolerated

Drug therapy

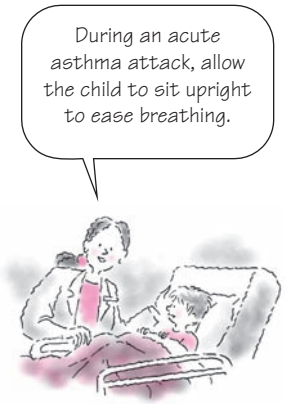
- Bronchodilator: albuterol (Proventil)
- Chromone derivative: cromolyn (Intal) to prevent the release of mast cell products after an antigen-antibody union has taken place
- Inhaled corticosteroids to decrease edema of the mucous membranes (for chronic asthma, daily doses to control chronic inflammation)

INTERVENTIONS AND RATIONALES

- Monitor respiratory and cardiovascular status. *Tachycardia, tachypnea, and quiet breath sounds signal worsening respiratory status.*
- Monitor vital signs *to detect changes and prevent complications.*
- Evaluate the nature of the child's cough (hacking, unproductive progressing to productive), especially at night in the absence of infection. *Early detection and treatment lessens respiratory distress.*
- Modify the environment to avoid an allergic reaction; remove the offending allergen. *Allergens can trigger an asthma attack.*
- Rinse the child's mouth after he inhales medication *to promote comfort and prevent irritation to the oral mucosa.*
- For exercise-induced asthma, give prophylactic treatments of cromolyn or beta-adrenergic blockers 10 to 15 minutes before the child exercises. *Premedication may prevent an asthma attack.* (See *Living with asthma,* page 582.)

Living with asthma

Encourage the parents of a child with asthma to help the child lead as normal a life as possible. Stress the importance of not restricting activities. Encourage participation in exercise and sports. Explain that aerobic activities, such as swimming, running, and brisk walking actually increase the efficiency of the body's use of oxygen. Prophylactic use of medication typically allows participation in almost any activity, even those that typically precipitate an attack.



• Forbid smoking in the child's environment. *Second-hand smoke can trigger an asthma attack.*

During an acute attack

• Allow the child to sit upright *to ease breathing;* provide moist oxygen, if necessary. *This position promotes chest expansion; moist oxygen promotes mobilization of secretions.*

• Monitor for alterations in vital signs (especially cardiac stimulation and hypotension) *to detect signs of impending respiratory arrest and cardiac decompensation.*

• Monitor urine for glucose if the child is receiving corticosteroids *to detect early signs of hyperglycemia.*

• Administer inhaled medications via a metered-dose inhaler and monitor peak flow rates. *Peak flow rates indicate the degree of lung impairment.*

• Maintain a calm environment; provide emotional support and reassurance *to decrease anxiety and decrease oxygen demands.*

• Monitor effectiveness of drug therapy. *Failure to respond to drugs during an acute attack can result in status asthmaticus.*

Teaching topics

• Breathing exercises to increase ventilatory capacity
• Properly using inhalers
• Avoiding allergens
• Identifying triggers
• Maintaining follow-up care

Bronchiolitis

Bronchiolitis is a lower respiratory infection that's spread by contact with respiratory secretions. It typically affects children younger than age 2 years during the winter and spring months. Mortality from bronchiolitis in this age-group is 1% to 6%.

CAUSE

• Respiratory syncytial virus

DATA COLLECTION FINDINGS

• Anorexia
• Crackles
• Fever
• Possible air trapping and atelectasis
• Sternal retractions
• Tachypnea
• Thick mucus
• Wheezing

DIAGNOSTIC FINDING

• Bronchial mucus culture may show respiratory syncytial virus.

NURSING DIAGNOSES

• Impaired gas exchange
• Ineffective airway clearance
• Ineffective breathing pattern

TREATMENT

• Cool mist tent
• Humidified oxygen
• I.V. fluids

Drug therapy

• Bronchodilator: albuterol (Proventil)
• Respiratory syncytial virus immune globulin, administered I.V. if indicated
• Antiviral: ribavarin (Virazole)

INTERVENTIONS AND RATIONALES

• Monitor vital signs and pulse oximetry *to determine oxygenation needs and to detect deterioration or improvement in the child's condition.*

• Monitor respiratory and cardiovascular status. *Tachycardia may result from hypoxia or effects of bronchodilator use.*

• Use gloves, gowns, and aseptic hand washing as secretion precautions *to prevent spread of infection.*

• Administer chest physiotherapy after airway edema has abated. *Chest physiotherapy helps loosen mucus that may be blocking small airways.*

• Administer humidified oxygen therapy *to liquefy secretions and reduce bronchial edema.*

• Maintain I.V. therapy *to promote hydration and replace electrolytes.*

Teaching topics

• Reviewing medications, dosages, and adverse reactions
• Providing adequate nutrition and hydration
• Knowing the importance of a humidified environment

• Avoiding people with cold symptoms
• Preventing spread of infection

Bronchopulmonary dysplasia

Bronchopulmonary dysplasia is a chronic lung disease that begins in infancy. It occurs in newborns who require ventilatory support with high positive airway pressure and oxygen in the first 2 weeks of life. Infants at risk may be born prematurely or may have a respiratory disorder.

In this disorder, an acute insult to the neonate's lungs, such as respiratory distress syndrome, pneumonia, or meconium aspiration, requires positive-pressure ventilation and a high concentration of oxygen over time. These therapies result in tissue and cellular injury to the immature lung that may cause permanent damage.

CONTRIBUTING FACTORS

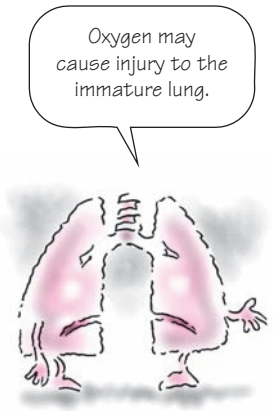
• Damage to the bronchiolar epithelium (from hyperoxia and positive pressure)
• Difficulty clearing mucus from the lungs
• Illness such as respiratory distress syndrome, pneumonia, or meconium aspiration
• Oxygen toxicity from administration of high concentration of oxygen and long-term assisted ventilation
• Possibly genetic factors
• Prematurity

DATA COLLECTION FINDINGS

• Crackles, rhonchi, wheezes
• Delayed development
• Dyspnea
• Hepatomegaly (if right-sided heart failure)
• Hypoxia without ventilator assistance
• Jugular vein distention
• Fatigue, delayed muscle growth
• Pallor, circumoral cyanosis
• Peripheral edema (if right-sided heart failure)
• Prolonged capillary filling time
• Respiratory distress
• Sternal retractions
• Weight loss or difficulty feeding

DIAGNOSTIC FINDINGS

• ABG analysis reveals hypoxemia.
• Chest X-ray reveals pulmonary changes (bronchiolar metaplasia and interstitial fibrosis) may also reveal atelectasis.



NURSING DIAGNOSES

• Delayed growth and development
• Imbalanced nutrition: Less than body requirements
• Impaired gas exchange

TREATMENT

• Chest physiotherapy
• Continued ventilatory support and oxygen
• Enteral or total parenteral nutrition
• Supportive measures to enhance respiratory function

Drug therapy

• Bronchodilators: albuterol (Proventil) to counter increased airway resistance
• Dexamethasone (Decadron) therapy to reduce inflammation
• Diuretics: furosemide (Lasix)

INTERVENTIONS AND RATIONALES

• Monitor respiratory and cardiovascular status. *Monitoring is essential because children with bronchopulmonary dysplasia are susceptible to lower respiratory tract infections, hypertension, and respiratory failure.*
• Monitor vital signs, pulse oximetry, and intake and output *to evaluate and maintain adequate hydration, which is necessary to liquefy secretions and to detect early signs of respiratory compromise.*
• Provide adequate time for rest *to decrease oxygen demands.*
• Provide chest physiotherapy *to mobilize secretions that interfere with oxygenation.*
• Administer medications, as ordered, *to improve pulmonary function and oxygenation.*
• Provide a quiet environment. *Unnecessary noise or activity may increase the child's anxiety and cause respiratory distress.*

Teaching topics

• Visiting and becoming involved in the child's care, especially if child requires lengthy hospitalization
• Recognizing signs of respiratory infection and knowing the importance of seeking prompt medical attention

Croup

Croup is a group of related upper airway respiratory conditions that commonly affect toddlers. It includes acute spasmodic laryngitis, acute obstructive laryngitis, and acute laryngotracheobronchitis.

CAUSES

- Virus (most cases)
- Bacteria

DATA COLLECTION FINDINGS

- Barking, brassy cough or hoarseness, sometimes described as a "seal bark" cough
- Condition usually begins at night and during cold weather and frequently recurs
- Crackles and decreased breath sounds (indicate condition has progressed to bronchi)
- Increased dyspnea and lower accessory muscle use
- Inspiratory stridor with varying degrees of respiratory distress
- Onset may be sudden or gradual

DIAGNOSTIC FINDINGS

- If bacterial infection is the cause, throat cultures may identify the organisms and their sensitivity to antibiotics as well as rule out diphtheria.
- Laryngoscopy may reveal inflammation and obstruction in epiglottal and laryngeal areas.
- Neck X-ray shows areas of upper airway narrowing and edema in subglottic folds and rules out the possibility of foreign body obstruction as well as masses and cysts.
- Pulse oximetry may reveal hypoxia.

NURSING DIAGNOSES

- Anxiety
- Ineffective breathing pattern
- Risk for deficient fluid volume

TREATMENT

- Clear liquid diet to keep mucus thin
- Cool humidification during sleep with a cool mist tent or room humidifier
- Rest from activity
- Tracheostomy, oxygen administration

Drug therapy

- Antipyretics: acetaminophen (Tylenol)
- Inhaled racemic epinephrine (Asthma-Nefrin) to alleviate respiratory distress
- Corticosteroid: methylprednisolone (Solu-Medrol) to reduce inflammation and swelling

INTERVENTIONS AND RATIONALES

- Monitor respiratory and cardiovascular status *to detect any indications that obstruction is worsening.*
- Monitor vital signs and pulse oximetry *to detect early signs of respiratory compromise.*
- Administer oxygen therapy and maintain the child in a cool mist tent, if needed. *Cool mist helps liquefy secretions.*
- Administer medications, as ordered, and note effectiveness *to maintain or improve child's condition.*
- Allow the parents to hold the child *to provide comfort.*
- Provide emotional support for the parents *to decrease anxiety.*
- Provide age-appropriate activities for the child confined to the mist tent *to ease anxiety.*
- Monitor for rebound obstruction when administering racemic epinephrine; *the drug's effects are short term and may result in rebound obstruction.*

Teaching topics

- Keeping the child calm to ease respiratory effort and conserve energy
- Knowing methods of decreasing laryngeal spasm, such as taking the child into the bathroom, turning on the shower, and letting the room fill with steam or allowing the child to breathe cool air outside during the night
- Using a vaporizer near the child's bed

Cystic fibrosis

Cystic fibrosis is a generalized dysfunction of the exocrine glands that affects multiple organ systems. This disorder is characterized by:

- airway obstruction caused by the increased and constant production of mucus
- little or no release of pancreatic enzymes (lipase, amylase, and trypsin).

Transmitted as an autosomal recessive trait, cystic fibrosis is the one of the most common inherited diseases in children and one of the most common causes of childhood death. The disease occurs equally in both sexes. With improvements in treatment over the past decade, the average life expectancy has risen dramatically. The clinical effects may become apparent soon after birth or take years to develop.

CAUSE

- Genetic inheritance (Research suggests that there may be as many as 300 genes that code for cystic fibrosis.)

DATA COLLECTION FINDINGS

- Bulky, greasy, foul-smelling stools that contain undigested food
- Distended abdomen and thin arms and legs from steatorrhea
- Failure to thrive from malabsorption
- History of a chronic, productive cough and recurrent respiratory infections, often due to *Pseudomonas* infections
- Meconium ileus in the newborn from a lack of pancreatic enzymes
- Parents' report of a salty taste on the child's skin
- Voracious appetite from undigested food lost in stools

DIAGNOSTIC FINDINGS

- Chest X-ray indicates early signs of obstructive lung disease.
- Sweat test using pilocarpine iontophoresis is greater than 60 mEq/L
- Stool specimen analysis indicates the absence of trypsin.

NURSING DIAGNOSES

- Imbalanced nutrition: Less than body requirements
- Ineffective airway clearance
- Risk for infection

TREATMENT

- Chest physiotherapy
- Multivitamins twice per day, especially fat-soluble vitamins
- High-protein formula, such as Probana, if needed

Drug therapy

- Anti-inflammatory: prednisone (Medicorten) or ibuprofen to decrease inflammation
- Mucolytic (dornase alfa Pulmozyme), bronchodilator, or antibiotic nebulizer inhalation treatment before chest physiotherapy
- I.V. antibiotics for a *Pseudomonas* infection when infection interferes with daily functioning
- Oral pancreatic enzyme replacement: pancrelipase (Pancrease)
- Tobramycin (TOBI) administered with a nebulizer

INTERVENTIONS AND RATIONALES

- Monitor respiratory and cardiovascular status *to detect early signs of hypoxia.*
- Monitor vital signs and intake and output *to detect dehydration, which may worsen respiratory status.*
- Monitor pulse oximetry *to detect early signs of hypoxia.*
- Administer pancreatic enzymes with meals and snacks *to aid digestion and absorption of nutrients.*
- Provide high-calorie, high-protein foods with added salt *to replace sodium loss and promote normal growth.*
- Encourage breathing exercises and perform chest physiotherapy two to four times a day *to mobilize secretions, to maintain lung capacity, and to increase oxygenation.*
- Encourage physical activity *to promote normal development.*

Teaching topics

- Avoiding cough suppressants and antihistamines because the child must be able to cough and expectorate
- Seeking genetic counseling for the family
- Promoting as normal a life for the child as possible

In cystic fibrosis, the child's sweat contains two to five times the normal levels of sodium and chloride. Parents may report a salty taste on the child's skin.

Epiglottitis

Epiglottitis, a potentially life-threatening infection, causes inflammation and edema of the

epiglottis, a lidlike cartilaginous structure overhanging the entrance to the larynx that serves to prevent food from entering the larynx and trachea while swallowing. Epiglottitis is most common among preschoolers.

CAUSES

- Bacterial *Haemophilus influenzae* (most common causative organism)
- Pneumococci and group A beta-hemolytic streptococci

DATA COLLECTION FINDINGS

- Difficult and painful swallowing
- Extending the neck in a sniffing position
- Fever
- Increased drooling
- Irritability
- Lower rib retractions
- Pallor
- Rapid pulse rate
- Rapid respirations
- Refusal to drink
- Restlessness
- Sore throat
- Stridor
- Tripod sitting position
- Use of accessory muscles

DIAGNOSTIC FINDINGS

- Lateral neck X-ray shows an enlarged epiglottis.
- Throat examination reveals a large, edematous, bright red epiglottis.

NURSING DIAGNOSES

- Anxiety
- Ineffective airway clearance
- Ineffective breathing pattern

TREATMENT

- Emergency endotracheal intubation or a tracheotomy
- Oxygen therapy or cool mist tent
- I.V. fluid to prevent dehydration

Drug therapy

- Parenteral antibiotics according to causative organism: 10-day course

Remember, don't inspect the throat of a child with epiglottitis without emergency personnel and supplies on hand because airway occlusion could result.

INTERVENTIONS AND RATIONALES

- Monitor vital signs and pulse oximetry *to detect any changes in oxygenation.*
- Monitor respiratory and cardiovascular status *to determine the severity of the child's condition and to prevent respiratory failure or arrest.*
- Have someone stay with the child at all times. *Airway obstruction can occur quickly.*
- Defer inspecting the throat until emergency personnel and supplies arrive *to avoid a spasm of the epiglottis that may lead to airway occlusion.*
- Reduce the number of examining personnel *to decrease the child's anxiety.*
- Allow the child to sit on a parent's lap; *sitting on a parent's lap makes breathing easier and decreases the child's anxiety.*
- Have equipment ready for a tracheotomy or intubation. *Emergency intubation and tracheostomy equipment should be on hand in case complete obstruction occurs.*
- Maintain oxygen therapy, if necessary. *Humidified oxygen prevents secretions from thickening.*
- Administer medications as ordered *to treat infection and to improve respiratory function.*
- Provide emotional support for the child and family *to decrease anxiety.*

Teaching topics

- Understanding the signs and symptoms of this disorder and recognizing those who need immediate medical attention
- Understanding the importance of beginning *H. influenzae* immunization at age 2 months

Sudden infant death syndrome

Sudden infant death syndrome (SIDS) is the sudden death of an infant in which a postmortem examination fails to confirm the cause of death. The peak age is 3 months; 90% of cases occur before age 6 months, especially during the winter and early spring months.

Children who are diagnosed with SIDS are typically described as healthy with no previous medical problems. They are usually found dead sometime after being put down to sleep.

CAUSES
• May result from an abnormality in the control of ventilation, causing prolonged apneic periods with profound hypoxia and cardiac arrhythmias
• Stomach sleeping (studies indicate a decreased incidence of SIDS in infants who sleep on their backs)
• Undetected abnormalities, such as an immature respiratory system and respiratory dysfunction

DATA COLLECTION FINDINGS
• History of low birth weight
• History of siblings with SIDS
• History of prematurity
• History of being one in a multiple birth
• Death takes place during sleep without noise or struggle

DIAGNOSTIC FINDINGS
• Autopsy is the only way to diagnose SIDS. Autopsy findings indicate pulmonary edema, intrathoracic petechiae, and other minor changes suggesting chronic hypoxia.

NURSING DIAGNOSES
• Ineffective tissue perfusion: Cardiopulmonary
• Ineffective breathing pattern
• Grieving

TREATMENT
• If parents bring the infant to the emergency department, the doctor decides whether to try to resuscitate.
• If successfully resuscitated, the child is temporarily placed on mechanical ventilation. After he's extubated, the child is tested for infantile apnea and the parents are given a home apnea monitor and taught infant cardiopulmonary resuscitation.
• Parents of an infant who has died of SIDS require emotional and other support.

Drug therapy
• If resuscitation is attempted, drugs are administered according to Pediatric Advanced Life Support protocols; drug therapy may include epinephrine, atropine and, after ABG analysis, sodium bicarbonate if appropriate.

INTERVENTIONS AND RATIONALES
• Because most infants with SIDS can't be resuscitated, focus your interventions on providing emotional support for the family. Keep in mind grief may be coupled with guilt. Also, the parents may express anger at emergency department personnel, each other, or anyone involved with the child's care. Stay calm and let them express their feelings. *Parents need to express feelings to prevent dysfunctional grieving.*
• Let the parents touch, hold, and rock the infant, if desired, and allow them to say goodbye to the infant *to facilitate the grieving process.*
• Provide literature on SIDS and support groups; suggest psychological support for the surviving children *to help prevent maladaptive emotional responses to loss, to promote a realistic perspective on the tragedy, and to promote coping.*
• Reinforce the fact that the death wasn't the parents' fault *to help alleviate guilt.*

Teaching topics
• Preparing the family for how the infant will look and feel if members touch and hold him
• Contacting a minister, priest, rabbi, or other clergy; relatives; friends; and local support groups for grieving parents

Memory jogger

Try to remember the phrase, "Back to sleep." Research indicates a decreased incidence of SIDS in infants placed on their backs to sleep.

Pump up on practice questions

1. A parent brings her child to the pediatrician's office because of difficulty breathing

and a "barking" cough. These signs are associated with which of the following conditions?

1. Cystic fibrosis
2. Asthma
3. Epiglottitis
4. Croup

Answer: 4. A "seal bark" cough and difficulty breathing would indicate croup. Cystic fibrosis produces a chronic productive cough and recurrent respiratory infections. Asthma may cause prolonged expiration with an expiratory wheeze on auscultation, dyspnea, and accessory muscle use. Epiglottitis results in increased drooling, difficulty swallowing, tachypnea, and stridor.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

2. A woman whose child awakens at night with a "barking" cough asks the nurse for advice. The nurse should instruct the mother to:

1. take the child into the bathroom, turn on the shower, and let the room fill with steam.
2. bring the child to the emergency department immediately.
3. notify the pediatrician immediately.
4. call emergency medical services to transport the child to the hospital for emergency tracheotomy.

Answer: 1. The nurse should instruct the mother to take her child into the bathroom, close the door, turn on the shower's hot-water spigot full-force, and sit with the child as the room fills with steam; this should decrease laryngeal spasm associated with croup. If a child demonstrates symptoms associated with epiglottitis, not croup (increased drooling, stridor, tachypnea), the mother should notify the pediatrician immediately and call the emergency medical services to transport the child to the hospital; emergency tracheotomy may be necessary. Epiglottitis is a potentially life-threatening infection that causes inflammation and edema of the epiglottis. Taking the child to the hospital by herself could jeopardize the child's condition if that condition deteriorates en route.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

3. A child with croup is placed in a cool mist tent. Which statement should the nurse include when teaching the mother about this type of therapy?

1. "You won't be able to touch your child while he's in the cool mist tent."
2. "The cool mist is necessary because it will thin the child's mucus, making it easier to expectorate."
3. "You can bring in your child's favorite stuffed animal to comfort him while he's in the cool mist tent."
4. "You can bring in any of your child's favorite toys so he can play while he's in the cool mist tent."

Answer: 2. The mother should be taught the purpose of the cool mist tent, which is to thin mucus and facilitate expectoration. The mother is able to touch her child while he's in the cool mist tent. She should be encouraged to bring in toys for the child to play with but to avoid stuffed toys, which may become damp and promote bacterial growth, and toys that produce sparks or friction.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

4. The physician orders chest physiotherapy for a pediatric client. The nurse shouldn't perform chest physiotherapy when the client is experiencing:

1. a productive cough.
2. retained secretions.
3. acute bronchoconstriction.
4. hypoxia.

Answer: 3. The nurse shouldn't administer chest physiotherapy during episodes of acute bronchoconstriction or airway edema (loosening mucus plugs could cause airway obstruction). Chest physiotherapy aids the elimination of secretions and reexpansion of lung tissue. Successful treatment with chest phys-

iotherapy produces improved breath sounds, improved oxygenation, and increased sputum production and airflow. Therefore, it should be performed when a productive cough, retained secretions, or hypoxia is present.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

5. When preparing to teach the parents of an infant about preventing SIDS, the nurse should include:

1. positioning the infant on his stomach when sleeping.
2. positioning the infant in an infant seat to sleep.
3. positioning the infant on his back to sleep.
4. positioning the infant in a side-lying position to sleep.

Answer: 3. The parents should be instructed to position the infant on his back to sleep to decrease the risk of SIDS. Infants may be positioned in an infant seat during periods of respiratory distress to encourage lung expansion but it shouldn't be encouraged as a routine position for sleep. Research demonstrates an increased incidence of SIDS in infants positioned on their stomachs to sleep. The side-lying position should also be avoided because those infants can reposition themselves into a prone (stomach-lying) position.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

6. Which of these test results is a key finding in the child with cystic fibrosis?

1. Chest X-ray that reveals interstitial fibrosis
2. Neck X-ray showing areas of upper airway narrowing
3. Lateral neck X-ray revealing an enlarged epiglottis
4. Positive pilocarpine iontophoresis sweat test

Answer: 4. A child with cystic fibrosis has a positive pilocarpine iontophoresis sweat test. The child sweats normally, but this sweat contains two to five times the normal levels of sodium and chloride. Chest X-ray findings that reveal bronchiolar metaplasia and interstitial fibrosis are associated with bronchopulmonary dysplasia. A neck X-ray that reveals upper airway narrowing and edema in the subglottic folds indicates croup. A lateral neck X-ray that reveals an enlarged epiglottis indicates epiglottitis.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

7. When communicating with the grieving family after a death from SIDS, the nurse should:

1. instruct the parents to place other infants on their backs to sleep.
2. stress that the death isn't the parents' fault.
3. stress that an autopsy must be done to confirm diagnosis.
4. stress that the parents are still young and can have more children.

Answer: 2. It's most important for the nurse to stress that death from SIDS is not predictable or preventable and that it isn't the parents' fault. Although it's important to inform the parents that an autopsy is necessary, that's secondary. Instructing the parents to place other infants on their backs to sleep implies that the parents did something wrong to cause the infant's death. Stressing that the parents are still young and can have other children minimizes their grief.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

8. Which of these client histories is most consistent with the diagnosis of SIDS?

1. The child was physically abused in the past.
2. The infant had a history of many medical problems.
3. The infant was healthy and was found shortly after being put down to sleep.
4. The infant was described as lethargic, irritable, and feeding poorly before being put down to sleep.

Answer: 3. Children who are diagnosed with SIDS are typically described as healthy with no previous medical problems. They are usually found dead sometime after being put down to sleep. Depending on how long the infant has been dead, the infant may have a mottled complexion with extreme cyanosis of the lips, fingertips, or pooling of blood in the legs and feet that may be mistaken for bruising.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

9. The nurse is teaching the parents of a child with cystic fibrosis. The nurse should instruct the parents to avoid:

1. encouraging their child to be physically active.
2. administering pancreatic enzymes with meals and snacks.
3. administering cough suppressants.
4. encouraging their child to live as normal a life as possible.

Answer: 3. The parents of a child with cystic fibrosis should be taught to avoid administering cough suppressants and antihistamines to their child. Administration of these drugs interferes with the child's ability to cough and expectorate. The parents should encourage the child to be physically active and lead as normal a life as possible. Pancreatic enzymes should be administered with meals and snacks.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

10. Which is the most appropriate nursing diagnosis for the child with epiglottitis?

1. Anxiety related to separation from parent
2. Decreased cardiac output related to bradycardia
3. Ineffective airway clearance related to laryngospasm
4. Impaired gas exchange related to noncompliant lungs

Answer: 3. Epiglottitis is a life-threatening emergency that results from laryngospasm and edema. Therefore, ineffective airway clearance is the most appropriate diagnosis for this child. Anxiety related to separation shouldn't apply because the child doesn't need to be separated from the parent. The child will most likely be tachycardic, not bradycardic, unless respiratory failure ensues. The child has impaired gas exchange from impeded airflow, not from a noncompliant lung.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

29 Hematologic & immune systems

In this chapter, you'll learn:

- the pediatric hematologic and immune systems and their functions
- tests used to diagnose hematologic and immune disorders
- common hematologic and immune disorders.

Brush up on key concepts

The hematologic and immune systems consist of blood and blood-forming tissues as well as such structures as the lymph nodes, thymus, spleen, and tonsils. Reviewing the functions of these systems and the development of a child's immune response will lay the groundwork for effective patient care.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 592 and 593.

What blood does

The functions of blood include:

- regulating body temperature by transferring heat from deep within the body to small vessels near the skin
- providing cell nutrition by carrying nutrients from the GI tract to the tissues and removing waste products by transporting them to the lungs, kidneys, liver, and skin for excretion
- defending against foreign antigens by transporting leukocytes and antibodies to the sites of infection, injury, and inflammation
- transporting hormones from endocrine glands to various parts of the body
- maintaining acid-base balance
- carrying oxygen to tissues and removing carbon dioxide.

Each little component does its part

Blood is composed of several components. These include:

- **erythrocytes** (red blood cells [RBCs]), which carry oxygen to the tissues and remove carbon dioxide
- **leukocytes** (white blood cells [WBCs]), which include lymphocytes, monocytes, and granulocytes; these participate in the immune response
- **thrombocytes** (platelets), which contribute to clotting
- **plasma** (the fluid part of blood), which carries antibodies and nutrients to tissues and carries away wastes.

It's common

Communicable diseases and **infections** are commonly seen during the time a child's immune system develops. Over time, a child receives protection from communicable diseases either naturally or artificially.

It's natural

- **Natural immunity** is present at birth. Examples of natural immunity include barriers against disease, such as skin and mucous membranes, and bactericidal substances of body fluids, such as intestinal flora and gastric acidity.
- With **naturally acquired active immunity,** the immune system makes antibodies after exposure to disease. It requires contact with the disease.
- With **naturally acquired passive immunity,** no active immune process is involved. The antibodies are passively received through placental transfer by immunoglobulin (Ig) G (the smallest Ig) and breast-feeding (colostrum).

It's artificial

Artificially acquired immunity can be active or passive. In **artificially acquired active immunity,** medically engineered substances are ingested or injected to stimulate the immune response against a specific disease. Immu-

Cheat sheet

Pediatric hematologic & immune refresher

ACQUIRED IMMUNODEFICIENCY SYNDROME

Key signs and symptoms

- Failure to thrive
- Mononucleosis-like prodromal symptoms
- Night sweats
- Recurring diarrhea
- Weight loss

Key test results

- $CD4^+$ T-cell count measures the severity of immunosuppression.
- Enzyme-linked immunosorbent assay and Western blot are positive for human immunodeficiency virus (HIV) antibody.
- Viral culture or p24 antigen test reveals presence of HIV in children under age 18 months.

Key treatments

- Antibiotic therapy according to sensitivity of infecting organisms
- Antiviral agents such as zidovudine (Retrovir)
- Monthly gamma globulin administration

Key interventions

- Monitor vital signs, intake and output, and growth and development.
- Monitor respiratory and neurologic status.
- Maintain standard precautions.

HEMOPHILIA

Key signs and symptoms

- Multiple bruises without petechiae
- Prolonged bleeding after circumcision, immunizations, or minor injuries

Key test result

- Prolonged partial thromboplastin time (PTT)

Key treatments

- Cryoprecipitate (frozen factor VIII) administration to maintain an acceptable serum level of the clotting factor; usually done by the family at home
- Fresh frozen plasma

Key interventions

- Monitor vital signs and intake and output.
- When bleeding occurs:
  - elevate the affected extremity above the heart
  - immobilize the site
  - apply pressure to the site for 10 to 15 minutes
  - decrease the child's anxiety.

IRON DEFICIENCY ANEMIA

Key signs and symptoms

- Fatigue, listlessness
- Increased susceptibility to infection
- Pallor
- Tachycardia
- Numbness and tingling of the extremities
- Vasomotor disturbances

Key test results

- Hemoglobin (Hb), hematocrit, and serum ferritin levels are low.
- Serum iron levels are low, with high binding capacity.

Key treatments

- Oral preparation of iron or a combination of iron and ascorbic acid (which enhances iron absorption)

Key interventions

- Administer iron before meals with citrus juice.
- Give liquid iron through a straw; for infants, administer by oral syringe toward the back of the mouth.
- Don't give iron with milk products.

LEUKEMIA

Key signs and symptoms

- Fatigue
- History of infections
- Low-grade fever
- Lymphadenopathy
- Pallor
- Petechiae and ecchymosis
- Poor wound healing and oral lesions

Key test results

- Blast cells appear in the peripheral blood.
- Blast cells may be as high as 95% in the bone marrow.
- Initial white blood cell count may be 10,000/µl at time of diagnosis in a child with acute lymphocytic leukemia between ages 3 and 7.

Pediatric hematologic & immune refresher *(continued)*

LEUKEMIA *(continued)*

Key treatments

- Bone marrow transplantation
- Radiation therapy
- Chemotherapy

Key interventions

- Provide pain relief.
- Monitor vital signs and intake and output.
- Inspect the skin frequently.
- Provide nursing measures to ease adverse effects of radiation and chemotherapy.

REYE'S SYNDROME

Key signs and symptoms

- Stage 5: seizures, loss of deep tendon reflexes, flaccidity, respiratory arrest (Death is usually a result of cerebral edema or cardiac arrest.)

Key test results

- Blood test results show elevated serum ammonia levels; serum fatty acid and lactate levels are also elevated.
- Coagulation studies reveal prolonged prothrombin time and PTT.
- Liver biopsy shows fatty droplets distributed through cells.
- Liver function studies show aspartate aminotransferase and alanine aminotransferase elevated to twice normal levels.

Key treatments

- Endotracheal intubation and mechanical ventilation
- Exchange transfusion
- Induced hypothermia

Key interventions

- Monitor vital signs and pulse oximetry.
- Monitor cardiac, respiratory, and neurologic status.
- Monitor fluid intake and output.
- Monitor blood glucose levels.
- Maintain seizure precautions.
- Keep head of bed at 30-degree angle.
- Maintain oxygen therapy, which may include intubation and mechanical ventilation.
- Administer blood products as necessary.
- Administer medications, as ordered, and monitor for adverse effects.
- Maintain hypothermia blanket as needed, and monitor temperature every 15 to 30 minutes while in use.
- Check for loss of reflexes and signs of flaccidity.

SICKLE CELL ANEMIA

Key signs and symptoms

- In infants, colic and splenomegaly
- In toddlers and preschoolers, hypovolemia, shock, and pain at site of crisis
- In school-age children and adolescents, enuresis, extreme pain at site of crisis, and priapism

Key test results

- More than 50% Hb S indicates sickle cell disease; a lower level of Hb S indicates sickle cell trait.

Key treatments

- Hydration with I.V. fluid administration
- Transfusion therapy as necessary
- Treatment for acidosis
- Analgesics: morphine or hydromorphone (Dilaudid)

Key interventions

- Monitor vital signs and intake and output.
- Administer pain medications and note effectiveness.

nizations are an example of this kind of immunity.

With **artificially acquired passive immunity,** antibodies are injected without stimulating the immune response. Examples include tetanus antitoxin, hepatitis B immune globulin, and varicella zoster immune globulin.

Keep abreast of diagnostic tests

Here are some important tests used to diagnose hematologic and immunologic disorders, along with common nursing interventions associated with each test.

Not my type?

Blood typing is used to classify blood according to the presence of major antigens A and B

on RBC surfaces and according to serum antibodies anti-A and anti-B. ABO blood typing is necessary before transfusion to prevent a lethal reaction.

Nursing actions

- Explain the procedure to the child and his family.
- Handle the sample gently to prevent hemolysis.
- Apply pressure to the venipuncture site to prevent hematoma or bleeding.

Tuning into the immune system

Laboratory studies, such as **$CD4^+$ T-cell count** and **enzyme-linked immunosorbent assay (ELISA),** are used to assess immunosuppression.

Nursing actions

- Explain the procedure to the child and his family.
- Handle the sample gently to prevent hemolysis.
- Apply pressure to the venipuncture site to prevent hematoma or bleeding.

Honing in on hematology

Hematology studies are used to analyze a blood sample for WBC count and differential, hemoglobin level (Hb), hematocrit, and platelet count.

Nursing actions

- Explain the procedure to the child and his family.
- Apply pressure to the venipuncture site to prevent hematoma and bleeding.

Clot measure

A **coagulation study** tests a blood sample to analyze prothrombin time (PT), international normalized ratio, partial thromboplastin time (PTT), and bleeding time.

Nursing actions

- Note the child's current drug therapy before the procedure.
- Check the venipuncture site for bleeding after the procedure.

A look at the liver

Liver function studies measure levels of hepatic enzymes, such as aspartate aminotransferase (AST) and alanine aminotransferase (ALT).

Nursing actions

- Before the test, prepare the child for venipuncture.
- After the test, check the venipuncture site for bleeding.

Polish up on patient care

Major hematologic and immune disorders in pediatric patients include acquired immunodeficiency syndrome (AIDS), hemophilia, iron deficiency anemia, leukemia, Reye's syndrome, and sickle cell anemia.

Acquired immunodeficiency syndrome

With AIDS, the human immunodeficiency virus (HIV) attacks helper T cells. AIDS may be spread through sexual contact, percutaneous or mucous membrane exposure to needles or other sharp instruments contaminated with blood or bloody body fluid (for example, in I.V. drug abuse), contaminated blood transfusion, or mother to infant transmission before or around the time of birth. Most children in the United States with AIDS are born to mothers with HIV infection.

HIV has a much shorter incubation period in children than adults. In adults, the incubation period may last 10 years or more. By contrast, children who receive the virus by placental transmission are usually HIV-positive by age 6 months and develop clinical signs by age 3.

Because of passive antibody transmission, all infants born to HIV-infected mothers test positive for antibodies to the HIV virus up to about age 18 months. Confirmation of diagno-

sis during this time requires detection of the HIV antigen.

CAUSES
- Contaminated blood products
- Infected parent

DATA COLLECTION FINDINGS
- Failure to thrive
- Lymphadenopathy
- Mononucleosis-like prodromal symptoms
- Neurologic impairment, such as loss of motor milestones and behavioral changes
- Night sweats
- Recurrent opportunistic infections
- Recurring diarrhea
- Weight loss

DIAGNOSTIC FINDINGS
- $CD4^+$ T-cell count measures the severity of immunosuppression.
- Culture and sensitivity tests reveal infection with opportunistic organisms.
- ELISA and Western blot are positive for HIV antibody.
- Viral culture or p24 antigen test reveals presence of HIV in children under age 18 months.

NURSING DIAGNOSES
- Ineffective protection
- Imbalanced nutrition: Less than body requirements
- Deficient fluid volume

TREATMENT
- Blood administration, if necessary
- Follow-up laboratory studies
- High-calorie diet provided in small frequent meals
- I.V. fluids to maintain hydration
- Nutrition supplements, if necessary
- Parenteral nutrition, if necessary

Drug therapy
- Antibiotic therapy according to sensitivity of infecting opportunistic organism
- Antiviral agents such as zidovudine (Retrovir)
- Monthly gamma globulin administration
- Prophylactic antibiotic therapy with cotrimoxazole (Bactrim) to prevent *Pneumocystis carinii* pneumonia
- Routine immunizations (excluding varicella vaccine, which isn't recommended for HIV-infected children.)

INTERVENTIONS AND RATIONALES
- Monitor vital signs and intake and output *to detect tachycardia, hypotension, or decreased urine output, which may indicate fluid volume deficit or electrolyte imbalance.*
- Provide appropriate play activities *to provide stimulation and promote development.*
- Encourage fluid intake *to prevent dehydration.*
- Monitor respiratory and neurologic status *to detect early signs of compromise.*
- Maintain standard precautions *to prevent the spread of infection.*
- Administer medications, as ordered, *to help boost immune response and prevent opportunistic infections.*
- Provide psychosocial support. *An AIDS diagnosis is devastating for a child and his family.*

As with adults, children with AIDS exhibit nonspecific signs and symptoms.

Teaching topics
- Avoiding consumption of raw or undercooked meats
- Avoiding swimming in a lake or river
- Avoiding contact with young farm animals
- Following infection-control techniques
- Understanding risk factors from pets (especially cats)
- Recognizing signs and symptoms of infection and getting immediate treatment
- Practicing safe sex, if appropriate

Children with HIV or AIDS and their families must maintain strict personal hygiene.

Hemophilia

Hemophilia, which affects 1 in 5,000 males, results from a deficiency in one of the coagulation factors.

The types of hemophilia are:
• hemophilia A (also called factor VIII deficiency or classic hemophilia), the most common type (75% of all cases)
• hemophilia B (also called factor IX deficiency or Christmas disease)
• hemophilia C (factor XI deficiency).

Hemophilia is an X-linked recessive disorder. The inheritance pattern is described below:
• If the father has the disorder and the mother doesn't, all daughters will be carriers, but sons won't have the disease.
• If the mother is a carrier and the father doesn't have hemophilia, each son has a 50% chance of getting hemophilia and each daughter has a 50% chance of being a carrier.

CAUSE
• Genetic inheritance

DATA COLLECTION FINDINGS
• Bleeding into the throat, mouth, and thorax
• Hemarthrosis
• Multiple bruises without petechiae
• Peripheral neuropathies from bleeding near peripheral nerves
• Prolonged bleeding after circumcision, immunizations, or minor injuries

DIAGNOSTIC FINDING
• PTT is prolonged.

NURSING DIAGNOSES
• Ineffective protection
• Risk for deficient fluid volume
• Risk for injury

TREATMENT
• Avoiding aspirin, sutures, and cauterization, which may aggravate bleeding
• Blood transfusion if necessary
• Cryoprecipitate administration, to maintain an acceptable serum level of the clotting factor; usually done by the family at home
• Establishing HIV status (child is at increased risk for acquiring HIV through blood product transfusions)
• Administration of fresh frozen plasma to restore deficient coagulation factors
• Promoting vasoconstriction during bleeding episodes by applying ice, pressure, and hemostatic agents

Drug therapy
• Desmopressin acetate (DDAVP) to promote release of factor VIII in individuals with mild or moderate hemophilia A

INTERVENTIONS AND RATIONALES
• Monitor vital signs and intake and output *to evaluate renal status and monitor for fluid overload or dehydration.*
• Monitor cardiovascular status and check for signs of bleeding; *tachycardia or hypotension may indicate hypovolemia.*
• Measure the joint's circumference and compare it to that of an unaffected joint *to evaluate for bleeding into the joint, which may lead to hypovolemia.*
• Note swelling, pain, or limited joint mobility. *Changes may indicate progressive decline in function.*
• Pad toys and other objects in the child's environment *to promote child safety and prevent bleeding.*
• Recommend protective headgear, soft foam Toothettes (instead of bristle toothbrushes), and stool softeners as appropriate *to prevent bleeding.*
• Discourage abnormal weight gain, *which increases the stress on joints.*

When bleeding occurs
• Elevate the affected extremity above the heart *to decrease circulation to affected area and promote venous return.*
• Immobilize the site *to prevent clots from dislodging*
• Apply pressure to the site for 10 to 15 minutes *to stop bleeding*
• Decrease anxiety *to lower the child's heart rate.*
• Apply ice to the site *to promote vasoconstriction.*

To treat hemarthrosis
• Immobilize the affected extremity; elevate it in a slightly flexed position *to prevent further injury.*
• Decrease pain and anxiety *to lower the child's heart rate and minimize blood loss.*

• Have the child avoid excessive handling or weight bearing for 48 hours *to prevent bleeding and to rest the site.*
• Begin mild range-of-motion exercises after 48 hours *to facilitate absorption of blood and prevent contractures.*

Teaching topics
• Seeking genetic counseling for parents
• Avoiding contact sports
• Performing home treatment for bleeding episodes

Iron deficiency anemia

The most common nutritional anemia during childhood, iron deficiency anemia is characterized by poor RBC production. Insufficient body stores of iron lead to:
• depleted RBC mass
• decreased Hb concentration (hypochromia)
• decreased oxygen-carrying capacity of the blood.

Most commonly, iron deficiency anemia occurs when the child experiences rapid physical growth, low iron intake, inadequate iron absorption, or loss of blood.

CAUSES
• Blood loss secondary to drug-induced GI bleeding (from anticoagulants, aspirin, or steroids) or due to heavy menses, hemorrhage from trauma, GI ulcers, or cancer
• Inadequate dietary intake of iron (less than 1 to 2 mg/day), which may occur following prolonged unsupplemented breast-feeding or bottle-feeding of infants, or during periods of stress such as rapid growth in children and adolescents
• Iron malabsorption, as in chronic diarrhea, partial or total gastrectomy, and malabsorption syndromes, such as celiac disease and pernicious anemia
• Intravascular hemolysis-induced hemoglobinuria or paroxysmal nocturnal hemoglobinuria
• Mechanical erythrocyte trauma caused by a prosthetic heart valve or vena cava filters

DATA COLLECTION FINDINGS
Anemia progresses gradually, and many children are initially asymptomatic, except for symptoms of an underlying condition. Children with advanced anemia display the following symptoms:
• dyspnea on exertion
• fatigue
• headache
• inability to concentrate
• irritability
• listlessness
• pallor
• susceptibility to infection
• tachycardia.

In cases of chronic iron deficiency anemia, children display the following symptoms:
• cracks in corners of the mouth
• dysphagia
• neuralgic pain
• numbness and tingling of the extremities
• smooth tongue
• spoon-shaped, brittle nails
• vasomotor disturbances.

DIAGNOSTIC FINDINGS
• Bone marrow studies reveal depleted or absent iron stores and normoblastic hyperplasia.
• Hb, hematocrit, and serum ferritin levels are low.
• Mean corpuscular Hb is decreased in severe anemia.
• RBC count is low, with microcytic and hypochromic cells. (In early stages, RBC count may be normal, except in infants and children.)
• Serum iron levels are low, with high binding capacity.

NURSING DIAGNOSES
• Imbalanced nutrition: Less than body requirements
• Fatigue
• Impaired gas exchange

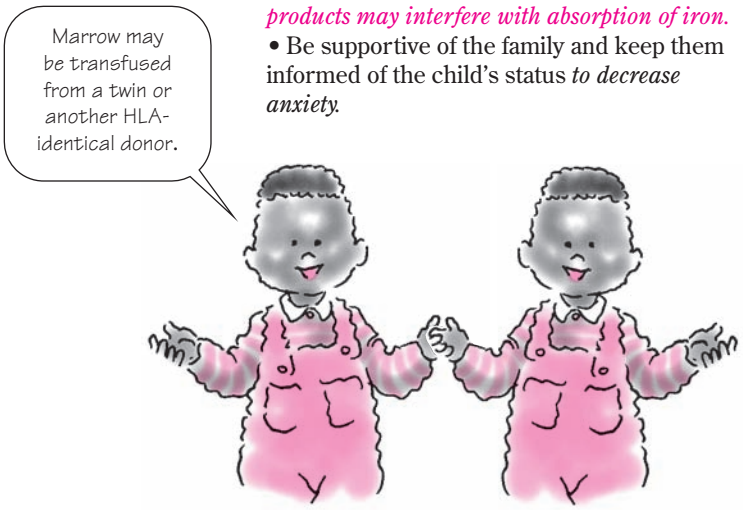
TREATMENT
• Increased iron intake (for children and adolescents) by adding foods rich in iron to diet or (for infants) adding iron supplements
• Treatment for any underlying condition

Drug therapy

- Oral preparation of iron or a combination of iron and ascorbic acid (which enhances iron absorption)
- Cyanocobalamin (vitamin B_{12}) if intrinsic factor is lacking
- Iron dextran (InFeD) if additional therapy is needed

INTERVENTIONS AND RATIONALES

- Carefully collect data on the child's drug history. *Certain drugs, such as pancreatic enzymes and vitamin E, may interfere with iron metabolism and absorption and other drugs, such as aspirin and steroids, may cause GI bleeding.*
- Provide passive stimulation; allow frequent rest periods; give small, frequent feedings; and elevate the head of the bed *to decrease oxygen demands.*
- Implement proper hand washing *to decrease risk of infection.*
- Provide foods high in iron (liver, dark leafy vegetables, and whole grains) *to replenish iron stores.*
- Administer iron before meals with citrus juice. *Iron is best absorbed in an acidic environment.*
- Give liquid iron through a straw *to prevent staining the child's skin and teeth.* For infants, administer by oral syringe toward the back of the mouth.
- Don't give iron with milk products. *Milk products may interfere with absorption of iron.*
- Be supportive of the family and keep them informed of the child's status *to decrease anxiety.*



Teaching topics

- Keeping iron supplements safely stored out of the child's reach at home
- Brushing teeth after iron administration
- Reporting reactions to iron supplementation, such as nausea, vomiting, diarrhea, constipation, fever, or severe stomach pain, which may require a dosage adjustment

Leukemia

Leukemia is the abnormal, uncontrolled proliferation of WBCs. In leukemia, WBCs are produced so rapidly that immature cells (blast cells) are released into the circulation. These blast cells are nonfunctional, can't fight infection, and are formed continuously without respect to the body's needs. This proliferation robs healthy cells of sufficient nutrition.

In children, the most common type of leukemia is acute lymphocytic leukemia (ALL). This type of leukemia is marked by extreme proliferation of blast cells. In adolescents, acute myelogenous leukemia is more common and is believed to result from a malignant transformation of a single stem cell.

CAUSES AND CONTRIBUTING FACTORS

- Chemical exposure and viruses
- Chromosomal disorders
- Down syndrome
- Radiation exposure

DATA COLLECTION FINDINGS

Clinical findings for leukemia may appear with surprising abruptness in children with few, if any, warning signs. The following are common signs and symptoms of leukemia:

- blood in urine, stool, or vomitus
- bone and joint pain
- decrease in all blood cells when bone marrow undergoes atrophy (leads to anemia, bleeding disorders, and immunosuppression)
- fatigue
- history of infections
- lassitude
- low-grade fever
- lymphadenopathy
- pallor

• pathologic fractures (when bone marrow undergoes hypertrophy)
• petechiae and ecchymosis
• poor wound healing and oral lesions.

DIAGNOSTIC FINDINGS

• Blast cells appear in the peripheral blood (where they normally don't appear).
• Blast cells may be as high as 95% in the bone marrow (they are normally less than 5%) as measured by marrow aspiration in the posterior iliac crest (the sternum can't be used in children).
• Initial WBC count may be less than 10,000/µl at the time of diagnosis in a child with ALL between ages 3 and 7. (This child has the best prognosis.)
• Lumbar puncture indicates if leukemic cells have crossed the blood-brain barrier.

NURSING DIAGNOSES

• Ineffective protection
• Acute or chronic pain
• Risk for infection

TREATMENT

• Bone marrow transplantation (Marrow from a twin or another donor with identical human leukocyte antigen [HLA], usually a sibling, is transfused to repopulate the recipient's bone marrow with normal cells.)
• High-protein, high-calorie, bland diet
• I.V. fluids, as necessary
• Oxygen therapy if needed
• Radiation therapy
• Transfusion therapy as needed

Drug therapy

• Analgesics
• Antiemetics: hydroxyzine (Atarax) and ondansetron (Zofran)
• Chemotherapy: intrathecal, usually with methotrexate (Folex)
• Corticosteroids: prednisone (Deltasone)

INTERVENTIONS AND RATIONALES

• Monitor vital signs and intake and output *to determine fluid volume deficit and renal status.*
• Give special attention to mouth care *to prevent infection and bleeding.*
• Inspect the skin frequently *to evaluate for skin breakdown.*
• Give increased fluids *to flush chemotherapeutic drugs through the kidneys.*
• Provide a high-protein, high-calorie, bland diet with no raw fruits or vegetables. *Eliminating raw fruits and vegetables helps prevent infection. A diet meeting the child's caloric requirements helps ensure that the child's maintenance and growth needs are met.*
• Provide pain relief as ordered and document effectiveness and adverse effects. *Analgesics depress the central nervous system (CNS), thereby reducing pain.*
• Monitor the patient for CNS changes, such as confusion, that may result from cerebral damage.
• Provide nursing measures to ease the adverse reactions of radiation and chemotherapy *to promote comfort and encourage adequate nutritional intake.*

Teaching topics

• Avoiding infection
• Adjusting to changes in body image
• Contacting support groups
• Recognizing signs and symptoms of infection and the need to seek immediate medical attention

Reye's syndrome

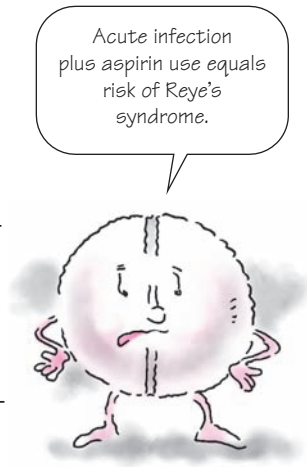
Reye's syndrome is an acute illness that causes fatty infiltration of the liver, kidneys, brain, and myocardium. It can lead to hyperammonemia, encephalopathy, and increased intracranial pressure (ICP).

CAUSES

• Acute viral infection, such as upper respiratory tract, type B influenza, or varicella (Reye's syndrome almost always follows within 1 to 3 days of infection.)
• Concurrent aspirin use (high incidence)

DATA COLLECTION FINDINGS

Reye's syndrome develops in five stages:
• Stage 1: vomiting, lethargy, hepatic dysfunction



• Stage 2: hyperventilation, delirium, hyperactive reflexes, hepatic dysfunction
• Stage 3: coma, hyperventilation, decorticate rigidity, hepatic dysfunction
• Stage 4: deepening coma, decerebrate rigidity, large fixed pupils, minimal hepatic dysfunction
• Stage 5: seizures, loss of deep tendon reflexes, flaccidity, respiratory arrest. Death is usually a result of cerebral edema or cardiac arrest.

The severity of signs and symptoms varies with degree of encephalopathy and cerebral edema.

DIAGNOSTIC FINDINGS

• Blood test results show elevated serum ammonia levels; serum fatty acid and lactate levels are also increased.
• Cerebrospinal fluid (CSF) analysis shows WBC count less than 10/µl; with coma, there's increased CSF pressure.
• Coagulation studies reveal prolonged PT and PTT.
• Liver biopsy shows fatty droplets uniformly distributed throughout cells.
• Liver function studies show AST and ALT are elevated to twice normal levels.

NURSING DIAGNOSES

• Decreased intracranial adaptive capacity
• Ineffective thermoregulation
• Risk for deficient fluid volume

TREATMENT

• Craniotomy
• Endotracheal intubation and mechanical ventilation to control partial pressure of arterial carbon dioxide levels
• Enteral or parenteral nutrition as needed
• Exchange transfusion
• Induced hypothermia
• Transfusion of fresh frozen plasma

Drug therapy

• Osmotic diuretics: mannitol (Osmitrol)
• Vitamins: phytonadione (AquaMEPHYTON)

INTERVENTIONS AND RATIONALES

• Monitor vital signs and pulse oximetry *to determine oxygenation status.*
• Monitor cardiac, respiratory, and neurologic status *to evaluate the effectiveness of interventions and monitor for complications such as seizures.*
• Monitor fluid intake and output *to prevent fluid overload.*
• Monitor blood glucose levels *to detect hyperglycemia or hypoglycemia and prevent complications.*
• Maintain seizure precautions *to prevent injury.*
• Keep head of bed at 30-degree angle *to decrease ICP and promote venous return.*
• Maintain oxygen therapy, which may include intubation and mechanical ventilation, *to promote oxygenation and maintain thermoregulation.*
• Administer blood products as necessary *to increase oxygen-carrying capacity of blood and prevent hypovolemia.*
• Administer medications, as ordered, and monitor for adverse effects *to detect complications.*
• Maintain hypothermia blanket as needed, and monitor temperature every 15 to 30 minutes while in use *to prevent injury and maintain thermoregulation.*
• Check for loss of reflexes and signs of flaccidity *to determine degree of neurologic involvement.*
• Provide good skin and mouth care and range-of-motion (ROM) exercises *to prevent alteration in skin integrity and to promote joint motility.*
• Provide postoperative craniotomy care if necessary *to promote wound healing and prevent complications.*
• Be supportive of the family and keep them informed of the child's status *to decrease anxiety.*

Teaching topics

• Avoiding aspirin products
• Explaining all procedures and nursing care measures to the family
• Referring the family to support groups as indicated

Sickle cell anemia

With sickle cell anemia, a defect in the Hb molecule changes the oxygen-carrying capacity and shape of RBCs. The altered Hb molecule is referred to as Hb S. In this disorder, RBCs acquire a sickle shape.

The child may experience periodic, painful attacks called sickle cell crises. A sickle cell crisis may be triggered or intensified by:
- dehydration
- deoxygenation
- acidosis.

CAUSE

- Genetic inheritance (sickle cell anemia is an autosomal recessive trait; the child inherits the gene that produces Hb S from two healthy parents who carry the defective gene)

DATA COLLECTION FINDINGS

Signs and symptoms vary with the age of the child. Before age 4 months, symptoms are rare (because fetal Hb prevents excessive sickling).

In infants

- Colic from pain caused by an abdominal infarction
- Dactylitis or hand-foot syndrome from infarction of the small bones of the hands and feet
- Splenomegaly from sequestered RBCs

In toddlers and preschoolers

- Hypovolemia and shock from sequestration of large amounts of blood in spleen
- Pain at site of vaso-occlusive crisis

In school-age children and adolescents

- Delayed growth and development and delayed sexual maturity
- Enuresis
- Extreme pain at site of crisis
- History of pneumococcal pneumonia and other infections due to atrophied spleen
- Poor healing of leg wounds from inadequate peripheral circulation of oxygenated blood
- Priapism

DIAGNOSTIC FINDINGS

- Laboratory studies show Hb level is 6 to 9 g/dl (in a toddler).
- More than 50% Hb S indicates sickle cell disease; a lower level of Hb S indicates sickle cell trait.
- RBCs are crescent-shaped and prone to agglutination.

NURSING DIAGNOSES

- Ineffective tissue perfusion: Peripheral
- Impaired gas exchange
- Acute pain

TREATMENT

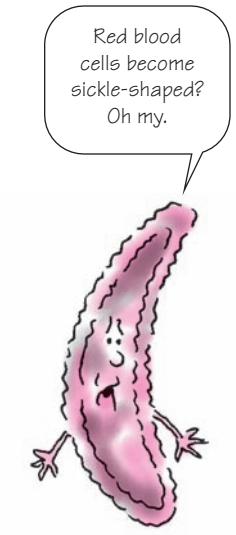
- Bed rest
- Hydration with oral or I.V. fluid (may be increased to 3 L/day during crisis)
- Short-term oxygen therapy (long-term oxygen decreases bone marrow activity, further aggravating anemia)
- Transfusion therapy as necessary
- Treatment for acidosis as necessary

Drug therapy

- Analgesic: morphine or hydromorphone (Dilaudid)
- Hydroxyurea (Droxia)
- Pneumococcal vaccine

INTERVENTIONS AND RATIONALES

- Administer sufficient pain medication (concerns regarding addiction are clinically unfounded) *to promote comfort.*
- Monitor cardiovascular, respiratory, and neurologic status. *Tachycardia, dyspnea, or hypotension may indicate fluid volume deficit or electrolyte imbalance. Change in level of consciousness may signal neurologic involvement.*
- Monitor for symptoms of acute chest syndrome from a pulmonary infarction *to identify early complications.*
- Check vision *to monitor for retinal infarction.*
- Encourage the child to receive the pneumococcal vaccine *to prevent infection.*
- Give large amounts of oral or I.V. fluids *to prevent fluid volume deficit and prevent complications.*
- Teach the child relaxation techniques *to decrease the child's stress level.*



• Maintain the child's normal body temperature *to prevent stress and maintain adequate metabolic state.*
• Monitor vital signs and intake and output *to determine renal function and hydration status.*
• Provide proper skin care *to prevent skin breakdown.*
• Reduce the child's energy expenditure *to improve oxygenation.*
• Remove tight clothing *to prevent inadequate circulation.*
• Suggest family screening and initiate genetic counseling *to identify possible carriers of the disease.*
• Provide support to the child and his family *to reduce anxiety and feelings of helplessness.*

Teaching topics

• Avoiding activities that promote a crisis, such as excessive exercise, mountain climbing, or deep sea diving
• Avoiding high altitudes
• Seeking early treatment of illness to prevent dehydration
• Avoiding aspirin use, which enhances acidosis and promotes sickling

Pump up on practice questions

1. The nurse is taking a history from the mother of a pediatric client suspected of having Reye's syndrome. The history reveals the use of several medications. Which medication might be implicated in the development of Reye's syndrome?

1. Phenytoin (Dilantin)
2. Furosemide (Lasix)
3. Phytonadione (AquaMEPHYTON)
4. Aspirin

Answer: 4. Aspirin use has been implicated in the development of Reye's syndrome in children with a history of recent acute viral infection. Phenytoin, furosemide, and phytonadione aren't associated with the development of Reye's syndrome.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

2. The nurse is teaching the mother of a child diagnosed with iron deficiency anemia. Which statement is true?

1. Iron shouldn't be administered with foods containing ascorbic acid because they delay absorption.
2. Iron should be administered with milk products because they enhance absorption.
3. Liquid iron should be administered to an infant toward the front of the mouth using an oral syringe.
4. Iron shouldn't be administered with milk products because they delay absorption.

Answer: 4. Iron shouldn't be administered with milk products because they delay absorption. Iron should be administered before meals with citrus juice (contains ascorbic acid) because iron is best absorbed in an acidic environment. To prevent staining of the teeth, liquid iron should be administered toward the back of the mouth, not the front.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Knowledge

3. The nurse is teaching the mother of a pediatric client with sickle cell anemia. Which statement by the mother indicates a need for further teaching?

1. "My child can't possibly have sickle cell anemia. He's 4 months old and he's never been sick before."
2. "I know my child should receive a pneumococcal vaccine when the doctor suggests."
3. " I know I should call the pediatrician immediately if my child begins to vomit."
4. "I know I should try to keep my child's body temperature normal by keeping him away from fluctuations in temperature."

Answer: 1. Further teaching is indicated if the mother states that her child can't have sickle cell anemia because he's 4 months old and has never been sick before. Symptoms of sickle cell anemia rarely appear before age 4 months because the predominance of fetal hemoglobin prevents excessive sickling. The child should receive a pneumococcal vaccine when appropriate. The mother should notify the physician if the child vomits so that treatment can be initiated to prevent dehydration, which can precipitate a crisis. Changes in body temperature may also trigger a crisis and should be avoided.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

4. The nurse is teaching a mother about the benefits of breast-feeding her infant. Which type of immunity is passed on to the infant during breast-feeding?

1. Natural immunity
2. Naturally acquired active immunity
3. Naturally acquired passive immunity
4. Artificially acquired active immunity

Answer: 3. Naturally acquired passive immunity is received through placental transfer and breast-feeding. Natural immunity is present at birth. Naturally acquired active immunity occurs when the immune system makes antibodies after exposure to disease. Artificially acquired active immunity occurs when medically engineered substances (immunizations) are ingested or injected to stimulate the immune response against a specific disease.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Application

5. The physician prescribes iron supplements for a child with iron deficiency anemia. Which adverse reactions may occur as a result of iron supplementation?

1. Tachycardia, hypotension, and vomiting
2. Tachycardia, hypertension, and vomiting
3. Vomiting, severe stomach pain, and diarrhea
4. Vomiting, severe stomach pain, and petechiae

Answer: 3. Nausea, vomiting, diarrhea, constipation, fever, and severe stomach pain are adverse reactions associated with iron supplementation. If these occur, the physician should be notified and the dosage adjusted. Tachycardia, hypotension, and petechiae may be present with bleeding disorders but aren't associated with iron supplementation. Hypertension isn't an adverse effect of iron supplementation.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Knowledge

6. The nurse is providing dietary teaching for the mother of a child with iron deficiency anemia. Which iron-rich foods should the mother include in her child's diet?

1. Liver, dark leafy vegetables, and whole grains
2. Dark leafy vegetables, chicken, and whole grains
3. Whole grains, citrus fruit, and yogurt
4. Citrus fruit, liver, and whole grains

Answer: 1. The mother should be instructed to give her child iron-rich foods, such as liver, dark leafy vegetables, and whole grains. Chicken is a good source of protein, but it isn't high in iron. Citrus fruits aid iron absorption but aren't high in iron. Yogurt is a good source of calcium but isn't high in iron.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Knowledge

7. The nurse is teaching a child with sickle cell anemia and the child's mother about activities that may promote a vaso-occlusive crisis. Which activity is acceptable for this child?

1. Skiing
2. Mountain climbing
3. Deep sea diving
4. Softball in the park

Answer: 4. The child with sickle cell anemia should be instructed to avoid activities that can promote a crisis, such as excessive exercise, mountain climbing, or deep sea diving. Extremes in temperature can also promote a crisis, so skiing should be avoided. Mountain climbing and deep sea diving may expose the child to altered atmospheric pressures and a deoxygenated state. These conditions can lead to a sickle cell crisis.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

8. A neonate experiences prolonged bleeding after his circumcision and has multiple bruises without petechiae. These data collection findings suggest:

1. iron deficiency anemia.
2. hemophilia.
3. sickle cell anemia.
4. leukemia.

Answer: 2. Signs of hemophilia include prolonged bleeding after circumcision, immunizations, or minor injuries; multiple bruises without petechiae; peripheral neuropathies from bleeding near peripheral nerves; bleeding into the throat, mouth, and thorax; and hemarthrosis. Signs and symptoms associated with iron deficiency anemia include dyspnea on exertion, fatigue, and listlessness. Signs and symptoms associated with sickle cell anemia include pain at the site of occlusion, poor healing of leg wounds, priapism, enuresis, and delayed growth and sexual maturity. Signs and symptoms associated with leukemia include history of infections, lymphadenopathy, hematuria, hematemesis, blood in stools, petechiae, and ecchymosis.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

9. A child with hemophilia is hospitalized with bleeding into the knee. Which action should the nurse take first?

1. Prepare to administer a whole blood transfusion.
2. Prepare to administer a plasma transfusion.
3. Immediately perform active ROM exercises on the knee
4. Elevate and immobilize the knee.

Answer: 4. Immobilizing and elevating the knee help to prevent further injury. The nurse should anticipate transfusing the missing clotting factor—not whole blood or plasma, which won't stop the bleeding promptly and may pose a risk of fluid overload. Excessive motion should be avoided for at least 48 hours. ROM exercises may be initiated after 48 hours but not immediately.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

10. A nurse is caring for a child with AIDS. Which of the following precautions must the nurse maintain?

1. Airborne precautions
2. Standard precautions
3. Protective isolation
4. Strict hand washing

Answer: 2. The nurse caring for a child with AIDS should maintain standard precautions. Airborne precautions are instituted for clients known or suspected to be infected with microorganisms transmitted by airborne droplet nuclei, such as clients with tuberculosis. Protective isolation is instituted for clients who require added protection from infection, such as those who have undergone bone marrow transplant or those with burns. Strict hand washing should be performed when caring for all clients.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Comprehension

30 Neurosensory system

In this chapter, you'll learn:

- the function of the neurosensory system
- development of a child's hearing and sight
- tests used to diagnose neurosensory disorders
- common neurosensory disorders.

Brush up on key concepts

The **central nervous system** (CNS) is the body's communication network. It receives sensory stimuli through the five senses and either perceives, integrates, interprets, or retains the stimulus in memory. In an infant, early responses are primarily reflexive; the infant learns to discriminate stimuli and bring motor responses under conscious control. Language helps the older child improve and increase perception. In pediatric patients, flaccid muscles usually indicate a CNS disorder.

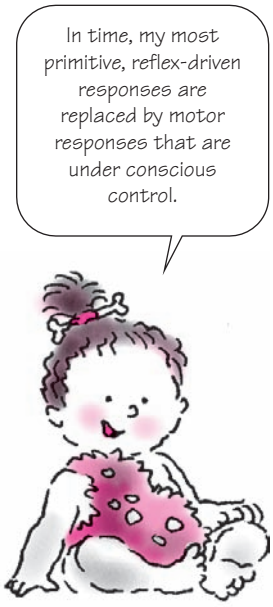
At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 608 to 610.

Upward, then downward

In children younger than age 3, the **ear canal** is directed upward. In older children, the ear canal is directed downward and forward. A child's **hearing** develops as follows:

- Sound discrimination is present at birth.
- By age 5 to 6 months, the infant is able to localize sounds presented on a horizontal plane and begins to imitate selected sounds.
- By age 7 to 12 months, the infant can localize sounds in any plane.
- By age 18 months, the child can hear and follow a simple command without visual cues.

Children who have difficulty with language development by age 18 months should have their hearing evaluated.



First, just alert

At birth, **visual function** is limited to alertness to visual stimuli 8″ to 12″ (20.3 to 30.5 cm) from the eyes. Normal newborns already have a blink reflex. After that, these findings are noted:

- Tear glands begin to secrete within the first 2 weeks of life.
- Transient strabismus (deviation of the eye) is a normal finding in the first few months.
- An infant can fixate on an object and follow a bright light or toy by 5 to 6 weeks of age.
- An infant can reach for objects at varying distances at age 3 to 4 months.
- Vision reaches 20/20 when the child is about 4 years old.

Keep abreast of diagnostic tests

Here are some important tests used to diagnose pediatric neurosensory disorders, along with common nursing interventions associated with each test.

Head check

A **basic assessment of cerebral function** includes:

- level of consciousness
- communication
- mental status.

3-D pics

Computed tomography (CT) scan is a radiologic process that produces three-dimensional images. It can be invasive (if contrast medium is used) or noninvasive.

Nursing actions

- Explain the purpose of test to the parents and the child.
- Make sure that the child holds still during the test.
- Make sure that written, informed consent has been obtained if a contrast medium is used.

(Text continues on page 610.)

Cheat sheet

Pediatric neurosensory refresher

ATTENTION DEFICIT HYPERACTIVITY DISORDER

Key signs and symptoms

- Decreased attention span
- Difficulty organizing tasks and activities
- Easily distracted

Key test results

- Complete psychological, medical, and neurologic evaluations rule out other problems.

Key treatments

- Behavioral modification and psychological therapy
- Amphetamines: methylphenidate (Ritalin), dextroamphetamine sulfate (Dexedrine), amphetamine sulfate, and amphetamine aspartate (Adderall)

Key interventions

- Give one simple instruction at a time.
- Provide consistency in child's daily routine.
- Reduce environmental stimuli.

CEREBRAL PALSY

Key signs and symptoms

- Abnormal muscle tone and coordination (the most common associated problem)
- Difficulty sucking or keeping a nipple or food in the mouth
- Infrequent voluntary movement or arm or leg tremors with voluntary movement
- Legs crossed when lifted from behind

Key test results

- Neuroimaging studies determine the site of brain impairment.
- Cytogenic studies (genetic evaluation of the child and other family members) rule out other potential causes.
- Metabolic studies rule out other causes.

Key treatments

- Braces or splints and special appliances, such as adapted eating utensils and a low toilet seat with arms, to help child perform activities independently
- Range-of-motion (ROM) exercises to minimize contractures
- Muscle relaxants or neurosurgery to decrease spasticity, if appropriate

Key interventions

- Assist with locomotion, communication, and educational opportunities.
- Divide tasks into small steps.
- Perform ROM exercises if the child is spastic.

DOWN SYNDROME

Key signs and symptoms

- Flat, broad forehead
- Mild to moderate retardation
- Short stature with pudgy hands
- Small head with slow brain growth
- Small jaw
- Upward slanting eyes

Key test result

- Amniocentesis allows prenatal diagnosis.

Key treatment

- Treatment for coexisting conditions—congenital heart problems, visual defects, or hypothyroidism

Key interventions

- Provide activities appropriate for the child's mental rather than chronological age.
- Set realistic, reachable, short-term goals; break tasks into small steps.
- Provide stimulation and communicate at a level appropriate to the child's mental age rather than chronological age.

HYDROCEPHALUS

Key signs and symptoms

- High-pitched cry
- Rapid increase in head circumference and full, tense, bulging fontanels (before cranial sutures close)

Key test result

- Skull X-rays show thinning of the skull with separation of the sutures and widening of fontanels.

Pediatric neurosensory refresher *(continued)*

HYDROCEPHALUS *(continued)*

Key treatments

- Ventriculoperitoneal shunt insertion to allow cerebrospinal fluid (CSF) to drain from the lateral ventricle in the brain
- Anticonvulsants: carbamazepine (Tegretol), phenobarbital (Luminal), diazepam (Valium), phenytoin (Dilantin)

Key interventions

- Monitor vital signs and intake and output.
- Monitor neurologic status.
- After the shunt is inserted, don't lay the child on the side of the body where it's located.
- Lay the child flat.
- If the caudal end of the shunt must be externalized because of infection, keep the bag at ear level.

MENINGITIS

Key signs and symptoms

- Nuchal rigidity that may progress to opisthotonos
- Positive Brudzinski's sign (flexion of the knees and hips in response to passive neck flexion)
- Positive Kernig's sign (inability to extend leg when hip and knee are flexed)

Key test results

- Lumbar puncture shows increased CSF pressure, cloudy color, increased white blood cell count and protein level, and a decreased glucose level if the meningitis is caused by bacteria.

Key treatments

- Airborne precautions; should be maintained until at least 24 hours of effective antibiotic therapy have elapsed; continued precautions recommended for meningitis caused by *Haemophilus influenzae* or *Neisseria meningitidis*
- Seizure precautions
- Analgesics to treat pain of meningeal irritation
- Corticosteroids such as dexamethasone (Decadron)
- Parenteral antibiotics: ceftazidime (Fortaz), ceftriaxone (Rocephin); possibly intraventricular administration of antibiotics

Key interventions

- Monitor vital signs and intake and output.
- Monitor the child's neurologic status frequently.
- Examine the young infant for bulging fontanels and measure head circumference.

OTITIS MEDIA

Key signs and symptoms

Acute suppurative otitis media

- Fever (mild to very high)
- Severe, deep, throbbing pain (from pressure behind the tympanic membrane)
- Pain that suddenly stops (if tympanic membrane ruptures)
- Signs of upper respiratory tract infection (sneezing, coughing)

Acute secretory otitis media

- Popping, crackling, or clicking sounds on swallowing or with jaw movement
- Sensation of fullness in the ear

Chronic otitis media

- Cholesteatoma (cystlike mass in the middle ear)
- Decreased or absent tympanic membrane mobility
- Painless, purulent discharge in chronic suppurative otitis media

Key test results

Acute suppurative otitis media

- Otoscopy reveals obscured or distorted bony landmarks of the tympanic membrane.

Acute secretory otitis media

- Otoscopy reveals clear or amber fluid behind the tympanic membrane and tympanic membrane retraction, which causes the bony landmarks to appear more prominent. If hemorrhage into the middle ear has occurred, as in barotrauma, the tympanic membrane appears blue-black.

Chronic otitis media

- Otoscopy shows thickening, sometimes scarring, and decreased mobility of the tympanic membrane.

Key treatments

Acute suppurative otitis media

- Myringotomy for children with severe, painful bulging of the tympanic membrane
- Antibiotic therapy, usually amoxicillin (Amoxil)

Acute secretory otitis media

- Inflation of the eustachian tube by performing Valsalva's maneuver several times a day, which may be the only treatment required
- Nasopharyngeal decongestant therapy

Chronic otitis media

- Elimination of eustachian tube obstruction
- Excision of cholesteatoma
- Mastoidectomy
- Antibiotic therapy, usually amoxicillin (Amoxil)

Key interventions

- Watch for and report headache, fever, severe pain, or disorientation.
- Instruct parents not to feed their infant in a supine position or put him to bed with a bottle.

(continued)

Pediatric neurosensory refresher *(continued)*

OTITIS MEDIA *(continued)*

- After myringotomy, maintain drainage flow; place sterile cotton loosely in the external ear and change cotton frequently.
- After tympanoplasty, reinforce dressings and observe for excessive bleeding from the ear canal.
- Warn the child against blowing his nose or getting the ear wet when bathing.

SEIZURE DISORDERS

Key signs and symptoms

- Aura just before the seizure's onset (reports of unusual tastes, feelings, or odors)
- Eyes deviating to a particular side or blinking
- Usually unresponsive during tonic-clonic muscular contractions; may experience incontinence
- Irregular breathing with spasms

Key test result

- EEG results help differentiate epileptic from nonepileptic seizures. Each seizure has a characteristic EEG tracing.

Key treatments

- I.V. diazepam (Valium) or lorazepam (Ativan)
- Phenobarbital (Luminal) or fosphenytoin (Cerebyx)
- Phenytoin (Dilantin) or carbamazepine (Tegretol) to keep neuron excitability below the seizure threshold

Key interventions

- Monitor neurologic status.
- Stay with the child during a seizure.
- Move the child to a flat surface.
- Place the child on his side to allow saliva to drain out.
- Don't try to interrupt the seizure.

SPINA BIFIDA

Key signs and symptoms

Spina bifida occulta

- Dimple on the skin over the spinal defect
- No neurologic dysfunction (usually), except occasional foot weakness or bowel and bladder disturbances

Meningocele

- No neurologic dysfunction (usually)
- Saclike structure protruding over the spine

Myelomeningocele

- Permanent neurologic dysfunction (paralysis below the spinal defect, bowel and bladder incontinence)

Key test results

- Amniocentesis reveals neural tube defect.
- Elevated alpha-fetoprotein levels in mother's blood may indicate the presence of a neural tube defect.
- Acetylcholinesterase measurement can be used to confirm the diagnosis.

Key interventions

- Teach parents how to cope with their infant's physical problems.
- Teach parents how to recognize early signs of complications, such as hydrocephalus, pressure ulcers, and urinary tract infections.

Before surgery

- Watch for signs of hydrocephalus. Measure head circumference daily. Be sure to mark the spot where the measurement was made.
- Watch for signs of meningeal irritation, such as fever and nuchal rigidity.

After surgery

- Watch for hydrocephalus, which commonly follows surgery. Measure the infant's head circumference as ordered.
- Monitor vital signs often.

- If a contrast medium is used, check for allergies to contrast media, shellfish, or iodine.

MRI = More realistic image

Magnetic resonance imaging (MRI) shows the CNS in greater detail than a CT scan. A noniodinated contrast medium may be used to enhance lesions. Advances in MRI allow visualization of cerebral arteries and venous sinuses without administration of a contrast medium.

Nursing actions

- If the child has any surgically implanted metal objects (for example, pins and clips), notify the radiology department because these objects can interfere with the picture.
- Explain the procedure to the parents and the child.
- Make sure the child holds still during the test.

Electrifying activity

Electroencephalography (EEG) shows abnormal electrical activity in the brain (for example, from a seizure, a metabolic disorder, or a drug overdose).

Nursing actions

- Explain the purpose of the test, and make sure the child holds still during the test.

Wavy reflections

Ultrasonography reveals carotid lesions or changes in carotid blood flow and velocity. High-frequency sound waves reflect back the velocity of blood flow, which is then reported as a graphic recording of a waveform.

Nursing actions

- Explain the purpose of the test to the parents and the child.
- Make sure the child holds still during the test.

Fluid check

With **lumbar puncture,** a needle is inserted into the subarachnoid space of the spinal cord, usually between L3 and L4 (or L4 and L5). This allows aspiration of cerebrospinal fluid (CSF) for analysis and for measuring CSF pressure.

Nursing actions

- Before the procedure, make sure that written, informed consent has been obtained.
- Keep the child in a side-lying, knee-chest position during the procedure.
- Have the child rest for 1 hour after the procedure.

Vessel visualization

With **cerebral arteriography,** also known as *angiography,* a catheter is inserted into an artery—usually the femoral artery—and is indirectly threaded up to the carotid artery. Then a radiopaque dye is injected, allowing X-ray visualization of the cerebral vasculature.

Nursing actions

- Explain the procedure to the parents and the child.
- Make sure that written, informed consent has been obtained.
- Identify allergies to contrast media, shellfish, or iodine before the test.
- Make sure the child holds still during the test, and monitor him for allergic reaction.
- Immobilize the site after the test, and monitor it for pulses and evidence of bleeding.
- Monitor neurovascular status distal to the insertion site.

Pressure check

Intracranial pressure (ICP) monitoring is a direct, invasive method of identifying trends in ICP. A subarachnoid screw and an intraventricular catheter convert CSF pressure readings into waveforms that are displayed digitally on an oscilloscope monitor. Another option is to insert a fiber-optic catheter into the ventricle, subarachnoid space, subdural space, or brain parenchyma. Pressure changes are reported digitally or in waveform.

Nursing actions

Before the procedure

- Explain the procedure to the parents and the child.
- Make sure that written, informed consent has been obtained.

After the procedure

- Monitor waveforms and pressure readings. Identify trends and alert the doctor to changes in trends.
- Maintain sterile technique during care of monitoring equipment.
- Monitor the site for signs of infection.

Nerve times

Electromyography detects lower motor neuron disorders, neuromuscular disorders, and nerve damage. A needle inserted into selected muscles at rest and during voluntary contraction picks up nerve impulses and measures nerve conduction time.

Nursing actions

- Explain the procedure to the parents and the child.

• Check the child's medications for those that may interfere with the test (cholinergics, anticholinergics, skeletal muscle relaxants).
• Make sure that written, informed consent has been obtained.
• Make sure the child holds still during the procedure.
• Monitor the site for infection or bleeding after the procedure.

Exploring the ear

Otoscopic examination allows visualization of the canal and inner structures of the ear.

Nursing actions

• Provide a speculum that fits appropriately into the ear canal.
• Help keep the child still during the examination.

Getting an eyeful

Ophthalmoscopic examination helps visualize interior eye structures.

Nursing actions

• Explain the procedure to the parents and the child.
• Allow the child to hold a favorite toy during the test to decrease anxiety and promote cooperation.

Memory jogger

Here's a tip for remembering diagnostic criteria for ADHD: think of a child who can't **SIT** still.

Seven (age by which symptoms appear)

Impaired social or academic function

Two or more settings

Polish up on patient care

Major neurologic disorders in pediatric patients are attention deficit hyperactivity disorder (ADHD), cerebral palsy, Down syndrome, hydrocephalus, meningitis, otitis media, seizure disorder, and spina bifida.

Attention deficit hyperactivity disorder

ADHD, which was previously called *attention deficit disorder,* includes the following long-term behaviors:
• hyperactivity
• impulsiveness
• inattention.

These manifestations occur in all facets of the child's life and frequently worsen when sustained attention is required, for example, during school. To qualify as ADHD, behaviors must be present in two or more settings, must be present before age 7, and must result in a significant impairment in social or academic functioning.

CAUSE

• Deficit in neurotransmitters (possibly)

DATA COLLECTION FINDINGS

• Climbs, runs, or talks excessively
• Decreased attention span
• Difficulty organizing tasks and activities
• Difficulty waiting for turns
• Easily distracted
• Fails to give close attention to school work or activity
• Fails to listen when spoken to directly
• Fidgets or squirms in seat
• Frequent forgetfulness and losing things needed for tasks
• Impulsive behavior
• Unable to follow directions

DIAGNOSTIC FINDINGS

• Complete psychological, medical, and neurologic evaluations rule out other problems.
• To diagnose ADHD, the findings are combined with data from several sources, including parents, teachers, and the child.

NURSING DIAGNOSES

• Imbalanced nutrition: Less than body requirements
• Risk for impaired parenting
• Risk for injury

TREATMENT

• Behavioral modification and psychological therapy
• Interdisciplinary interventions: pathologic assessment and diagnosis of specific learning needs

Drug therapy

• Amphetamines: methylphenidate (Ritalin); dextroamphetamine sulfate (Dexedrine), saccharate, amphetamine sulfate, and amphetamine aspartate (Adderall) to help the child concentrate
• Selective norepinephrine reuptake inhibitor: atomoxetine (Strattera)
• Other medications: imipramine (Tofranil), clonidine (Catapres)

INTERVENTIONS AND RATIONALES

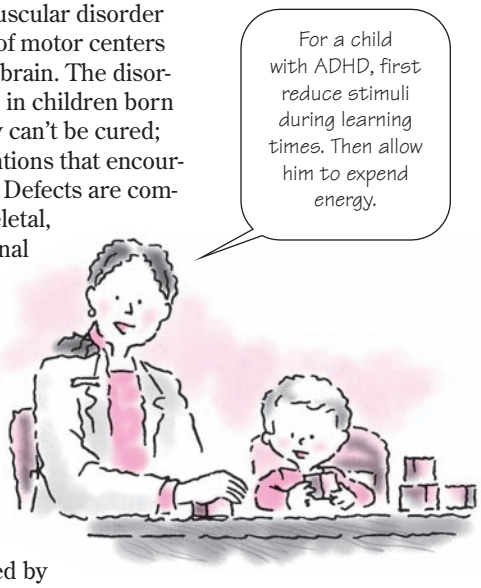
• Monitor growth. *If the child is receiving methylphenidate, growth may be slowed.*
• Give one simple instruction at a time *so the child can successfully complete the task, which promotes self-esteem.*
• Give medications in the morning and at lunch *to avoid interfering with sleep.*
• Ensure adequate nutrition; *medications and hyperactivity may cause increased nutrient needs.*
• Reduce environmental stimuli *to decrease distraction.*
• Formulate a schedule for the child *to provide consistency and routine.*

Teaching topics

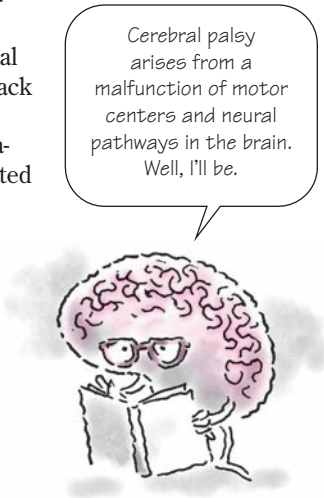
• Allowing the child to expend energy after being in restrictive environments such as school
• Monitoring for adverse reactions to medications
• Structuring learning to minimize distractions
• Taking breaks from caregiving to avoid strain
• Teaching important material in the morning (when medication levels peak)

Cerebral palsy

Cerebral palsy is a neuromuscular disorder arising from a malfunction of motor centers and neural pathways in the brain. The disorder is most commonly seen in children born prematurely. Cerebral palsy can't be cured; treatment includes interventions that encourage optimum development. Defects are common, including musculoskeletal, neurologic, GI, and nutritional defects as well as other systemic complications (abnormal reflexes, fatigue, growth failure, genitourinary complaints, respiratory infections).



Classifications of cerebral palsy include:
• ataxic type—the least common type; essentially a lack of coordination caused by disturbances in movement and balance
• athetoid type—characterized by involuntary, uncoordinated motion with varying degrees of muscle tension (Children with this type of cerebral palsy experience writhing muscle contractions whenever they attempt voluntary movement. Facial grimacing, poor swallowing, and tongue movements cause drooling and poor speech articulation. Despite their abnormal appearance, these children commonly have average or above-average intelligence.)
• rigid type—an uncommon type of cerebral palsy characterized by rigid postures and lack of active movement
• spastic type—the most common type; featuring hyperactive stretch reflex in associated muscle groups, hyperactive deep tendon reflexes, rapid involuntary muscle contraction and relaxation, contractions affecting extensor muscles, and scissoring (the child's legs are crossed and the toes are pointed down, so the child stands on his toes).
• mixed type—more than one type of cerebral palsy. (These children are usually severely disabled.)



Abnormal muscle tone and coordination characterize all forms of cerebral palsy.

CAUSES

- Anoxia before, during, or after birth
- Infection
- Trauma (hemorrhage)

Risk factors

- Low birth weight
- Low Apgar score at 5 minutes
- Metabolic disturbances
- Seizures

DATA COLLECTION FINDINGS

All types

- Abnormal muscle tone and coordination (the most common associated problem)
- Dental anomalies
- Mental retardation of varying degrees in 18% to 50% of cases (Most children with cerebral palsy have at least a normal IQ but can't demonstrate it on standardized tests.)
- Seizures
- Speech, vision, or hearing disturbances
- Difficulty sucking or keeping a nipple or food in the mouth
- Infrequent voluntary movement or arm or leg tremors with voluntary movement
- Legs crossed when lifted from behind (rather than being pulled up or "bicycling" as with a normal infant)
- Difficulty separating legs, making diaper changing difficult
- Persistent use of only one hand (as infant ages, good hand use but poor leg use)

Although cerebral palsy can't be cured, treatment encourages the child to reach his full potential.

Ataxic cerebral palsy

- Poor balance and muscle coordination
- Unsteady, wide-based gait

Athetoid cerebral palsy

- Slow state of writhing muscle contractions whenever voluntary movement is attempted
- Facial grimacing
- Poor swallowing
- Drooling
- Poor speech articulation

Rigid cerebral palsy

- Rigid posture
- Lack of active movement

Spastic cerebral palsy

- Hyperactive stretch reflex in associated muscle groups
- Hyperactive deep tendon reflexes
- Rapid involuntary muscle contraction and relaxation
- Contractures affecting the extensor muscles
- Scissoring

Mixed cerebral palsy

- Signs of more than one type of cerebral palsy
- Severely disabled

DIAGNOSTIC FINDINGS

- Neuroimaging studies determine the site of brain impairment.
- Cytogenic studies (genetic evaluation of the child and other family members) rule out other potential causes.
- Metabolic studies rule out other causes.

NURSING DIAGNOSES

- Impaired physical mobility
- Delayed growth and development
- Impaired verbal communication

TREATMENT

- High-calorie diet, if appropriate
- Artificial urinary sphincter for the incontinent child who can use hand controls
- Braces or splints and special appliances, such as adapted eating utensils and a low toilet seat with arms, to help child perform activities independently
- Neurosurgery to decrease spasticity, if appropriate
- Orthopedic surgery to correct contractures
- Range-of-motion (ROM) exercises to minimize contractures
- Special feeding techniques to overcome abnormal tongue movements and promote swallowing

Drug therapy

- Muscle relaxants to decrease spasticity, if appropriate
- Anticonvulsants: phenytoin (Dilantin), phenobarbital (Luminal)

INTERVENTIONS AND RATIONALES

- Assist with locomotion, communication, and educational opportunities *to enable the child to attain optimal developmental level.*
- Increase caloric intake for the child with increased motor function *to keep up with increased metabolic needs.*
- Make food easy to manage *to decrease stress during mealtimes.*
- Promote normal swallowing using special feeding techniques *to prevent inadequate nutritional intake.*
- Provide a safe environment, for example, by using protective headgear or bed pads *to prevent injury.*
- Provide rest periods *to promote rest and reduce metabolic needs.*
- Perform ROM exercises if the child is spastic *to maintain proper body alignment and mobility of joints.*
- Promote age-appropriate mental activities and incentives for motor development *to promote growth and development.*
- Divide tasks into small steps *to promote self-care and activity and increase self-esteem.*
- Refer the child for speech, nutrition, and physical therapy *to maintain or improve functioning.*
- Use assistive communication devices if the child can't speak *to promote a positive self-concept.*

Teaching topics

- Contacting appropriate social service agencies, child development specialist, mental health services, home care assistance
- Understanding the child's condition and prognosis

Down syndrome

The first disorder researchers attributed to a chromosomal aberration, Down syndrome is characterized by:

- mental retardation
- dysmorphic facial features
- other distinctive physical abnormalities

(60% of patients have congenital heart defects, respiratory infections, chronic myelogenous leukemia, and a weak immune response to infection).

CAUSE

- Genetic nondisjunction, with three chromosomes on the 21st pair (total of 47 chromosomes), known as trisomy

Risk factors

- Maternal age (the older the mother, the greater the risk of genetic nondisjunction)

DATA COLLECTION FINDINGS

- Brushfield's spots (marbling and speckling of the iris)
- Flat, broad forehead
- Flat nose and low-set ears
- Hypotonia
- Mild to moderate retardation
- Protruding tongue (because of a small oral cavity)
- Short stature with pudgy hands
- Simian crease (a single crease across the palm)
- Small head with slow brain growth
- Small jaw
- Upward slanting eyes

DIAGNOSTIC FINDINGS

- Amniocentesis allows prenatal diagnosis. It's recommended for women older than age 34 regardless of a negative family history, or a woman of any age if she or the father carries a translocated chromosome.
- Karyotype shows the specific chromosomal abnormality.

NURSING DIAGNOSES

- Delayed growth and development
- Risk for injury
- Risk for aspiration

TREATMENT

- Treatment for coexisting conditions—congenital heart problems, visual defects, or hypothyroidism
- Skeletal, immunologic, metabolic, biochemical, and oncologic problems treated according to specific problem

Drug therapy

• Megavitamin therapy (controversial) to promote growth and development potential

INTERVENTIONS AND RATIONALES

• Provide activities and toys appropriate for the child's mental rather than chronological age *to support optimal development.*

• Set realistic, reachable, short-term goals; break tasks into small steps *to encourage their successful accomplishment.*

• Use behavior modification, if applicable, *to promote safety and prevent injury to the child and others.*

• Provide stimulation and communicate at a level appropriate to the child's mental age rather than chronological age *to promote a healthy emotional environment.*

• Provide a safe environment *to prevent injury.*

• Mainstream daily routines *to promote normalcy.*

• Provide emotional support to the parents *to promote healthy coping skills and reduce anxiety.*

Teaching topics

• Contacting early intervention programs

• Contacting support groups for caregivers

• Establishing self-care skills to promote independence

With hydrocephalus, an excessive amount of CSF accumulates in the ventricular spaces of the brain.

Hydrocephalus

Hydrocephalus is an increase in the amount of CSF in the ventricles and subarachnoid spaces of the brain. The ventricles become dilated because of an imbalance in the rate of production and absorption of CSF. This condition may be congenital or acquired.

With noncommunicating hydrocephalus, an obstruction occurs in the free circulation of CSF, causing increased pressure on the brain or spinal cord. In most cases, congenital hydrocephalus is noncommunicating.

Communicating hydrocephalus involves the free flow of CSF between the ventricles and the spinal theca. Increased pressure on the spinal cord is caused by defective absorption of CSF.

CAUSES

• Arnold-Chiari malformation (downward displacement of cerebellar components through the foramen magnum into the cervical spinal canal); common in hydrocephalus with spina bifida

• Overproduction of CSF by the choroid plexus

• Scarring, congenital anomalies, or hemorrhage; causes CSF to be absorbed abnormally after it reaches the subarachnoid space (in communicating hydrocephalus)

• Tumors, hemorrhage, or structural abnormalities; block CSF flow, causing fluid to accumulate in the ventricles (in noncommunicating hydrocephalus)

DATA COLLECTION FINDINGS

• "Cracked pot" sound when the skull is percussed

• Distended scalp veins

• High-pitched cry

• Inability to support the head when upright

• Irritability or lethargy; decreased attention span

• Rapid increase in head circumference and full, tense, bulging fontanels (before cranial sutures close)

• Sunset sign (sclera visible above the iris; a late sign)

• Widening suture lines

• Vomiting (usually upon awakening in the morning and not related to food intake)

DIAGNOSTIC FINDINGS

• Angiography, CT scan, and MRI differentiate hydrocephalus from intracranial lesions and may demonstrate Arnold-Chiari malformation.

• Light reflects off the opposite side of the skull with skull transillumination.

• Skull X-rays show thinning of the skull with separation of the sutures and widening of fontanels.

NURSING DIAGNOSES

• Risk for injury

• Delayed growth and development

• Decreased intracranial adaptive capacity

TREATMENT

- Ventriculoperitoneal shunt insertion to allow CSF to drain from the lateral ventricle in the brain

Drug therapy

- Anticonvulsants: carbamazepine (Tegretol), phenobarbital (Luminal), diazepam (Valium), phenytoin (Dilantin)

INTERVENTIONS AND RATIONALES

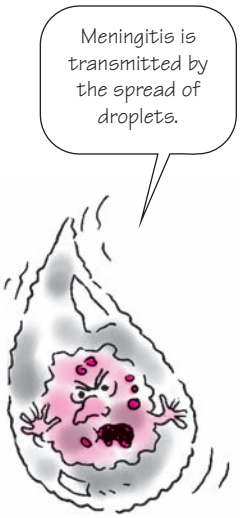
- Measure head circumference *to aid in diagnosis of hydrocephalus.*
- Monitor vital signs and intake and output *to evaluate for fluid volume excess, which can further elevate ICP.*
- Monitor neurologic status *to identify changes indicative of increased ICP.*
- After the shunt is inserted, don't position the child on the side of the body where it's located *to promote CSF drainage and prevent shunt occlusion.*
- Position the child flat *to avoid rapid decompression.*
- Observe for shunt blockage with increased ICP (identified by increased head circumference and full fontanel) *to prevent complications.*
- Observe for signs of infection. *Signs of shunt infection usually occur within the first month after shunt insertion.*
- If the caudal end of the shunt must be externalized because of infection, keep the bag at ear level *to promote CSF drainage.*
- Support the head when child is upright *to prevent injury and promote CSF drainage.*
- Provide proper skin care to the head; turn the patient's head frequently *to avoid skin breakdown.*

Teaching topics

- Recognizing signs of increasing ICP
- Understanding care required after shunt insertion

Meningitis

Meningitis is an inflammation of the brain and spinal cord meninges. It's most common in infants and toddlers. The incidence of meningitis is greatly reduced with routine *Haemophilus influenzae* type B vaccine.



CAUSES

- Viral or bacterial agents transmitted by the spread of droplets (organisms enter the blood from nasopharynx or middle ear)

DATA COLLECTION FINDINGS

- Coma
- Delirium
- Fever
- Headache
- High-pitched cry
- Irritability
- Nuchal rigidity that may progress to opisthotonos (arching of the back)
- Gradual or abrupt onset following an upper respiratory infection
- Petechial or purpuric lesions possibly present in bacterial meningitis
- Positive Brudzinski's sign (flexion of the knees and hips in response to passive neck flexion)
- Positive Kernig's sign (inability to extend leg when hip and knee are flexed)
- Projectile vomiting
- Seizures

DIAGNOSTIC FINDINGS

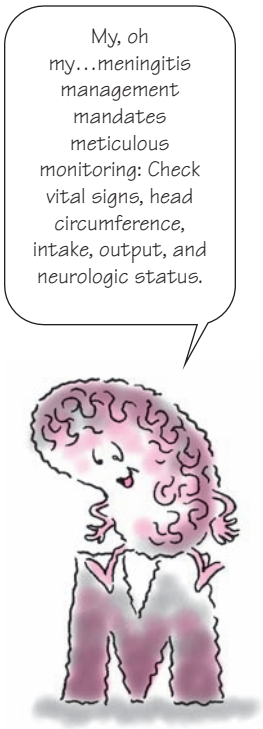
- Lumbar puncture shows increased CSF pressure, cloudy color, increased WBC count and protein level, and a decreased glucose level if the meningitis is caused by bacteria.

NURSING DIAGNOSES

- Decreased intracranial adaptive capacity
- Ineffective breathing pattern
- Risk for injury

TREATMENT

- Burr holes to evacuate subdural effusion, if present
- Airborne precautions; should be maintained until at least 24 hours of effective antibiotic therapy have elapsed; continued precautions



recommended for meningitis caused by *H. influenzae* or *Neisseria meningitidis*
- Hypothermia blanket
- Oxygen therapy, may require intubation and mechanical ventilation to induce hyperventilation to decrease ICP
- Seizure precautions
- Treatment for coexisting conditions

Drug therapy
- Analgesics to treat pain of meningeal irritation
- Corticosteroids: dexamethasone (Decadron)
- Parenteral antibiotics: ceftazidime (Fortaz), ceftriaxone (Rocephin); possibly intraventricular administration of antibiotics

INTERVENTIONS AND RATIONALES
- Monitor vital signs and intake and output *to assess for fluid volume excess.*
- Monitor the child's neurologic status frequently *to detect signs of increased ICP.*
- Provide a dark and quiet environment. *Environmental stimuli can increase ICP or stimulate seizure activity.*
- Maintain seizure precautions *to prevent injury.*
- Administer medications as ordered *to combat infection and decrease ICP.*
- Move the child gently *to prevent a rise in ICP.*
- Maintain isolation precautions, as ordered, *to prevent the spread of infection.*
- Provide emotional support for the family *to decrease anxiety.*
- Examine the young infant for bulging fontanels and measure head circumference; *hydrocephalus is a complication that can result from meningitis.*

Teaching topics
- Understanding the importance of isolation and sanitation

Otitis media

Otitis media is inflammation of the middle ear that's sometimes accompanied by infection. The fluid presses on the tympanic membrane, causing pain and, possibly, rupture or perforation. This condition may be chronic or acute and suppurative or secretory.

Acute otitis media is common in children. Its incidence increases during the winter months, paralleling the seasonal increase in nonbacterial respiratory tract infections. With prompt treatment, the prognosis for acute otitis media is excellent; however, prolonged accumulation of fluid in the middle ear cavity causes chronic otitis media and, possibly, perforation of the tympanic membrane.

CAUSES
All types
- Obstructed eustachian tube
- Wider, shorter, more horizontal eustachian tubes and increased lymphoid tissue in children as well as other anatomic anomalies

Acute suppurative otitis media
- Bacterial infection with pneumococci, *H. influenzae* (the most common cause in children under age 6), *Moraxella (Branhamella) catarrhalis*, beta-hemolytic group A streptococci, staphylococci (most common cause in children age 6 or older), or gram-negative bacteria
- Respiratory tract infection, allergic reaction, nasotracheal intubation, or position changes that allow nasopharyngeal flora to reflux through the eustachian tube and colonize the middle ear

Chronic suppurative otitis media
- Inadequate treatment of acute otitis media episodes
- Infection by resistant strains of bacteria
- Tuberculosis (rarely)

Acute secretory otitis media
- Barotrauma (pressure injury caused by inability to equalize pressure between the environment and the middle ear), as occurs during rapid aircraft descent in a person with upper respiratory tract infection or during rapid underwater ascent in scuba diving (barotitis media)
- Obstruction of the eustachian tube secondary to eustachian tube dysfunction from viral infection or allergy, which causes a

buildup of negative pressure in the middle ear that promotes transudation of sterile serous fluid from blood vessels in the membrane of the middle ear

Chronic secretory otitis media

• Persistent eustachian tube dysfunction from mechanical obstruction (adenoidal tissue overgrowth or tumors), edema (allergic rhinitis or chronic sinus infection), or inadequate treatment of acute suppurative otitis media

DATA COLLECTION FINDINGS

Acute suppurative otitis media

• Bulging and erythema of tympanic membrane
• Dizziness
• Ear pain that suddenly stops (if tympanic membrane ruptures)
• Fever (mild to very high)
• Hearing loss (usually mild and conductive)
• Nausea and vomiting
• Pain pattern (pulling the pinna doesn't exacerbate pain)
• Pulling on the ear
• Purulent drainage in the ear canal from tympanic membrane rupture
• Severe, deep, throbbing ear pain (from pressure behind the tympanic membrane)
• Signs of upper respiratory tract infection (sneezing and coughing)
• Tinnitus (ringing in the ears)

Acute secretory otitis media

• Echo heard by child when speaking; vague feeling of top-heaviness (caused by accumulation of fluid)
• Popping, crackling, or clicking sounds on swallowing or with jaw movement
• Sensation of fullness in the ear
• Severe conductive hearing loss

Chronic otitis media

• Cholesteatoma (cystlike mass in the middle ear)
• Decreased or absent tympanic membrane mobility
• Painless, purulent discharge in chronic suppurative otitis media
• Thickening and scarring of the tympanic membrane

DIAGNOSTIC FINDINGS

Acute suppurative otitis media

• Culture of the ear drainage identifies the causative organism.
• Otoscopy reveals obscured or distorted bony landmarks of the tympanic membrane.
• Pneumatoscopy may show decreased tympanic membrane mobility, but this procedure is painful with an obviously bulging, erythematous tympanic membrane.

Acute secretory otitis media

• Otoscopy reveals clear or amber fluid behind the tympanic membrane and tympanic membrane retraction, which causes the bony landmarks to appear more prominent. If hemorrhage into the middle ear has occurred, as in barotrauma, the tympanic membrane appears blue-black.

Chronic otitis media

• Otoscopy shows thickening, sometimes scarring, and decreased mobility of the tympanic membrane.
• Pneumatoscopy shows decreased or absent tympanic membrane movement.

NURSING DIAGNOSES

• Hyperthermia
• Acute pain
• Disturbed sensory perception (auditory)

TREATMENT

Acute suppurative otitis media

• Myringotomy for patients with severe, painful bulging of the tympanic membrane

Drug therapy

• Antibiotic therapy, usually amoxicillin (Amoxil); antibiotics must be used with discretion to prevent development of resistant strains of bacteria in patients with recurring otitis media
• Amoxicillin-clavulanate potassium (Augmentin) in areas with a high incidence of beta-lactamase-producing *H. influenzae* and in patients who aren't responding to amoxicillin
• Cefaclor (Ceclor) or co-trimoxazole (Bactrim) for patients allergic to penicillin derivatives

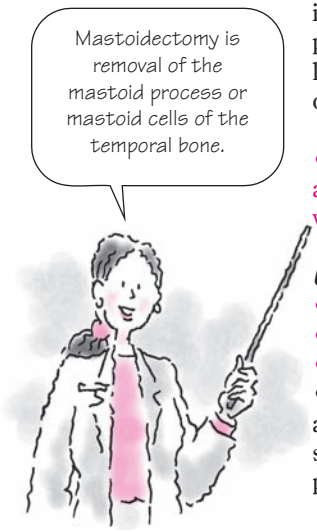
• Prevention: broad-spectrum antibiotics, such as amoxicillin-clavulanate potassium (Augmentin) or cefuroxime (Ceftin) in high-risk patients

Acute secretory otitis media

• Concomitant treatment of the underlying cause, such as elimination of allergens or adenoidectomy for hypertrophied adenoids
• Inflation of the eustachian tube by performing Valsalva's maneuver several times a day, which may be the only treatment required
• Myringotomy and aspiration of middle ear fluid if decongestant therapy fails, followed by insertion of a polyethylene tube into the tympanic membrane for immediate and prolonged equalization of pressure; the tube falls out spontaneously after 9 to 12 months

Drug therapy

• Nasopharyngeal decongestant therapy for at least 2 weeks; sometimes used indefinitely, with periodic evaluation



Chronic otitis media

• Elimination of eustachian tube obstruction
• Excision of cholesteatoma
• Mastoidectomy
• Treatment of otitis externa; myringoplasty and tympanoplasty to reconstruct middle ear structures when thickening and scarring are present

Drug therapy

• Broad-spectrum antibiotics, such as amoxicillin-clavulanate potassium (Augmentin) or cefuroxime (Ceftin), for exacerbations of otitis media

INTERVENTIONS AND RATIONALES

• Monitor vital signs *to determine baseline values and detect early signs of worsening infection.*
• Watch for and report headache, fever, severe pain, or disorientation *to detect early signs of complications.*
• Administer analgesics as needed, or apply heat to the ear *to relieve pain.*
• Identify and treat allergies *to prevent recurrences of otitis media.*
• Encourage the child and his parents to complete the prescribed course of antibiotic treatment *to prevent reinfection.*
• For children with acute secretory otitis media, watch for and immediately report pain and fever *to detect early signs of secondary infection.*
• Tell the parents to avoid feeding the infant in a supine position or putting him to bed with a bottle *to prevent reflux of nasopharyngeal flora.*
• Encourage the child to perform Valsalva's maneuver several times daily *to promote eustachian tube patency.*
• After myringotomy, maintain drainage flow; place sterile cotton loosely in the external ear *to absorb drainage,* and change the cotton frequently *to prevent infection.*
• After tympanoplasty, reinforce dressings, and observe for excessive bleeding from the ear canal *to determine fluid volume deficit.*

Teaching topics

• Avoiding blowing the nose or getting the ear wet when bathing
• Instilling nasopharyngeal decongestants properly, if prescribed
• Recognizing upper respiratory tract infections and getting early treatment
• Returning for follow-up examination after completion of antibiotic therapy

Seizure disorder

A seizure is a sudden, episodic, involuntary alteration in consciousness, motor activity, behavior, sensation, or autonomic function. (See *Classifying seizures.*) Epilepsy is a common, recurrent seizure disorder.

CAUSES

• Excessive neuronal discharges (epilepsy)
• Hyperexcitable nerve cells that surpass the seizure threshold
• Neurons overfiring without regard to stimuli or need

DATA COLLECTION FINDINGS

• Aura just before the seizure's onset (reports of unusual tastes, feelings, or odors)
• Eyes deviating to a particular side or blinking
• Irregular breathing with spasms

Classifying seizures

Seizures can take various forms, depending on their origin and whether they're localized to one area of the brain, as occurs in partial seizures, or occur in both hemispheres, as happens in generalized seizures. This chart describes each type of seizure and lists common signs and symptoms.

Type	Description	Signs and symptoms
Partial		
Simple partial	Symptoms confined to one hemisphere	Possibly motor (change in posture), sensory (hallucinations), or autonomic (flushing, tachycardia) symptoms; no loss of consciousness
Complex partial	Begins in one focal area but spreads to both hemispheres (more common in adults)	Loss of consciousness, aura of visual disturbances, postictal symptoms
Generalized		
Absence (petit mal)	Sudden onset; lasts 5 to 10 seconds; can have 100 daily; precipitated by stress, hyperventilation, hypoglycemia, or fatigue; differentiated from daydreaming	Loss of responsiveness but continued ability to maintain posture control and not fall; twitching eyelids; lip smacking; no postictal symptoms
Myoclonic	Movement disorder (not a seizure) that occurs as child awakens or falls asleep; may be precipitated by touch or visual stimuli; may be focal or generalized and symmetrical or asymmetrical	No loss of consciousness; sudden, brief, shocklike involuntary contraction of one muscle group
Clonic	Opposing muscles contract and relax alternately in rhythmic pattern; may occur in one limb more than others	Mucus production
Tonic	Muscles are maintained in continuous contracted state (rigid posture)	Variable loss of consciousness; pupils dilate; eyes roll up; glottis closes; possible incontinence; may foam at mouth
Tonic-clonic (grand mal, major motor)	Violent total body seizure	Aura; tonic first (20 to 40 seconds), followed by clonic; postictal symptoms
Atonic	Drop and fall attack; needs to wear protective helmet	Loss of posture tone
Akinetic	Sudden, brief loss of muscle tone or posture	Temporary loss of consciousness

(continued)

Classifying seizures *(continued)*

Type	Description	Signs and symptoms
Miscellaneous		
Febrile	Seizure threshold lowered by elevated temperature; occurs when temperature is rapidly rising; only one seizure per fever; common in 4% of population younger than age 5	Lasts less than 5 minutes; generalized, transient, and nonprogressive; doesn't generally result in brain damage; EEG is normal after 2 weeks
Status epilepticus	Prolonged or frequent repetition of seizures without interruption; results in anoxia and cardiac and respiratory arrest	Consciousness not regained between seizures; lasts more than 30 minutes

• Usually lack of responsiveness during tonic-clonic muscular contractions, possibly accompanied by incontinence
• May be disoriented to time and place, drowsy, and uncoordinated immediately after a seizure

DIAGNOSTIC FINDINGS

• EEG results help differentiate epileptic from nonepileptic seizures. Each seizure has a characteristic EEG tracing.

NURSING DIAGNOSES

• Ineffective airway clearance
• Risk for injury
• Disturbed sensory perception (tactile)

TREATMENT

• Drug therapy; if not responsive, ablative therapy
• Supportive care (maintaining airway, protecting from injury) until seizure ends
• Ketogenic diet when drug therapy fails

Drug therapy

• Sedatives: I.V. diazepam (Valium) or lorazepam (Ativan)
• Anticonvulsants: phenobarbital (Luminal) or fosphenytoin (Cerebyx); phenytoin (Dilantin), or carbamazepine (Tegretol) to keep neuron excitability below the seizure threshold

INTERVENTIONS AND RATIONALES

• Monitor vital signs *to determine baseline values and detect any changes.*
• Monitor neurologic status *to detect changes.*
• Stay with the child during a seizure *to prevent injury.*
• Move the child to a flat surface *to prevent falling.*
• Place the child on his side to allow saliva to drain out *to ensure a patent airway.*
• Don't try to interrupt the seizure *to promote safety.*
• Gently support the head and keep the child's hands from inflicting self-harm, but don't restrain the child *to prevent injury.*
• Don't use tongue blades; *use of tongue blades during seizure activity may cause trauma to the mouth and result in airway obstruction from an aspirated tooth or laryngospasm.*
• Reduce external stimuli *to avoid worsening seizure activity.*
• Loosen tight clothing *to promote comfort.*
• Record seizure activity. *Description of seizure activity helps to diagnose the type, which will aid in developing a treatment plan.*
• Pad the crib or bed *to prevent injury.*
• Monitor serum levels of anticonvulsant medications, such as phenytoin, *to prevent toxicity or subtherapeutic levels.*

Teaching topics

• Controlling seizures
• Instituting safety measures during seizure activity

Spina bifida

Spina bifida has two main forms. Spina bifida occulta, the more common and less severe form, is characterized by incomplete closure of one or more vertebrae without protrusion of the spinal cord or meninges (membranes covering the spinal cord). Spina bifida cystica, the more severe form, is distinguished by incomplete closure of one or more vertebrae that causes protrusion of the spinal contents in an external sac or cystic lesion.

Spina bifida cystica has two classifications:

meningocele, an external sac that contains meninges and CSF

myelomeningocele, an external sac that contains meninges, CSF, and a portion of the spinal cord or nerve roots.

CAUSES

- Combination of genetic and environmental factors
- Exposure to a teratogen
- Part of a multiple malformation syndrome (for example, chromosomal abnormalities such as trisomy 18 or 13 syndrome)
- Low intake of folic acid by mother before and during pregnancy

DATA COLLECTION FINDINGS

Spina bifida occulta

- Dimple on the skin over the spinal defect
- No neurologic dysfunction (usually), except occasional foot weakness or bowel and bladder disturbances
- Port wine nevi on the skin over the spinal defect
- Soft fatty deposits on the skin over the spinal defect
- Trophic skin disturbances (ulcerations, cyanosis)
- Tuft of hair on the skin over the spinal defect

Meningocele

- No neurologic dysfunction (usually)
- Saclike structure protruding over the spine

Myelomeningocele

- Arnold-Chiari syndrome
- Clubfoot
- Curvature of the spine
- Knee contractures
- Permanent neurologic dysfunction (paralysis below the spinal defect, bowel and bladder incontinence)
- Possible mental retardation
- Saclike structure protruding over the spine

DIAGNOSTIC FINDINGS

- Amniocentesis reveals neural tube defect.
- Elevated alpha-fetoprotein levels in mother's blood may indicate the presence of a neural tube defect.
- Acetylcholinesterase measurement can be used to confirm the diagnosis.
- After birth, spinal X-ray can show the bone defect.
- Fetal karyotype should be done in addition to the biochemical tests because of the association of neural tube defects with chromosomal abnormalities.
- Myelography can differentiate spina bifida from other spinal abnormalities, especially spinal cord tumors.
- Ultrasound may identify the open neural tube or ventral wall defect.

NURSING DIAGNOSES

- Delayed growth and development
- Impaired physical mobility
- Risk prone health behavior

TREATMENT

- Meningocele: surgical closure of the protruding sac and continual assessment of growth and development
- Myelomeningocele: repair of the sac (doesn't reverse neurologic deficits) and supportive measures to promote independence and prevent further complications
- Spina bifida occulta: usually no treatment

INTERVENTIONS AND RATIONALES

Before surgery

- Hold and cuddle the infant on your lap and position him on his abdomen; handle the infant carefully, and don't apply pressure to the defect *to prevent injury at the site of the defect.*

• Clean the defect, inspect it often, and cover it with sterile dressings moistened with sterile normal saline solution *to prevent infection*.
• Usually, the infant can't wear a diaper or a shirt until after surgical correction *because it will irritate the sac,* so keep him warm in an infant Isolette *to prevent hypothermia*.
• Watch for signs of hydrocephalus. Measure head circumference daily. Be sure to mark the spot where the measurement was made *to ensure accurate readings.*
• Watch for signs of meningeal irritation, such as fever and nuchal rigidity, *to detect signs of meningitis.*
• Perform passive range-of-motion exercises and casting *to minimize contractures. To prevent hip dislocation,* moderately abduct the hips with a pad between the knees, or with sandbags and ankle rolls.
• Monitor intake and output. Watch for decreased skin turgor and dryness *to detect dehydration.*
• Provide a diet high in calories and protein *to ensure adequate nutrition*.

After surgery

• Watch for hydrocephalus, which commonly follows surgery. Measure the infant's head circumference, as ordered, *to detect signs of hydrocephalus and prevent associated complications.*
• Monitor vital signs often *to detect early signs of shock, infection, and increased ICP.*
• Change the dressing regularly, as ordered, and check for and report any signs of drainage, wound rupture, and infection *to promote early treatment and prevent complications.*
• Place the infant in the prone position *to protect and assess the site*.
• If leg casts have been applied to treat deformities, watch for signs that the child is outgrowing them. Regularly check distal pulses *to ensure adequate circulation.*
• When spina bifida is diagnosed prenatally, refer the prospective parents to a genetic counselor, *who can provide information and support the couple's decisions on how to manage the pregnancy.*

Teaching topics

• Handling the infant without applying pressure to the defect
• Coping with the infant's physical problems
• Recognizing early signs of complications, such as hydrocephalus, pressure ulcers, and urinary tract infections
• Maintaining a positive attitude and working through feelings of guilt, anger, and helplessness
• Conducting intermittent catheterization and conduit hygiene
• Recognizing developmental lags (a possible result of hydrocephalus)
• Ensuring maximum mental development
• Planning activities appropriate to the child's age and abilities

Pump up on practice questions

1. The nurse is collecting data on a child who may have meningitis. For which findings should the nurse watch?

1. Flat fontanel
2. Irritability, fever, and vomiting
3. Jaundice, drowsiness, and refusal to eat
4. Negative Kernig's sign

Answer: 2. Data collection findings associated with acute bacterial meningitis include irritability, fever, and vomiting along with seizure activity. Fontanels would be bulging as ICP rises. Jaundice, drowsiness, and refusal to eat may indicate a GI disturbance rather than meningitis. Kernig's sign would be present due to meningeal irritation.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

2. The nurse is collecting data on a child who may have a seizure disorder. Which of the following is a description of an absence seizure?

1. Sudden, momentary loss of muscle tone
2. Minimal or no alteration in muscle tone, with a brief loss of responsiveness
3. Loss of muscle tone and temporary loss of consciousness
4. Brief, sudden contraction of a muscle or muscle group

Answer: 2. Absence seizures are characterized by a brief loss of responsiveness with minimal or no alteration in muscle tone. They may go unrecognized because the child's behavior changes very little. A sudden, momentary loss of muscle tone describes atonic seizures. Loss of muscle tone and temporary loss of consciousness characterize akinetic seizures. A brief, sudden contraction of muscles describes a myoclonic seizure.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

3. The nurse is caring for a child who's experiencing a seizure. Which nursing intervention takes highest priority when caring for this child?

1. Protect the child from injury.
2. Use a padded tongue blade to protect the airway.
3. Shout at the child to end the seizure.
4. Allow seizure activity to end without interference.

Answer: 1. The nurse should identify the seizure type and protect the child from injury. A padded tongue blade should never be used because it can cause damage to the mouth and airway. Shouting will only agitate or confuse the child. Interfering with seizure activity may cause injury to the child. Allowing the seizure activity to end without interference may cause the child injury. The nurse should position the child on his side to ensure a patent airway and place the child on the ground if he's likely to fall and sustain injury.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

4. The nurse is caring for a child with spina bifida. Which factor determines the extent of sensory and motor function loss in the lower limbs of the child?

1. Maternal age at conception
2. Degree of spinal cord abnormality
3. Uterine environmental factors such as cloudy amniotic fluid
4. Time frame from diagnosis to birth of the infant

Answer: 2. The extent of motor and sensory loss primarily depends on the degree of spinal cord abnormality. Secondarily, it depends on traction or stretch resulting from an abnormally tethered cord, trauma to exposed neural tissue during delivery, and postnatal damage resulting from drying or infection of the neural plate. Maternal age and uterine environment haven't been identified as factors. The time from diagnosis to birth isn't related.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

5. The nurse is caring for an infant with spina bifida. Which data collection findings suggest hydrocephalus?

1. Depressed fontanels and suture lines
2. Deep-set eyes, which appear to look upward only
3. Rapid increase in head size and irritability
4. Motor and sensory dysfunction in the foot and leg

Answer: 3. Hydrocephalus is an increase in the amount of CSF in the ventricles and subarachnoid spaces of the brain. Data collection findings associated with hydrocephalus include a rapid increase in head size, irritability, suture line separation, and bulging fontanels. The eyes appear to look downward only, with the cornea prominent over the iris (sunset sign). The loss of sensory and motor function is related to the spinal cord defect of spina bifida—not hydrocephalus.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

6. The nurse is teaching a father whose infant has had several episodes of otitis media. Which statement made by the father indicates that he needs further teaching?

1. "Children who live in homes where family members smoke have fewer infections."
2. "The eustachian tube in infants is shorter and less angled than in older children."
3. "Breast-feeding is one way to help decrease the number of infections."
4. "I wrap him up and always put a hat on him when we go out."

Answer: 1. Children who live in households where smoking occurs have more, not fewer, respiratory infections that lead to otitis media.

The other statements about otitis media are correct.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Application

7. The school nurse is monitoring several children with ADHD who are taking methylphenidate (Ritalin). The nurse should conduct monthly follow-up examinations to monitor:

1. if the child is experiencing a dry mouth.
2. if the child is growing in height.
3. the parent's coping abilities from the child's perspective.
4. when the child is taking the medication.

Answer: 2. Common adverse reactions to methylphenidate include slowed growth in height, sleeplessness, decreased appetite, and crying. Dry mouth is a common adverse reaction to tricyclic antidepressants. Knowing how the parents are coping from the child's perspective may be helpful information, but it isn't the most important. Knowing when the child takes the medication would be important if the child has problems with sleeplessness.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

8. The nurse is teaching the mother of a child with ADHD how to manage the child. Which statement by the mother indicates that she needs further teaching?

1. "I only give him one direction at a time."
2. "I encourage my child to ride his bike after school."
3. "My child enjoys rollerblading with friends."
4. "I have my child do homework right after school."

Answer: 4. Children with ADHD need time to expend their energy after being in a restrictive environment such as school. They need time to participate in activities that they enjoy, such as running, bike riding, or inline skating. Homework should be done later in the evening, not right after school.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

9. The nurse is caring for an infant with spina bifida. What's the most important technique for diagnosing hydrocephalus?

1. Measurement of head circumference
2. Skull X-ray showing a thinning skull
3. Angiography revealing hydrocephalus
4. MRI revealing hydrocephalus

Answer: 1. Measuring head circumference is the most important monitoring technique for diagnosing hydrocephalus and is a key part of routine infant screening. Skull X-rays, angiography, and MRI may be used to confirm the diagnosis.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

10. The nurse is caring for a child after shunt insertion to relieve hydrocephalus. Which intervention should the nurse perform?

1. Position the child in an upright position.
2. Avoid positioning the child on the side where the shunt is located.
3. Position the child in semi-Fowler's position.
4. Position the child in a prone position.

Answer: 2. After the shunt is inserted, the nurse should avoid positioning the child on the side of the body where the shunt is located. The child should lie supine to avoid rapid decompression. The child shouldn't be in an upright, semi-Fowler's, or prone position.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

31 Musculoskeletal system

In this chapter, you'll learn:

- the function of the pediatric musculoskeletal system
- tests used to diagnose musculoskeletal disorders
- common pediatric musculoskeletal disorders.

Brush up on key concepts

The musculoskeletal system is a complex system of **bones, muscles, ligaments, tendons,** and other **connective tissues.** The functions of the musculoskeletal system include:

- giving the body form and shape
- protecting vital organs
- making movement possible
- storing calcium and other minerals
- providing the site for hematopoiesis (blood cell formation).

At any point, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 630 and 631.

Growing pains

Here are a few facts about the **pediatric musculoskeletal system:**

- Bones and muscles grow and develop throughout childhood.
- Bone lengthening occurs in the epiphyseal plates at the ends of bones; when the epiphyses close, growth stops.
- Bone healing occurs much faster in the child than in the adult because the child's bones are still growing.
- The younger the child, the faster the bone heals.
- Bone healing takes approximately 1 week for every year of life up to age 10.

Fractured logic

The most common fractures in the child are **clavicular fractures** and **greenstick fractures:**

- Clavicular fractures may occur during vaginal birth because the shoulders are the widest part of the body.
- Greenstick fractures of the long bones are related to the increased flexibility of the young child's bones. (The compressed side of the bone bends while the side under tension fractures.)

Keep abreast of diagnostic tests

Here are some important tests used to diagnose musculoskeletal disorders, along with common nursing interventions associated with each test.

Using physical examination to assess the pediatric patient's musculoskeletal function and ability is also an important element in diagnosis.

Look inside the joint

Arthroscopy is the visual examination of the interior of a joint with a fiber-optic endoscope.

Nursing actions

- Explain the procedure to the parents and child.
- Make sure that written, informed consent has been obtained.
- Tell the child and his parents that he will need to fast after midnight before the procedure.
- Note allergies because local anesthesia is used.
- Tell the child he may feel a thumping sensation as the cannula is inserted into the joint capsule.
- After the procedure, explain activity restrictions and ice application to control swelling.

Cheat sheet

Pediatric musculoskeletal refresher

CLUBFOOT

Key signs and symptoms

- Can't be corrected manually (distinguishes true clubfoot from apparent clubfoot)

Key test result

- X-rays show superimposition of the talus and calcaneus and a ladderlike appearance of the metatarsals.

Key treatments

- Correcting deformity with a series of casts or surgical correction
- Maintaining correction until foot gains normal muscle balance
- Observing foot closely for several years to prevent foot deformity from recurring

Key interventions

- Ensure that shoes fit correctly.
- Prepare for surgery, if necessary.

DEVELOPMENTAL HIP DYSPLASIA

Key signs and symptoms

- Affected side exhibits an increased number of folds on posterior thigh when child is supine with knees bent
- Appearance of shortened limb on affected side when child is supine
- Restricted abduction of hips

Key test results

- Barlow's sign: A click is felt when the infant is placed supine with hips flexed 90 degrees and when the knees are fully flexed and the hip is brought into midabduction.
- Ortolani's click: It can be felt by the fingers at the hip area as the femur head snaps out of and back into the acetabulum. It's also palpable during examination with the child's legs flexed and abducted.
- Positive Trendelenburg's test: When the child stands on the affected leg, the opposite pelvis dips to maintain erect posture.

Key treatments

- A hip-spica cast or corrective surgery for older children
- Bryant's traction
- Casting or a Pavlik harness to keep the hips and knees flexed and the hips abducted for at least 3 months

Key interventions

- Give reassurance that early, prompt treatment will probably result in complete correction.
- Assure the parents that the child will adjust to restricted movement and return to normal sleeping, eating, and playing in a few days.

DUCHENNE'S MUSCULAR DYSTROPHY

Key signs and symptoms

- Eventual muscle weakness and wasting
- Gowers' sign (use of hands to push self up from floor)
- Pelvic girdle weakness, indicated by waddling gait and falling

Key test results

- Electromyography typically demonstrates short, weak bursts of electrical activity in affected muscles.
- Muscle biopsy shows variation in the size of muscle fibers and, in later stages, shows fat and connective tissue deposits, with no dystrophin.

Key treatments

- Physical therapy
- Surgery to correct contractures
- Use of such devices as splints, braces, trapeze bars, overhead slings, and a wheelchair to help preserve mobility

Key interventions

- Perform range-of-motion exercises.
- If respiratory involvement occurs, encourage coughing, deep-breathing exercises, and diaphragmatic breathing.
- Encourage adequate fluid intake, increase dietary fiber, and obtain an order for a stool softener.

Pediatric musculoskeletal refresher *(continued)*

FRACTURES

Key signs and symptoms

- Loss of motor function
- Muscle spasm
- Pain or tenderness
- Skeletal deformity
- Swelling

Key test result

- X-rays may be used to confirm location and extent of fracture.

Key treatments

- Casting
- Reduction and immobilization of the fracture
- Surgery: open reduction and external fixation of the fracture

Key interventions

- Keep the child in proper body alignment.
- Provide support above and below the fracture site when moving the child.
- Elevate the fracture above the level of the heart.
- Apply ice to the fracture to promote vasoconstriction.
- Monitor pulses distal to the fracture every 2 to 4 hours.
- Monitor color, temperature, and capillary refill.

JUVENILE RHEUMATOID ARTHRITIS

Key signs and symptoms

- Inflammation around joints
- Stiffness, pain, and guarding of affected joints

Key test results

- Hematology studies reveal an elevated erythrocyte sedimentation rate, a positive antinuclear antibody test, and the presence of rheumatoid factor.

Key treatments

- Heat therapy: warm compresses, baths
- Splint application

Key intervention

- Monitor joints for deformity.

SCOLIOSIS

Key signs and symptoms

- Disappearance of the curve in the spinal column

Nonstructural scoliosis

- When the child bends at the waist to touch the toes, the curve in the spinal column disappears.

Structural scoliosis

- Failure of the spinal curve to straighten and asymmetry of the hips, ribs, shoulders, and shoulder blades when the child bends forward with the knees straight and the arms hanging down toward the feet

Key test result

- X-rays may aid diagnosis.

Key treatments

- Nonstructural scoliosis: postural exercises, shoe lifts
- Structural scoliosis: steel rods, prolonged bracing, spinal fusion

Key interventions

After spinal fusion and insertion of rods

- Turn the child by logrolling only.
- Maintain the child in correct body alignment.
- Maintain the bed in a flat position.

Soft-tissue sighting

A **computed tomography (CT) scan** is used to identify injuries to the soft tissue, ligaments, tendons, and muscles.

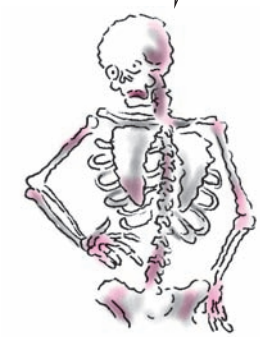
Nursing actions

- Explain the procedure to the parents and child.
- Make sure written, informed consent has been obtained if a contrast medium is used.
- If a contrast medium is being used, check for allergies to shellfish, contrast media, or iodine.
- Tell the child to hold still during the procedure.
- Tell the child that he'll be placed in a tube-like circle for the study and pictures will be taken of the extremity.

Cross-section check

Magnetic resonance imaging (MRI) allows cross-sectional imaging of bones and joints. MRI, which uses a strong magnetic field and radio waves, has largely replaced arthrography for assessing joint anatomy.

X-rays are a great tool for identifying calcifications, bone deformities, and fractures as well as measuring bone density.



MRI is also used to assess certain muscle and soft tissue injuries. No ionizing radiation is used.

Nursing actions

- Explain the procedure to the parents and child.
- Instruct the child to hold still during the procedure.
- Note if the child has any metal implants, which may interfere with the study.

Spinal vision

Myelography is an invasive procedure used to evaluate abnormalities of the spinal canal and cord. It entails injection of a radiopaque contrast medium into the subarachnoid space of the spine. Serial X-rays are then used to visualize the progress of the contrast medium as it passes through the subarachnoid space.

Nursing actions

- Explain the procedure to the parents and child.
- Make sure that written, informed consent has been obtained.
- Before the test, check for allergies to the contrast medium.
- If metrizamide (Amipaque) is used as the contrast medium, discontinue phenothiazines 48 hours before the test.
- When the contrast medium is injected, tell the child that he may experience a burning sensation, warmth, headache, salty taste, nausea, and vomiting.
- After the test, have the child sit in his room or lie in bed with his head elevated 60 degrees. He must not lie flat for at least 8 hours.
- Encourage the child to drink extra fluids.
- Check that the child voids within 8 hours after returning to his room.
- Instruct the child and his parents to immediately report pain, weakness, irritability, severe headache, or headache that lasts longer than 24 hours.

Combos are common. Nearly all cases of clubfoot are equinovarus, involving a combination of abnormal positions.

Hard tissue check

X-rays are probably the most useful diagnostic tool to evaluate musculoskeletal disorders. They can help to identify joint disruption, calcifications, and bone deformities, fractures, and destruction as well as measure bone density.

Nursing actions

- Explain the test to the parents and child.
- Tell the child he must hold still during the X-ray. Cover the genital area with a lead apron.

Polish up on patient care

Major musculoskeletal disorders in pediatric patients are clubfoot (talipes), developmental hip dysplasia (dislocated hip), Duchenne's muscular dystrophy, fractures, juvenile rheumatoid arthritis, and scoliosis.

Clubfoot

Clubfoot, also known as *talipes,* is a congenital disorder in which the foot and ankle are twisted and can't be manipulated into correct position. Clubfoot occurs in these five forms:

- talipes equinovarus: combination of positions
- talipes calcaneus: dorsiflexion, as if walking on one's heels
- talipes equinus: plantar flexion, as if pointing one's toes
- talipes valgus: eversion of the ankles, with the feet turning out
- talipes varus: inversion of the ankles, with the soles of the feet facing each other.

CAUSES

- Arrested development during the 9th and 10th weeks of embryonic life, when the feet are formed
- Deformed talus and shortened Achilles tendon
- Possible genetic predisposition

DATA COLLECTION FINDINGS

- Deformity usually obvious at birth
- Can't be corrected manually (distinguishes true clubfoot from apparent clubfoot)

DIAGNOSTIC FINDINGS
• X-rays show superimposition of the talus and calcaneus and a ladderlike appearance of the metatarsals.

NURSING DIAGNOSES
• Delayed growth and development
• Impaired physical mobility
• Risk for peripheral neurovascular dysfunction

TREATMENT
Treatment is administered in three stages:

Correcting the deformity with either surgical correction or a series of casts to gradually stretch and realign the angle of the foot and, after cast removal, application of Denis Browne splint at night until age 1

Maintaining the correction until the foot gains normal muscle balance

Observing the foot closely for several years to prevent the deformity from recurring.

INTERVENTIONS AND RATIONALES
• Monitor neurovascular status *to ensure circulation to the foot with cast in place.*
• Ensure that shoes fit correctly *to promote comfort and prevent skin breakdown.*
• Prepare the child for surgery, if necessary, *to maintain or promote healing process and to decrease anxiety.*

Teaching topics
• Using a blow-dryer on the cool setting to provide relief of itching
• Importance of placing nothing inside the cast
• Keeping corrective devices on as much as possible
• Walking as exercise after surgical repair

Developmental hip dysplasia

Developmental hip dysplasia (dislocated hip) results from an abnormal development of the hip socket. It occurs when the head of the femur is still cartilaginous and the acetabulum (socket) is shallow; as a result, the head of the femur comes out of the hip socket. It can affect one or both hips and occurs in varying degrees of dislocation, from partial (subluxation) to complete.

CAUSES
• Breech delivery
• Fetal position in utero
• Genetic predisposition
• Laxity of the ligaments
• Multiple fetuses

DATA COLLECTION FINDINGS
• On the affected side, an increased number of folds on the posterior thigh when the child is supine with knees bent
• Appearance of a shortened limb on the affected side
• Restricted abduction of the hips

DIAGNOSTIC FINDINGS
• Barlow's sign is present: A click is felt when the infant is placed in a supine position with hips flexed 90 degrees, knees fully flexed, and the hip brought into midabduction.
• Ortolani's click is present: It can be felt by the fingers at the hip area as the femur head snaps out of and back into the acetabulum. It's also palpable during examination with the child's legs flexed and abducted.
• Sonography and MRI may be used to assess reduction.
• Trendelenburg's test is positive: When the child stands on the affected leg, the opposite pelvis dips to maintain erect posture.
• Ultrasonography shows the involved cartilage and acetabulum.
• X-rays show the location of the femur head and a shallow acetabulum; X-rays can also be used to monitor progression of the disorder.

NURSING DIAGNOSES
• Delayed growth and development
• Impaired physical mobility
• Risk for impaired skin integrity

TREATMENT
• A hip-spica cast or corrective surgery for older children

Memory jogger

When you think **OTB**, don't think Off Track Betting. Instead think of **O**rtolani, **T**rendelenburg, and **B**arlow—all key tests in diagnosing hip dysplasia.

What's the common goal of treatment for developmental hip dysplasia? Enlarging and deepening the acetabulum through pressure.

• Bryant's traction, if the acetabulum doesn't deepen
• Casting or a Pavlik harness to keep the hips and knees flexed and the hips abducted for at least 3 months

INTERVENTIONS AND RATIONALES

• Monitor circulation before application of cast or traction; after application, have the child wiggle his toes *to detect signs of impaired circulation*. The nurse should be able to place one finger between the child's skin and the cast.
• Provide skin care *to prevent skin breakdown.*
• Give reassurance that early, prompt treatment will probably result in complete correction *to decrease anxiety.*
• Assure the parents that the child will adjust to restricted movement and return to normal sleeping, eating, and play in a few days *to ease anxiety.*
• Inspect skin, especially around bony prominences, *to detect cast complications and skin breakdown.*

Teaching topics

• Correctly splinting or bracing the hips
• Receiving frequent checkups
• Coping with restricted movement
• Removing braces and splints while bathing the child and replacing them immediately afterward
• Stressing good hygiene

Duchenne's muscular dystrophy

A genetic disorder that occurs only in males, Duchenne's muscular dystrophy (also called *pseudohypertrophic dystrophy*) is marked by muscular deterioration that progresses throughout childhood. It generally results in death from cardiac or respiratory failure in the late teens or early 20s because of a defect on the X chromosome that prevents production of dystrophin. The absence of dystrophin results in breakdown of muscle fibers. Muscle fibers are replaced with fatty deposits and collagen in muscles. There's no known cure.

CAUSE

• Sex-linked recessive trait

DATA COLLECTION FINDINGS

• Cardiac or pulmonary failure
• Decreased ability to perform self-care activities
• Delayed motor development
• Eventual contractures and muscle hypertrophy
• Eventual muscle weakness and wasting
• Gowers' sign (use of hands to push self up from floor)
• Pelvic girdle weakness, indicated by waddling gait and falling
• Toe-walking

DIAGNOSTIC FINDINGS

• Electromyography typically demonstrates short, weak bursts of electrical activity in affected muscles.
• Muscle biopsy shows variations in the size of muscle fibers and, in later stages, shows fat and connective tissue deposits, with no dystrophin.

NURSING DIAGNOSES

• Impaired gas exchange
• Impaired physical mobility
• Impaired walking

TREATMENT

• Gene therapy (under investigation to prevent muscle degeneration)
• High-fiber, high-protein, low-calorie diet
• Physical therapy
• Surgery to correct contractures
• Use of such devices as splints, braces, trapeze bars, overhead slings, and a wheelchair to help preserve mobility

INTERVENTIONS AND RATIONALES

• Perform range-of-motion (ROM) exercises *to promote joint mobility.*
• Provide emotional support to the child and his parents *to decrease anxiety and promote coping mechanisms.*
• If respiratory involvement occurs, encourage coughing, deep-breathing exercises, and diaphragmatic breathing *to maintain a patent*

airway and mobilize secretions to prevent complications associated with retained secretions.

• Encourage the use of a footboard or high-topped sneakers and a foot cradle *to increase comfort and prevent footdrop.*

• Encourage adequate fluid intake, increase dietary fiber, and obtain an order for a stool softener *to prevent constipation associated with inactivity.*

Teaching topics

• Recognizing early signs of respiratory complications

• Avoiding long periods of bed rest and inactivity, if necessary, by limiting television viewing and other sedentary activities

• Planning a low-calorie, high-protein, high-fiber diet (because child is prone to obesity from reduced physical activity)

• Helping the child maintain peer relationships and realize his intellectual potential (Encourage parents to keep child in regular school as long as possible.)

• Referring parents to a local support group

Fractures

A fracture is a break in the bone's integrity. With a complete fracture, the bone is entirely broken across, resulting in a break in the bone's continuity. An incomplete fracture extends only partially through the bone without completely destroying the bone's continuity. A closed (or simple) fracture doesn't puncture the skin surface, whereas an open (or compound) fracture punctures through the skin surface.

Common sites of fractures include the arm, clavicle, knee, and femur. The outcome usually depends on the severity of the fracture and the treatment provided. Potential complications include fat emboli, improper bone growth, compartment syndrome, and infection.

CAUSES

• Childhood accidents, such as falls and motor vehicle accidents (most common cause)

• Child abuse

• Pathologic conditions

DATA COLLECTION FINDINGS

• Bony crepitus

• Bruising

• Impaired sensation

• Loss of motor function

• Muscle spasm

• Pain or tenderness

• Paralysis

• Paresthesia

• Skeletal deformity

• Swelling

DIAGNOSTIC FINDING

• X-rays confirm the location and extent of the fracture.

NURSING DIAGNOSES

• Ineffective tissue perfusion (peripheral)

• Acute pain

• Risk for impaired skin integrity

TREATMENT

• Casting

• Reduction and immobilization of the fracture

• Surgery: open reduction and external fixation of the fracture

• Traction, depending on the site of the fracture (see *Common orthopedic treatments,* page 636)

INTERVENTIONS AND RATIONALES

• Keep the child in proper body alignment *to promote bone healing and prevent tissue damage.*

• Provide support above and below the fracture site when moving the child *to promote comfort.*

• Monitor for any pressure areas caused by traction, the child's cast, or bedclothes to *prevent a break in skin integrity and tissue damage.*

• Elevate the fracture above the level of the heart *to promote venous return and decrease edema.*

• Apply ice to the fracture to promote vasoconstriction, *which inhibits edema and pain.*

• Monitor pulses distal to the fracture every 2 to 4 hours *to monitor blood flow to the distal extremity.*

Common orthopedic treatments

The use of casts, traction, and braces are common orthopedic treatments.

CASTS

A cast is a hard mold that encases a body part, usually an extremity, to provide immobilization without discomfort.

General cast care

- Turn the cast frequently to dry all sides; use palms to lift or turn a wet cast to prevent indentations.
- Expose as much of the cast to air as possible, but cover exposed body parts.
- Be aware of discomfort to the child because chemical changes in the drying cast cause temperature extremes against the child's skin.
- After it's dry, maintain a dry cast; wetting the cast softens it and may cause skin irritation.
- Smooth out the cast's rough edges, and petal the edges.
- Monitor circulation: Note the color, temperature, and edema of digits. Note the child's ability to wiggle the extremities without tingling or numbness.
- Observe for any drainage or foul odor from the cast.
- Prevent small objects or food from falling into the cast.
- Don't use powder on the skin near the cast; it becomes a medium for bacteria when it absorbs perspiration.
- Instruct the child and his family to notify the doctor if numbness, tingling, burning, stinging, increased swelling, increased pain, or loss of movement distal to the cast occur.

Hip-spica cast

A hip-spica cast is a body cast extending from midchest to legs.

- The legs are abducted with a bar between them; never lift or turn the child with the crossbar.
- Perform cast care as listed above but with additional measures.
- Line the back edges of the cast with plastic or other waterproof material.
- Keep the cast level but on a slant, with the head of the bed raised:
  - The body and cast should stay at 180 degrees.
  - The head of the bed is raised on shock blocks or the mattress is raised using a wedge pillow so that the child is on a slant with the head up.
  - Urine and stools drain downward away from the cast.
  - A Bradford frame can be used for this purpose.
- Use a mattress firm enough to support the cast; use pillows to support parts of the cast, if needed.
- Reposition frequently to avoid pressure on the skin and the bony prominences; check for pressure as the child grows.
- Provide sponge baths to prevent the cast from becoming wet.
- Inspect cast for cracks, dents, softening, and drainage.
- Increase fluid intake but avoid fruit juices that may cause diarrhea.
- Increase dietary fiber and fluids to prevent constipation.

TRACTION

Traction decreases muscle spasms and realigns and positions bone ends. It works by pulling on the distal ends of bones.

- Skin traction pulls indirectly on the skeleton by pulling on the skin with adhesive, moleskin, or elastic bandage.
- Skeletal traction pulls directly on the skeleton with pins or tongs.

Traction-related care

- Check that the weights hang free.
- Check for skin irritation, infection at pin sites, and neurovascular response of the extremity.
- Prevent constipation by increasing fluids and fiber.
- Prevent respiratory congestion by promoting pulmonary hygiene using blowing games.
- Provide pain relief if necessary.
- Provide stimulation appropriate for the child.

Bryant's traction

This is the only skin traction designed specifically for the lower extremities of the child under age 2; the child's body weight provides countertraction.

- Legs are kept straight and extend 90 degrees toward the ceiling from the trunk; both legs are suspended even if only one is affected.
- The buttocks are kept slightly off the bed to ensure sufficient and continuous traction on the legs.
- Traction may be followed by application of a hip-spica cast.

BRACES

A brace is a plastic shell or metal-hinged appliance that aids mobility and posture.

Brace-related care

- Provide good skin care, especially at the bony prominences.
- Check to ensure accurate fit as the child grows.
- When applying full body braces to the spastic child, put the feet in first.

Milwaukee brace

- Attempts to slow the progression of spinal curvature of less than 40 degrees until bone growth stops
- Extends from the iliac crest of the pelvis to the chin
- Must be fitted
- Can be used until the child reaches skeletal maturity
- Must be worn 20 to 23 hours a day; may be removed for bathing and swimming

Boston brace

- Functions the same as a Milwaukee brace
- Extends from the axillary area to the iliac crest; must be fitted
- Can be easily covered by clothing

• Monitor color, temperature, and capillary refill *to determine whether the affected extremity is adequately perfused.*
• Monitor sensation *to determine whether perfusion to the nerves is intact.*
• Use pediatric pain assessment tools *to determine the level of pain.*
• Turn and reposition the child every 2 hours *to help relieve skin pressure and prevent skin breakdown.*
• Protect cast from moisture and petal the edges *to promote healing of the fracture and prevent skin breakdown.*

Teaching topics
• Caring for a child in cast or traction
• Preventing injury
• Reporting signs of infection or complications

Juvenile rheumatoid arthritis

Juvenile rheumatoid arthritis (JRA) is an autoimmune disease of the connective tissue. It's characterized by chronic inflammation of the synovia and possible joint destruction. Episodes recur with remissions and exacerbations.

The three main forms of JRA are:
• pauciarticular JRA—asymmetrical involvement of fewer than five joints, usually affecting large joints, such as the knees, ankles, and elbows.
• polyarticular JRA—symmetrical involvement of five or more joints, especially hands and weight-bearing joints, such as hips, knees, and feet. Involvement of the temporomandibular joint may cause earache; involvement of the sternoclavicular joint may cause chest pain.
• systemic disease with polyarthritis—involves the lining of the heart and lungs, blood cells, and abdominal organs. Exacerbations may last for months. Fever, rash, and lymphadenopathy may occur.

CAUSES
• Autoimmune response
• Genetic predisposition

DATA COLLECTION FINDINGS
• Inflammation around the joints
• Stiffness, pain, and guarding of the affected joints

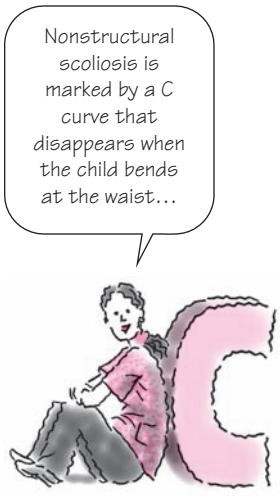
DIAGNOSTIC FINDINGS
• Hematology studies reveal an elevated erythrocyte sedimentation rate, a positive antinuclear antibody test, and the presence of rheumatoid factor.
• Slit-lamp evaluation may show iridocyclitis (inflammation of the iris and the ciliary body).

NURSING DIAGNOSES
• Disturbed body image
• Impaired physical mobility
• Chronic pain

TREATMENT
• Heat therapy: warm compresses, baths
• Splint application
• Exercise

Drug therapy
• Low-dose corticosteroids
• Low-dose methotrexate (Rheumatrex) used as a second-line medication
• Nonsteroidal anti-inflammatory drugs: naproxen (Naprosyn), ibuprofen (Motrin)

INTERVENTIONS AND RATIONALES
• Monitor joints for deformity *to detect early changes as a complication of this disease process.*
• Administer medications, as prescribed, and note their effectiveness *to relieve pain and prevent further joint damage.*
• Assist with ROM and other exercises *to maintain joint mobility.*
• Apply warm compresses or encourage the child to take a warm bath in the morning *to promote comfort and increase mobility.*
• Apply splints *to maintain a functional position and prevent contractures.*
• Provide assistive devices if necessary *to encourage the normal performance of daily activities.*



Teaching topics
- Understanding how stress and climate can influence exacerbations
- Receiving preventive eye care

Scoliosis

Scoliosis is a lateral curvature of the spine, which occurs more commonly among females. It's commonly identified at puberty and throughout adolescence. Scoliosis stops progressing when bone growth stops.

CAUSES

Nonstructural (functional or postural) scoliosis
- Nonprogressive C curve from some other condition, such as poor posture, or unequal leg length

Structural (progressive) scoliosis
- Progressive S curve with a primary and compensatory curvature resulting in spinal and rib changes
- Unknown origin
- Birth defect
- Neuromuscular, connective tissue, or rheumatoid disease
- Injury
- Abnormal growth or tumor

DATA COLLECTION FINDINGS

Nonstructural scoliosis
- Disappearance of the curve in the spinal column when the child bends at the waist to touch the toes

Structural scoliosis
- Failure of the spinal curve to straighten and asymmetry of the hips, ribs, shoulders, and shoulder blades when the child bends forward with the knees straight and the arms hanging down toward the feet

DIAGNOSTIC FINDING
- X-rays may aid the diagnosis.

NURSING DIAGNOSES
- Delayed growth and development
- Disturbed body image
- Impaired physical mobility

TREATMENT

Nonstructural scoliosis
- Postural exercises
- Shoe lifts

Structural scoliosis
- Electrical stimulation for mild to moderate curvatures
- Harrington, Luque, or Cotrel-Dubousset rods for curves greater than 40 degrees (to realign the spine or when curves fail to respond to orthotic treatment)
- Possible prolonged bracing (Milwaukee or Boston brace)
- Skin traction or halo femoral traction
- Spinal fusion with bone from the iliac crest

INTERVENTIONS AND RATIONALES

After spinal fusion and insertion of rods
- Monitor vital signs and intake and output *to detect early signs of dehydration.*
- Turn the child only by logrolling *to prevent injury.*
- Maintain correct body alignment *to promote joint mobility and prevent injury.*
- Maintain the bed in a flat position *to prevent injury and complications.*
- Help the child adjust to the increase in height and altered self-perception *to promote self-esteem and decrease anxiety.*

Teaching topics
- Performing stretching exercises for the spine
- Helping the child maintain self-esteem

Pump up on practice questions

1. A child is diagnosed with developmental hip dysplasia. Which treatment is effective in reducing hip dysplasia in older children?

1. Body cast
2. Frejka pillow
3. Double pillow
4. Hip-spica cast

Answer: 4. The hip-spica cast is the effective method for reducing hip dysplasia in older children. The hip-spica cast is used when an abduction brace is ineffective or if an adduction contracture is present. The other devices aren't effective for hip dysplasia.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

2. A child must undergo arthroscopy. You know your teaching about the procedure has been effective when the mother states:

1. "I'm glad he won't feel anything during the procedure."
2. "I'm glad he doesn't have to fast before the procedure."
3. "I need to tell the doctor that he's allergic to lidocaine."
4. "I don't need to sign a consent form for the procedure."

Answer: 3. Because a local anesthetic is used before the procedure, the mother should make sure the physician is aware of her child's allergy to lidocaine. The child may feel a thumping sensation as the cannula is inserted in the joint capsule. The child may need to fast after midnight before the procedure. The arthroscopy procedure requires that written, informed consent be obtained.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

3. A child is diagnosed with developmental hip dysplasia. Which device other than the hip-spica cast is used in the treatment of this condition?

1. Pillow
2. Denis Browne splint
3. Pavlik harness
4. Foot cast

Answer: 3. A Pavlik harness is used to stabilize the hip. A regular pillow isn't sufficient. A Denis Browne splint is used to treat talipes equinovarus. A foot cast isn't effective for hip dysplasia.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge

4. A child has been placed in a hip-spica cast. The cast is properly positioned if:

1. it's snug, allowing some movement of the extremity.
2. it allows no extremity movement but allows one finger to fit between the skin and the cast.
3. it's snug, allowing no movement of the extremity.
4. it's snug without disturbing the client's neurovascular status.

Answer: 2. The nurse should be able to place one finger between the child's skin and the cast. The child should be unable to move the extremity, but the cast shouldn't fit snugly.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Knowledge

5. A child's clubfoot has been placed in a cast. The child develops itching under the cast and asks the nurse for help. The nurse should:

1. use sterile applicators to relieve the itch.
2. apply water under the cast.
3. apply cool air under the cast with a blow-dryer.
4. apply hydrocortisone cream.

Answer: 3. A blow-dryer on the cool setting should be directed toward the itchy area to provide relief. Nothing should be put inside the cast because this can cause further skin irritation. Water would wet the cast and wouldn't be helpful. Hydrocortisone cream can ball up and be irritating, and it would be difficult to apply inside the cast.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

6. A child has undergone repair of a clubfoot and is allowed full activity. The nurse is teaching the child's parents about activities for the child. Which activity would benefit the child most?

1. Walking
2. Playing catch
3. Standing
4. Swimming

Answer: 1. Walking stimulates all of the involved muscles and helps to strengthen them. All the options are good exercises for clubfoot, but walking is the best choice.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

7. The nurse is treating a child with JRA. Which factors can exacerbate the condition?

1. Stress and climate
2. Dehydration and climate
3. Exposure to cold
4. Exercise

Answer: 1. Exacerbations of JRA can be precipitated by exposure to stress and climate. Dehydration and exposure to cold can precipitate vaso-occlusive crisis in the client with sickle cell anemia. Exposure to cold can precipitate an exacerbation of Raynaud's disease. Exercise should be encouraged in the child with JRA.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

8. A child is admitted with an undiagnosed musculoskeletal condition. Which diagnostic tool is most useful in evaluating a musculoskeletal disorder?

1. Myelography
2. MRI
3. CT scan
4. X-rays

Answer: 4. X-rays are the most useful diagnostic tool to evaluate musculoskeletal diseases. They can be used to help identify joint disruption, bone deformities, calcifications, and bone destruction and fractures as well as to measure bone density. Myelography is an invasive procedure used to evaluate abnormalities of the spinal canal and cord. MRI, a form of cross-sectional imaging using a strong magnetic field and radio waves, has largely replaced arthrography for assessing joint anatomy. A CT scan can be used to identify injuries of soft tissue, ligaments, tendons, and muscles.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

9. The nurse is developing a dietary teaching plan for a child with Duchenne's muscular dystrophy. The nurse should include instructions for which type of diet in the child's teaching plan?

1. Low-calorie, high-protein, and high-fiber diet
2. Low-calorie, high-protein, and low-fiber diet
3. High-calorie, high-protein diet, and restricted fluids
4. High-calorie, high-protein, and high-fiber diet

Answer: 1. A child with muscular dystrophy is prone to constipation and obesity, so dietary intake should include a diet low in calories, high in protein, and high in fiber. Adequate fluid intake should also be encouraged.

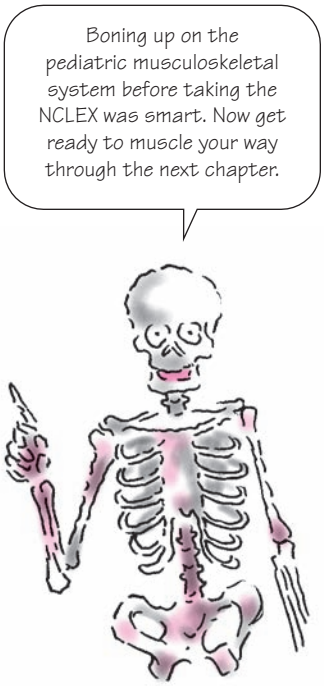
Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Knowledge

10. The nurse is teaching the mother of a child with scoliosis. The nurse knows that teaching has been successful when the mother makes which statement?

1. "I'm glad my daughter will outgrow this deformity."
2. "I'm afraid that my daughter will feel unattractive because she must wear a brace."
3. "I'll make sure that my daughter doesn't do any stretching exercises that could worsen her spine."
4. "I'm glad my daughter will only need to wear a brace for a short period of time."

Answer: 2. Teaching is successful when the mother shows concern about her daughter's feelings toward wearing a brace for scoliosis correction. Although scoliosis ceases to progress when bone growth stops, the child won't outgrow the deformity. Stretching exercises for the spine may help improve scoliosis. Prolonged bracing is usually indicated to correct the deformity.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis



32 Gastrointestinal system

In this chapter, you'll learn:

- parts of the GI system and their function
- tests used to diagnose GI disorders
- common pediatric GI disorders.

Brush up on key concepts

The GI tract, also known as the **alimentary canal,** consists of a long, hollow, muscular tube that includes several glands and accessory organs. It performs the crucial task of supplying essential nutrients to fuel the other organs and body systems. Because the GI system is so crucial to the rest of the body systems, any problem in this system can quickly affect the overall health, growth, and development of the child.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 644 and 645.

GI junior

Listed here are characteristics of the pediatric GI system:

- Peristalsis occurs within 2½ to 3 hours in the neonate and extends to 3 to 6 hours in older infants and children.
- Stomach capacity of the neonate is 30 to 60 ml, which gradually increases to 200 to 350 ml by age 12 months and to 1,500 ml by adolescence.
- The neonatal abdomen is larger than the chest up to age 8 weeks, and the musculature is poorly developed.
- The sucking and extrusion reflex persists to age 3 to 4 months (extrusion reflex protects the infant from foods that its system is too immature to digest).
- At age 4 months, saliva production begins and aids in the process of digestion.
- Spit-ups are frequent in the neonate because of the immature muscle tone of the lower esophageal sphincter and the low volume capacity of the stomach.
- Increased myelination of nerves to the anal sphincter allows for physiologic control of bowel function, usually around age 2.
- The liver's slow development of glycogen storage capacity makes the infant prone to hypoglycemia.
- From ages 1 to 3, composition of intestinal flora becomes more adultlike and stomach acidity increases, reducing the number of GI infections.

Nutrient breakdown

The GI tract breaks down food (carbohydrates, fats, and proteins) into molecules small enough to permeate cell membranes, thus providing cells with the necessary energy to function properly. The GI tract prepares food for cellular absorption by altering its physical and chemical composition. (See *Digestive organs and glands,* page 647.)

Malfunction junction

A malfunction along the GI tract can produce far-reaching metabolic effects, eventually threatening life itself. A common indication of GI problems is referred pain, which makes diagnosis especially difficult.

Keep abreast of diagnostic tests

Here are some important tests used to diagnose GI system disorders, along with common nursing interventions associated with each test.

Swallow this

Barium swallow is primarily used to examine the esophagus.

(Text continues on page 646.)

Cheat sheet

Pediatric gastrointestinal refresher

ACETAMINOPHEN POISONING

Key signs and symptoms

- Diaphoresis
- Nausea and vomiting

Key test results

- Serum aspartate aminotransferase and serum alanine aminotransferase levels become elevated soon after ingestion.
- Acetaminophen levels are greatly elevated.

Key treatment

- Gastric lavage

Key interventions

- Monitor vital signs and intake and output.
- Monitor cardiovascular and GI status.

CELIAC DISEASE

Key signs and symptoms

- Generalized malnutrition and failure to thrive due to protein and carbohydrate malabsorption
- Steatorrhea and chronic diarrhea due to fat malabsorption
- Weight and height below normal for age-group

Key test result

- Immunologic assay screen is positive for celiac disease.

Key treatment

- Gluten-free diet

Key interventions

- Monitor growth and development.
- Give small, frequent meals.

CLEFT LIP AND PALATE

Key signs and symptoms

- Cleft lip: can range from simple notch on upper lip to complete cleft from lip edge to floor of the nostril, on either side of the midline but rarely along the midline itself; is obvious at birth (with or without cleft palate)
- Cleft palate without cleft lip: may not be detected until mouth examination or development of feeding difficulties

Key test result

- Prenatal ultrasound may indicate severe defects.

Key treatments

- Cheiloplasty performed between 2 and 3 months of age to unite lip and gum edges in anticipation of teeth eruption, providing route for adequate nutrition and sucking
- Cleft palate repair surgery; scheduled at about age 18 months to allow for growth of palate and to be done before infant develops speech patterns; infant must be free from ear and respiratory infections

Key interventions

- Be alert for respiratory distress when feeding.

Before cleft lip repair surgery

- Hold the infant while feeding and promote sucking between meals.

After cleft lip repair surgery

- Observe for cyanosis as the infant begins to breathe through the nose.
- Keep infant's hands away from the mouth by using restraints or pinning the sleeves to the shirt; use adhesive strips to hold the suture line in place.
- Anticipate the infant's needs.
- Place the infant on the right side to prevent aspiration.
- Clean the suture line after each feeding by dabbing it with half-strength hydrogen peroxide or normal saline solution.

After cleft palate repair surgery

- Position the toddler on the abdomen or side.
- Anticipate edema and a decreased airway from palate closure, which may make the toddler appear temporarily dyspneic, and assess for signs of altered oxygenation.
- Keep hard or pointed objects (utensils, straws, frozen dessert sticks) away from the mouth.

ESOPHAGEAL ATRESIA AND TRACHEOESOPHAGEAL FISTULA

Key signs and symptoms

- Esophageal atresia: excessive salivation and drooling due to inability to pass food through the esophagus
- Tracheoesophageal fistula: choking, coughing, and intermittent cyanosis during feeding due to food that goes through the fistula into the trachea

Pediatric gastrointestinal refresher *(continued)*

ESOPHAGEAL ATRESIA AND TRACHEOESOPHAGEAL FISTULA *(continued)*

Key test result

• Neonates are fed first with a few sips of sterile water to detect these anomalies and to prevent aspiration of formula or breast milk into the lungs.

Key treatment

• Surgical correction by ligating the tracheoesophageal fistula and reanastomosing the esophageal ends; in many cases, done in stages

Key intervention

• Monitor respiratory status.

FAILURE TO THRIVE

Key signs and symptoms

• Altered body posture (child is stiff or floppy and doesn't cuddle)
• Disparities between chronological age and height and weight
• History of insufficient stimulation and inadequate parental knowledge of child development

Key test result

• Negative nitrogen balance indicates inadequate intake of protein or calories.

Key treatments

• High-calorie diet
• Parent counseling
• Vitamin and mineral supplements

Key interventions

• Properly feed and interact with the child.
• Provide the child with visual and auditory stimulation.
• When caring for child in parent's presence, act as role model for effective parenting skills. Demonstrate comfort measures and show the mother how to hold the infant in en face position.

INTESTINAL OBSTRUCTION

Key signs and symptoms

• Complete small-bowel obstruction: bowel contents propelled toward mouth (instead of rectum) by vigorous peristaltic waves; persistent epigastric or periumbilical pain
• Partial large-bowel obstruction: leakage of liquid stool around the obstruction (common).

Key test results

• With large-bowel obstruction, barium enema reveals a distended, air-filled colon or, in sigmoid volvulus, a closed loop of sigmoid with extreme distention.
• X-rays confirm the diagnosis. Abdominal films show the presence and location of intestinal gas or fluid.

Key treatment

• I.V. therapy to correct fluid and electrolyte imbalances

Key interventions

• Monitor vital signs frequently.
• Monitor cardiovascular status; observe the child closely for signs of shock (pallor, rapid pulse, and hypotension).
• Stay alert for signs and symptoms of metabolic alkalosis (changes in sensorium; slow, shallow respirations; hypertonic muscles; tetany) or acidosis (dyspnea on exertion; disorientation; and, later, deep, rapid breathing, weakness, and malaise).
• Watch for signs and symptoms of secondary infection.

PYLORIC STENOSIS

Key signs and symptoms

• Projectile vomiting during or shortly after feedings, preceded by reverse peristaltic waves (going left to right) but not by nausea; child resumes eating after vomiting

Key test result

• Ultrasound reveals hypertrophied sphincter.

Key treatment

• Pyloromyotomy performed by laparoscopy

Key interventions

• Provide small, frequent, thickened feedings with the head of the bed elevated; burp the child frequently.
• Position the child on his right side to prevent aspiration.

SALICYLATE POISONING

Key signs and symptoms

• High fever from the stimulation of carbohydrate metabolism
• Petechiae and bleeding tendency

Key test results

• Prothrombin time is prolonged.
• Serum salicylate levels are elevated.

Key treatments

• Gastric lavage or emesis induction with ipecac syrup
• I.V. fluids
• Sodium bicarbonate

Key interventions

• Administer oral and I.V. fluids.
• Monitor urine pH.
• Monitor cardiovascular and GI status.

Gastrografin is now used instead of barium for certain patients. Like barium, Gastrografin facilitates imaging through X-rays. Unlike barium, however, if Gastrografin escapes from the GI tract, it's absorbed by the surrounding tissue. Escaped barium isn't absorbed and can cause complications.

Nursing actions

- Explain the procedure to the child and his parents.
- Maintain the child on nothing-by-mouth (NPO) status beginning midnight before the test.
- Tell the child he must hold still during the X-ray.
- After the test, monitor bowel movements for excretion of barium. Also monitor GI function.

Upper GI imaging

For an **upper GI series,** swallowed barium sulfate proceeds into the esophagus, stomach, and duodenum to reveal abnormalities. The barium outlines stomach walls and delineates ulcer craters and filling defects.

A **small-bowel series,** an extension of the upper GI series, visualizes barium flowing through the small intestine to the ileocecal valve.

Nursing actions

- Explain the procedure to the child and his parents.
- Maintain the child on NPO status beginning midnight before the test.
- Tell the child he must hold still during the X-ray.
- Make sure the lead apron is properly placed over the genital area.
- After the test, monitor bowel movements for excretion of barium. Also monitor GI function.

Lower GI look

A **barium enema (lower GI series)** allows X-ray visualization of the colon and is used to detect lesions, obstructions, and motility problems.

Nursing actions

- Explain the procedure to the child and his parents.
- Usually, the child will follow a liquid diet for 24 hours before the test. Bowel preparations are administered before the examination.
- Tell the child X-rays will be taken on a test table and he must hold still.
- Cover the genital area with a lead apron during X-ray.

Stool search

A **stool specimen** can be examined for suspected GI bleeding, infection, or malabsorption. Certain tests require several specimens, such as the **guaiac test** for occult blood, a microscopic stool examination for ova and parasites, and tests for fat.

Nursing actions

- Obtain the specimen in the correct container (container may need to be sterile or contain preservative).
- Be aware that the specimen may need to be transported to the laboratory immediately or placed in the refrigerator.

Fiber-optic findings

With **esophagogastroduodenoscopy,** insertion of a fiber-optic scope allows direct visual inspection of the esophagus, stomach and, sometimes, duodenum. **Proctosigmoidoscopy** permits inspection of the rectum and distal sigmoid colon. **Colonoscopy** allows inspection of the descending, transverse, and ascending colon. Biopsies may be obtained during the procedures.

Nursing actions

- Explain the procedure to the child and his parents.
- Make sure that written, informed consent has been obtained.
- A mild sedative may be administered before the examination.
- The child may be kept on NPO status from midnight beforehand (upper GI tests).
- The child may be placed on a liquid diet for 24 hours before the examination or require enemas or laxatives until bowel contents are clear (lower GI examinations).

Digestive organs and glands

Here's a quick rundown of the major organs and glands that facilitate digestion.

SALIVARY GLANDS
The salivary glands provide saliva to moisten the mouth, lubricate food to ease swallowing, and begin food breakdown using the enzyme ptyalin. After food is swallowed, it enters the esophagus and is transported to the stomach.

STOMACH
The stomach is a muscular, saclike organ located between the esophagus and small intestine in the left upper quadrant of the abdomen. Food and fluids enter the stomach and are mixed with stomach secretions. Contractions called *peristalsis* push the food gradually into the small intestine through the pyloric opening at the lower end of the stomach.

INTESTINE
The intestine extends from the pyloric opening to the anus. It's made up of the small and large intestines:
• The small intestine is made up of the duodenum, jejunum, and ileum and is about 20′ (6 m) long. Most digestion takes place in the small intestine; digested food is absorbed through the walls of the small intestine and into the blood for distribution throughout the body.
• The large intestine is about 5′ (1.5 m) long and includes the cecum (and appendix), colon, and rectum. Indigestible food passes into the large intestine, where it's formed into solid feces and eliminated through the rectum.

LIVER
The liver, which is located in the right upper quadrant of the abdomen, stores and filters blood; secretes bile; processes sugars, fats, proteins, and vitamins; and detoxifies drugs, alcohol, and other substances.

GALLBLADDER
The gallbladder is located beneath the liver and serves as a storage place for bile. Bile is a greenish fluid that helps the small intestine to emulsify and absorb fat and fat-soluble vitamins.

PANCREAS
The pancreas is a large gland located behind the stomach. It has both exocrine and endocrine functions. The exocrine function involves cells that secrete digestive enzymes, bicarbonate, and hormones into the small intestine to aid digestion. The endocrine function involves the islets of Langerhans, which contain alpha and beta cells. Alpha cells secrete glucagon, which stimulates glycogenolysis in the liver. Beta cells secrete insulin to promote carbohydrate metabolism.

Fluoroscopic findings

Endoscopic retrograde cholangiopancreatography is the radiographic examination of the pancreatic ducts and hepatobiliary tree following the injection of contrast media into the duodenal papilla. It's done on children with suspected pancreatic disease or obstructive jaundice.

Nursing actions

Before the procedure
• Explain the procedure to the child and his parents.
• Make sure that written, informed consent has been obtained.
• Check the child's history for allergies to cholinergics and iodine.
• Administer a sedative and monitor the child for the drug's effect.

Children who are intubated require diligent oral and nasal care, close monitoring, and emotional support to minimize fear.

After the procedure
- Monitor the child's gag reflex, and keep the child on NPO status until his gag reflex returns.
- Protect the child from aspiration of mucus by positioning him on his side.
- Monitor the child for urine retention.

Tube topics

Certain GI disorders require **nasogastric** (NG) or **oralgastric intubation:**
- to empty the stomach and intestine
- to aid diagnosis and treatment
- to decompress obstructed areas
- to detect and treat GI bleeding
- to administer medications or feedings.

Tubes usually inserted through the nose include short NG tubes (Levin and Salem Sump) and long intestinal tubes (Cantor and Miller-Abbott). The larger Ewald tube is usually inserted orally.

Nursing actions

For a child who has an NG or oralgastric tube in place
- Maintain accurate intake and output records. Measure gastric drainage every 8 hours; record amount, color, odor, and consistency. When irrigating the tube, note the amount of saline solution instilled and aspirated.
- Check for fluid and electrolyte imbalances.
- Provide good oral and nasal care. Make sure the tube is secure but isn't causing pressure on the nostrils. Change the tape to the nose every 24 hours. Gently wash the area around the tube, and apply a water-soluble lubricant to soften crusts. These measures help prevent sore throat and nose, dry lips, nasal excoriation, and parotitis.
- To support the short tube's weight, anchor it to the child's clothing.
- After removing the tube from a child with GI bleeding, watch for signs and symptoms of recurrent bleeding, such as hematemesis, decreased hemoglobin (Hb) levels, pallor, chills, diaphoresis, hypotension, and rapid pulse.
- Provide emotional support because many children panic at the sight of a tube. Maintaining a calm, reassuring manner can help minimize the child's fear.

Polish up on patient care

Pediatric GI disorders discussed in this chapter include acetaminophen poisoning, celiac disease, cleft lip and palate, esophageal atresia and tracheoesophageal fistula, failure to thrive, intestinal obstruction, pyloric stenosis, and salicylate poisoning.

Acetaminophen poisoning

Acetaminophen is an analgesic antipyretic agent that achieves its effect without inhibiting platelet aggregation. Because acetaminophen is an over-the-counter medication commonly found in the home, it's a common cause of poisoning in children.

With acetaminophen poisoning, hepatotoxicity occurs at plasma levels greater than 200 mg/ml at 4 hours after ingestion and greater than 50 mg/ml by 12 hours after ingestion.

CAUSE

- Acetaminophen overdose

DATA COLLECTION FINDINGS

- Anorexia
- Central nervous system changes (restlessness, agitation, seizures)
- Diaphoresis
- Encephalopathy
- Hepatic failure, death, or resolution of symptoms 7 to 8 days after ingestion
- Hypothermia
- Liver dysfunction
- Nausea and vomiting
- Oliguria
- Pallor
- Right-upper-quadrant tenderness usually occurs 24 to 48 hours after ingestion; jaundice evident 72 to 96 hours after ingestion
- Severe hypoglycemia
- Shock

DIAGNOSTIC FINDINGS

- Blood glucose levels are decreased.

• Serum aspartate aminotransferase and serum alanine aminotransferase levels become elevated soon after ingestion.
• Prothrombin time (PT) is prolonged.
• Acetaminophen levels are greatly elevated.

NURSING DIAGNOSES

• Imbalanced nutrition: Less than body requirements
• Risk for deficient fluid volume
• Hypothermia

TREATMENT

• Gastric lavage
• Hyperthermia blanket
• I.V. fluid
• Oxygen therapy (intubation and mechanical ventilation may be required)

Drug therapy

• Acetylcysteine (Mucomyst)
• Activated charcoal
• Ipecac

INTERVENTIONS AND RATIONALES

• Monitor liver function studies *to detect signs of liver damage and to monitor effectiveness of treatment.*
• Monitor vital signs and intake and output. *Tachycardia and decreased urine output may signify dehydration.*
• Monitor cardiovascular and GI status *to determine the effectiveness of treatment.*
• Administer hyperthermia therapy by using a warming blanket, limiting exposure during routine nursing care, and covering the child with warm blankets *to help the child become normothermic.*
• Administer oral acetylcysteine in a carbonated beverage or fruit juice. *Acetylcysteine has an offensive odor and taste. Administering this drug in a carbonated beverage will help the child swallow it.* With small children, administer it directly into an NG tube *to avoid this difficulty.*

Teaching topics

• Storing medication safely and other steps to prevent poisoning
• Monitoring cough and cold preparations that may contain acetaminophen; reading labels carefully

Celiac disease

Celiac disease, also known as *gluten enteropathy* or *sprue,* is characterized by poor food absorption and intolerance of gluten, which is a protein found in such grains as wheat, rye, oats, and barley.

With celiac disease, the child experiences a decrease in the amount and activity of enzymes in the intestinal mucosal cells. This causes the villi of the proximal small intestine to atrophy, decreasing intestinal absorption. It also affects fat and vitamin absorption. Celiac disease usually becomes apparent between ages 6 and 18 months as foods containing gluten are introduced into the infant's diet.

CAUSES

• Gluten intolerance (inability to absorb rye, oat, wheat, and barley glutens)
• Immunoglobulin A deficiency
• Too-early introduction of protein solids

DATA COLLECTION FINDINGS

• Abdominal distention and pain
• Anorexia and vomiting
• Generalized malnutrition and failure to thrive due to malabsorption of protein and carbohydrates
• Irritability
• Steatorrhea and chronic diarrhea due to fat malabsorption
• Weight and height below normal for age-group

DIAGNOSTIC FINDINGS

• Blood chemistry tests reveal hypocalcemia and hypoalbuminemia.
• Hematology tests reveal decreased Hb level and hypothrombinemia.
• Immunologic assay screen is positive for celiac disease.
• Intestinal biopsy is used to confirm the diagnosis.
• Reticulin antibody levels are elevated.
• Stool specimen reveals high fat content.

Give the child with celiac disease small, frequent meals to reduce fatigue and improve nutritional intake.

NURSING DIAGNOSES
- Imbalanced nutrition: Less than body requirements
- Delayed growth and development
- Deficient fluid volume

TREATMENT
- Diet: gluten-free but includes corn and rice products, soy and potato flour, breast milk or soy-based formula, and all fresh fruits
- Folate
- Iron (Feosol) supplements
- Vitamins A and D in water-soluble forms

INTERVENTIONS AND RATIONALES
- Give the child small, frequent meals *to reduce fatigue and improve nutritional intake.*
- Record the consistency, appearance, and number of stools. *The disappearance of steatorrhea is a good indicator that the child's ability to absorb nutrients is improving.*
- Monitor growth and development *to determne growth delay and to detect changes in level of functioning* and, as appropriate, plan an activity program for the child.

Teaching topics
- Providing foods and formula the child can eat (breads made from rice, corn, soybean, potato, tapioca, sago, or gluten-free wheat; dry cereals made only with rice or corn; cornmeal or hominy)

Cleft lip and palate

With cleft lip and palate, the bone and tissue of the upper jaw and palate fail to fuse completely at the midline. The defects may be partial or complete, unilateral or bilateral, and may involve just the lip, just the palate, or both.

Cleft lip and palate also increase the risk of:
- aspiration because increased open space in the mouth may cause formula or breast milk to enter the respiratory tract
- upper respiratory infection and otitis media because the increased open space decreases natural defenses against bacterial invasion.

CAUSES
- Congenital defects; in some cases multifactorial environmental and genetic factors play a role
- Part of another chromosomal or mendelian abnormality
- Prenatal exposure to teratogens

DATA COLLECTION FINDINGS
- Abdominal distention from swallowed air
- Cleft lip: can range from a simple notch on the upper lip to complete cleft from the lip edge to the floor of the nostril, on either side of the midline, but rarely along the midline itself
- Cleft palate: may be partial or complete, and unilateral or bilateral
- Difficulty swallowing
- Note that cleft lip with or without cleft palate is obvious at birth; cleft palate without cleft lip may not be detected until a mouth examination is done or until feeding difficulties develop.

DIAGNOSTIC FINDING
- Prenatal ultrasonography may indicate severe defects.

NURSING DIAGNOSES
- Imbalanced nutrition: Less than body requirements
- Impaired swallowing
- Risk for aspiration

TREATMENT
- Cheiloplasty performed between 2 and 3 months of age to unite the lip and gum edges in anticipation of teeth eruption, providing a route for adequate nutrition and sucking
- Cleft palate repair surgery (staphylorrhaphy); scheduled at about age 18 months to allow for growth of the palate and to be done before the infant develops speech patterns; infant must be free from ear and respiratory infections
- Long-term, team-oriented care to address speech defects, dental and orthodontic problems, nasal defects, and possible alterations in hearing
- If cleft lip is detected on sonogram while the infant is in utero, possible fetal repair

INTERVENTIONS AND RATIONALES

• Monitor vital signs and intake and output *to determine fluid volume status.*
• Monitor respiratory status *to detect signs of aspiration.*
• Evaluate the quality of the infant's suck by determining if he can form an airtight seal around a finger or nipple placed in his mouth *to determine an effective feeding method.*
• Monitor for respiratory distress when feeding *to avoid aspiration.*
• As the child grows older, explore his feelings *to evaluate actual and potential coping problems.*

Preoperative interventions for cleft lip repair

• Feed the infant slowly and in an upright position *to decrease the risk of aspiration.*
• Burp the infant frequently during feeding *to eliminate swallowed air and decrease the risk of emesis.*
• Use gavage feedings *if oral feedings are unsuccessful.*
• Administer a small amount of water after feedings *to prevent formula from accumulating and becoming a medium for bacterial growth.*
• Give small, frequent feedings *to promote adequate nutrition and prevent tiring the infant.*
• Hold the infant while feeding and promote sucking between meals. *Sucking is important to speech development.*

Postoperative interventions for cleft lip repair

• Observe for cyanosis as the infant begins to breathe through the nose *to detect signs of respiratory compromise.*
• Keep the infant's hands away from the mouth by using restraints or pinning the sleeves to the shirt; use adhesive strips to hold the suture line in place *to prevent tension and to maintain an intact suture line.*
• Anticipate the infant's needs *to prevent crying, which may cause tension on the suture line.* Don't position him prone.
• Give extra care and support *because the infant can't meet emotional needs by sucking.*
• Use a syringe with tubing to administer foods at the side of the mouth *to prevent trauma to the suture line.*
• Place the infant on the right side *to prevent aspiration.*
• Clean the suture line after each feeding by dabbing it with half-strength hydrogen peroxide or normal saline solution *to prevent crusts and scarring.*
• Monitor for pain and administer pain medication as prescribed; note effectiveness of pain medication *to promote comfort.*

Preoperative interventions for cleft palate repair

• Feed the infant with a cleft palate nipple or a Teflon implant *to enhance nutritional intake.*
• Wean the infant from the bottle or breast before cleft palate surgery; *the toddler must be able to drink from a cup.*

Postoperative interventions for cleft palate repair

• Position the toddler on the abdomen or side *to promote a patent airway.*
• Anticipate edema and a decreased airway from palate closure, which may make the toddler appear temporarily dyspneic, and observe for signs of altered oxygenation *to promote good respiration.*
• Keep hard or pointed objects (utensils, straws, frozen dessert sticks) away from the mouth *to prevent trauma to the suture line.*
• Use a cup to feed; don't use a nipple or pacifier *to prevent injury to the suture line.*
• When feeding the infant with a spoon, place the spoon into the side of the mouth; *touching the roof of the mouth may interrupt the suture line.*
• Use elbow restraints *to keep the toddler's hands out of the mouth.*
• Provide soft toys *to prevent injury.*
• Start the toddler on clear liquids and progress to a soft diet; rinse the suture line by giving the toddler a sip of water after each feeding *to prevent infection.*
• Distract or hold the toddler *to try to keep the tongue away from the roof of the mouth.*

Teaching topics

• Bonding with the child (because it results in facial disfigurement, the condition may cause shock, guilt, and grief for the parents and may block parental bonding with the child)
• Following-up with speech therapy

• Understanding the child's susceptibility to otitis media (from the altered position of the eustachian tubes) and other infections

Esophageal atresia and tracheoesophageal fistula

Feeding a neonate a few sips of sterile water will detect or rule out esophageal atresia and tracheoesophageal fistula.

Esophageal atresia occurs when the proximal end of the esophagus ends in a blind pouch; food can't enter the stomach via the esophagus.

Tracheoesophageal fistula occurs when a connection exists between the esophagus and the trachea. It may result in the reflux of gastric juice after feeding; this can allow acidic stomach contents to cross the fistula, irritating the trachea.

Esophageal atresia and tracheoesophageal fistula occur in many combinations and may be associated with other defects. Esophageal atresia with tracheoesophageal fistula is the most common of these conditions. Esophageal atresia alone is the second most common of these conditions.

Esophageal atresia with tracheoesophageal fistula occurs when either:

• the distal end of the esophagus ends in a blind pouch and the proximal end of the esophagus is linked to the trachea via a fistula

• the proximal end of the esophagus ends in a blind pouch and the distal portion of the esophagus is connected to the trachea via a fistula.

CAUSES

• Congenital defect
• Maternal history of polyhydramnios
• Prenatal exposure to teratogens

DATA COLLECTION FINDINGS

Esophageal atresia

• Excessive salivation and drooling due to inability to pass food through the esophagus
• Inability to pass an NG tube
• Regurgitation of undigested formula immediately after feeding; possible respiratory distress and cyanosis if secretions are aspirated

Tracheoesophageal fistula

• Abdominal distention from air that goes through the fistula into the stomach
• Choking, coughing, and intermittent cyanosis during feeding due to food that goes through the fistula into the trachea
• Excessive drooling of saliva; possibly the first symptom
• Tracheal irritation from gastric acids that reflux across the fistula

Esophageal atresia with tracheoesophageal fistula

• Excessive salivation and drooling due to inability to pass food through the esophagus
• Inability to pass an NG tube
• Regurgitation of undigested formula immediately after feeding; possible respiratory distress and cyanosis if secretions are aspirated
• Signs of respiratory distress (coughing, choking, and intermittent cyanosis) because the infant has difficulty tolerating oral foods and handling oral secretions or refluxed gastric contents

DIAGNOSTIC FINDINGS

• Neonates are fed first with a few sips of sterile water to detect these anomalies and to prevent the aspiration of formula or breast milk into the lungs.
• Ultrasonography or X-ray identifies the abnormality.

NURSING DIAGNOSES

• Imbalanced nutrition: Less than body requirements
• Risk for infection
• Risk for impaired parenting

TREATMENT

• Gastrostomy tube (PEG tube) inserted (child not fed orally)
• Surgical correction by ligating the tracheoesophageal fistula and reanastomosing the esophageal ends; in many cases, repair done in stages

INTERVENTIONS AND RATIONALES

• Monitor vital signs *to detect tachycardia and tachypnea, which could indicate hypoxemia.*

• Monitor respiratory status. *Poor respiratory status may result in hypoxemia.*
• Position the infant with his head elevated to 30 degrees *to decrease reflux at the distal esophagus.*
• Suction as needed *to stimulate cough and clear airways.*
• If feeding the child through a gastrostomy tube after surgery, anticipate abdominal distention from air. Keep the child upright during feedings *to reduce the chance of refluxed stomach contents and aspiration pneumonia.* Keep tube open and elevated before and after feedings *to allow release of gas.*
• Administer gastrostomy feedings only by gravity flow—not a feeding pump—*to help meet nutritional and metabolic requirements.*

Postoperative care

• Maintain chest tube and respiratory support *to prevent respiratory compromise.*
• Keep a suction catheter ready *to get rid of secretions and prevent aspiration.*
• Mark the catheter to indicate the distance from the infant's nose to the point just above the anastomosis *to avoid causing trauma to the anastomosis site.*
• Make sure the NG tube is secure and handle with extreme caution *to avoid displacement.*
• Administer antibiotics as prescribed *to prevent infection.*
• Administer total parenteral nutrition (TPN) *to maintain nutritional support.*

Teaching topics

• Understanding proper care of child at home, such as feeding and bathing techniques

Failure to thrive

Failure to thrive is a chronic, potentially life-threatening condition characterized by failure to maintain weight and height above the 5th percentile on age-appropriate growth charts. Most children are diagnosed before age 2. It can result from physical, emotional, or psychological causes.

CAUSES

• Organic: acute or chronic illness (GI reflux, malabsorption syndrome, congenital heart defect, or cystic fibrosis)
• Nonorganic: psychological problem between child and primary caregiver, such as failure to bond
• Mixed: combination of organic and nonorganic

DATA COLLECTION FINDINGS

• Altered body posture; child is stiff or floppy, doesn't cuddle
• Delayed psychosocial behavior; for example, reluctance to smile or talk
• Disparities between chronological age and height and weight
• History of inadequate feeding techniques, such as bottle propping or insufficient burping
• History of insufficient stimulation and inadequate parental knowledge of child development
• History of medical problems
• History of sleep disturbances
• Psychosocial family problems
• Regurgitation of food after almost every feeding, part being vomited and the remainder swallowed (rumination of food)

DIAGNOSTIC FINDINGS

• Negative nitrogen balance indicates inadequate intake of protein or calories.
• Associated physiologic causes may be detected.
• Reduced creatinine-height index reflects muscle mass and estimates muscle protein depletion.

NURSING DIAGNOSES

• Delayed growth and development
• Impaired parenting
• Imbalanced nutrition: Less than body requirements

TREATMENT

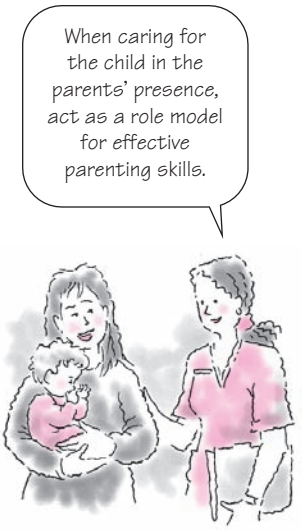
• High-calorie diet
• Parent counseling
• Respite care for the child

Drug therapy

- Vitamin and mineral supplements

INTERVENTIONS AND RATIONALES

- Weigh the child on admission and daily *to determine fluctuations in weight.*
- Properly feed and interact with the child *to promote nutrition and growth and development.*
- Establish specific times for feeding, bathing, and sleeping *to establish and maintain a structured routine.*
- Provide the child with visual and auditory stimulation *to promote normal sensory development.*
- Observe the interaction of parent with child *to determine if failure to thrive is due to parent's inability to form emotional attachment to child.*
- When caring for the child in the parent's presence, act as a role model for effective parenting skills. Demonstrate comfort measures such as rocking the infant, and show the mother how to hold the infant in an en face position *to increase the parent's knowledge of routine child care practices.*
- Teach the mother about normal growth and development, and identify ages at which the child should be able to master developmental tasks, such as rolling over, crawling, and walking. *This will assist the parents in monitoring the child's growth and development.* Also discuss problem behaviors associated with specific ages, such as colic, temper tantrums, and sleeping difficulties, *to further enhance the parents' understanding of developmental norms.*
- Discuss the child's need for tactile and sensory stimulation. Demonstrate play activities that promote developmental skills, such as shaking a rattle in front of the infant to build eye-and-hand coordination or placing a mobile above the infant to encourage visual tracking and trunk and head control. *Sensory experiences promote cognitive development.*



Teaching topics

- Understanding normal parenting skills
- Obtaining counseling for the parents, if necessary
- Understanding formula preparation and feeding techniques

Intestinal obstruction

Intestinal obstruction is the partial or complete blockage of the lumen in the small or large bowel. Small-bowel obstruction is far more common and usually more serious. Complete obstruction in any part of the bowel, if untreated, can cause death within hours from shock and vascular collapse.

Intestinal obstruction can occur in three forms:

- simple: blockage prevents intestinal contents from passing, with no other complications
- strangulated: blood supply to part or all of the obstructed section is cut off, in addition to blockage of the lumen
- close-looped: both ends of a bowel section are occluded, isolating it from the rest of the intestine.

CAUSES

Mechanical causes

- Adhesions and strangulated hernias (most common causes of small-bowel obstruction)
- Carcinomas (most common cause of large-bowel obstruction)
- Compression of the bowel wall due to stenosis, intussusception, volvulus of the sigmoid or cecum, tumors, or atresia
- Congenital bowel deformities
- Ingestion of foreign bodies (such as fruit pits or worms)
- Obstruction after abdominal surgery

Other causes

- Paralytic ileus
- Electrolyte imbalances
- Toxicity (uremia, generalized infection)
- Neurogenic abnormalities (spinal cord lesions)
- Thrombosis or embolism of mesenteric vessels

DATA COLLECTION FINDINGS

Partial small-bowel obstruction

- Abdominal distention
- Colicky pain
- Constipation
- Drowsiness
- Dry oral mucous membranes and tongue
- Intense thirst
- Malaise
- Nausea
- Vomiting (the higher the obstruction, the earlier and more severe the vomiting)

Complete small-bowel obstruction

- Persistent epigastric or periumbilical pain
- Bowel contents propelled toward mouth (instead of rectum) by vigorous peristaltic waves

Partial large-bowel obstruction

With partial large-bowel obstruction, signs and symptoms develop slowly because the colon can absorb fluid from its contents and distend well beyond its normal size. Signs and symptoms may include the following:

- dramatic abdominal distention
- colicky abdominal pain; may appear suddenly, producing spasms that last less than 1 minute and recur every few minutes
- constipation (may be only clinical effect for days)
- continuous hypogastric pain and nausea; vomiting usually absent at first
- leakage of liquid stools around the obstruction (common)
- loops of large bowel becoming visible on the abdomen.

Complete large-bowel obstruction

- Continuous pain
- Fecal vomiting
- Localized peritonitis

DIAGNOSTIC FINDINGS

- With large-bowel obstruction, barium enema reveals a distended, air-filled colon or, in sigmoid volvulus, a closed loop of sigmoid with extreme distention.
- With obstruction in the upper intestine, arterial blood gas (ABG) analysis reveals metabolic alkalosis from dehydration and loss of gastric hydrochloric acid.
- With lower bowel obstruction, ABG analysis reveals metabolic acidosis caused by slower dehydration and loss of intestinal alkaline fluids.
- X-rays confirm the diagnosis. Abdominal films show the presence and location of intestinal gas or fluid.

NURSING DIAGNOSES

- Imbalanced nutrition: Less than body requirements
- Acute pain
- Ineffective tissue perfusion: Gastrointestinal

TREATMENT

- I.V. therapy to correct fluid and electrolyte imbalances
- NG intubation to decompress the bowel to relieve vomiting and distention
- Surgical resection with anastomosis, colostomy, or ileostomy, commonly after decompression with an NG tube (for large-bowel obstruction)
- TPN for protein deficit from chronic obstruction, paralytic ileus, infection, or prolonged postoperative recovery time that requires NPO status

Drug therapy

- Analgesics (usually nonopioid to avoid reduced intestinal motility commonly caused by opioid analgesics)
- Antibiotics for peritonitis

INTERVENTIONS AND RATIONALES

- Monitor vital signs frequently. *A drop in blood pressure may indicate reduced circulating blood volume due to blood loss from a strangulated hernia.*
- Monitor child's cardiovascular status *to observe for signs of shock, such as pallor, rapid pulse, and hypotension.*
- Stay alert for signs and symptoms of metabolic alkalosis (changes in sensorium; slow, shallow respirations; hypertonic muscles; tetany) or acidosis (dyspnea on exertion; disorientation; and later, deep, rapid breathing, weakness, and malaise). *This allows for early detection of complications.*
- Watch for signs and symptoms of secondary infection, such as fever and chills. *Sus-*

The highs and lows of intestinal obstruction are simple: high means marked vomiting with limited abdominal distention; low means little vomiting with marked distention.

tained temperature elevations after surgery may signal onset of pulmonary complications or wound infection.
• Monitor intake and output; monitor urine output carefully *to evaluate renal function, circulating blood volume, and possible urine retention caused by bladder compression by the distended intestine.*
• Catheterize the child for residual urine immediately after he has voided *if you suspect bladder compression.* Also, measure abdominal girth frequently *to detect progressive distention.*
• Provide fastidious mouth and nose care if the child has vomited or undergone decompression by intubation *to prevent skin breakdown*. Look for signs of dehydration (thick, swollen tongue; dry, cracked lips; dry oral mucous membranes).
• Keep the child in Fowler's position as much as possible *to promote pulmonary ventilation and ease respiratory distress from abdominal distention.*
• Listen for bowel sounds, and watch for signs of returning peristalsis (passage of flatus and mucus through the rectum) *to promote nutritional status.*

Teaching topics
• Preparing the child and his family for the possibility of surgery, and providing emotional support and positive reinforcement afterward

Pyloric stenosis

With pyloric stenosis, hyperplasia and hypertrophy of the circular muscle at the pylorus narrow the pyloric canal, thereby preventing the stomach from emptying normally. The defect is most commonly seen in male infants between ages 1 and 6 months.

CAUSES
• Exact cause unknown
• Family history of pyloric stenosis

DATA COLLECTION FINDINGS
• Olive-size bulge palpated below the right costal margin
• Poor weight gain
• Symptoms of malnutrition and dehydration despite the child's apparent adequate intake of food
• Projectile vomiting during or shortly after feedings, preceded by reverse peristaltic waves (going left to right) but not by nausea; child resumes eating after vomiting
• Symptoms appearing at about 4 weeks in formula-fed infants and about 6 weeks in breast-fed infants
• Tetany

DIAGNOSTIC FINDINGS
• ABG analysis reveals metabolic alkalosis.
• Blood chemistry tests may reveal hypocalcemia, hypokalemia, and hypochloremia.
• Hematest reveals blood in vomitus.
• Ultrasound shows hypertrophied sphincter.
• Endoscopy reveals hypertrophied sphincter.
• Upper GI shows narrow pyloric channel.

NURSING DIAGNOSES
• Imbalanced nutrition: Less than body requirements
• Risk for deficient fluid volume
• Risk for infection

TREATMENT
• Diet: Maintain NPO status before surgery
• I.V. therapy to correct fluid and electrolyte imbalances
• Possible insertion of an NG tube, kept open and elevated for gastric decompression
• Surgical intervention: pyloromyotomy performed by laparoscopy

Drug therapy
• Potassium supplements but only after it's confirmed that kidneys are functioning properly
• I.V. calcium administration

INTERVENTIONS AND RATIONALES
• Weigh the infant daily *to monitor growth.*
• Monitor vital signs and intake and output *to evaluate renal function and check for signs of dehydration.*
• Monitor for metabolic alkalosis and dehydration from frequent emesis *to detect early complications.*

• Monitor abdominal and cardiovascular status *to detect early signs of compromise.*
• Provide small, frequent, thickened feedings with the head of the bed elevated; burp the infant frequently (preoperatively) *to promote nutrition and prevent aspiration.*
• Position the infant on the right side *to prevent the aspiration of vomitus.*

Postoperative care
• After surgery, feed the infant small amounts of oral electrolyte solution at first; then increase the amount and concentration of food until normal feeding is achieved *to meet nutritional needs and prevent vomiting.*
• Provide a pacifier *to meet nonnutritive sucking needs and maintain comfort.*
• Provide routine postoperative care *to maintain and improve the infant's condition and to detect early complications.* Position the infant on his side *to decrease the risk of aspiration if vomiting occurs. Laying the infant on the right side may aid the flow of fluid through the pyloric valve by gravity.*
• Keep the incision area clean. *The infant is at an increased risk for infection because the incision is near the diaper area.*

Teaching topics
• Feeding the infant, including specific formula, volume, and technique
• Preventing infection

Salicylate poisoning

Salicylate (aspirin) is an analgesic, antipyretic, and anti-inflammatory agent that inhibits platelet aggregation. Poisoning may result from an overdose of salicylate. Symptoms begin when children ingest 150 to 200 mg of aspirin per kilogram of body weight. The peak blood level is reached within 2 to 3 hours of ingestion. The prognosis of the child with salicylate poisoning depends on the amount of salicylate ingested and how quickly treatment begins.

CAUSE
• Aspirin overdose

DATA COLLECTION FINDINGS
• Coma
• Diarrhea
• High fever from the stimulation of carbohydrate metabolism
• Increased respiratory rate from metabolic acidosis
• Irritability, restlessness
• Petechiae and bleeding tendency
• Restlessness
• Seizures
• Stomach ulcer
• Stupor
• Tachycardia
• Tinnitus or altered hearing
• Vomiting

DIAGNOSTIC FINDINGS
• Blood glucose levels are initially elevated and then decreased.
• PT is prolonged.
• Serum salicylate levels are elevated.

NURSING DIAGNOSES
• Imbalanced nutrition: Less than body requirements
• Hyperthermia
• Risk for deficient fluid volume

TREATMENT
• Oral or I.V. fluids
• Gastric lavage or emesis induction with ipecac syrup
• Hemodialysis
• Hypothermia blanket
• Possible intubation and mechanical ventilation

Drug therapy
• Calcium and potassium supplements, if indicated
• Sodium bicarbonate
• Vitamin K to control bleeding

INTERVENTIONS AND RATIONALES
• Administer oral and I.V. fluids *to dilute the poison and prevent dehydration.*
• Monitor vital signs and intake and output *to detect dehydration and early signs of compromise.*

• Monitor cardiovascular and GI status *to evaluate for signs of metabolic acidosis and GI bleeding.*
• Maintain mechanical ventilation, if required, *to ensure adequate oxygenation.*
• Monitor urine pH; *pH over 8 aids salicylate excretion.*
• Dress the child lightly and sponge him with tepid water or use a cooling blanket *to reduce fear and promote comfort.*
• Monitor body temperature every 15 to 30 minutes according to policy while hypothermia blanket is in use *to evaluate its effectiveness and prevent injury.*
• Monitor blood glucose levels *to detect hypoglycemia.*

Teaching topics

• Storing medication safely and taking steps to prevent poisoning
• Monitoring child's temperature and encouraging a high fluid intake

Pump up on practice questions

1. A 3-week-old neonate diagnosed with pyloric stenosis is admitted to the hospital during a vomiting episode. Which action by the nurse is most appropriate?

1. Placing the neonate on his back to sleep
2. Weighing the neonate every 12 hours
3. Positioning the neonate on his right side
4. Taking vital signs every 8 hours

Answer: 3. The nurse should position the neonate on his right side to prevent aspiration. The neonate should be weighed daily, not every 12 hours. Vital signs should be monitored every 4 hours, not every 8 hours.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

2. The nurse teaches a mother to position an infant with a tracheoesophageal fistula with his head elevated to 30 degrees. The nurse should recognize that teaching was effective when the mother makes which statement?

1. "Positioning him with his head elevated to 30 degrees helps with eating."
2. "Positioning him with his head elevated to 30 degrees helps his breathing."
3. "Positioning him with his head elevated to 30 degrees keeps gastric juices from backing up."
4. "Positioning him with his head elevated to 30 degrees makes him comfortable."

Answer: 3. Placing the infant with his head elevated to 30 degrees helps decrease gastric reflux into the trachea. The child won't be taking food by mouth until after the fistula is surgically repaired. The infant will also breathe easier and be more comfortable with his head elevated, but they aren't the primary reasons for elevating the infant's head to 30 degrees.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

3. A child with an NG tube in place complains of nausea. Which action by the nurse is most appropriate?

1. Administer an antiemetic.
2. Irrigate the NG tube.
3. Notify the physician about the nausea.
4. Reposition the NG tube.

Answer: 2. The nurse should first check NG tube placement, then irrigate the tube to check for patency. If nausea continues, the NG tube may be repositioned, depending on the child's condition. If the child continues to

complain of nausea after these measures, the physician should be notified and an antiemetic given as ordered.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

4. The mother of a child diagnosed with celiac disease asks the nurse which foods should be eliminated from her child's diet. The nurse should advise the mother to eliminate:

1. malted milk, wheat bread, and spaghetti.
2. rice cereals, milk, and corn bread.
3. tapioca, potato bread, and peanut butter.
4. corn cereals, milk, and honey.

Answer: 1. The mother should provide her child with a gluten-free diet, eliminating such foods as malted milk, wheat bread, and spaghetti. Rice and corn cereals, milk, corn and potato breads, tapioca, peanut butter, and honey are all appropriate for a gluten-free diet.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

5. The nurse is caring for a toddler after surgical repair of a cleft palate. The nurse should position the child:

1. on his back.
2. on his stomach.
3. on his back with his head slightly elevated.
4. for comfort.

Answer: 2. After surgical repair of a cleft palate, the child should be positioned on his stomach to prevent pooling of secretions in the oropharynx. The child shouldn't be positioned on his back. The nurse shouldn't choose a position based on comfort.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

6. The nurse is caring for a child with a complete intestinal obstruction. Which is a key finding in this client?

1. Vomiting
2. Intense thirst
3. Visible peristaltic waves
4. Nausea

Answer: 3. Visible peristaltic waves propel bowel contents toward the mouth instead of the rectum. Vomiting, intense thirst, and nausea are symptoms of a small-bowel obstruction and aren't the key findings in complete intestinal obstruction.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

7. The nurse is caring for an infant with a cleft lip and palate. This condition places the infant at increased risk for:

1. upper respiratory infections and otitis media.
2. otitis media and diarrhea.
3. upper respiratory infections and diarrhea.
4. diarrhea and vomiting.

Answer: 1. The infant with a cleft lip and palate is at increased risk for upper respiratory infections and otitis media because the increased open space decreases natural defenses against bacteria. It doesn't increase the risk of vomiting and diarrhea.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

8. The nurse is teaching the mother of an infant with a cleft palate. Which teaching point should the nurse tell the mother?

1. Surgical repair is delayed until the child is 6 months old.
2. Surgical repair is delayed until the child is 18 months old.
3. Surgical repair is done between birth and age 3 months.
4. Surgical repair is done as soon as arrangements can be made.

Answer: 2. Surgical repair of a cleft palate (staphylorrhaphy) is scheduled at about age 18 months to allow for growth of the palate and to be done before the infant develops speech patterns. Surgical repair of a cleft lip (cheiloplasty) takes place between birth and age 3 months.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

9. A 4-week-old neonate is brought to the pediatrician's office. The neonate has been experiencing projectile vomiting shortly after feedings. The neonate most likely has:

1. an intestinal obstruction.
2. intussusception.
3. a tracheoesophageal fistula.
4. pyloric stenosis.

Answer: 4. Symptoms of pyloric stenosis generally develop between ages 4 and 6 weeks. They include a palpable bulge below the right costal margin, projectile vomiting during or shortly after feeding, resuming feeding after vomiting, poor weight gain, malnutrition, and dehydration. Intestinal obstruction presents with constipation, colicky abdominal pain, nausea, and dramatic abdominal distention. Intussusception causes sudden onset of severe abdominal pain; the infant is usually inconsolable. Tracheoesophageal fistula causes abdominal distention and coughing, choking, and intermittent cyanosis during feeding.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

10. The nurse is caring for a neonate. What intervention is routinely performed for all neonates to rule out the possibility of tracheoesophageal fistula and esophageal atresia?

1. Feeding the neonate a few sips of sterile water before introducing breast milk or formula
2. Feeding the neonate a few sips of formula before introducing breast milk
3. Feeding the neonate a few sips of formula in an upright position
4. Feeding the neonate sterile water for the first two feedings

Answer: 1. All neonates should be fed first with a few sips of sterile water to rule out these anomalies and to prevent the aspiration of formula into the lungs. Feeding the neonate formula, breast milk, or sterile water for the first two feedings could put the neonate at risk for aspiration pneumonia if either anomaly is present.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

33 Endocrine system

In this chapter, you'll review:

- endocrine function in childhood
- tests used to diagnose endocrine disorders
- common endocrine disorders.

Brush up on key concepts

Together with the nervous system, the endocrine system regulates and integrates the body's metabolic activities. A disorder of the endocrine system involves a hyposecretion or hypersecretion of hormones, which affect the body's metabolic processes and function.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on page 662.

Endocrine junior

Here are key points about endocrine function in childhood:

• The **pituitary gland** controls the release of seven different hormones and is the master gland for all age-groups.

• The **adrenal cortex** begins secreting glucocorticoids and mineralocorticoids early in embryonic life.

Ch..ch..changes

The pituitary gland is stimulated at puberty to produce androgen steroids responsible for **secondary sex characteristics.**

Female secondary sexual development during puberty involves an increase in the size of the ovaries, uterus, vagina, labia, and breasts. The first visible sign of sexual maturity is the appearance of breast buds. Body hair then appears in the pubic area and under the arms and menarche begins. The ovaries, present at birth, remain inactive until puberty.

Male secondary sexual development consists of genital growth and the appearance of pubic and body hair.

A place to integrate

The endocrine system meets the nervous system at the **hypothalamus.** The hypothalamus, the main integrative center for the endocrine and autonomic nervous systems, controls the function of endocrine organs by neural and hormonal stimulation.

Neural pathways connect the hypothalamus to the posterior pituitary, or neurohypophysis. Neural stimulation of the posterior pituitary provokes the secretion of hormones (chemical transmitters released from specialized cells into the bloodstream). Hormones are then carried to specialized organ-receptor cells that respond to them.

Negative feedback

In addition to hormonal and neural controls, a **negative feedback system** regulates the endocrine system. The mechanism of feedback may be simple or complex:

• **Simple feedback** occurs when the level of a substance regulates secretion of a hormone. For example, a low serum calcium level stimulates parathyroid hormone secretion; a high serum calcium level inhibits it.

• **Complex feedback** occurs through an axis established between the hypothalamus, pituitary gland, and target organ. For example, secretion of the hypothalamic corticotropin-releasing hormone stimulates release of pituitary corticotropin, which, in turn, stimulates cortisol secretion by the adrenal gland (the target organ). A rise in the serum cortisol level inhibits corticotropin secretion by decreasing corticotropin-releasing hormone.

Cheat sheet

Pediatric endocrine refresher

DIABETES MELLITUS

Key signs and symptoms

- Polydipsia
- Polyphagia
- Polyuria

Key test results

- Fasting plasma glucose level (no calorie intake for at least 8 hours) is greater than or equal to 126 mg/dl.
- Plasma glucose value in the 2-hour sample of the oral glucose tolerance test is greater than or equal to 200 mg/dl. This test should be performed after a loading dose of 75 g of anhydrous glucose.
- A random plasma glucose value (obtained without regard to the time of the child's last food intake) greater than or equal to 200 mg/dl accompanied by symptoms of diabetes indicates diabetes mellitus.

Key treatments

- Exercise
- Insulin replacement
- Strict diet planned to meet nutritional needs, control blood glucose levels, and reach and maintain appropriate body weight

Key interventions

- Monitor vital signs and intake and output.
- Provide appropriate treatment for hypoglycemia.
- Teach the child and his parents about complying with the prescribed treatment program; monitoring blood glucose levels at home; rotating injection sites; and preventing, recognizing, and treating hypoglycemia and hyperglycemia at home.

HYPOTHYROIDISM

Key signs and symptoms

Untreated hypothyroidism in infants

- Hoarse crying
- Persistent jaundice
- Puffy face and swollen tongue

Untreated hypothyroidism in older children

- Stunted growth (dwarfism)
- Cognitive impairment
- Weight gain

Key test result

- Radioimmunoassay confirms hypothyroidism with low triiodothyronine and thyroxine levels.

Key treatments

- Oral thyroid hormone (thyroxine)
- Supplemental vitamin D to prevent rickets from rapid bone growth

Key interventions

- During early management of infantile hypothyroidism, monitor blood pressure and pulse rate and report hypertension and tachycardia immediately (normal infant heart rate is approximately 120 beats/minute).
- Check axillary temperature every 2 to 4 hours. Keep the infant warm and his skin moist.
- If the infant's tongue is unusually large, position him on his side and observe him frequently.
- Teach the child and his parents to recognize signs of supplemental thyroid hormone overdose (rapid pulse rate, irritability, insomnia, fever, sweating, weight loss).

Remember to tailor your teaching to the child's needs, abilities, and developmental stage.

Keep abreast of diagnostic tests

Here are some important tests used to diagnose endocrine disorders, along with common nursing interventions associated with each test.

Function studies

An **endocrine function study** focuses on measuring the level or effect of a hormone,

such as the effect of insulin on blood glucose levels.

Sophisticated techniques of hormone measurement have improved the diagnosis of endocrine disorders. For example, the human growth hormone (GH) stimulation test measures human GH levels after I.V. administration of arginine, an amino acid that, under normal circumstances, stimulates human GH. This test is used to diagnose GH deficiency.

Nursing actions

- Explain the test to the child and his parents.
- Check with the laboratory and consult facility protocol to determine specific actions to take before the test (for example, nothing-by-mouth for blood glucose test).

Minute measurements

A **radioimmunoassay** is used to measure minute quantities of hormones.

Nursing actions

- Explain the test to the child and his parents.

Polish up on patient care

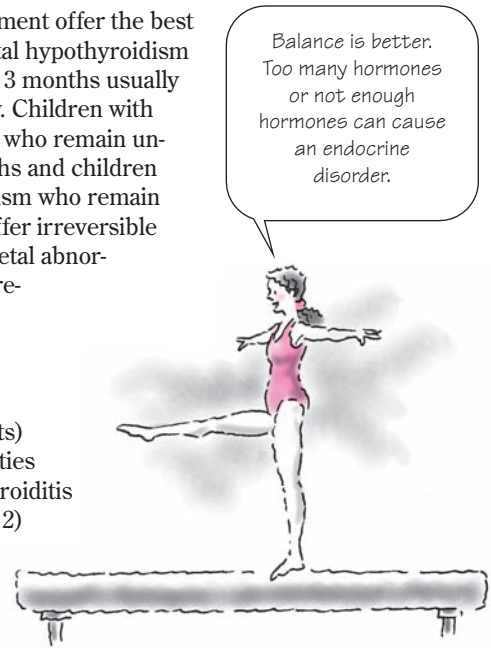
Two major endocrine disorders in pediatric patients are hypothyroidism and diabetes mellitus.

Hypothyroidism

Hypothyroidism occurs when the body doesn't produce enough thyroid gland hormone, the hormone necessary for normal growth and development. (See *Thyroid gland hormones,* page 664.)

Two types of hypothyroidism exist. Congenital hypothyroidism is present at birth. Acquired hypothyroidism is commonly due to thyroiditis, an inflammation of the thyroid gland that results in injury or damage to thyroid tissue. Hypothyroidism is three times more common in girls than in boys.

Early diagnosis and treatment offer the best hope. Infants with congenital hypothyroidism who are treated before age 3 months usually grow and develop normally. Children with congenital hypothyroidism who remain untreated beyond age 3 months and children with acquired hypothyroidism who remain untreated beyond age 2 suffer irreversible cognitive impairment. Skeletal abnormalities, however, may be reversible with treatment.



CAUSES

- Antithyroid drugs taken during pregnancy (in infants)
- Chromosomal abnormalities
- Chronic autoimmune thyroiditis (in children older than age 2)
- Defective embryonic development that causes congenital absence or underdevelopment of the thyroid gland (most common cause in infants)
- Inherited enzymatic defect in the synthesis of thyroxine (T_4) caused by an autosomal recessive gene (in infants)

DATA COLLECTION FINDINGS

General findings

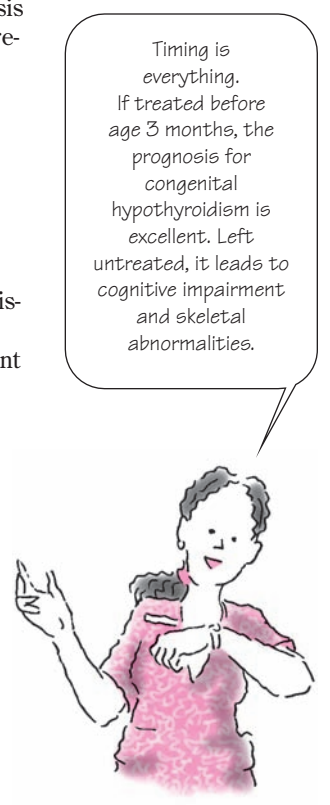
- Delayed dentition
- Enlarged tongue
- Hypotonia
- Legs short in relation to trunk size
- Cognitive impairment (develops as the disorder progresses)
- Short stature with the persistence of infant proportions
- Short, thick neck

With slow basal metabolic rate

- Cool body and skin temperature
- Decreased perspiration
- Dry, scaly skin
- Easy weight gain
- Slow pulse

Untreated hypothyroidism in infants

- Hoarse crying
- Persistent jaundice
- Puffy face and swollen tongue



Thyroid gland hormones

- The thyroid gland secretes the iodinated hormones thyroxine and triiodothyronine.
- Thyroid hormones, necessary for normal growth and development, act on many tissues to increase metabolic activity and protein synthesis.
- Deficiency of thyroid hormone causes varying degrees of hypothyroidism, from a mild, clinically insignificant form to life-threatening myxedema coma.

Untreated hypothyroidism in older children

- Stunted growth (dwarfism)
- Cognitive impairment
- Weight gain

DIAGNOSTIC FINDINGS

- Electrocardiogram shows bradycardia and flat or inverted T waves in untreated infants.
- Hip, knee, and thigh X-rays reveal absence of the femoral or tibial epiphyseal line and delayed skeletal development that's markedly inappropriate for the child's chronological age.
- With myxedema coma, laboratory tests may also show a low serum sodium level, decreased pH, and increased partial pressure of arterial carbon dioxide, indicating respiratory acidosis.
- Increased gonadotropin levels accompany precocious puberty in older children and may coexist with hypothyroidism.
- Serum cholesterol, alkaline phosphatase, and triglyceride levels are elevated.
- Normocytic normochromic anemia is present.
- Radioimmunoassay confirms hypothyroidism with low triiodothyronine (T_3) and T_4 levels.
- Thyroid scan and ^{131}I uptake tests show decreased uptake levels and confirm the absence of thyroid tissue in athyroid children.
- Thyroid-stimulating hormone (TSH) level is decreased when hypothyroidism is due to hypothalamic or pituitary insufficiency.
- TSH level is increased when hypothyroidism is due to thyroid insufficiency.

NURSING DIAGNOSES

- Delayed growth and development
- Interrupted family processes
- Deficient knowledge (treatment regimen)

TREATMENT

- Routine monitoring of T_4 and TSH levels
- Periodic evaluation of growth to ensure that thyroid replacement is adequate

Drug therapy

- Oral thyroid hormone: levothyroxine (Synthroid)
- Supplemental vitamin D to prevent rickets resulting from rapid bone growth

INTERVENTIONS AND RATIONALES

- During early management of infantile hypothyroidism, monitor blood pressure and pulse rate; report hypertension and tachycardia immediately (normal infant heart rate is approximately 120 beats/minute) *to detect signs of hyperthyroidism, which indicate that the dose of thyroid replacement medication is too high.*
- Check axillary temperature every 2 to 4 hours. Keep the infant warm and his skin moist *to promote normothermia and reduce metabolic demands.*
- If the infant's tongue is unusually large, position him on his side and observe him frequently *to prevent airway obstruction.*
- Provide the parents with support, referrals, and counseling as necessary *to help them cope with the possibility of caring for a physically and cognitively impaired child.*
- Recommend that adolescent girls seek future-oriented counseling that stresses the importance of adequate thyroid replacement during pregnancy. Ideally, women should have excellent control before conception *to prevent pregnancy complications.*

Teaching topics

• Recognizing signs of supplemental thyroid hormone overdose (rapid pulse rate, irritability, insomnia, fever, sweating, weight loss)
• Understanding that the child requires lifelong treatment with thyroid supplements
• Complying with the treatment regimen to prevent further mental impairment
• Adopting a positive but realistic attitude and focusing on the child's strengths rather than weaknesses
• Providing stimulating activities to help the child reach maximum potential (referring parents to appropriate community resources for support)
• Preventing infantile hypothyroidism (Emphasize the importance of adequate nutrition during pregnancy, including iodine-rich foods and the use of iodized salt or, in the case of sodium restriction, an iodine supplement.)

Diabetes mellitus

The diabetes that commonly occurs in childhood is known as type 1 diabetes. However, recently, type 2 diabetes, which was previously thought to be a disease of adults, has increased in incidence among children. Children with type 1 diabetes must take insulin to replace what their pancreas can no longer produce. (See *Understanding type 1 diabetes,* page 666.) Type 2 diabetes can sometimes be controlled with weight loss, dietary changes, and exercise.

CAUSES

• Genetic predisposition
• Viral infection
• Obesity (type 2 diabetes)

Hyperglycemia

• Cortisone use
• Decreased exercise with no decrease in food intake
• Decreased use of insulin
• Increased sugar intake
• Increased stressors
• Infection

Hypoglycemia

• Increased insulin use
• Excessive exercise
• Failure to eat

DATA COLLECTION FINDINGS

• Polydipsia
• Polyphagia
• Polyuria

Hyperglycemia

• Abdominal cramping
• Dry, flushed skin
• Fatigue
• Fruity breath odor
• Headache
• Mental status changes
• Nausea
• Thin appearance and possible malnourishment
• Vomiting
• Weakness

Hypoglycemia in conjunction with diabetes

• Behavior changes (belligerence, confusion, slurred speech)
• Diaphoresis
• Palpitations
• Tachycardia
• Tremors

DIAGNOSTIC FINDINGS

• Fasting plasma glucose level (no calorie intake for at least 8 hours) is greater than or equal to 126 mg/dl.
• Plasma glucose value in the 2-hour sample of the oral glucose tolerance test is greater than or equal to 200 mg/dl. This test should be performed after a loading dose of 75 g of anhydrous glucose.
• A random plasma glucose value (obtained without regard to the time of the child's last food intake) greater than or equal to 200 mg/dl and accompanied by symptoms of diabetes indicates diabetes mellitus.
• Test for glycosuria and ketonuria using dipstick, Clinitest, Acetest, Keto-Diastix, or glucose enzymatic test strip is positive.

Memory jogger

To remember the key assessment findings in diabetes mellitus, think "tri-poly" (sounds like Tripoli):

- **Poly**dipsia
- **Poly**phagia
- **Poly**uria.

Now I get it!

Understanding type 1 diabetes

Here are important points to help you understand how type 1 diabetes develops.

THE KEY PLAYERS

- The endocrine part of the pancreas produces glucagon from the alpha cells and insulin from the beta cells.
- Glucagon, the hormone of the fasting state, releases stored glucose to raise the blood glucose level.
- Insulin, the hormone of the nourished state, facilitates glucose transport, promotes glucose storage, stimulates protein synthesis, and enhances free fatty acid uptake and storage.

WHAT HAPPENS

Absolute or relative insulin deficiency causes diabetes mellitus. Here's what happens:

- Pancreatic beta cells are destroyed, no insulin is produced, and the cells can't utilize glucose.
- Excess glucose in the blood spills into the urine.
- The increased level of blood glucose can act as an osmotic diuretic, resulting in dehydration, hypotension, and renal shutdown.
- The body attempts to compensate for lost energy by breaking down fatty acids to form ketones, which results in metabolic acidosis.

Monitor the child's blood glucose and electrolyte levels for early signs of electrolyte imbalances.

NURSING DIAGNOSES

- Disturbed body image
- Risk for deficient fluid volume
- Deficient knowledge (treatment regimen)

TREATMENT

- Exercise
- Strict diet planned to meet nutritional needs, control blood glucose levels, and reach and maintain appropriate body weight

Drug therapy

- Insulin replacement

INTERVENTIONS AND RATIONALES

- Monitor vital signs and fluid intake and output *to detect high urine output, which may signify hyperglycemia, or weak, thready pulse, which may indicate hypoglycemia.*
- Monitor blood glucose and electrolyte levels *to detect early signs of electrolyte imbalance.*
- Provide appropriate treatment for hypoglycemia *to stabilize the child's condition and prevent complications.*
- Evaluate the child's understanding of diabetes and his attitude about the need to manage it. *This will help you plan teaching.*
- Correct misconceptions the child may have regarding diabetes and the therapeutic regimen. Use age-appropriate teaching materials *to increase his knowledge of his condition and instill confidence in his ability to manage it.*
- Provide an opportunity for the child to interact with peers who have experienced diabetes *to decrease the child's feelings of isolation and sense of being different from others.*
- Explore ways of dealing with peer pressure. Ask the adolescent if he feels that social pressure causes him to ignore his diet or avoid self-administering insulin. Ask if he feels embarrassed by his disorder. *Peer pressure is a reality that each adolescent must learn to deal with.*

Hyperglycemia

• Administer regular insulin for fast action *to promote an euglycemic state and prevent complications.*
• Maintain I.V. fluids without dextrose *to flush out acetone and maintain hydration.*
• Monitor blood glucose level *to detect early changes and prevent complications such as diabetic ketoacidosis.*

Hypoglycemia

• Give a fast-acting carbohydrate, such as honey, orange juice, or sugar cubes, followed later by a protein source *to establish normal glucose levels, thereby preventing complications of hypoglycemia.*

Teaching topics

• Complying with the prescribed treatment program, including diet, exercise, and insulin administration
• Monitoring blood glucose levels
• Importance of rotating injection sites
• Understanding the importance of good hygiene
• Preventing, recognizing, and treating hypoglycemia and hyperglycemia
• Understanding the effect of blood glucose control on long-term health
• Managing diabetes during minor illness, such as a cold, the flu, and an upset stomach
• Providing the child and his parents with written materials that cover the teaching topic
• Providing the child and his parents with information about the Juvenile Diabetes Foundation

Pump up on practice questions

1. The nurse is teaching the mother of a child diagnosed with type 1 diabetes. The mother asks why her child must inject insulin and can't take pills as her uncle does. Which reply is most appropriate?

1. "Because a child's pancreas is less developed than an adult's, antidiabetic pills aren't recommended for children."
2. "Pills only affect fat and protein metabolism, not sugar."
3. "The only way to replace insulin is by injection."
4. "Your child may be able to take pills when he's older."

Answer: 3. With type 1 diabetes, the pancreas doesn't produce insulin, so the child must receive insulin replacement by injection. Oral antidiabetic agents stimulate the pancreas to produce more insulin, delay the release of glucose from the liver, or decrease absorption of glucose and are only effective in treating type 2 diabetes. Because the pancreas in the child with type 1 diabetes doesn't produce insulin, the child will never be a candidate for oral antidiabetic agents.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

2. The nurse is teaching the mother of a diabetic child how to recognize the signs and symptoms of hypoglycemia. Which signs and symptoms should the nurse discuss?

1. Behavioral changes, increased heart rate, sweating, and tremors
2. Nausea, fruity breath odor, headache, and fatigue
3. Polydipsia, polyuria, polyphagia, and weight loss
4. Enlarged tongue, hypotonia, easy weight gain, and cool skin temperature

Answer: 1. The signs and symptoms of hypoglycemia include behavioral changes, increased heart rate, sweating, and tremors. Nausea, fruity breath odor, headache, and fatigue are present in hyperglycemia. Polydipsia, polyuria, polyphagia, and weight loss are classic signs of diabetes. Enlarged tongue, hypotonia, easy weight gain, and cool skin temperature are associated with hypothyroidism.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

3. The nurse is collecting data on a child who may have diabetes. Which laboratory value would help confirm a diagnosis of type 1 diabetes?

1. A fasting plasma glucose level of 110 mg/dl
2. A fasting plasma glucose level of 126 mg/dl
3. A random plasma glucose level of 180 mg/dl
4. A 2-hour oral glucose tolerance test result of 140 mg/dl

Answer: 2. According to the American Diabetes Association, diabetes is present when any of the following criteria exist: symptoms of diabetes plus a random plasma glucose level greater than or equal to 200 mg/dl, a fasting plasma glucose level greater than or equal to 126 mg/dl, or a 2-hour oral glucose tolerance test result greater than or equal to 200 mg/dl.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

4. The nurse is caring for a child with type 1 diabetes. The nurse enters the child's room, finds him diaphoretic, and can't waken him. The nurse should anticipate which emergency intervention?

1. Administering honey followed by a protein source
2. Administering orange juice followed by a protein source
3. Administering I.V. dextrose
4. Administering insulin

Answer: 3. The child is unconscious and may be experiencing a hypoglycemic reaction; therefore, the nurse should make sure that I.V. dextrose is available for administration. A conscious child experiencing a hypoglycemic episode should be given a fast-acting carbohydrate, such as honey, orange juice, or sugar cubes, followed by a protein source. Insulin administration would further worsen the child's condition.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

5. The nurse is teaching the parents of a child with diabetes. Which agent should the nurse teach the parents to administer if their child suffers a severe hypoglycemic reaction?

1. Subcutaneous insulin
2. I.V. dextrose
3. Subcutaneous glucagon
4. Oral fast-acting carbohydrate

Answer: 3. The nurse should instruct the parents of a child with diabetes about proper administration of subcutaneous glucagon if their child suffers a severe hypoglycemic episode. Subcutaneous insulin would further worsen the child's condition. I.V. dextrose is reserved for health care professionals specially trained in I.V. drug administration. Oral administra-

tion of fast-acting carbohydrates is reserved for a conscious child who isn't suffering from a severe hypoglycemic reaction.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

6. The nurse is teaching a child with diabetes about occurrences that can alter insulin requirements. Which should be emphasized?

1. Illness, stress, growth, food intake, and exercise
2. Water intake, illness, stress, and exercise
3. Exposure to ultraviolet light, illness, stress, and exercise
4. Sodium intake, exercise, stress, and illness

Answer: 1. Illness, stress, growth, food intake, and exercise can alter insulin requirements. Water intake, ultraviolet light exposure, and sodium intake don't alter insulin requirements.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

7. The nurse is teaching a child with diabetes. Which statement by the child indicates that teaching was effective?

1. "If I want to eat ice cream, I'll just give myself more insulin."
2. "I'm so busy, I'm glad I can still skip meals if I need to."
3. "I will remember to take my regular dose of insulin even if I'm sick."
4. "I will monitor my blood glucose level to determine how much insulin I need."

Answer: 4. Diabetic teaching is effective when the child verbalizes the importance of monitoring his blood glucose level to determine his insulin needs. Teaching should stress the importance of maintaining a diabetic diet and avoiding inappropriate items such as ice cream, not skipping meals when using insulin, and the need to adjust insulin doses during times of illness.

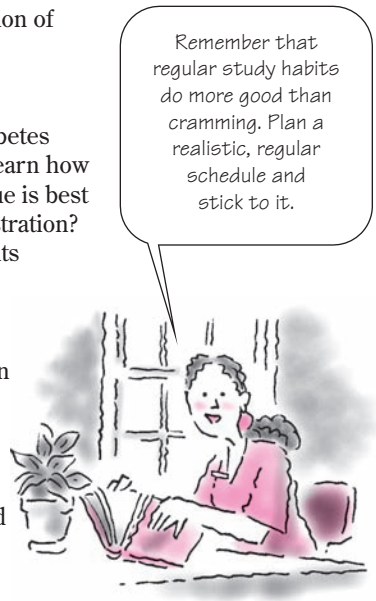
Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

8. A 10-year-old boy with type 1 diabetes comes to the pediatrician's office to learn how to administer insulin. Which technique is best to ensure responsible insulin administration?

1. The child observes his parents as they administer his injections.
2. The child learns to administer his insulin with supervision.
3. The child manages his insulin administration independently.
4. The child learns to draw up his own insulin and his parents inject it.

Answer: 2. School-age children should be encouraged to administer their own insulin with adult supervision to ensure that the correct procedure is followed and that the correct dose is administered. Having the child observe the parents or draw up his insulin and not inject it doesn't allow the child to take sufficient responsibility for his care. Allowing the child to administer his insulin without adult supervision gives him too much responsibility.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application



9. A 9-year-old boy with type 1 diabetes takes a mixture of regular and neutral protamine Hagedorn (NPH) insulin. He's scheduled to go on a camping trip, and his mother asks the nurse whether it's safe for him to participate in this activity. What's the most appropriate response?

1. "He needs to understand the physical limitations placed on a client with diabetes."
2. "He should have a light snack before doing any hiking."
3. "He shouldn't go on this trip because it's potentially dangerous."
4. "Have him increase his morning NPH insulin to compensate for higher metabolism while hiking."

Answer: 2. A light meal before rigorous exercise gives the child adequate blood glucose levels during the peak action of his morning NPH insulin. Restricting the child's physical activity discourages a normal lifestyle and isn't necessary. The child's diagnosis alone shouldn't be used to evaluate the danger of the trip. Increasing the child's insulin would increase the likelihood of a hypoglycemic reaction.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

10. The nurse administers oral thyroid hormone to an infant with hypothyroidism. For which signs of overdose should the nurse observe the infant?

1. Tachycardia, fever, irritability, and sweating
2. Bradycardia, cool skin temperature, and dry, scaly skin
3. Bradycardia, fever, hypotension, and irritability
4. Tachycardia, cool skin temperature, and irritability

Answer: 1. The infant experiencing an overdose of thyroid replacement hormone exhibits tachycardia, fever, irritability, and sweating. Bradycardia, cool skin temperature, and dry, scaly skin are signs of hypothyroidism.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

34 Genitourinary system

In this chapter, you'll review:

- pediatric genitourinary system
- tests used to diagnose genitourinary disorders
- common pediatric genitourinary disorders.

Brush up on key concepts

The genitourinary system includes the genitalia and urinary structures. The focus of this chapter is the kidneys, ureters, and bladder, which are involved in renal and urinary function. The chapter also discusses a sexually transmitted disease (STD) that affects pediatric patients.

You can review the major points of this chapter by consulting the *Cheat sheet* on pages 672 and 673.

High turnover

Water, which is controlled by the genitourinary system, is the body's primary fluid. An infant has a much greater percentage of total body water in extracellular fluid (42% to 45%) than an adult does (20%). Because of the increased percentage of water in a child's extracellular fluid, a child's **water turnover rate** is two to three times greater than an adult's. Every day, 50% of an infant's extracellular fluid is exchanged, compared with only 20% of an adult's; a child is, therefore, more susceptible than an adult to dehydration.

Sweating it out

A neonate also has a greater ratio of body surface area to body weight than an adult; this results in greater **fluid loss through the skin.**

Less efficient during stress

A child's kidneys attain the adult number of **nephrons** (about 1 million in each kidney) shortly after birth. The nephrons, which form urine, continue to mature throughout early childhood.

An infant's renal system can maintain a healthy fluid and electrolyte status. However, it doesn't function as efficiently during stress as an adult's renal system. For example, if a child doesn't receive enough fluid to meet his needs, his kidneys can't adequately concentrate urine to prevent dehydration. Conversely, if the child receives too much fluid, he may be unable to dilute urine appropriately to get rid of the increased volume.

Concentration change

An infant's kidneys don't concentrate urine at an adult level (average **specific gravity** is less than 1.010 for an infant, compared with 1.010 to 1.030 for an adult).

Although the number of daily voidings decreases with increasing age (because of increased urine concentration), the total amount of urine produced daily may not vary significantly.

An infant usually voids 5 to 10 ml/hour, a 10-year-old child usually voids 10 to 25 ml/hour, and an adult usually voids 35 ml/hour.

Short path to the bladder

A child has a short urethra; therefore, organisms can travel easily to the bladder, increasing the risk of bladder infection.

Keep abreast of diagnostic tests

Here are some important tests used to diagnose genitourinary disorders, along with common nursing interventions associated with each test.

Cheat sheet

Pediatric genitourinary refresher

CHLAMYDIA

Key signs and symptoms

In a child with conjunctivitis

- Edematous eyelids
- Fiery red conjunctivae with a thick pus

In a child with pneumonia

- Crackles and wheezing on auscultation of lungs
- Failure to gain weight
- Nasal congestion
- Sharp cough
- Tachypnea

Key test results

- Cultures reveal *Chlamydia trachomatis*.

Key treatments

- Antibiotic: erythromycin (Ilotycin)
- Chest physiotherapy to mobilize secretions in a child with pneumonia
- Humidified oxygen to alleviate labored breathing and prevent hypoxemia in a child with pneumonia
- Irrigation of eyes with sterile saline solution to clear copious discharge

Key interventions

- Check the neonate of an infected mother for signs of chlamydial infection.
- Administer medication as prescribed, and monitor its effectiveness.
- Auscultate breath sounds and monitor oxygenation.

HYPOSPADIAS

Key signs and symptoms

- Altered angle of urination
- Meatus terminating at some point along lateral fusion line, ranging from the perineum to the distal penile shaft

Key test results

- Observation confirms aberrant placement of the meatus; therefore, diagnostic testing isn't necessary.

Key treatments

- Avoiding circumcision (the foreskin may be needed later during surgical repair)
- Analgesics: morphine or acetaminophen (Tylenol) for postoperative pain relief
- Antispasmodic agent: propantheline (Pro-Banthine) prescribed postoperatively

Surgery

- Meatotomy (surgical procedure in which the urethra is extended into a normal position); may initially be performed to restore normal urinary function
- When the child is age 12 to 18 months, surgery to release the adherent chordee (fibrous band that causes the penis to curve downward)
- Surgery possibly delayed until age 4 if repair is to be extensive
- Indwelling urinary catheter or suprapubic urinary catheter postoperatively

Key interventions

- Keep the area clean.
- Encourage parents to express feelings and concerns about changes in the child's body appearance or function. Provide accurate information and answer questions thoroughly.
- Instruct parents in hygiene of uncircumcised penis.

Postoperative care

- Monitor for signs of infection.
- Leave the dressing in place for several days.
- Take care to avoid pressure on the child's catheter and avoid kinking the catheter.

NEPHRITIS

Key signs and symptoms

- Anorexia
- Burning during urination
- Flank pain
- Shaking chills
- Temperature of 102° F (38.9° C) or higher
- Urinary frequency
- Urinary urgency

Pediatric genitourinary refresher *(continued)*

NEPHRITIS *(continued)*

Key test results

• Pyuria (pus in urine) is present. Urine sediment reveals the presence of leukocytes singly, in clumps, and in casts and, possibly, a few red blood cells.
• Urine culture reveals significant bacteriuria: more than 100,000/µl of urine. Proteinuria, glycosuria, and ketonuria are less common.

Key treatments

• Antibiotic therapy appropriate to the specific infecting organism over a 10- to 14-day course
• Urinary analgesics such as phenazopyridine (Pyridium)

Key interventions

• Force fluids to achieve urine output of more than 2 L/day. However, discourage intake greater than 3 L/day.
• Teach the child and parents about:
– refrigerating or culturing a urine specimen within 30 minutes of collection to prevent overgrowth of bacteria
– completing the prescribed antibiotic therapy, even after symptoms subside
– long-term follow-up care for high-risk children.

NEPHROBLASTOMA

Key signs and symptoms

• Associated congenital anomalies — microcephaly, mental retardation, genitourinary tract problems
• Nontender mass, usually midline near the liver; usually detected by the parent while bathing or dressing the child

Key test results

• Excretory urography reveals a mass displacing the normal kidney structure.
• Computed tomography scan or sonography will reveal metastasis.

Key treatments

• Nephrectomy within 24 to 48 hours of diagnosis because these tumors metastasize quickly
• Radiation therapy (following surgery)
• Chemotherapy (following surgery) with dactinomycin, doxorubicin, or vincristine

Key interventions

• Monitor vital signs and intake and output.
• Don't palpate the abdomen, and prevent others from doing so.
• Handle and bathe the child carefully, and loosen clothing around the abdomen.
• Prepare the child and family members for a nephrectomy within 24 to 48 hours of diagnosis.

After nephrectomy

• Monitor urine output and report output less than 30 ml/hour.
• Assist with turning, coughing, and deep breathing.
• Encourage early ambulation.
• Provide pain medications, as necessary.
• Monitor postoperative dressings for signs of bleeding.
• Use aseptic technique for dressing changes.

URINARY TRACT INFECTION

Key signs and symptoms

• Frequent urge to void with pain or burning on urination
• Lethargy
• Low-grade fever
• Urine that's cloudy and foul-smelling

Key test results

• Clean-catch urine culture yields large amounts of bacteria.

Key treatments

• Cranberry juice to acidify urine
• Forced fluids to flush infection from the urinary tract
• Antibiotics: co-trimoxazole (Bactrim) or ampicillin to prevent glomerulonephritis

Key interventions

• Monitor intake and output.
• Evaluate toileting habits for proper front-to-back wiping and proper hand washing.
• Encourage increased intake of fluids and cranberry juice.
• Assist the child when necessary to ensure that the perineal area is clean after elimination.

Blood analysis

Blood tests are used to analyze serum levels of chemical substances, such as uric acid, creatinine, and blood urea nitrogen, and electrolytes, such as sodium, potassium, chloride, calcium, magnesium, and phosphorus.

Nursing actions

• Explain to the parent and child that the test requires a blood sample and may cause some discomfort from the needle stick.

Infant specimen collection

Use the clean-catch method to collect urine from an infant, as follows:
- After properly cleaning the skin and genitals, apply a pediatric urine collector to dry skin (powders or creams shouldn't be used).
- If the child doesn't void within 45 minutes, remove the bag and repeat the procedure.

- Allow the child to hold a comfort object, such as a stuffed animal or blanket, to help diminish his anxiety.

Urine testing

Urinalysis is used to determine urine characteristics, such as:
- presence of red blood cells (RBCs)
- presence of white blood cells
- presence of casts or bacteria
- specific gravity and pH
- physical properties, such as clarity, color, and odor.

Nursing actions

- Before specimen collection, explain the importance of cleaning the meatal area thoroughly.
- Explain that the culture specimen should be caught midstream, in a sterile container. (See *Infant specimen collection.*)
- Explain that the specimen for urinalysis should be caught in a clean container, preferably at the first voiding of the day.
- Begin a 24-hour specimen collection after discarding the first voiding; such specimens commonly necessitate special handling or preservatives.
- When obtaining a urine specimen from a catheterized child, aspirate a sample through the collection port in the catheter, with a sterile needle and a syringe.

Fluids in and out

Intake and output data help determine the child's hydration status.

Nursing actions

To provide the most useful and accurate information, you should:
- use calibrated containers
- validate intake and output measurements by checking the child's weight daily
- monitor all fluid losses daily, including blood, vomitus, diarrhea, and wound and stoma drainage.

Kidney pictures

Kidney-ureter-bladder (KUB) radiography is used to assess the size, shape, position, and possible areas of calcification of the renal organs.

Nursing actions

- Explain the procedure to the parents and the child.
- Tell the child that the X-ray takes only a few minutes and remind him to remain still.
- Shield the genitals of a male child to prevent irradiation of the testes.

I.V. action

Excretory urography aids in checking renal pelvic structures. A contrast medium is introduced into the renal pelvis, allowing visualization of the collecting system and ureters.

Nursing actions

- Check the child's history for allergies to iodine, shellfish, or contrast media.
- Monitor the child's intake and output.
- Explain the purpose of the test to the child and his parents.
- Maintain the child on nothing-by-mouth status for 8 hours before the test.
- Make sure that written, informed consent has been obtained.
- Increase hydration after the procedure.

While the water's running

Voiding cystourethrography aids in viewing the bladder and related structures during voiding.

Nursing actions

- Check the child's history for allergies to iodine, shellfish, and contrast media.
- Monitor the child's intake and output.
- Explain the purpose of the test to the child and his parents.
- Make sure that written, informed consent has been obtained.
- After the procedure, encourage the child to drink lots of fluid to reduce burning on urination and to flush out residual dye.

Polish up on patient care

Common genitourinary disorders in pediatric patients include chlamydia, hypospadias, nephritis, nephroblastoma (Wilms' tumor), and urinary tract infections (UTIs).

Chlamydia

Chlamydial infections are the most common STDs in the United States. In infants, the infecting organism is passed from the infected mother to the fetus during passage through the birth canal.

Chlamydia is the most common cause of ophthalmia neonatorum (eye infection at birth or during the 1st month) and a major cause of pneumonia in infants in the first 3 months of life. With antibiotic therapy, the chance of cure is good.

CAUSE

- *Chlamydia trachomatis* infection

DATA COLLECTION FINDINGS

In a child with conjunctivitis

- Edematous eyelids
- Fiery red conjunctivae with a thick, puslike discharge

In a child with pneumonia

- Crackles and wheezing on auscultation of lungs
- Failure to gain weight
- Nasal congestion
- Sharp cough
- Tachypnea

DIAGNOSTIC FINDINGS

- Cultures reveal *C. trachomatis.*
- Blood studies show elevated levels of immunoglobulin (Ig) G and IgM antibodies.

Picture this. Several tests help picture the renal system: KUB radiography, excretory urography, and voiding cystourethrography.

NURSING DIAGNOSES

- Ineffective airway clearance
- Interrupted family processes
- Risk for infection

TREATMENT

- Humidified oxygen to alleviate labored breathing and prevent hypoxemia in a child with pneumonia
- Chest physiotherapy to mobilize secretions in a child with pneumonia
- Irrigation of the eyes with sterile saline solution to clear copious discharge

Drug therapy

- Antibiotic: erythromycin (Ilotycin)

INTERVENTIONS AND RATIONALES

- Check the neonate of an infected mother for signs of chlamydial infection *to identify infection early and initiate treatment.*
- Administer medication as prescribed and monitor its effectiveness *to improve the child's condition.*
- Obtain appropriate specimens for diagnostic testing *to aid in diagnosis of infection.*
- Auscultate breath sounds and monitor oxygenation *to determine oxygen status and respiratory function.*
- Suction as needed *to provide airway clearance.*

Teaching topics

- Completing the entire course of drug therapy
- Taking proper care of the eyes

Hypospadias

Hypospadias is a congenital anomaly of the penis. With this condition, the urethral opening may be anywhere along the ventral side of the penis. The condition shortens the distance to the bladder, offering easier access for bacteria.

CAUSES

- Genetic factors

DATA COLLECTION FINDINGS

- Altered angle of urination
- Meatus terminating at some point along lateral fusion line, ranging from the perineum to the distal penile shaft
- Normal urination (with penis elevated) impossible

DIAGNOSTIC FINDINGS

- Observation confirms aberrant placement of the opening; therefore, diagnostic testing isn't necessary.

NURSING DIAGNOSES

- Disturbed body image
- Deficient knowledge (disease process and treatment regimen)
- Risk for infection (urinary tract)

TREATMENT

- Avoiding circumcision (the foreskin may be needed later during surgical repair)
- No treatment (in mild disorder)

Surgery

- Meatotomy (procedure in which the urethra is extended into a normal position); may initially be performed to restore normal urinary function
- When the child is age 12 to 18 months, surgery to release the adherent chordee (fibrous band that causes the penis to curve downward)
- Surgery possibly delayed until age 4 if repair is to be extensive
- Indwelling urinary catheter or suprapubic urinary catheter postoperatively

Drug therapy

- Analgesics: morphine or acetaminophen (Tylenol) for postoperative pain relief
- Antispasmodic agent: propantheline (Pro-Banthine) prescribed postoperatively

INTERVENTIONS AND RATIONALES

- Monitor urine output *to ensure that the infant maintains a normal urine output of 5 to 10 ml/hour.*
- Keep the area clean *to prevent bacteria invasion and infection.*
- Encourage the parents to express feelings and concerns about changes in the child's body appearance or function. Provide accurate information and answer questions thoroughly. *Encouraging open discussion enables the nurse to provide emotional support and may help ease the parents' anxiety.*

Postoperative care

- Monitor for signs of infection *to identify complications.*
- Leave the dressing in place for several days *to encourage healing of the grafted skin flap.*
- Take care to avoid pressure on the child's catheter *to prevent trauma to the incision site* and avoid kinking of the catheter *to ensure urine flow.*
- Encourage early ambulation *to prevent complications of immobility.*

Teaching topics

- Practicing hygiene of uncircumcised penis
- Caring for the catheter
- Understanding signs and symptoms of UTI or incisional infection

Nephritis

Also known as *acute infective tubulointerstitial nephritis, pyelonephritis,* or *glomerulonephritis,* this disorder is a sudden inflammation that primarily affects the interstitial area and the renal pelvis or, less typically, the renal tubules. One of the most common renal diseases, nephritis occurs more often in females, probably because of their shorter urethra and the proximity of the urinary meatus to the vagina and rectum.

With treatment and continued follow-up care, the prognosis is good and extensive permanent damage is rare.

CAUSES

- Infection of the kidneys (the most common cause) by bacteria, which usually are normal intestinal and fecal flora that grow readily in urine (The most common causative organism is *Escherichia coli,* but *Proteus, Pseudomonas, Staphylococcus aureus,* and *Enterococcus faecalis* [formerly *Streptococcus faecalis*] may also cause such infections.)
- Hematogenic infection (as in septicemia or endocarditis)
- Inability to empty the bladder (for example, in patients with neurogenic bladder), urinary stasis, or urinary obstruction due to tumors or strictures
- Contamination from instruments used in diagnostic testing, surgery, and routine patient care (such as catheterization, cystoscopy, or urologic surgery)
- Lymphatic infection

DATA COLLECTION FINDINGS

- Anorexia
- Burning during urination
- Dysuria
- Flank pain
- General fatigue
- Hematuria (usually microscopic but may be gross)
- Nocturia
- Shaking chills
- Temperature of 102° F (38.9° C) or higher
- Urinary frequency
- Urinary urgency
- Urine that's cloudy and has an ammonia-like or fishy odor

DIAGNOSTIC FINDINGS

- Excretory urography may show asymmetrical kidneys.
- Pyuria (pus in urine) is present. Urine sediment reveals the presence of leukocytes singly, in clumps, and in casts and, possibly, a few RBCs.
- Urine culture reveals significant bacteriuria: more than 100,000/µl of urine. Proteinuria, glycosuria, and ketonuria are less common.
- Urine specific gravity and osmolality are low, resulting from a temporarily decreased ability to concentrate urine.
- Urine pH is slightly alkaline.
- KUB radiography may reveal calculi, tumors, or cysts in the kidneys and urinary tract.

NURSING DIAGNOSES

- Impaired urinary elimination
- Risk for infection
- Acute pain

TREATMENT

- Follow-up treatment for antibiotic therapy: reculturing urine 1 week after drug therapy stops and then periodically for the next year to detect residual or recurring infection
- Surgery to relieve obstruction or correct the anomaly responsible for obstruction or vesicoureteral reflux; antibiotics aren't always effective

Antibiotic therapy

Antibiotic therapy is targeted to the specific infecting organism; the course of therapy is 10 to 14 days. Therapy for specific organisms is described below:

- *Enterococcus* — ampicillin (Principen), penicillin G (Pfizerpen), or vancomycin (Vancocin)
- *E. coli* — nalidixic acid (NegGram), and nitrofurantoin (Macrobid)
- *Proteus* — ampicillin, sulfisoxazole, nalidixic acid, and a cephalosporin
- *Pseudomonas* — gentamicin, and carbenicillin (Geocillin)
- *Staphylococcus* — penicillin G; if resistance develops, a semisynthetic penicillin, such as nafcillin (Unipen) or a cephalosporin

When the infecting organism can't be identified, therapy usually consists of a broad-spectrum antibiotic, such as ampicillin or cephalexin (Keflex).

Other drug therapy

- Urinary analgesics: phenazopyridine (Pyridium)

INTERVENTIONS AND RATIONALES

- Monitor urine specific gravity *to detect dehydration.*
- Monitor vital signs *to detect fever and hypertension.*
- Administer antipyretics *to reduce fever.*
- Force fluids *to achieve urine output of more than 2 L/day.* However, discourage intake greater than 3 L/day. *Excessive fluid intake may decrease the effectiveness of the antibiotics.*
- Provide a diet that contains 500 mg of calcium for children up to age 3, 800 mg for children over age 3, and 1,300 mg for adolescents; moderate sodium restriction; moderate animal protein intake; and avoidance of high doses of vitamin C. *These measures help to prevent renal calculi formation.*

Teaching topics

- Collecting a clean-catch urine specimen
- Refrigerating or culturing a urine specimen within 30 minutes of collection to prevent overgrowth of bacteria
- Completing prescribed antibiotic therapy, even after symptoms subside
- Understanding long-term follow-up care for high-risk children

Nephroblastoma

Nephroblastoma, also known as Wilms' tumor, is an embryonal cancer of the kidney. The average age at diagnosis is 2 to 4 years. The prognosis is excellent if there's no metastasis.

Nephroblastoma is measured in four stages:

- In stage I, the tumor is limited to the kidney.
- In stage II, the tumor extends beyond the kidney but can be completely excised.
- In stage III, the tumor spreads but is confined to the abdomen and lymph nodes.
- In stage IV, the tumor metastasizes to the lung, liver, bone, and brain.

CAUSE

- Genetic predisposition

DATA COLLECTION FINDINGS

- Abdominal pain
- Associated congenital anomalies, such as microcephaly, mental retardation, and genitourinary tract problems
- Constipation
- Hematuria
- Hypertension
- Nontender mass, usually midline near the liver; commonly detected by the parent while bathing or dressing the child

DIAGNOSTIC FINDINGS

- Excretory urography reveals a mass displacing the normal kidney structure.
- Computed tomography scan or sonography reveals metastasis.
- Serum blood studies show anemia.

NURSING DIAGNOSES

- Fear
- Chronic and acute pain
- Anxiety

TREATMENT

- Nephrectomy within 48 hours of diagnosis
- Radiation therapy (following surgery)

Drug therapy

- Analgesics (postoperatively): morphine
- Chemotherapy (following surgery) with dactinomycin (Cosmegen), doxorubicin (Adriamycin), or vincristine (Oncovin)

INTERVENTIONS AND RATIONALES

- Monitor vital signs and intake and output *to determine fluid volume status.*
- Don't palpate the abdomen and prevent others from doing so *to prevent the dissemination of cancer cells to other sites.*
- Handle and bathe the child carefully and loosen clothing around the abdomen *to prevent pressure on the abdomen, which may cause dissemination of cancer cells.*
- Prepare the child and family members for a nephrectomy within 24 to 48 hours of diagnosis. *Surgery must be performed quickly after diagnosis because these tumors metastasize quickly.*

After nephrectomy

- Monitor urine output and report output less than 30 ml/hour.
- Assist with turning, coughing, and deep breathing.

• Encourage early ambulation.
• Provide pain medications, as necessary.
• Monitor postoperative dressings for signs of bleeding.
• Use aseptic technique for dressing changes.
These measures will help prevent postoperative complications, such as pneumonia, wound infection, and kidney failure.

Teaching topics
• Providing adequate nutrition and hydration
• Dealing with adverse reactions to chemotherapy
• Contacting support groups

Urinary tract infection

A UTI is a microbial invasion of the kidneys, ureters, bladder, or urethra.

The risk of UTI varies, depending on the child's age and the presence of obstructive uropathy or voiding dysfunction. In the neonatal period, UTIs occur most commonly in males, possibly because of the higher incidence of congenital abnormalities in male neonates. By age 4 months, UTIs are more common in girls than in boys. The increased incidence in girls continues throughout childhood.

After infancy, nearly all UTIs occur when bacteria enter the urethra and ascend the urinary tract. Females are especially at risk for infection because the female urethra is much shorter than the male urethra. The female urethra is subject to more direct contamination because of its proximity to the anal opening. *E. coli* causes approximately 75% to 90% of all UTIs in females.

CAUSES
• Incomplete bladder emptying
• Irritation by bubble baths
• Poor hygiene
• Reflux

DATA COLLECTION FINDINGS
• Abdominal pain
• Enuresis
• Frequent urge to void with pain or burning on urination
• Hematuria
• Lethargy
• Low-grade fever
• Poor feeding patterns
• Urine that's cloudy and foul-smelling

DIAGNOSTIC FINDINGS
• Clean-catch urine culture yields large amounts of bacteria.
• Urine pH is increased.

NURSING DIAGNOSES
• Impaired urinary elimination
• Acute pain
• Risk for infection

TREATMENT
• Cranberry juice to acidify urine
• Forced fluids to flush infection from the urinary tract

Drug therapy
• Antibiotics: co-trimoxazole (Bactrim) or ampicillin to prevent glomerulonephritis

INTERVENTIONS AND RATIONALES
• Monitor input and output *to determine if fluid replacement therapy is adequate.*
• Evaluate toileting habits for proper front-to-back wiping and proper hand washing *to prevent recurrent infection.*
• Encourage increased intake of fluids and cranberry juice *to flush the infection from the urinary tract and acidify the urine.*
• Assist the child when necessary to ensure that the perineal area is clean after elimination. *Cleaning the perineal area by wiping from the area of least contamination (urinary meatus) to the area of greatest contamination (anus) helps prevent UTIs.*

Teaching topics
• Avoiding tub baths or bubble baths
• Encouraging the child to use the toilet every 2 hours
• Performing proper toilet hygiene; wiping from front to back
• Proper hand washing

Memory jogger

To remember the clinical findings associated with urinary tract infection, think, "The urinary tract is **FULL** of infection." Look for:

Frequent urge to void

Urine that's foul-smelling and cloudy

Low-grade fever

Lethargy.

Pump up on practice questions

1. A school-age child is diagnosed with acute glomerulonephritis (nephritis). Which nursing action takes priority when caring for this child?

1. Monitoring blood pressure every 4 hours
2. Checking urine specific gravity every 8 hours
3. Offering the child fluids every hour
4. Providing the child with a regular diet and snacks

Answer: 1. Hypertension is a major complication that can occur during the acute phase of glomerulonephritis; therefore, blood pressure should be monitored at least every 4 hours. Specific gravity should also be monitored, but it doesn't take priority over blood pressure monitoring. Fluids may be limited and a low-sodium diet initiated if the child is hypertensive.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

2. The nurse is collecting data on a young girl who may have a UTI. A girl is more susceptible to UTIs than a boy because she has:

1. smaller kidneys.
2. a smaller bladder.
3. a shorter urethra.
4. no pubic hair.

Answer: 3. A girl is more susceptible to UTIs than a boy because she has a shorter urethra, making it easier for organisms to travel to the bladder. An infant's smaller, immature kidneys cause a low glomerular filtration rate but don't make the infant prone to a UTI. A small child voids more frequently because of a small bladder, but this doesn't make the child prone to UTI. Pubic hair growth signals the onset of puberty and its absence is normal in young children.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

3. An infant is admitted to the pediatric unit for surgical repair of hypospadias. The infant's urine output is 7 ml/hour. What nursing action is most appropriate?

1. Notify the physician immediately.
2. Prepare to administer I.V. fluids.
3. Offer the infant formula every hour.
4. Continue to monitor urine output.

Answer: 4. Normal urine output for an infant is 5 to 10 ml/hour. If urine output falls within the normal range, the nurse should continue monitoring. It isn't necessary to notify the physician, administer I.V. fluids, or increase the infant's intake of formula.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

4. The nurse must obtain a urine specimen from an infant. The nurse can best obtain a clean-catch specimen by:

1. applying a pediatric urine collector to dry skin.
2. placing the infant on a pediatric bedpan.
3. inserting an indwelling urinary catheter.
4. wringing out a cloth diaper after the infant voids.

Answer: 1. The nurse should properly clean the infant's skin and genitals and apply a pediatric urine collector to dry skin (powders or creams shouldn't be used). If the infant doesn't void within 45 minutes, the bag should be removed and the procedure repeated. This is the least invasive method, making it the best way to obtain a specimen. Placing the infant on a pediatric bedpan, inserting an indwelling urinary catheter, and wringing out a urine-filled cloth diaper aren't the best methods for collecting urine specimens from an infant.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Knowledge

5. The nurse is assisting with the creation of a teaching plan for a school-age child with a UTI. Which should be evaluated first?

1. The child's dietary intake
2. The child's toileting habits
3. The child's calcium intake
4. The child's activity level

Answer: 2. The nurse should evaluate the child's toileting habits before creating a teaching plan for the school-age child with a UTI. Based on her findings, the nurse should instruct the child in proper front-to-back wiping, hand washing, and using the toilet every 2 hours. It isn't necessary to inquire about the child's dietary intake, calcium intake, or activity level at this time.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

6. A child is admitted to the pediatric unit with a fever of 102.5º F (39.2º C), shaking chills, and flank pain. From these data collection findings, the nurse would most likely suspect which diagnosis?

1. UTI
2. Nephritis
3. Nephroblastoma
4. Urolithiasis

Answer: 2. With nephritis, the child exhibits fever of 102º F (38.9º C) or higher, shaking chills, flank pain, urinary urgency and frequency, and burning during urination. The child experiencing a UTI may exhibit low-grade fever, dysuria, urinary frequency and urgency, lethargy, and cloudy, foul-smelling urine. The child with a nephroblastoma typically exhibits a nontender mass, usually midline near the liver; abdominal pain; hypertension; hematuria; and constipation. The child with urolithiasis exhibits colicky flank pain, nausea, vomiting, hematuria, and dysuria.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

7. The nurse is teaching parents of an infant with hypospadias. The nurse should tell the parents to avoid:

1. using disposable diapers.
2. positioning the infant on his back to sleep.
3. bathing the infant in an infant bathtub.
4. having the infant circumcised.

Answer: 4. The parents should be instructed to avoid having the infant circumcised because the foreskin may be needed for surgical repair. The parents would be permitted to use disposable diapers for their infant and bathe him in an infant tub. The parents should be instructed to place their child on his back to sleep to decrease the risk of sudden infant death syndrome.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

8. A toddler is admitted to the pediatric unit with a diagnosis of nephroblastoma. When providing routine care for this toddler, the nurse should avoid:

1. palpating the toddler's abdomen.
2. positioning the toddler on his side.
3. bathing the toddler.
4. loosening the toddler's clothing.

Answer: 1. The nurse shouldn't palpate the toddler's abdomen and should prevent others from doing so to avoid disseminating cancer cells to other sites. The toddler may be carefully positioned on his side and may be bathed but must be handled carefully. The toddler's clothes should be loosened around the abdomen.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

9. A parent reports finding a mass in her child's abdomen. After the diagnosis of nephroblastoma is confirmed, the nurse should prepare the child and family for:

1. immediate chemotherapy.
2. immediate radiation therapy.
3. nephrectomy within 24 to 48 hours of diagnosis.
4. discharge to home with hospice care.

Answer: 3. The nurse should prepare the child and his family for a nephrectomy, which is usually performed within 24 to 48 hours of diagnosis. Chemotherapy and radiation are used as follow-up treatment after nephrectomy is completed. Because the prognosis is excellent if there's no metastasis, hospice isn't necessary.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

10. A neonate is suspected of having a chlamydial infection. The neonate most likely contracted this infection:

1. transplacentally.
2. during passage through the birth canal.
3. through sexual abuse.
4. in the nursery because of improper infection-control measures.

Answer: 2. Chlamydia is transmitted to the neonate during passage through the birth canal, not transplacentally or by improper infection-control measures. Transmission from sexual abuse in neonates is less common than transmission through the birth canal.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Knowledge

35 Integumentary system

In this chapter, you'll review:

- characteristics of the pediatric integumentary system
- tests used to diagnose integumentary disorders
- common integumentary disorders.

Brush up on key concepts

The skin, the primary component of the integumentary system, forms a protective barrier between internal structures and the external environment. Tough and resilient, the skin is virtually impermeable to aqueous solutions, bacteria, and toxic compounds.

At any time, you can review the major points of this chapter by consulting the *Cheat Sheet* on pages 684 and 685.

Thin-skinned at birth

Like most body systems, the integumentary system isn't mature at birth. Therefore, it provides a less effective barrier to physical elements and microorganisms during birth and infancy than during childhood. This helps to explain why infants and young children are more prone to infection.

Untouched

The **skin** of infants and young children appears smoother than that of adults. A child's skin has less terminal hair and hasn't been subjected to long-term exposure to environmental elements.

I'm chilly

Infants have poorly developed **subcutaneous fat,** predisposing them to hypothermia. **Eccrine sweat glands** don't begin to function until the first month of life, which also inhibits the infant's ability to control body temperature.

Is it hot in here?

With the onset of adolescence, **apocrine glands** enlarge and become active. This activity leads to axillary sweating and characteristic body odor. The **sebaceous glands** begin to produce sebum in response to hormone activity, which predisposes the adolescent to acne. Along with the skin glands becoming active, coarse terminal hair grows in the axillae and pubic areas of both sexes and on the faces of males.

Here's the skinny

Skin performs many vital functions, including:

- protecting against trauma
- regulating body temperature
- serving as an organ of excretion and sensation
- synthesizing vitamin D in the presence of ultraviolet light.

Wearing layers

Skin has three primary layers:

The **epidermis** (the outermost layer) produces keratin as its primary function. It contains two sublayers: the stratum corneum, an outer, horny layer of keratin that protects the body against harmful environmental substances and restricts water loss, and the cellular stratum, where keratin cells are synthesized. The epidermis contains melanocytes that produce melanin, which gives the skin its color. It also contains Langerhans' cells, which are involved in several immunologic reactions.

The **dermis** (the middle layer) contains collagen, which strengthens the skin to prevent it from tearing, and elastin to give it resilience.

Subcutaneous tissue (the innermost layer) consists mainly of fat (containing mostly triglycerides), which provides heat, insulation, shock absorption, and a reserve of calories.

Cheat sheet

Pediatric integumentary refresher

ACNE VULGARIS

Key signs and symptoms

- Closed comedo, or whitehead (acne plug not protruding from the follicle and covered by the epidermis)
- Inflammation and characteristic acne pustules, papules or, in severe forms, acne cysts or abscesses (caused by rupture or leakage of an enlarged plug into the dermis)
- Open comedo, or blackhead (acne plug protruding from the follicle and not covered by the epidermis)

Key treatments

- Exposure to ultraviolet light (but never when a photosensitizing agent, such as tretinoin, is being used)
- Oral isotretinoin (Accutane) limited to those with nodulocystic or recalcitrant acne who don't respond to conventional therapy
- Systemic therapy: usually tetracycline (Sumycin) to decrease bacterial growth; alternatively, erythromycin (E-mycin; tetracycline contraindicated during pregnancy and childhood because it discolors developing teeth)
- Topical medications: benzoyl peroxide (Benzac), clindamycin (Cleocin), or erythromycin and benzoyl peroxide (Benzamycin) antibacterial agents, alone or in combination with tretinoin (retinoic acid), or a keratolytic

Key interventions

- Identify predisposing factors.
- Instruct the patient using tretinoin to apply it at least 30 minutes after washing the face and at least 1 hour before bedtime. Warn against using it around the eyes or lips. After treatments, the skin should look pink and dry.
- Advise the patient to avoid exposure to sunlight or to use a sunblock. If the prescribed regimen includes tretinoin and benzoyl peroxide, tell the patient to use one preparation in the morning and the other at night.
- Instruct the patient to take tetracycline on an empty stomach and not to take it with antacids or milk.
- Tell the patient who's taking isotretinoin to avoid vitamin A supplements. Also discuss how to deal with the dry skin and mucous membranes that usually occur during treatment. Warn the female patient about the severe risk of teratogenesis.
- Offer emotional support to the patient who's insecure about his appearance.

BURNS

Key signs and symptoms

For first-degree burn (partial thickness of skin)

- Dry, painful, red skin with edema
- Sunburn appearance

For second-degree burn (partial thickness of skin)

- Moist, weeping blisters with edema
- Severe pain

For third-degree burn (full thickness of skin)

- Avascular site without blanching or pain
- Dry, pale, leathery skin

Key test results

- To determine the extent of injury, many burn facilities use the Lund-Browder chart, which is a body surface area chart that accounts for age.

Key treatments

- I.V. fluids to prevent and treat shock; urine output maintained at 1 to 2 ml/kg
- Protective isolation, depending on burn severity

Key interventions

- Stop the burning in an emergency situation.
- Maintain a patent airway in the immediate postburn phase.
- Monitor vital signs and intake and output.
- Prevent heat loss.

CONTACT DERMATITIS

Key signs and symptoms

- Characteristic bright red, maculopapular rash in the diaper area

Pediatric integumentary refresher *(continued)*

CONTACT DERMATITIS *(continued)*

Key treatments

- Cleaning affected area with mild soap and water
- Leaving affected area open to air

Key interventions

- Keep the diaper area clean and dry.

HEAD LICE

Key signs and symptoms

- Pruritus of the scalp
- White flecks attached to the hair shafts

Key test results

- Examination reveals lice eggs, which look like white flecks, firmly attached to hair shafts near the base.

Key treatments

- Pyrethrins (Rid) or permethrin (Nix) shampoos or lindane (GBH) in resistant cases

Key interventions

- Explain the need to wash bed linens, hats, combs, brushes, and anything else that comes in contact with the hair.

IMPETIGO

Key signs and symptoms

- Macular rash progressing to a papular and vesicular rash, which oozes and forms a moist, honey-colored crust

Key treatments

- Washing affected area with disinfectant soap

Key interventions

- Apply antibiotic ointment.
- Wash the area three times daily with antiseptic soap.

RASHES

Key signs and symptoms

- Papular rash: raised solid lesions with color changes in circumscribed areas
- Pustular rash: vesicles and bullae that fill with purulent exudate
- Vesicular rash: small, raised, circumscribed lesions filled with clear fluid

Key test results

- Aspirate from lesions may reveal cause.
- Patch test may identify cause.

Key treatments

- Antibacterial, antifungal, or antiviral agent (depending on cause)
- Antihistamines if the rash is the result of an allergy

Key interventions

- Maintain standard precautions to prevent the spread of infection.
- Teach sanitary techniques.
- Cover weeping lesions.

SCABIES

Key signs and symptoms

- Linear black burrows between fingers and toes and in palms, axillae, and groin

Key test results

- Drop of mineral oil placed over the burrow, followed by superficial scraping and examination of expressed material under a microscope may reveal ova or mite feces.

Key treatments

- Application of permethrin (Elimite)

Key interventions

- Teach the child and parents to apply permethrin from the neck down covering the entire body, wait 15 minutes before dressing, and avoid bathing for 8 to 12 hours.
- Explain the need to change bed linens, towels, and clothing after bathing and lotion application.

Thinner, more sensitive

A child's skin differs from an adult's in two important ways:

- A child has thinner and more sensitive skin than an adult.
- Birthmarks in a neonate can result from the sensitivity of the infant's skin, the incomplete migration of skin cells, or clogged pores.

Keep abreast of diagnostic tests

Here are some tests used to diagnose skin disorders, along with common nursing interventions associated with each test.

Slide show

With **diascopy,** a lesion is covered with a microscope slide or piece of clear plastic. The area is observed to determine whether dilated capillaries or extravasated blood is causing the lesion's redness.

Nursing actions

• Explain the procedure to the child and his parents.

Light up and down

Sidelighting shows minor elevations or depressions in lesions; it also helps determine the configuration and degree of eruption.

Subdued lighting, another test, highlights the difference between normal skin and circumscribed lesions that are hypopigmented or hyperpigmented.

Nursing actions

• Explain the procedure to the child and his parents.

Spotlight on disease

Microscopic immunofluorescence identifies immunoglobulins and elastic tissue, skin manifestations of immunologically mediated disease.

Nursing actions

• Explain the procedure to the child and his parents.

Important nursing actions after skin biopsy include preventing infection, injury, and irritation.

Organism info

Gram stains and **exudate cultures** help identify organisms responsible for underlying infections.

Nursing actions

• Explain the procedure to the child and his parents.
• Obtain cultures as directed by facility policy.

Patching it together

Patch tests identify contact sensitivity (usually in dermatitis).

Nursing actions

• Explain the procedure to the child and his parents.

Tissue test

A **skin biopsy** determines the histology of cells. It can be used to diagnose or confirm a disorder.

Nursing actions

Before the procedure
• Explain the procedure to the child and his parents.
• Make sure written, informed consent has been obtained.
After the procedure
• Prevent secondary infections by cutting the child's nails and applying mittens and elbow restraints.
• Suggest that the child wear light, loose, nonirritating clothing over the procedure site.

Polish up on patient care

Major skin disorders in pediatric patients include acne vulgaris, burns, contact dermatitis (diaper rash), head lice, impetigo, rashes, and scabies.

Acne vulgaris

An inflammatory disease of the sebaceous follicles, acne vulgaris primarily affects adolescents, although lesions can appear as early as age 8. Although acne strikes boys more often and more severely, it usually occurs in girls at an earlier age and tends to last longer, sometimes into adulthood. The prognosis is good with treatment.

CAUSES

• Androgen-stimulated sebum production
• Follicle occlusion
• *Propionibacterium acnes,* a normal skin flora

Predisposing factors

• Androgen stimulation
• Certain drugs, including corticosteroids, corticotropin, androgens, iodides, bromides, trimethadione, phenytoin, isoniazid, lithium,

and halothane; cobalt irradiation; or total parenteral nutrition (TPN)
• Cosmetics
• Exposure to heavy oils, greases, or tars
• Heredity
• Hormonal contraceptives (many females experience an acne flare-up during their first few menses after starting or discontinuing hormonal contraceptives)
• Trauma or rubbing from tight clothing
• Unfavorable climate

DATA COLLECTION FINDINGS

• Acne scars from chronic, recurring lesions
• Closed comedo, or whitehead (acne plug not protruding from the follicle and covered by the epidermis)
• Open comedo, or blackhead (acne plug protruding from the follicle and not covered by the epidermis)
• Inflammation and characteristic acne pustules, papules or, in severe forms, acne cysts or abscesses (caused by rupture or leakage of an enlarged plug into the dermis)

DIAGNOSTIC FINDINGS

• Diagnostic testing isn't necessary. The appearance of characteristic acne lesions, especially in an adolescent patient, confirms the presence of acne vulgaris.

NURSING DIAGNOSES

• Impaired skin integrity
• Disturbed body image
• Risk for infection

TREATMENT

• Exposure to ultraviolet light (but never when a photosensitizing agent, such as tretinoin, is being used)

Drug therapy

• Intralesional corticosteroid injection
• Oral isotretinoin (Accutane) — limited to those with nodulocystic or recalcitrant acne who don't respond to conventional therapy; contraindicated during pregnancy
• Systemic therapy: tetracycline (Sumycin) to decrease bacterial growth; alternatively, erythromycin (tetracycline contraindicated during pregnancy and childhood because it discolors developing teeth)
• Topical medications: benzoyl peroxide (Benzac), clindamycin (Cleocin), or erythromycin and benzoyl peroxide (Benzamycin) antibacterial agents, alone or in combination with tretinoin (retinoic acid, Retin-A), or a keratolytic
• Antiandrogenic agents: estrogens or spironolactone (Aldactazide)

INTERVENTIONS AND RATIONALES

• Check the patient's drug history *because certain medications, such as some hormonal contraceptives, may cause an acne flare-up.*
• Try to identify predisposing factors *to determine if any may be eliminated or modified.*
• Explain the causes of acne to the patient and his family. Make sure they understand that the prescribed treatment is more likely to improve acne than a strict diet and fanatic scrubbing with soap and water. Provide written instructions regarding treatment *to eliminate misconceptions.*
• Instruct the patient using tretinoin to apply it at least 30 minutes after washing the face and at least 1 hour before bedtime. Warn against using it around the eyes or lips *to prevent damage.* After treatments, the skin should look pink and dry. *If it appears red or starts to peel, the preparation may have to be weakened or applied less often.*
• Advise the patient to avoid exposure to sunlight or to use a sunscreen *to prevent a photosensitivity reaction.* If the prescribed regimen includes tretinoin and benzoyl peroxide, tell the patient to use one preparation in the morning and the other at night *to avoid skin irritation.*
• Instruct the patient to take tetracycline on an empty stomach and not to take it with antacids or milk *because it interacts with their metallic ions and is then poorly absorbed.*
• Tell the patient who's taking isotretinoin to avoid vitamin A supplements, *which can worsen adverse effects.* Also discuss how to deal with the dry skin and mucous membranes that usually occur during treatment. Warn the female patient about the severe risk of teratogenesis.

• Inform the patient that acne takes a long time to clear — sometimes years for complete resolution. Encourage continued local skin care even after acne clears. Explain the adverse effects of all drugs *to promote compliance.*
• Pay special attention to the patient's perception of his physical appearance, and offer emotional support *to help the patient cope with the effects of his condition.*

Teaching topics
• Understanding the treatment regimen
• Avoiding prolonged exposure to sunlight
• Eliminating misconceptions
• Eliminating predisposing factors, such as cosmetic use and emotional stress

Burns

Most pediatric burns occur in children under age 5. Overall, burns are the third leading cause of accidental death in children (after motor vehicle accidents and drowning). Burns are classified as first-, second-, or third-degree, depending on severity.

Remember that the Rule of Nines, generally used to determine the extent of a burn, is inaccurate for children. Use the Lund-Browder chart instead.

CAUSES
• Contact with hot liquid or electricity (most common cause of burns in children under age 3)
• Contact with flames (most common cause of burns in older children)
• Exposure to ultraviolet light (sunburn)

DATA COLLECTION FINDINGS
First-degree burn (partial thickness of skin)
• Dry, painful, red skin with edema
• Looks like sunburn

Second-degree burn (partial thickness of skin)
• Moist, weeping blisters with edema
• Severe pain

Third-degree burn (full thickness of skin)
• Avascular site without blanching or pain
• Dry, pale, leathery skin
• Diuresis 2 to 5 days after the burn, as fluid shifts back
• Fluid shift from intravascular to interstitial compartments
• Hypovolemia and symptoms of shock from fluid shift
• Infection due to altered skin integrity

DIAGNOSTIC FINDINGS
• To determine the extent of injury, many burn facilities use the Lund-Browder chart, which is a body surface area (BSA) chart that accounts for age. (The Rule of Nines is inaccurate for children because the head can account for 13% to 19% of the BSA and the legs account for 10% to 16%, depending on the child's age and size.)

NURSING DIAGNOSES
• Ineffective airway clearance
• Deficient fluid volume
• Risk for infection

TREATMENT
• Debridement
• Diet: adequate nutritional support to avoid negative nitrogen balance and prevent overfeeding
• Escharotomy
• I.V. fluids to prevent and treat shock; urine output maintained at 1 to 2 ml/kg
• Oxygen therapy (may require intubation)
• Protective isolation, depending on burn severity
• Skin grafting
• TPN

Drug therapy
• Analgesics: morphine
• Diuretic therapy: mannitol (Osmitrol) to flush hemoglobin from the kidneys
• Antibiotics: silver sulfadiazine (Silvadene) or mafenide acetate (Sulfamylon) to limit infection at the site

INTERVENTIONS AND RATIONALES
• Stop the burning in an emergency situation *to prevent further injury.*
• Maintain a patent airway in the immediate postburn phase; *inhalation of smoke may cause airway edema.*
• Monitor vital signs and intake and output *to detect signs of complications.*
• Maintain I.V. analgesics *to relieve pain*; don't administer I.M. injections.

- Assist with debridement *to promote healing.*
- Elevate the burned body part *to promote venous drainage and decrease edema.*
- Apply a thin layer of topical medication, such as mafenide acetate, over the burn *to prevent infection.*
- Prevent heat loss *to reduce metabolic demands.*
- Explain treatments, pain management, and the need for the child's active participation in the treatment plan. Allow the child choices, where appropriate, *to help the child feel less afraid and anxious.*
- Encourage family and friends to participate in the child's care when appropriate *to create a pleasant, loving, and supportive atmosphere.*
- Allow the child to participate in everyday activities, such as playing and school activities, *to normalize the child's situation.*
- Give the child the opportunity to maintain the developmental tasks already achieved, such as eating in a high chair, not using diapers if the child has been toilet-trained, and allowing self-feeding if the child is able, *to prevent regression.*
- Rock, cuddle, and treat the patient like any other child *to encourage normalcy in his situation.*
- Promote a comfortable atmosphere for the child *to encourage the child to talk and act out feelings of depression, hostility, and anxiety.*

Teaching topics

- Explaining treatment to the child and his parents
- Coping strategies for dealing with long-term care
- Preventing burns
- Wound care

Contact dermatitis

Contact dermatitis, also known as *diaper rash*, is a local skin reaction in the areas normally covered by a diaper.

CAUSES

- Body soaps, bubble baths, tight clothes, and wool or rough clothing
- Clothing dyes or the soaps used to wash diapers
- Irritation due to acidic urine and stools or the formation of ammonia in the diaper
- Moist, warm environment found in a plastic diaper lining

DATA COLLECTION FINDINGS

- Characteristic bright red, maculopapular rash in the diaper area
- Irritability because the rash is painful and warm

DIAGNOSTIC FINDINGS

- Diagnostic testing isn't necessary. Diagnosis is based on inspection of the diaper area, which exhibits the characteristic bright red maculopapular rash.

NURSING DIAGNOSES

- Risk for infection
- Acute pain
- Impaired skin integrity

TREATMENT

- Cleaning affected area with mild soap and water
- Leaving affected area open to air

Drug therapy

- Application of vitamin A and D skin cream or zinc oxide ointment to help the skin heal
- Antibiotics if secondary infection occurs

INTERVENTIONS AND RATIONALES

- Keep the diaper area clean and dry *to maintain skin integrity.*
- Change the diaper immediately after the child voids or defecates *to prevent skin breakdown.*
- Wash the area with mild soap and water *to promote healing.*
- Avoid plastic bed linings, and keep the area open to the air, if possible, *to promote circulation and comfort.*
- Avoid using commercially prepared diaper wipes on

When applying insecticidal treatments, carefully follow the manufacturer's directions to avoid neurotoxicity.

broken skin; *the chemicals and alcohol in these wipes may be irritating and painful.*

Teaching topics
- Preventing diaper rash
- Administering medication properly

Head lice

Head lice (pediculosis capitis) is a contagious infestation of lice eggs, which look like white flecks that are firmly attached to hair shafts near the base. The cause of this disorder isn't related to the hygiene of a child or family members; however, head lice is easily transmitted among children and family members.

CAUSES
- Infestation with *Pediculus humanus* (usually acquired by sharing of clothing and combs or close physical contact with peers)

DATA COLLECTION FINDINGS
- Pruritus of the scalp
- White flecks attached to the hair shafts

DIAGNOSTIC FINDINGS
- Examination reveals lice eggs, which look like white flecks, firmly attached to hair shafts near the base.

NURSING DIAGNOSES
- Disturbed body image
- Impaired skin integrity
- Social isolation

TREATMENT
- Removal of lice and eggs using a fine-toothed comb

Drug therapy
- Medicated shampoo: pyrethrins (Rid) or permethrin (Nix); lindane (GBH) in resistant cases
- Preventive drug therapy for other family members and classmates

INTERVENTIONS AND RATIONALES
- Carefully follow the manufacturer's directions when applying medicated shampoo *to avoid neurotoxicity.*
- Repeat treatment in 7 to 12 days *to ensure that all the eggs have been killed.*

Teaching topics
- Preventing reinfestation by washing bed linens, hats, combs, brushes, and anything else that comes in contact with the hair
- Identifying reinfestation
- Refraining from exchanging combs, brushes, headgear, or clothing with other children

Insidious, infectious itch! Impetigo may be spread to other parts of the body by scratching.

Impetigo

Impetigo is a highly contagious superficial infection of the skin, marked by patches of tiny blisters that erupt. It's common in children ages 2 to 5. Infection is spread by direct contact after an incubation period of 2 to 10 days.

CAUSES
- Group A beta-hemolytic streptococci
- Staphylococci

DATA COLLECTION FINDINGS
- Rash commonly seen on the face and extremities but may have spread to other parts of the body by scratching
- Macular rash progressing to a papular and vesicular rash, which oozes and forms a moist, honey-colored crust
- Pruritus

DIAGNOSTIC FINDINGS
- Diagnostic testing isn't necessary. Diagnosis is based on inspection of the rash.

NURSING DIAGNOSES
- Bathing or hygiene self-care deficit
- Impaired skin integrity
- Risk for infection

TREATMENT
- Washing area with disinfectant soap

Drug therapy
- Systemic antibiotics (in severe cases)
- Topical antibiotic ointment

INTERVENTIONS AND RATIONALES
- Apply antibiotic ointment *to eradicate the infection.*
- Wash the affected area three times daily with antiseptic soap *to promote skin healing.*
- Cover the child's hands, if necessary, and cut the child's nails *to prevent secondary infection.*
- Cover the lesions *to prevent their spread.*

Teaching topics
- Preventing recurrence
- Applying medications properly

Rashes

A rash is a temporary skin eruption. Three types of rashes — papular, pustular, and vesicular — are described here.

A *papular rash* may erupt anywhere on the body in various configurations and may be acute or chronic. Papular rashes characterize many cutaneous disorders; they may also result from allergies or infectious, neoplastic, or systemic disorders. Common causes of papular rashes in children are infectious diseases, such as molluscum and scarlet fever; scabies; insect bites; allergies or drug reactions; and miliaria.

A *pustular rash* is made up of groups of pustules that fill with purulent exudate. These lesions vary greatly in size and shape and can be generalized or localized to the hair follicles or sweat glands. Pustules appear with skin and systemic disorders, with use of certain drugs, and with exposure to skin irritants. Disorders that produce a pustular rash in children include varicella, erythema toxicum neonatorum, candidiasis, and impetigo. Pustules typify the inflammatory lesions of acne vulgaris, common in adolescents.

A *vesicular rash* is a scattered or linear distribution of vesicles. A vesicular rash may be mild or severe and temporary or permanent. It may result from infection, inflammation, or allergic reactions. Vesicular rashes in children may be caused by staphylococcal infections, varicella, hand-foot-mouth disease, or miliaria.

CAUSES
- Allergic reaction
- Environmental cause
- Viral, fungal, or bacterial infestation

DATA COLLECTION FINDINGS
- Papular rash: raised solid lesions with color changes in circumscribed areas
- Pustular rash: vesicles and bullae that fill with purulent exudate
- Vesicular rash: small, raised, circumscribed lesions filled with clear fluid

DIAGNOSTIC FINDINGS
- Aspirate from lesions may reveal cause.
- Patch test may identify cause.

NURSING DIAGNOSES
- Impaired skin integrity
- Risk for infection
- Disturbed body image

TREATMENT
- Antibacterial, antifungal, or antiviral agent (depending on cause)
- Antihistamines if the rash is from an allergy

INTERVENTIONS AND RATIONALES
- Keep the affected area cool. *Heat aggravates most skin rashes and increases pruritus; coolness decreases pruritus.*
- Keep the affected area clean and dry *to promote healing.*
- Avoid using powder or cornstarch *because they encourage bacterial growth.*
- Maintain standard precautions *to prevent the spread of infection.*
- Cover weeping lesions *to prevent transmission.*

Teaching topics
- Understanding sanitary techniques
- Avoiding sharing combs or hats
- Avoiding scratching

Scabies

Scabies is a parasitic skin disorder that causes severe pruritus. Scabies develops when microscopic itch mites enter a child's skin and provoke a sensitivity reaction. Mites can live their entire lives inside human skin, causing chronic infection. The female mite burrows into the skin to lay her eggs from which larvae emerge to copulate and then reburrow under the skin. Scabies is transmitted through the skin or through sexual contact.

CAUSES

- A female mite that burrows into the skin and deposits eggs in areas that are thin and moist

DATA COLLECTION FINDINGS

- Linear black burrows between fingers and toes and in palms, axillae, and groin
- Severe pruritus

DIAGNOSTIC FINDINGS

- Drop of mineral oil placed over the burrow, followed by superficial scraping and examination of expressed material under a microscope may reveal ova or mite feces.

NURSING DIAGNOSES

- Disturbed body image
- Impaired skin integrity
- Social isolation

TREATMENT

- Treatment for all members of the family (as well as close contacts of the child)

Drug therapy

- Application of permethrin (Elimite)

INTERVENTIONS AND RATIONALES

- Wash area thoroughly with soap and water *to promote healing.*
- Teach the child and parents to apply permethrin from the neck down covering the entire body, wait 15 minutes before dressing, and avoid bathing for 8 to 12 hours *to ensure effectiveness of therapy.*
- Withhold lindane cream if skin is raw or inflamed *to avoid irritating the skin.*
- Explain to the child and parents that if skin irritation or an allergic reaction develops, they should notify the doctor immediately, stop using the cream, and wash it off thoroughly *to avoid the risk of an anaphylactic reaction.*

Teaching topics

- Understanding that pruritus may persist for several weeks after treatment
- Following proper hygiene measures
- Changing bed linens, towels, and clothing and washing them in hot water and drying them in a hot dryer after bathing and lotion application
- Understanding the need to treat family members and close contacts because the parasite is transmitted by close personal contact and through clothes and linens

Pump up on practice questions

1. The clothes of a 16-year-old girl catch fire while she's lighting the grill for a family picnic. The girl's mother, a nurse, tells her to drop and roll to extinguish the flames. Which action should the mother take next?

1. Move her daughter away from the grill.
2. Remove her daughter's clothing.
3. Use the garden hose to wet her daughter down.
4. Call the fire department.

Answer: 3. In emergency burn care, the priority is to stop the burning. The client shouldn't be moved because flames may intensify. After the fire is extinguished, the client's clothes should be removed to prevent further injury. Emergency medical personnel should be summoned after the flames are extinguished.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

2. A child has sustained third-degree burns of the hands, face, and chest. Which nursing diagnosis takes priority?

1. Ineffective airway clearance related to edema
2. Disturbed body image related to physical appearance
3. Impaired urinary elimination related to fluid loss
4. Risk for infection related to epidermal disruption

Answer: 1. When a client is admitted to the hospital for burns, the primary focus is on assessing for and managing an effective airway. Disturbed body image, impaired urinary elimination, and risk for infection are all integral parts of burn management but aren't the first priority.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

3. The nurse is caring for a child with second- and third-degree burns. Which analgesic would most effectively manage the client's severe pain?

1. Acetaminophen administered by suppository
2. Meperidine administered I.M.
3. Codeine administered by mouth
4. Morphine administered I.V.

Answer: 4. A client with severe burns requires strong analgesia. The most effective method of administering analgesics is the I.V. route. Second-degree burns are commonly too painful to be relieved by acetaminophen. I.M. medication may not be absorbed when the client is physiologically unstable. Codeine may not provide sufficient analgesia, and oral administration isn't usually the best route for a client with severe burns.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

4. A 14-month-old child is in a private room for treatment of burns. Which intervention can best meet the developmental needs of the child?

1. Ask the mother to room with the child.
2. Have nursing personnel visit the child regularly throughout the day.
3. Set the television to the child's favorite cartoon shows.
4. Attach a brightly colored balloon to the child's crib.

Answer: 1. The mother can best provide for the child's developmental needs by being present all of the time. At this age, the child is most susceptible to separation anxiety. A child of this age is likely to be apprehensive toward unfamiliar adults, so regular visits by nursing personnel wouldn't help. Television is a poor substitute for human contact. A balloon is dangerous for a child this age.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

5. A 13-year-old client has sustained third-degree burns over 20% of his body. When collecting data 72 hours after the burn, which finding should the nurse expect?

1. Increased urine output
2. Severe peripheral edema
3. Respiratory distress
4. Absent bowel sounds

Answer: 1. During the resuscitative-emergent phase of a burn, fluid shifts back into the interstitial space, resulting in diuresis. Edema resolves during the emergent phase, when fluid shifts back to the intravascular space. Respiratory rate increases during the first hours as a result of edema. When edema resolves, respirations return to normal. Absent bowel sounds occur in the initial stage.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

6. A child comes into the emergency department with a rash that's raised and has color changes in circumscribed areas. What type of rash should the nurse document?

1. Macular rash
2. Papular rash
3. Petechial rash
4. Vesicular rash

Answer: 2. A papular rash contains raised solid lesions with color changes in circumscribed areas. A macular rash is flat with color changes in circumscribed areas. Petechiae are pinpoint purple or red spots on the skin caused by minute hemorrhages. A vesicular rash contains small, raised circumscribed lesions filled with clear fluid.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

7. The nurse is developing a teaching plan for the mother of a neonate with diaper rash. The nurse should instruct the mother to prevent the rash by:

1. using disposable diapers so she doesn't have to change the infant often.
2. bathing the infant in a tub with bubble bath.
3. not washing the infant with soap.
4. keeping the infant's diaper area clean and dry.

Answer: 4. The mother should be instructed to keep the infant's diaper area clean and dry, to change the diaper immediately after the infant voids or defecates, to avoid bubble baths, and to wash the diaper area with mild soap and water with every diaper change.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

8. A mother calls the pediatrician's office because there's an outbreak of scabies at her child's day-care center. The nurse should instruct the mother to check her child for which findings associated with scabies infestation?

1. Pruritic papules, pustules, and linear burrows between fingers and toes
2. Oval white dots adhering to the hair shafts
3. Diffuse pruritic wheals
4. Pain, erythema, and edema at the site of the bite

Answer: 1. The mother should be instructed to check her child for pruritic papules, vesicles, and linear burrows between the fingers and toes. Oval flecks on the hair shaft indicate head lice. Diffuse pruritic wheals can indicate an allergic reaction. The mite bites don't cause pain, erythema, or edema.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

9. A 16-month-old child is being treated with permethrin (Elimite) for scabies. The child's mother is concerned that the drug hasn't been effective because her child continues to scratch. Which response by the nurse is most appropriate?

1. Stop treatment because the drug isn't safe for children under age 2.
2. Pruritus can be present for weeks after treatment.
3. Apply the drug every day until the rash disappears.
4. Pruritus is common in children under age 5 treated with Elimite.

Answer: 2. Pruritus may persist for weeks after the child is treated with Elimite for scabies. The drug is safe for use in infants as young as age 2 months. Treatment can safely be repeated in 2 weeks. Pruritus is caused by secondary reactions of mites.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Knowledge

10. The mother of a child diagnosed with head lice asks how she should get the nits out of her child's hair. The nurse gives the mother which instructions about head lice treatment?

1. The treatment should be repeated in 7 to 12 days.
2. Combing the hair after shampooing is necessary.
3. Treatment should be repeated every day for 7 days.
4. All children that had contact with the child should be prophylactically treated.

Answer: 1. Treatment should be repeated in 7 to 12 days to ensure that all of the eggs have been killed. Combing the hair thoroughly isn't necessary to remove lice eggs. People exposed should be observed for infestation before being treated.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

Pump up on more practice questions

1. The nurse is teaching the mother of an infant with tetralogy of Fallot. The mother asks what to do when her infant becomes very blue and has trouble breathing after crying. What should the nurse tell the mother to do?

1. "Leave the infant alone until the crying stops."
2. "Put the infant in the knee-chest position."
3. "Offer the infant a bottle of formula."
4. "Take the infant for a ride in the car."

Answer: 2. The infant is having a "tet," or blue spell, which is an acute spell of hypoxemia and cyanosis. This occurs when the infant's oxygen requirements exceed the oxygen supply in the blood. Treatment involves placing the infant in the knee-chest position to reduce venous return from the extremities because that blood is desaturated. The knee-chest position also increases systemic vascular resistance, which causes more blood to be shunted to the pulmonary artery. Leaving the infant alone until the crying stops will cause an increase in cyanosis. An infant who's crying and having trouble breathing shouldn't be offered a bottle because of the danger of aspiration. Taking the infant for a ride in the car may be an alternative if the mother can't quiet the infant.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

2. The nurse is providing care to a child who underwent a cardiac catheterization. Which intervention should the nurse provide?

1. Offer the child liquids immediately on awakening.
2. Allow the child to sleep as much as possible.
3. Monitor peripheral pulses for symmetry.
4. Change the dressing over the catheter site.

Answer: 3. The most important nursing intervention after cardiac catheterization is to assess peripheral pulses, especially those distal to the catheter site. The pulse may be weaker initially but typically becomes stronger in a short period. The dressing should be monitored, and the child may want liquids after the procedure; however, these interventions aren't as important as monitoring pulses. Allowing the child to sleep as much as possible may be appropriate but isn't the most important intervention.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

3. The nurse notices that the dressing over a client's cardiac catheterization site has a large amount of sanguineous drainage. What should the nurse do first?

1. Notify the on-call physician.
2. Apply pressure 1″ (2.5 cm) above the skin site.
3. Check the client's vital signs, including temperature.
4. Check the peripheral pulse distal to the site.

Answer: 2. If bleeding occurs, it's important to apply direct, continuous pressure above the percutaneous skin site to localize pressure over the punctured vessel. All of the other

actions are important, but applying pressure is the priority.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

4. The nurse is teaching the mother of a toddler with iron deficiency anemia about dietary modifications. Which statement by the mother indicates that she understands the teaching?

1. "I can let my child have four glasses of milk every day."
2. "I will feed my child fortified cereal and lots of green leafy vegetables."
3. "I plan to offer my child juice and cereal for snacks."
4. "I think my child will drink milk and juice easily."

Answer: 2. For the child with iron deficiency anemia, iron-rich foods, such as fortified cereal, green leafy vegetables, and red meat, need to be offered in larger amounts. Foods that contain less iron, such as milk, juice, yellow vegetables, and nonfortified cereals, should be offered in smaller amounts.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

5. A 10-year-old child is admitted to the pediatric unit in sickle cell crisis. What should the nurse do first?

1. Obtain vital signs, including temperature.
2. Determine the degree of pain using a pain scale.
3. Determine the rate of the I.V. fluids.
4. Obtain pertinent history information from the parents.

Answer: 1. All of the options are important, but the nurse should obtain vital signs first to determine the client's baseline. Children with sickle cell disease are prone to developing infections as a result of necrosis of body areas where vaso-occlusive crisis occurs; this crisis is also associated with localized pain at the site of infection. It's important for the child to receive adequate fluids to help prevent dehydration and increase blood volume. A history will help determine other coexisting conditions.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

6. The nurse is caring for a child with leukemia who has an absolute granulocyte count of 400 μl. Which intervention should the nurse implement?

1. Place the child in strict isolation.
2. Notify the physician immediately.
3. Restrict visitors with active infections.
4. Begin antibiotics according to protocol.

Answer: 3. When the absolute granulocyte count is low, a child has difficulty fighting an infection. Visitors with active infections should be restricted to prevent the child from developing an infection. The child should be placed in protective isolation, not strict isolation. Antibiotics shouldn't be started without a septic workup first. The physician must also be notified of the client's condition so that appropriate medical management is initiated.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Application

7. A client is receiving cyclophosphamide (Cytoxan) as part of a chemotherapy regimen. Which adverse reaction should the nurse teach the family to report right away?

1. Stomatitis
2. Flulike syndrome
3. Ototoxicity
4. Hematuria

Answer: 4. Hematuria, an indication of hemorrhagic cystitis, is an adverse effect of cyclophosphamide. Stomatitis is a rare complication with this medication. Flulike syndrome occurs with dacarbazine. Ototoxicity occurs more commonly with cisplatin.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Comprehension

8. A 15-month-old child has been admitted to the pediatric unit with the diagnosis of croup. The nurse collects the following data: respiratory rate, 36 breaths/minute; heart rate, 120 beats/minute; temperature, 100.7° F (38.2° C); pulse oximetry, 93%; and restlessness. From these findings, the nurse should infer that the:

1. toddler is in respiratory failure.
2. toddler's condition is improving.
3. mother should stay at the bedside.
4. parents can calm the toddler.

Answer: 1. Recognizing subtle signs of respiratory failure is an extremely important skill for nurses to develop. Subtle signs include restlessness, increase in respiratory effort, tachypnea, tachycardia, and an inability of the family to calm the child.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

9. A 6-year-old child with a history of asthma is brought to the clinic in respiratory distress. The nurse notes the following: respiratory rate, 36 breaths/minute; heart rate, 150 beats/minute; and anxiety. The nurse should be most concerned about the:

1. child's loose cough.
2. prolonged expiratory phase.
3. absence of wheezing.
4. whistling sound on inspiration.

Answer: 3. The most likely explanation for the respiratory distress is an acute asthma attack. These episodes usually begin with a cough, expiratory wheezing, and a prolonged expiratory phase and then may progress to more obvious symptoms, such as wheezing on inspiration, shortness of breath, and tight cough. The absence of wheezing during an attack indicates that the child is probably hypoxic and needs medical attention immediately.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

10. An adolescent with cystic fibrosis comes to the clinic for a follow-up appointment after discharge from the hospital for pneumonia. Which question should the nurse ask?

1. "How has your appetite been this past week?"
2. "How many doses of antibiotics have you missed?"
3. "Have you been sleeping well?"
4. "Have you gone back to school yet?"

Answer: 1. An important indication of how clients with cystic fibrosis are doing is their appetite. Poor appetite and weight loss are indications that an infectious process may be occurring. To ask how many doses of antibiotics the client has missed implies that the client isn't trustworthy, which doesn't help establish a therapeutic relationship. Asking

about sleep and returning to school would be important because they might provide helpful information about the client's overall health, but they aren't the most important questions.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

11. A 5-month-old boy is brought to the clinic by his mother, who reports that the infant has nasal congestion, symptoms of a cold, fever, and difficulty breathing. The nurse should first:

1. ask for more history information.
2. evaluate the respiratory status.
3. notify the available physician.
4. take vital signs, including temperature.

Answer: 2. Anytime a relative reports that a child has difficulty breathing, it's imperative for the nurse evaluate the respiratory status immediately. History information and vital signs can be obtained later. After the nurse determines the respiratory status, she can contact the physician if warranted.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Application

12. The nurse is counseling the mother of a child with attention deficit hyperactivity disorder (ADHD). The nurse should conclude that the mother understood the teaching when the mother responds with:

1. "When my child comes home from school, I have him do homework first."
2. "I take my child to play in the park as soon as school is over."
3. "My child loves to sit and watch television after the bus ride home."
4. "As soon as I arrive home, my child begins to read his favorite book."

Answer: 2. Children with ADHD are impulsive, have high energy levels, and don't follow directions well. An appropriate plan after the child has been in school all day would be to allow the child to run and play to burn up energy. This enables the child to concentrate better later.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

13. An infant is to receive amoxicillin 90 mg three times per day for 10 days to treat otitis media in the left ear. Amoxicillin suspension is supplied as 125 mg/5 ml. How much of the medication should the mother administer at each dosing time?

1. 1.8 ml
2. 3.6 ml
3. 13.45 ml
4. 26.90 ml

Answer: 2. Calculate the dose as follows:
125 mg : 5 ml :: 90 mg : X ml =
(90 mg $\times$ 5 ml) $\div$ (125 mg $\times$ X ml) =
450 $\div$ 125 = 3.6

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

14. A school-age child with hydrocephalus is admitted for a revision of his ventriculoperitoneal shunt. When he returns from surgery, how should the nurse position him?

1. On his abdomen where he's comfortable
2. In semi-Fowler's position to prevent aspiration
3. With the bed flat to prevent a subdural hematoma
4. On the same side as the shunt repair

Answer: 3. The child should be kept flat to decrease complications that might occur from too rapid a reduction in intracranial fluid. When the fluid is drained too rapidly, a subdural hematoma may result. In children with increased intracranial pressure, the position of choice is with the head of the bed elevated and the child lying on the side opposite the shunt to keep pressure off the shunt valve.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

15. A 10-month-old infant is admitted to the hospital from the clinic with a history of 2 days of fever, anorexia, crying, and poor sleeping. The infant is diagnosed with possible meningitis. In which situation should the nurse place the infant?

1. In strict isolation
2. In respiratory isolation
3. With other older infants
4. With another infant with meningitis

Answer: 2. The organisms that cause meningitis are transmitted by the spread of droplets. To protect the nursing staff and the family, an infant with the probable diagnosis of meningitis is placed in a private room in respiratory isolation until appropriate I.V. antibiotics have been administered for 24 hours.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Application

16. Parents bring a 4-year-old child to the clinic for a checkup. The child has been diagnosed with Duchenne's muscular dystrophy. What early signs would the nurse expect the child to exhibit?

1. Contracture deformities
2. Loss of independent ambulation
3. Difficulty climbing stairs
4. Small and weak muscles

Answer: 3. Muscular dystrophy has an early onset; signs are seen by age 5. Difficulty climbing stairs and riding a tricycle are early signs. Contractures are progressive and begin to develop later, and loss of independent ambulation usually occurs by age 11. Small, weak muscles are a later sign.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

17. The nurse is caring for an infant with bilateral plaster leg casts for congenital clubfoot. Which statement by the parents would indicate understanding of the nurse's teaching?

1. "When the casts get dirty, I will just wash them with soap and warm water."
2. "I will need to frequently check the temperature and color of my child's toes."
3. "I can dry the casts faster with a hair dryer so we can go meet my mother."
4. "When the casts are partly dry, I can coat them with a clear acrylic spray."

Answer: 2. Frequently checking the extremity distal to the cast is important. If the cast is too tight, neurovascular compromise can result. This may manifest as coolness, pale digits, pain, decreased sensation, and absence of pulse. Putting water on a plaster cast can soften it and cause it to become misshapen.

External heat shouldn't be used to dry the cast because the inside of the cast wouldn't be adequately dried. The cast shouldn't be sprayed with anything that would inhibit the loss of moisture from the plaster.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

18. The nurse in a clinic is counseling an adolescent who's wearing a Milwaukee brace for scoliosis. The nurse would consider the teaching successful when the adolescent states that the brace must be worn:

1. at night when sleeping.
2. during school hours.
3. 23 hours per day.
4. when eating meals and snacks.

Answer: 3. Routinely, the Milwaukee brace is worn about 23 hours per day to decrease the thoracic curvature as the adolescent grows. The adolescent can be out of the brace for about 1 hour when showering or exercising.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

19. The nurse is teaching the parents of an infant undergoing cleft lip repair. Which instruction should the nurse give?

1. Offer the pacifier as needed.
2. Lay the infant on his abdomen for sleep.
3. Sit the infant up for each feeding.
4. Loosen the arm restraints every hour.

Answer: 3. An infant who has undergone cleft lip repair is fed in the upright position with a syringe and attached tubing. This prevents stress to the suture line from sucking. Pacifiers wouldn't be used during the healing process. The infant would be put down for sleep on his back or side so the surgery site wouldn't be traumatized. Arm restraints would usually be loosened every 2 hours.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

20. A nurse is collecting data on an infant with persistent emesis. Which acid-base imbalance may occur based on the provisional diagnosis of pyloric stenosis?

1. Respiratory acidosis
2. Respiratory alkalosis
3. Metabolic acidosis
4. Metabolic alkalosis

Answer: 4. Persistent emesis may cause metabolic alkalosis from an excessive loss of potassium, hydrogen, and chloride. A compensatory increase in bicarbonate ions is caused by chloride loss. Metabolic acidosis occurs as a result of excessive diarrhea or malnutrition. Respiratory acidosis results from excessive retention of partial pressure of arterial carbon dioxide ($Paco_2$). Respiratory alkalosis results from a loss of $Paco_2$.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

21. The nurse is caring for an infant with esophageal atresia and tracheoesophageal fistula. Which statement indicates that the infant's parents understand the diagnosis?

1. "The esophagus ends in a blind pouch so eating can't occur."
2. "There's a connection between the esophagus and the trachea."
3. "The esophagus ends in a blind pouch and there's a tube between the trachea and esophagus."
4. "Stomach acids come back up into the trachea, causing heartburn."

Answer: 3. This statement correctly describes the most common type of esophageal atresia and tracheoesophageal fistula.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

22. The mother of a 6-week-old breast-fed infant asks the nurse why her infant wasn't diagnosed earlier with congenital hypothyroidism. Which response would the nurse give?

1. "Breast-fed infants may not display symptoms until they're weaned."
2. "If you had brought your infant in for a 2-week checkup, you would have been told."
3. "The diagnosis was made earlier, but replacement medication won't start yet."
4. "The public health nurse couldn't locate your home."

Answer: 1. Frequently, a neonate doesn't exhibit signs of congenital hypothyroidism because of the exogenous thyroid hormone supplied by the maternal circulation. It may not be obvious in infants because they have a functional remnant of the thyroid hormone. Breast-fed babies may not manifest symptoms until they're weaned. Telling the mother she missed her 2-week checkup puts the blame on the mother, which isn't necessary. The other responses aren't appropriate because the infant was breast-fed — preventing earlier diagnosis.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

23. The nurse is teaching a child with diabetes. Which statement by the child indicates that the teaching was successful?

1. "Intermediate insulin begins to work about 2 to 4 hours after the injection."
2. "I should take regular insulin early in the morning, long before breakfast."
3. "Hunger, headache, shakiness, and sweating are all signs of hyperglycemia."
4. "Because exercise increases the blood glucose level, I shouldn't eat snacks before I exercise."

Answer: 1. Intermediate insulin begins to act 2 to 4 hours after injection and peaks about 6 to 8 hours after injection. Regular insulin begins to act within 30 minutes and is usually administered right before breakfast. Hunger, headache, shakiness, and sweating are signs of hypoglycemia. Strenuous exercise decreases the blood glucose level, so children with diabetes usually need a snack before engaging in exercise.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

24. The nurse is teaching the mother of a child who's newly diagnosed with diabetes mellitus. As part of the teaching, the nurse reviews diet and snacks. Which statement indicates that the mother understands why her child needs snacks?

1. "Snacks will help my child not want to eat candy with friends."
2. "Snacks are given at the time insulin peaks to prevent hypoglycemia."
3. "Children can't eat all the calories they need in just three meals a day."
4. "The insulin shots make my child hungry, so snacks help prevent cheating on the diet."

Answer: 2. The diabetic diet for children includes at least two snacks per day at midafternoon and before bed. Snacks are given at the time insulin peaks to help prevent hypoglycemia. Snacks aren't given to help control the desire for sweets, to ensure suffi-

cient calorie intake, or to prevent the child from cheating on this diet.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

25. A 24-month-old toddler is seen in the clinic for a well-child checkup. The mother reports that she's in the process of toilet training her child but it isn't going well. The toddler has many accidents during the day. Which question should the nurse ask the mother?

1. "Does your child understand what's expected?"
2. "How many accidents a day does your child have?"
3. "Does your child seem to be in pain right before the accident?"
4. "What does your child's urine smell like?"

Answer: 4. This question would yield the most helpful information. When a child has a urinary tract infection (UTI), the urine commonly has a strong, foul smell. Many 24-month-old children are ready to be toilet trained and, at this age, they usually understand what's asked of them. It may be extremely difficult for the mother to ascertain whether the child has pain before an accident, but it's worth asking.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Analysis

26. A child with a UTI is being treated with co-trimoxazole (Bactrim) for 10 days. What would the nurse teach the mother?

1. "With this medication, it's important that your child drink lots of water."
2. "When your child has taken this medication for 5 days, call the clinic."
3. "While taking this medication, it's important for your child to stay out of the sun."
4. "If your child won't take this medication, mix it in 3 ounces of fruit juice."

Answer: 1. Co-trimoxazole can cause crystals to form in the kidneys if the child doesn't drink enough water. It isn't necessary for the mother to call the clinic halfway through the course of treatment. There's no reason for the child to stay out of the sun while on this medication. Three ounces of fruit juice is too much liquid in which to mix the medication.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

27. A child has just returned from surgery for removal of a kidney for Wilms' tumor. Which would be an appropriate nursing action?

1. Offer the child ice chips when awake.
2. Administer pain medication when the child requests it.
3. Monitor the child's vital signs.
4. Provide games at the child's developmental level.

Answer: 3. The child's vital signs should be taken immediately upon arrival from surgery to determine the baseline and to detect early changes from previous recordings. Following nephrectomy, the child will most likely have a nasogastric tube and won't be allowed ice or fluids by mouth. Pain medication should be administered on a routine schedule to keep the child comfortable. The child should be provided diversions only after sufficient recuperation from surgery.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

28. The mother of a 3-month-old infant calls the clinic and states that her child has a diaper rash. What should the nurse advise her to do?

1. Switch to cloth diapers until the rash is gone.
2. Use baby wipes with each diaper change.
3. Leave the diaper open while the infant sleeps.
4. Offer extra fluids to the infant until the rash improves.

Answer: 3. The mother should leave the diaper open or off while the child sleeps to promote air circulation to the area, improving the condition. There's no need to switch to cloth diapers; in fact, that may make the rash worse. Extra fluids won't make the rash better, and baby wipes contain alcohol, which may worsen the condition.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

29. The nurse is speaking to the mother of a 5-year-old child with a burn on his arm from hot soup. What advice should the nurse give to the child's mother?

1. Wash the area with soap and water.
2. Spray the area with a pain reliever.
3. Flush the area with tepid water.
4. Bring the child immediately to the clinic.

Answer: 3. When a child has a scalding type of burn, it's important to immediately flush the area with tepid water to cool the skin and prevent the burn from progressing. Soap shouldn't be used until the area has been flushed well. Spraying the area with pain reliever won't stop the burning process. The child shouldn't be taken to the clinic until the area has been flushed.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

30. A school-age child asks the school nurse how a person gets lice. The nurse should respond that lice are:

1. passed to other children because they don't wash their hands often.
2. spread easily among children because they share hats and combs.
3. only spread between children; adults don't have them.
4. hard to spread unless your immune system is depressed.

Answer: 2. Lice are spread easily between children because they share possessions more readily than adults do. Also, children tend to be in closer proximity to each other than adults are. The other options don't apply.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Application

Part VI Coordinating care

36 Management concepts

In this chapter, you'll review:

- management concepts
- nursing care delivery systems
- resource management
- quality management.

Brush up on key concepts

Management is a process used to make sure the objectives of a facility are met. In nursing, this involves coordinating staff to accomplish the objectives of the facility in the most efficient, cost-effective manner. You can review the major points of this chapter by consulting the *Cheat sheet* on page 708.

Role of the nurse-manager

A nurse-manager assumes 24-hour accountability for the nursing care delivered in a specific nursing area. The licensed practical nurse should be aware of the role of the nurse-manager.

Getting the job done

The nurse-manager's responsibilities typically include:

- policy and decision making
- providing adequate staffing for safe, effective patient care
- evaluating patient care and documentation
- providing patient-education activities
- coordinating nursing services with other patient-care services
- supervising and guiding staff members
- evaluating staff performance
- participating in staff recruitment and retention
- providing new staff members with an adequate, individualized orientation
- ensuring that staff members participate in continuing education and maintain required competencies
- making sure that staff education is appropriate for each member's assigned responsibilities
- planning and implementing budgets
- encouraging staff participation in policy and procedure development and quality monitoring.

MANAGEMENT STYLES

The nurse-manager's job description defines her authority over a specified group of employees and describes her job responsibilities.

What style!

Each manager directs her staff using a different management style. An effective manager commonly uses more than one style. At times, staff should participate in decision making; at other times, staff participation isn't appropriate. The most commonly used management styles include:

- *autocratic* — Decisions are made with little or no staff input. The manager doesn't delegate responsibility. Staff dependence is fostered. The autocratic leader excels in times of crisis.
- *laissez-faire* — Little direction, structure, or support is provided by the manager. The manager abdicates responsibility and decision

Cheat sheet

Management refresher

NURSE-MANAGER ROLE

• Assumes 24-hour accountability for the nursing care delivered in a specific nursing area

Management styles

• Autocratic — Decisions made with little or no staff input. Manager doesn't delegate responsibility. Staff dependence is fostered. The autocratic leader excels in times of crisis.

• Laissez-faire — Little direction, structure, or support provided by manager. Manager abdicates responsibility and decision making when possible. Staff development isn't facilitated. There's little interest in achieving the goals necessary for adequate patient care.

• Democratic — Staff members are encouraged to participate in decision making when possible. Most decisions are made by the group. Staff development is encouraged. Responsibilities are carefully delegated and feedback is given to staff members to encourage professional growth.

• Participative — Problems are identified by the manager and presented to the staff with possible solutions. Staff members are encouraged to provide input but the manager makes the decision. Negotiation is key. Manager encourages staff advancement.

DELEGATION

• Involves entrusting a task to another staff member

• Helps free the nurse of tasks that can be completed successfully by someone else

• Prepares staff member for career advancement

DISCHARGE PLANNING AND PATIENT TEACHING

• Should be initiated on admission

• For patients with planned admissions, should begin before hospitalization

• Should take into account cultural and developmental needs

Clinical pathways

• Multidisciplinary guidelines for patient care

• Documentation tool for nurses and other health care providers

• Provides sequences of multidisciplinary interventions that incorporate education, consultation, discharge planning, medications, nutrition, diagnostic testing, activities, treatments, and therapeutic modalities

QUALITY MANAGEMENT

• A system used to continually assess and evaluate the effectiveness of patient care

DISASTER MANAGEMENT PLAN

• Must be able to be implemented quickly

• Must include measures to control resources, establish and maintain communication within the facility and with neighboring responders, protect as many lives as possible, protect property, provide resources for the community, help the facility and staff recover after the disaster

making whenever possible. Staff development isn't facilitated. There's little interest in achieving the goals necessary for adequate patient care.

• *democratic* — Staff members are encouraged to participate in the decision-making process whenever possible. Most decisions are made by the group, not the manager. Staff development is encouraged. Responsibilities are carefully delegated to staff to encourage growth and accountability. Positive feedback is given to staff members to encourage professional growth.

• *participative* — Problems are identified by the manager and presented to the staff with several solutions. Staff members are encouraged to provide input, but the manager makes the final decision. Negotiation is a key element of this management style. The manager encourages staff advancement.

Come to an understanding

An effective nurse-manager has a good understanding of each management style. A manager who adopts the autocratic or laissez-faire management style rarely produces effective outcomes. One who adopts the democratic or participative style is typically successful because these styles foster staff input, goal achievement, and professional growth of staff members. For example, an effective nurse-manager recognizes and fosters the role of the nursing leaders on her staff. (See *Leaders aren't always managers*.)

Delegation

One of the most important tasks of the nurse is effective delegation. Delegation involves entrusting a task to another staff member. It's necessary because it helps free the nurse of tasks that can be completed successfully by someone else. In addition, when a nurse-manager delegates to a staff member, it also prepares the staff member for career advancement. (See *How to delegate safely.*)

Although it may be difficult to delegate at first, fostering a working environment that supports autonomy, independence, and professional growth helps with recruitment and retention of staff.

Discharge planning and patient teaching

Discharge planning and patient teaching go hand-in-hand; one can't be accomplished without the other.

Beginning with admission

Discharge planning and patient teaching should be initiated on admission to the hospital. For patients with planned admissions, discharge planning should begin before hospitalization. For example, if a patient requires a

How to delegate safely

Nurses must have a clear understanding of their responsibilities to ensure that delegating is done safely and successfully. Nurses must remember that although responsibility for a task has been delegated, accountability hasn't. Nurses should receive regular updates from the person assigned the task, ask specific questions, and evaluate the outcome.

FIVE "RIGHTS"

The National Council of State Boards of Nursing identifies five "rights" of delegation that must be satisfied by the delegating nurse:

Right task — The task being assigned or transferred must be within the scope of abilities and practice of the individual receiving the responsibility.

Right circumstance — The individual variables involved (patient condition, environment, caregiver training) must be appropriate for delegation.

Right person — The individual receiving the responsibility must have the legal authority to perform the task. Institutional policies regarding delegation must be consistent with the law.

Right direction and communication — Instructions and expectations must be clear and understood.

Right supervision and follow-up — The delegating nurse must supervise, guide, and evaluate the performance of individuals to whom she delegates. In addition to ensuring that a particular task has been successfully carried out, the delegating nurse must also provide additional training and feedback to coworkers who function under her direction.

Leaders aren't always managers

An effective nurse-manager recognizes the valuable role played by a nursing leader. A nursing leader can be any member of the nursing team who encourages her colleagues to achieve the unit goals. Most leaders are excellent role models. They help other staff members develop and improve their nursing skills. They solve problems and work to improve both patient care and working conditions at the health care facility.

Cultural dimensions of care

A critical aspect of the nursing process involves the assessment of cultural needs, followed by appropriate planning and implementation. Too often this vital component of patient care is neglected because of the urgent need to address the patient's physical needs.

- Culture, including religion, helps to determine a person's role and status in the family and community. It influences the availability of social and material supports, how illness and health are viewed, and how individuals who are sick are expected to behave.
- Involve the patient and his family in planning to meet cultural needs. Identify institutional and home care barriers, which may need to be addressed. Identify alternate means of meeting cultural or spiritual needs when in conflict with these barriers. For example, when caring for a Jehovah's Witness client, be aware that blood transfusions are forbidden because they're considered against God's will. What alternative treatments are available and acceptable? What legal ramifications need to be considered?
- Intervene as an advocate for the patient and family. Ensure that cultural and religious views are taken into account as physical care is rendered. For example, when caring for a Latter-day Saint (Mormon) patient, allowing the retention of special undergarments whenever possible will be appreciated.
- Evaluate the effectiveness of the care plan. Does the patient feel supported and validated? Are there areas of concern or conflict? Can these be mitigated or can the difficulties be discussed sufficiently with the patient and family so that they feel their concerns are understood?

Discharge planning and patient teaching are initiated as early in the care process as possible. For patients with scheduled admission dates, teaching begins before hospitalization.

nonemergency surgical procedure, the patient should be taught about the procedure and his postoperative care in the doctor's office before admission to the hospital. Patients planning outpatient or same-day treatment should also be taught before admission to the facility for the procedure. Discharge planning and patient teaching should take into account the patient's cultural and developmental needs. (See *Cultural dimensions of care.*)

Follow the clinical pathway

Clinical pathways are multidisciplinary guidelines for patient care. A clinical pathway is a documentation tool for nurses as well as other health care providers. It provides the sequences of multidisciplinary interventions that incorporate education, consultation, discharge planning, medication, nutrition, diagnostic testing, activities, treatments, and therapeutic modalities.

The goal of a clinical pathway is to achieve realistic expected outcomes for the patient and family members. It promotes a professional and collaborative goal for care and practice and assures continuity of care. It should also guarantee appropriate use of resources, which reduces costs and hospital length of stay while also providing the framework for quality management.

Clinical pathways are also used to guide the use of patient-teaching tools, such as:

- videos
- audiotapes
- printed materials.

The nurse-manager is responsible for monitoring the effectiveness of discharge planning and patient teaching. She must collaborate with all members of the interdisciplinary health care team to evaluate if patients attain their maximum state of wellness.

Quality management

The quality of patient care must be continually evaluated in order to search for methods of improvement. Because change is constant in health care, changes must occur before problems arise.

Assess and evaluate

Continuous quality improvement, based on principles from the business world, is a system used to assess and evaluate the effectiveness of patient care on a continual basis. Risk management assesses and evaluates care and identifies areas that need improvement by reviewing such incidents or events as:

- medication errors
- patient falls
- treatment errors
- treatment omissions.

Incidents or events are investigated and a plan is devised to minimize or eliminate the risk of recurrence. Continuous quality improvement calls for constant evaluation of the system for delivering services and the people performing the tasks.

Nothing but the best

Another method for evaluating patient care is benchmarking. The best practices from the top hospitals are compared with the practices in a comparable unit. That unit's practices may then be adapted based on how they compare with the best hospitals' practices or benchmarks.

Improving performance and promoting professionalism

Performance improvement, another component of continuous quality improvement, establishes a formal system of job performance evaluation and recommends ways to improve performance and promote professional growth. Performance evaluations provide recognition, structured feedback, and recommendations for improvement. They also provide an opportunity for both the nurse-manager and staff member to clarify performance expectations.

Disaster management

Each facility must devise a plan that can be implemented quickly in the event of a disaster. A disaster can include severe weather and natural disasters, such as earthquakes and tsunamis; release of bioterrorism agents; chemical and radiation emergencies; mass trauma; or outbreak of infectious disease. Whatever the disaster, health care facilities and their neighboring communities must be prepared when disaster strikes.

Be prepared!

Health care teams respond better to a disaster when they're properly prepared. Managers and leaders must work together to develop a plan. After the plan is developed, each staff member must be adequately trained. To guarantee the highest level of preparedness, facilities must conduct disaster drills to ensure that their plan can be implemented in an efficient manner. Moreover, staff members must also be trained to properly utilize and maintain equipment so that it's readily available should disaster strike. After the leadership and management team devises a hospital-wide plan, they must work with the community to make sure they're prepared and informed in the event of a disaster. They must also coordinate their plan with local, state, and federal agencies.

To be effective, the disaster plan must include:

- measures to control and direct all of the appropriate resources
- ways to establish and maintain communication within the facility and with neighboring responders and agencies
- interventions to protect as many lives as possible

- methods to protect property
- resources for the community
- road map for recovery of the facility and staff after the disaster.

If a disaster actually occurs, nursing leaders must be available to implement the plan. They must provide direction for mobilizing staff and equipment while ensuring that the needs of hospitalized patients are met. They must also plan with neighboring facilities to transfer patients to those facilities so that resources can be made available for the disaster victims.

Take the lead

Leaders also play a key role in the recovery phase that follows the activation of the disaster plan. Tasks include:

- calculating damages
- prioritizing the replenishment of supplies
- preparing for future disasters
- assessing staffing needs
- devising plans to relieve front-line personnel
- preparing for staff debriefing
- preparing for leadership debriefing
- evaluating the effectiveness of the disaster plan and response
- identifying measures to improve the disaster plan.

Disaster management plans must be integrated into the facility's culture to ensure safe, effective care before, during, and after a disaster.

There's always room for improvement when it comes to nursing care. Benchmarking and performance evaluations are two methods used to improve nursing practices.

Pump up on practice questions

1. A nurse-manager of an inpatient pediatric unit is at home one evening when she receives a call from a staff nurse informing her of a serious medication error that occurred on her unit. The nurse-manager was notified because she assumes accountability for what happens on the unit:

1. 5 days per week.
2. 24 hours per day, 7 days per week.
3. 8 hours per day, 7 days per week.
4. 24 hours per day, 5 days per week.

Answer: 2. Nurse-managers are accountable for nursing care in the unit 24 hours per day, 7 days per week.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

2. A staff nurse influences the behaviors of colleagues by guiding and encouraging them. The nurse is an excellent role model but has no formal authority over any peers. This nurse is demonstrating characteristics of which roles?

1. Manager
2. Autocrat
3. Leader
4. Authority

Answer: 3. A leader doesn't always need or have formal power and authority. The leader guides, directs, and enhances the activities of peers and colleagues and is an effective role model. A manager has a formal position of power in an organization and should be an effective leader. An autocrat doesn't seek staff input and doesn't encourage peers or subordinates to grow professionally. Authority is a characteristic of managers and is part of the formal position of power granted to someone as a result of her job description.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

3. A nurse-manager is concerned after receiving many time-off requests from staff members for the upcoming holiday season. She has come up with several possible solutions to the staffing dilemma and has scheduled a staff meeting to present ideas to the staff. Which management style is this manager demonstrating?

1. Participative
2. Democratic
3. Autocratic
4. Laissez-faire

Answer: 1. A participative manager identifies problems and presents staff with several possible solutions for discussion. A democratic manager usually allows many decisions to be made by the group. She also solicits the group's ideas about problem solving. An autocratic manager makes decisions without input from staff. A laissez-faire manager provides no direction and abdicates decision making whenever possible.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

4. In the recovery phase after a disaster, which action should the management team take?

1. Preparing for future disasters
2. Planning with neighboring facilities to transfer clients
3. Making resources available for those involved in the disaster
4. Providing staff training

Answer: 1. During the recovery phase, the management team prepares for future disasters. Planning with neighboring facilities to transfer clients and making resources available for those involved in the disaster occur during the response phase. Providing staff training occurs during the planning phase.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Knowledge

Learn the roles of nursing leaders and nurse-managers. This knowledge will help you pass the NCLEX and will also come in handy when you become a staff nurse.

5. A nurse has a client scheduled for a partial mastectomy and axillary lymph node removal the following week. The nurse should make sure that the client is well educated about the surgical procedure by:

1. talking with the nursing staff at the physician's office to find out what the client has been taught and her level of understanding.
2. making sure that the postanesthesia recovery unit nurses know what to teach the client before discharge.
3. providing all of the preoperative teaching before surgery.
4. having the postoperative nurses teach the client because she'll be too anxious before surgery.

Answer: 1. The nurse who's caring for a client scheduled for surgery should talk to the nurses in the physician's office to find out what the client has been taught. She should then reinforce the teaching and answer any questions the client has. The client will most likely be anxious before her surgery, but the nurse can proceed with teaching. The client will most likely be too sedated to learn about her postoperative care immediately after surgery.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

6. A nurse-manager of a medical-surgical unit is interviewing a licensed practical nurse for a staff position. The nurse appears to be qualified and has excellent references. She states, "I have misplaced my license." Based on her knowledge of her supervisory responsibilities, the nurse-manager should:

1. contact the state licensing agency and confirm the nurse's license.
2. hire the nurse but tell her that she must provide proof of license upon completing orientation.
3. avoid hiring the nurse because she can't provide proof of license.
4. trust that the nurse is telling the truth because she has excellent references.

Answer: 1. The nurse-manager must make sure that the nurse is licensed as a practical nurse. She can do this by contacting the state licensing agency. In the case of a new hire, the nurse-manager must make sure that the nurse is representing herself truthfully before offering her the position.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

7. The nurse-manager of an outpatient surgery department helps groom department staff members for career advancement. Which task can be safely delegated to a licensed practical nurse?

1. Termination of a patient-care assistant
2. Development of the staffing schedule for the next 2 months
3. 24-hour responsibility of patient-care assistants for 2 months
4. Selection of a new nursing care delivery system for use in the department

Answer: 2. A nurse-manager can only delegate tasks that are within the scope of practice and skill of her subordinates. Termination of employees and 24-hour accountability can't be delegated. The selection of a new nursing care delivery system affects the functioning of an entire department and shouldn't be delegated. It should be determined by input from all staff members.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

8. A new nurse-manager is trying to determine the best way to implement client teaching in an outpatient surgical center. She decides to gather data from other surgical centers and compare their teaching methods to this center's methods. Which quality improvement process is she using?

1. Benchmarking
2. Risk management
3. Performance improvement
4. Quality management

Answer: 1. Benchmarking is the process of comparing your organization's practices with those of organizations formally recognized as some of the best in the business. Risk management is the process of monitoring the organization's adverse occurrences or potential for such occurrences and taking steps to reduce or eliminate these incidents. Performance improvement is the process of evaluating the effectiveness of job performance and taking steps to improve it. Quality management is the overall process of evaluating and improving the quality of client services.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

9. Which health care team member is responsible for monitoring the effectiveness of discharge planning and client teaching?

1. Physician
2. Nurse-manager
3. Social worker
4. Staff nurse

Answer: 2. The nurse-manager is responsible for monitoring the effectiveness of discharge planning and client teaching. It isn't the responsibility of the physician, social worker, or staff nurse; however, they all play a collaborative role in discharge planning and client teaching.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Knowledge

10. When providing a performance evaluation, a nurse-manager should perform which activity?

1. Compare the staff member's performance to the performance of other staff members.
2. Clarify performance expectations.
3. Reprimand the staff member for past errors.
4. Provide an informal evaluation of the job performance.

Answer: 2. A performance evaluation provides a formal evaluation of the staff member's job performance. Practice issues should be addressed as they occur during the review period. The evaluation should provide recognition and structured feedback as well as recommendations for improvement. It should also provide the opportunity for clarifying performance expectations. The performance of other staff members shouldn't be discussed. A performance evaluation shouldn't be used to reprimand a staff member.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Comprehension

37 Law and ethics

In this chapter, you'll review:

- importance of nurse practice acts
- importance of obtaining informed consent
- patient's right to refuse treatment
- issues surrounding living wills, malpractice, and abuse.

Brush up on key concepts

Safe, effective nursing practice requires becoming fully aware of the legal and ethical issues surrounding professional practice. These issues range from understanding your state's nurse practice act to upholding patients' rights and fulfilling the many legal responsibilities you have as a nurse.

At any time, you can review the major points of this chapter by consulting the *Cheat sheet* on pages 718 and 719.

Nurse practice acts

Each state has a nurse practice act. It's designed to protect the nurse and the public by:
- defining the legal scope of nursing practice
- excluding untrained or unlicensed people from practicing nursing.

Your state's nurse practice act is the most important law affecting your nursing practice. You're expected to care for patients within defined practice limits; if you give care beyond those limits, you become vulnerable to charges of violating your state's nurse practice act.

Scope it out

Most nurse practice acts define important concepts, including the scope of nursing practice. In other words, they broadly outline what nurses can and can't do on the job. Make sure that you're familiar with the legally permissible scope of your nursing practice, as defined in your state's nurse practice act, and that you never exceed its limits. Otherwise, you're inviting legal problems.

Nurse practice acts also outline the conditions and requirements for licensure. To become licensed as a practical nurse, for instance, you must meet certain qualifications, such as passing the NCLEX-PN. All states require completion of a board of nursing–approved education program. Your state may have additional requirements, including:
- good moral character
- good physical and mental health
- minimum age
- fluency in English
- absence of drug or alcohol addiction.

Get on board

In every U.S. state and Canadian province, the nurse practice act creates a state or provincial board of nursing. The nurse practice act authorizes this board to administer and enforce rules and regulations about the nursing profession. The board is bound by the provisions of the nurse practice act that created it.

Moving violations

The nurse practice act also lists violations that can result in disciplinary action against a nurse. Depending on the nature of the violation, a nurse may face state board disciplinary action and liability for her actions.

Get it?

Understanding your nurse practice act's general provisions helps you to stay within the legal limits of nursing practice. Interpreting the nurse practice act isn't always easy, however. Nurse practice acts are laws, after all, so they tend to be worded in broad, vague terms, and contain wording that varies from state to state.

The key point to remember is this: Your state's nurse practice act isn't a word-for-word

Cheat sheet

Law and ethics refresher

NURSE PRACTICE ACTS

- Most important law affecting your nursing practice
- One for each state
- Designed to protect nurse and public by defining legal scope of practice and excluding untrained or unlicensed people from practicing nursing
- Outline conditions and requirements for licensure, such as passing NCLEX-PN
- All states require completion of a board of nursing–approved education program; your state may have additional requirements, including:
  - good moral character
  - good physical and mental health
  - minimum age
  - fluency in English
  - absence of drug or alcohol addiction.

INFORMED CONSENT

- Your patient's right to be adequately informed about a proposed treatment or procedure
- Responsibility for obtaining informed consent rests with the person who will perform the treatment or procedure (usually the doctor).
- The patient should be told that he has a right to refuse the treatment or procedure without having other care or support withdrawn and that he can withdraw consent after giving it.

Elements

- Description of the treatment or procedure
- Description of inherent risks and benefits that occur with frequency or regularity (or specific consequences significant to the given patient or his designated decision-maker)
- Explanation of the potential for death or serious harm (such as brain damage, stroke, paralysis, or disfiguring scars) or for discomforting adverse effects during or after the treatment or procedure
- Explanation and description of alternative treatments or procedures
- Name and qualifications of the person who will perform the treatment or procedure
- Discussion of possible consequences of not undergoing the treatment or procedure

Witnessing informed consent

- The patient voluntarily consented.
- The patient's signature is authentic.
- The patient appears to be competent to give consent.

RIGHT TO REFUSE TREATMENT

- Any mentally competent adult may legally refuse treatment if he's fully informed about his medical condition and about the likely consequences of his refusal.
- Some patients may refuse treatment on the grounds of freedom of religion.

Advance directives

- Living will — an advance care document that specifies a person's wishes about medical care if he's unable to make the decision for himself (in some states, living wills don't address the issue of discontinuing artificial nutrition and hydration)
- Durable power of attorney for health care — a document in which the patient designates a person to make medical decisions for him if he becomes incompetent (differs from the usual power of attorney, which requires the patient's ongoing consent and deals only with financial issues)

Grounds for challenging a patient's right to refuse treatment

- Patient is incompetent
- Compelling reasons exist to overrule patient's wishes

LIVING WILLS

- Living will laws generally include such provisions as:
  - who may execute a living will
  - witness and testator requirements
  - immunity from liability for following a living will's directives
  - documentation requirements

Law and ethics refresher *(continued)*

LIVING WILLS *(continued)*
– instructions on when and how the living will should be executed
– under what circumstances the living will takes effect.

RIGHT TO PRIVACY
• Right to make personal choices without outside interference

MEDICATION ADMINISTRATION
• One of the most important and, legally, one of the riskiest tasks a nurse performs

Five rights
• Right drug
• Right patient
• Right time
• Right dosage
• Right route

NEGLIGENCE
• Failure to exercise the degree of care that a person of ordinary prudence would exercise under the same circumstances

Four criteria for negligence claim
1. A person owed a duty to the person making the claim.
2. The duty was breached.
3. The breach resulted in injury to the person making the claim.
4. Damages were a direct result of the negligence of the health care provider.

Malpractice
• Specific type of negligence: a violation of professional duty or a failure to meet a standard of care or use the skills and knowledge of other professionals in similar circumstances

DOCUMENTATION ERRORS
• Complete, accurate, and timely documentation is crucial to the continuity of each patient's care.

Functions of well-documented record
• Reflects patient care given
• Demonstrates results of treatment
• Helps plan and coordinate care contributed by each professional
• Allows interdisciplinary exchange of information about patient
• Provides evidence of nurse's legal responsibilities toward patient
• Demonstrates standards, rules, regulations, and laws of nursing practice
• Supplies information for analysis of cost-to-benefit reduction
• Reflects professional and ethical conduct and responsibility
• Furnishes information for continuing education, risk management, diagnosis-related group assignment and reimbursement, continuous quality improvement, case management monitoring, and research

Common documentation errors
1. Omissions
2. Personal opinions
3. Vague entries
4. Late entries
5. Improper corrections
6. Unauthorized entries
7. Erroneous or vague abbreviations
8. Illegibility and lack of clarity

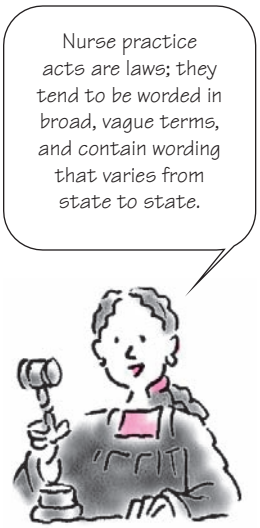
ABUSE
• The nurse plays a crucial role in recognizing and reporting incidents of suspected abuse.
• If you detect evidence of apparent abuse, you must pass the information along to appropriate authorities.
• In many states, failure to report actual or suspected abuse constitutes a crime.

checklist of how you should do your work. Ultimately, you must rely on your own education and knowledge of your facility's policies and procedures.

Declare independence

Most nurse practice acts pose another problem: They state that you have a legal duty to carry out a doctor's or a dentist's orders. Yet, as a licensed professional, you also have an ethical and legal duty to use your own judgment when providing patient care. When such conflicts arise, don't hesitate to act independently. Follow these guidelines:

• When you think an order is wrong, tell the doctor.
• If you're confused about an order, ask the doctor to clarify it.
• If the doctor fails to correct the error or answer your questions, inform your immediate supervisor or nurse-manager of your doubts.



Know your limits

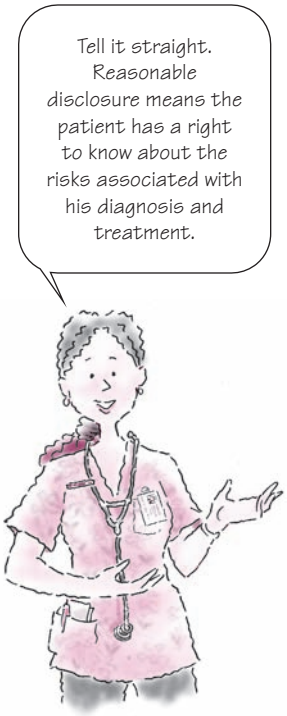
Conflicts of duty can also arise if your state's nurse practice act disagrees with your facility's policies. The nursing service department in each facility develops detailed policies and procedures for staff nurses. These policies and procedures usually specify the allowable scope of nursing practice within the facility. The scope may be narrower than the scope described in your nurse practice act, but it couldn't be broader.

In other words, your employer can't legally expand the scope of your practice to include tasks prohibited by your nurse practice act. You have a legal obligation to practice within the act's limits. Except in a life-threatening emergency, you can't exceed those limits without risking disciplinary action. To protect yourself, compare your facility's policies with your nurse practice act.

Change is good

With every new medical discovery or technological innovation, the world of nursing undergoes revision. To align nurse practice acts with current nursing practice, professional nursing organizations and state boards of nursing generally propose revisions to regulations. There's a catch: Nurse practice acts are statutory laws subject to the inevitably slow legislative process, so the law sometimes has trouble keeping pace with medicine.

What does all of this mean for you? To help protect yourself legally, you need to stay current with your state's nurse practice act while you keep up with innovations in health care practice.



Informed consent

Your patient has a legal right to be adequately informed about a proposed treatment or procedure. Responsibility for obtaining a patient's informed consent rests with the person who must carry out the treatment or procedure (usually the doctor). Carrying out a procedure without informed consent can be grounds for charges of assault and battery.

Informed consent involves providing the patient (or someone acting on his behalf) with enough information to know:

- what the patient is getting into if he decides to undergo the treatment or procedure
- the anticipated consequences if consent is refused or withdrawn.

Nurses may provide patients and their families with information that's within a nurse's scope of practice and knowledge base. However, a nurse can't substitute her knowledge for the doctor's input.

Straight talk

What should the doctor tell the patient? First, the patient has a right to reasonable disclosure of risks associated with the medical diagnosis and treatment. He also must be given an opportunity to evaluate options, alternatives, and risks before exercising his choice.

The basics of informed consent should include:

- description of the treatment or procedure
- description of inherent risks and benefits that occur with frequency or regularity (or specific consequences significant to the given patient or his designated decision-maker)
- explanation of the potential for death or serious harm (such as brain damage, stroke, paralysis, or disfiguring scars) or for discomforting adverse effects during or after the treatment or procedure
- explanation and description of alternative treatments or procedures
- name and qualifications of the person who will perform the treatment or procedure
- discussion of the possible consequences of not undergoing the treatment or procedure.

The patient should also be told that he has a right to refuse the treatment or procedure without having other care or support withdrawn and that he can withdraw consent after giving it.

Can I get a witness?

If you witness a patient's signature on a consent form, you attest to three things:

- The patient voluntarily consented.
- The patient's signature is authentic.

• The patient is competent to give consent.

What they don't know can hurt you

Another potential legal pitfall for nurses is called negligent nondisclosure. Let us say, for example, that you believe a patient is incompetent to participate in giving consent because of medication or sedation given to him. Perhaps you learn that the practitioner has discussed consent issues with the patient when the patient was heavily sedated or medicated. Under either of these scenarios, you have an obligation to bring it to the practitioner's attention immediately. If the practitioner isn't available, discuss your concerns with your supervisor.

Always document attempts to reach the practitioner and attending doctor in the medical record before allowing the patient to proceed with the treatment or procedure. Besides discussing this with the practitioner and your supervisor, you must also assess your patient's understanding of the information provided by the practitioner.

When a patient is incompetent

A patient is deemed mentally incompetent if he can't understand the explanations or can't comprehend the results of his decisions.

When a patient is incompetent, the practitioner has two alternatives:

• seek consent from the patient's next of kin (usually the spouse)

• petition the court to appoint a legal guardian for the patient.

Remember, however, that mental illness isn't the same as incompetence. Persons suffering from mental illness have been found competent to give consent because they're alert and, above all, able to understand the proposed treatment, risks, benefits, alternatives, and consequences of refusing treatment.

A minor problem

Every state allows an emancipated minor to consent to his own medical care and treatment. Definitions of emancipation vary from state to state, however. Most states allow teenagers to consent to treatment in cases involving pregnancy or sexually transmitted disease, even if they aren't emancipated.

Right to refuse treatment

Any mentally competent adult may legally refuse treatment if he's fully informed about his medical condition and about the likely consequences of his refusal. As a professional, you must respect that decision.

Most court cases related to the right to refuse treatment have involved patients with a terminal illness (or their families) who want to discontinue life support.

Quality time

Health care providers consider quality end-of-life care as an ethical obligation. But what does end-of-life mean, and how do you measure it? Some researchers point to five "domains," or focal points, that patients view as end-of-life issues. By understanding these domains from the patients' perspectives, nurses can improve the quality of end-of-life care.

• Pain and other symptoms are of concern for many patients.

• Many patients fear "being kept alive" after they can no longer enjoy life; they want to "die with dignity."

• Sense of control is also critical; some patients are adamant about controlling their end-of-life care decisions.

• Many patients are concerned about the burden their dying would impose on loved ones such as the need to provide physical care or witnessing the patient's death.

• Many patients express an overwhelming need to communicate with loved ones at this stage of their life. Dying offers important opportunities for growth, intimacy, reconciliation, and closure.

Never ignore a patient's request to refuse treatment. Instead, stop preparations for any treatment and notify the doctor and your supervisor according to your facility's protocol.

A religious experience

Some patients may refuse treatment on the grounds of freedom of religion. Jehovah's Witnesses, for instance, oppose blood transfusions, based on their interpretation of a biblical passage that forbids "drinking" blood. Some sect members believe that even a life-saving transfusion given against their will deprives them of everlasting life. The courts usually uphold their right to refuse treatment because of the constitutionally protected right to religious freedom. However, if the patient is a critically ill minor, the court may deny the parents' request to refuse treatment.

Most other religious freedom court cases involve Christian Scientists, who oppose many medical interventions, including medicines.

Planning in advance

Most states have enacted right-to-die laws (also called natural death laws or living will laws). These laws recognize the patient's right to choose death by refusing life-sustaining treatment when he has no hope of recovery.

Whenever a competent patient expresses his wishes concerning life-sustaining treatment, health care providers should attempt to follow them. If the patient is incompetent or unconscious, the decision becomes more difficult.

In some cases, the next of kin may express the patient's desires for him, but whether this is an honest interpretation of the patient's wishes is sometimes uncertain.

Written evidence of the patient's wishes provides the best indication of what treatment he'd consent to if he were still able to communicate. This information may be provided through advance directives, such as:

- living will — an advance care document that specifies a person's wishes about medical care if he's unable to make the decision for himself (in some states, living wills don't address the issue of discontinuing artificial nutrition and hydration)
- durable power of attorney for health care — a document in which the patient designates a person to make medical decisions for him if he becomes incompetent (this differs from the usual power of attorney, which requires the patient's ongoing consent and deals only with financial issues).

Most states recognize living wills as legally valid and have laws authorizing durable powers of attorney for initiating or terminating life-sustaining medical treatment.

Up to the challenge

There are two grounds for challenging a patient's right to refuse treatment: You can claim that the patient is incompetent, or you can claim that compelling reasons exist to overrule his wishes.

The courts consider a patient incompetent when he lacks the mental ability to make a reasoned decision, such as when he's delirious. The courts also recognize several compelling circumstances that justify overruling a patient's refusal of treatment. These include:

- when refusal endangers the life of another
- when a parent's decision to withhold treatment threatens a child's life
- when, despite refusing treatment, the patient makes statements indicating that he wants to live
- when the public interest outweighs the patient's right.

If your patient refuses treatment

Never ignore a patient's request to refuse treatment. If your patient tells you he's going to refuse treatment or he simply refuses to give consent, follow these guidelines:

- Stop preparations for any treatment at once.
- Notify the doctor immediately.
- Report your patient's decision to your supervisor promptly.

Never delay informing your supervisor, especially if a delay in treatment could be life-threatening. Any delay that you're responsible for greatly increases your legal risk.

Living wills

When a legally competent person draws up a living will, also known as an advanced directive, he declares the steps he wants or doesn't want taken if he becomes incompetent and no

longer able to express his wishes. The will applies to decisions to be made after a patient is incompetent and unable to make health care decisions. Generally, a living will authorizes the attending doctor to withhold or discontinue certain lifesaving procedures under specific circumstances.

A patient may also choose to execute a durable power of attorney for health care. If the patient becomes incompetent, this document designates a surrogate decision maker with authority to carry out the patient's wishes regarding health care decisions. Most states have laws authorizing durable power of attorney for health care only for the purpose of initiating or terminating life-sustaining medical treatment.

Living will laws: The main ingredients

Although living will laws vary from state to state, they generally include such provisions as:

- who may execute a living will
- witness and testator requirements
- immunity from liability for following a living will's directives
- documentation requirements
- instructions on when and how the living will should be executed
- under what circumstances the living will takes effect.

Immunity

Nurses and other health care providers who follow the wishes expressed in a living will authorized by law are generally immune from civil and criminal liability. No matter which state you work in, check your facility's policy and procedures manual, and seek advice from your facility's legal department if needed.

General guidelines

The Patient Self-Determination Act of 1990 requires facilities to provide patients with written information about their rights regarding advance directives as well as about the facility's procedure for implementing them. The law also requires the institution to document whether the patient has a an advance directive.

If your patient has a living will, take the following steps to safeguard his rights and protect yourself from liability:

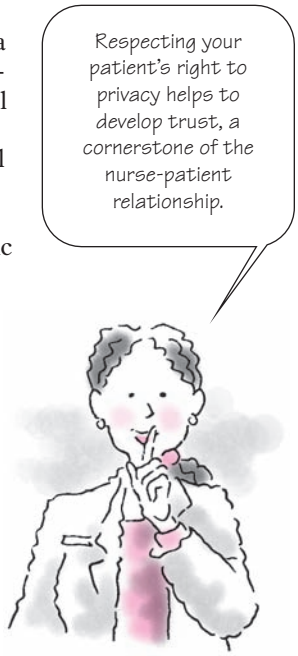
- Review your nursing or facility manual for specific directions on what to do. For instance, you may need to inform the patient's doctor about it, or you may need to ask your nursing supervisor to inform the facility's administration and legal affairs department.
- With the patient's permission, make sure the family knows about the will.
- If the patient can talk, discuss the will with him, especially if it contains terms that need further definition. As always, objectively document your actions and findings in the patient's record.
- If the patient drafts a living will while under your care, document this in your nurses' notes, describing the circumstances under which the will was drawn up and signed.
- Encourage the patient to review the living will with his family and doctor so that unclear passages can be discussed. Living wills should also be reviewed periodically to keep pace with changes in technology.

Right to privacy

Obtaining highly personal information from a patient can be uncomfortable and embarrassing. Reassuring the patient that you'll keep all information confidential may help put you both at ease. But stop to think about the legal complexities of this responsibility. What do you do when your patient's spouse, other health care professionals, the media, or public health agencies ask you to disclose confidential information?

It's in the Constitution! (...or is it?)

The right to privacy essentially is the right to make personal choices without outside interference. Although the U.S. Constitution doesn't explicitly sanction a right to privacy, the U.S. Supreme Court has cited several constitutional amendments that imply such a right.



The right to privacy has received even more attention at the state level. All states recognize the right to privacy through statutory or common law.

Making your patient feel privileged

The state courts have strongly protected a patient's right to have information kept confidential. Even in court, your patient is protected by the privilege doctrine. People who have a protected relationship, such as a doctor and patient, can't be forced, even during legal proceedings, to reveal communication between them unless the person who benefits from the protection agrees to it.

Unfortunately, only a handful of states (including New York, Arkansas, Oregon, and Vermont) recognize the nurse-patient relationship as protected. Some courts have held that the privilege exists when a nurse is following doctor's orders.

The Health Insurance Portability and Accountability Act (HIPAA) of 2003 protects the privacy, confidentiality, and security of medical information. Under HIPAA, only those who have a need to know patient information for the care of the patient and those authorized by the patient to have access to his medical information can lawfully enter a patient's medical record.

All 50 states and the District of Columbia have disclosure laws for child abuse cases. In fact, there may be a criminal penalty for failure to disclose such information.

Can I get a little privacy here?

Despite legal uncertainties regarding your responsibilities under the privilege doctrine, you have a professional and ethical responsibility to protect your patient's privacy. This responsibility requires more than keeping secrets. You may have to educate your patients about their privacy rights. Some of them may be unaware of what the right to privacy means, or even that they have such a right. Explain to the patient that he can refuse to allow pictures to be taken of his disorder and its treatment, for example. Tell him that he can choose to have information about his condition withheld from others, including family members. Make every effort to ensure that the patient's wishes are carried out.

Confidentially speaking

Under certain circumstances, you may lawfully disclose confidential information about your patient. For example, the courts generally allow disclosure when:

- the welfare of a person or a group of people is at stake
- disclosure is necessary for the patient's continued care
- patient consent is obtained for the disclosure
- the public's right to know outweighs the patient's right to keep his condition private (for example, media reports on the first kidney transplant or the President's annual physical examination).

In some situations, the law not only permits you to disclose confidential information, it requires you to do so. These situations include:

- instances of actual or suspected child abuse (All 50 states and the District of Columbia have disclosure laws for child abuse cases. Except for Maine and Montana, all states also grant immunity from legal action for a good-faith report on suspected child abuse. In fact, there may be a criminal penalty for failure to disclose such information.)
- instances of actual or suspected elder abuse (Some states have disclosure laws regarding elder abuse cases.)
- criminal cases (Some laws create an exemption to the privilege doctrine in criminal cases so that courts can have access to all essential information.)
- government requests. (For example, most states' public health departments require reports of all communicable diseases, births and deaths, and gunshot wounds.)

Medication administration

Administering drugs to patients continues to be one of the most important — and, legally, one of the riskiest — tasks you perform.

Getting it right

When administering drugs, one easy way to guard against malpractice liability is to remember the long-standing "five rights" formula:

the right drug
to the right patient
at the right time
in the right dosage
by the right route.

Just say "know"

When you have your nursing license, the law expects you to know about any drug you administer. More specifically, the law expects you to:

- know a drug's safe dosage limits, toxicity, potential adverse reactions, and indications and contraindications for use
- refuse to accept an illegible, confusing, or otherwise unclear drug order
- seek clarification of a confusing order from the doctor rather than trying to interpret it yourself.

Are there any questions?

If you question a drug order, follow your facility's policies. Usually, you're told to try each of the following actions until you receive a satisfactory answer:

- Look up the answer in a reliable drug reference.
- Ask your charge nurse.
- Ask the facility pharmacist.
- Ask the prescribing doctor.
- Continue to follow the chain of command.
- Get in touch with the facility administration and explain your problem.

An offer you CAN refuse

Nurses have the legal right not to administer drugs they think will harm patients. You may choose to exercise this right when you think:

- the prescribed dosage is too high
- the drug is contraindicated because of possible dangerous interactions with other drugs or with substances such as alcohol
- the patient's physical condition contraindicates using the drug.

In limited circumstances, you may also legally refuse to administer a drug on grounds of conscience. Some U.S. states and Canadian provinces have enacted right-of-conscience laws. These laws excuse medical personnel from the requirement to participate in any abortion or sterilization procedure. Under such laws, you may, for example, refuse to give any drug you believe is intended to induce abortion.

When you refuse to carry out a drug order, make sure that you:

- notify your immediate supervisor so she can make alternate arrangements (assigning a new nurse, clarifying the order)
- notify the prescribing doctor (if your supervisor hasn't done so already)
- document that the drug wasn't given and explain why (if your employer requires it).

Protecting yourself

If you make an error in giving a drug, or if your patient reacts negatively to a properly administered drug, immediately inform the patient's doctor and protect yourself by documenting the incident thoroughly. In addition to normal drug charting information, include the patient's reaction and any medical or nursing interventions taken.

In the event of error, you should also file an incident report. Identify what happened, the names and functions of all personnel involved, and what actions were taken to protect the patient after the error was discovered. Incident reports help track harmful or potentially harmful events so the management team can devise plans to prevent further occurrences.

Negligence

Because nurses are assuming an ever-widening list of patient care responsibilities, it isn't surprising that many nurses are anxious about the possibility of facing a lawsuit some day. Before you review the specific steps you can take to avoid a lawsuit, you need to thor-

oughly understand two important legal terms: negligence and malpractice.

Negligence is usually defined as a failure to exercise the degree of care that a person of ordinary prudence would exercise under the same circumstances. A claim of negligence requires that four criteria be met:

1. A person owed a duty to the person making the claim.
2. The duty was breached.
3. The breach resulted in injury to the person making the claim.
4. Damages were a direct result of the negligence of the health care provider.

Malpractice is a specific type of negligence. It's defined as a violation of professional duty or a failure to meet a standard of care or use the skills and knowledge of other professionals in similar circumstances.

You can take steps to avoid tort liability by using caution and common sense and by maintaining heightened awareness of your legal responsibilities. Follow the guidelines below to steer clear of legal pitfalls.

Know your own strengths...and weaknesses

Don't accept responsibilities that you aren't qualified for. If you make an error and then claim you weren't familiar with the unit's procedures, you won't be protected against liability.

You want me to work where?

You may be assigned to work on a specialized unit, which is reasonable as long as you're assigned duties you can perform competently and as long as an experienced nurse on the unit assumes responsibility for the specialized duties. Assigning you to perform total patient care on the unit is unsafe if you don't have the skills to plan and deliver that care. Notify your immediate supervisor if you believe an assignment is unsafe.

Delegation 101

Exercise great care when delegating duties because you may be held responsible for subordinates. Inspect all equipment and machinery regularly, and make sure that subordinates use them competently and safely. If someone under your supervision isn't familiar with a piece of equipment, teach him how to properly operate it before he uses it for the first time. Report incompetent health care personnel to superiors through the facility's chain of command.

May I take your order?

Never treat any patient without orders from his doctor, except in an emergency. Don't prescribe or dispense any medication without authorization. In most cases, only doctors and pharmacists may legally perform these functions.

Don't carry out any order from a doctor if you have any doubt about its accuracy or appropriateness. Follow your facility's policy for clarifying ambiguous orders. Document your efforts to clarify the order and whether or not the order was carried out.

Watch those medication mix-ups!

Medication errors are the most common and potentially most dangerous nursing errors. Mistakes in dosage, patient identification, or drug selection by nurses have led to vision loss, brain damage, cardiac arrest, and death.

Staying on your patient's good side

Trial attorneys have a saying: "If you don't want to be sued, don't be rude." Always remain calm when a patient or his family becomes difficult. Patients must be told the truth about adverse outcomes, but this information should be communicated with discretion and sensitivity.

Don't offer opinions

Avoid offering your opinion when a patient asks you what you think is the matter with him. If you give your opinion, you could be accused of making a medical diagnosis, which is practicing medicine without a license.

Before you sign on that dotted line...Read!

Never sign your name as a witness without fully understanding what you're signing as well as the legal significance of your signature.

Stick to the FACTs

From a legal standpoint, documenting care is as important as providing the actual care. If a procedure wasn't documented, the courts assume it wasn't performed. Make sure you document all observations, decisions, and actions. The patient's chart, when taken into the court room, is a nurse's "best evidence" of the care given. The chart should follow the "FACT" rule: be **F**actual, **A**ccurate, **C**omplete, and **T**imely.

Assisting in procedures: A word of caution

Don't assist with a surgical procedure unless you're satisfied that the patient has given proper informed consent. Never force a patient to accept treatment he has expressly refused. Don't use equipment that you aren't trained to use or that seems to be functioning improperly.

Use of restraints: Get it in writing

Restraints need to be applied correctly and checked according to the policies and procedures of the facility. Documentation must be exact and should include the status of the restrained patient; the need, number, and kind of restraint used; and the reason for its use. An omission or failure to monitor a restrained patient may result in a malpractice claim.

An ounce of prevention

Patient falls are a common area of nursing liability. Patients who are elderly, infirm, sedated, or mentally incapacitated are the most likely to fall. The best way to avoid liability is to prevent falls from occurring in the first place.

Knowing it in advance

Some patients with life-threatening or terminal conditions may choose to exercise their right to a living will or durable power of attorney. Be aware of your state's laws regarding advance directives.

Follow facility policies and procedures

Be familiar with the policies and procedures of the facility where you work. If they're sound and in accordance with the nurse practice act and you follow them carefully, they can protect you against a malpractice claim.

Provide a safe environment

When providing care, don't use faulty equipment. Follow your facility's policies and procedures for handling and reporting faulty equipment. Remove the equipment from the patient area immediately. Clearly mark the equipment as defective and unusable. Even after repairs are made, don't use the repaired equipment until technicians demonstrate that the equipment is operating properly. Document the steps you took to handle problems with faulty equipment to show that you followed the facility's policy and procedures.

Documentation errors

Complete, accurate, and timely documentation is crucial to the continuity of each patient's care. A well-documented medical record:

- reflects the patient care given
- demonstrates the results of treatment
- helps to plan and coordinate the care contributed by each professional
- allows interdisciplinary exchange of information about the patient
- provides evidence of the nurse's legal responsibilities toward the patient
- demonstrates standards, rules, regulations, and laws of nursing practice
- supplies information for analysis of cost-to-benefit reduction
- reflects professional and ethical conduct and responsibility
- furnishes information for a variety of uses: continuing education, risk management, diagnosis-related group assignment and reimbursement, continuous quality improvement, case management monitoring, and research.

Is everything covered?

With a large number of health care professionals involved in each patient's care, nursing documentation must be complete, accurate, and timely to foster continuity of care. It should cover:

- initial assessment using the nursing process and applicable nursing diagnoses
- nursing actions
- ongoing assessment, including the frequency of assessment
- variations from the assessment and plan
- accountability information, including forms signed by the patient, location of patient valuables, and patient education
- health teaching, including content and patient response
- procedures and diagnostic tests
- patient response to therapy, particularly to nursing interventions, drugs, and diagnostic tests
- statements made by the patient
- patient comfort and safety measures.

Avoiding the Big 8

In addition to their potential impact on patient care, charting errors or omissions, even if seemingly harmless, undermine your credibility in court. Be careful to especially avoid these eight common documentation errors:

Even seemingly harmless documentation errors can undermine your credibility in court.

Omissions — Include all significant facts that other nurses need to assess the patient. Otherwise, a court may conclude that you failed to perform an action missing from the record or tried to hide evidence.

Personal opinions — Don't enter personal opinions. Record only factual and objective observations and the patient's statements.

Vague entries — Instead of "Patient had a good day," state why: "Patient didn't complain of pain."

Late entries — If a late entry is necessary, identify it as such and sign and date it. Note the date and time you're relating back to.

Improper corrections — Never erase or obliterate an error. Instead, draw a single line through it, label it "error," and sign and date it.

Unauthorized entries — Only you should be keeping your records.

Erroneous or vague abbreviations — Use only standard abbreviations and follow facility policies.

Illegibility and lack of clarity — Write so that others can read your entry. Use a dictionary if you're unsure of spelling or usage.

Sign language

Sign all notes with your first initial, full last name, and title. Place your signature on the right side of the page as proof that you entered all the information between the previous nurse's signature and your own. If the last entry is unsigned, request that the nurse who made the entry sign it. Draw lines through empty or remaining spaces to prevent subsequent amendments or additions.

Verbal cues

As a general rule, verbal and telephone orders are acceptable only under acute or emergency circumstances, when the doctor can't promptly attend to the patient, or according to facility policy. Record the order on the doctor's order sheet, note the date and time of the order, and record the order verbatim. Repeat the order back to the doctor for accuracy. On the following line, write "v.o." for verbal order or "t.o." for telephone order and record the doctor's name, followed by your signature and the time. To avoid liability, be certain the doctor countersigns the order within the time specified by facility policy.

Abuse

As a nurse, you play a crucial role in recognizing and reporting incidents of suspected abuse. Abuse can be psychological, physical, sexual, or financial in nature. Abuse victims can be of any age, gender, or socioeconomic group. While caring for patients, you can readily note evidence of apparent abuse. If you do, you must pass the information along to the appropriate authorities. In many states, failure to report actual or suspected abuse constitutes a crime.

Filing a report

Make your report as complete and accurate as possible. Be careful not to let your personal feelings affect the way you make out a report or your decision to file the report.

Abuse cases can raise many difficult emotional issues. Remember, however, that not filing a report can have more serious consequences than filing one that contains an unintentional error. It's better to risk error than to risk breaching the child abuse reporting laws — and, in effect, perpetuating the abuse. Contact your facility's social work department if you have questions about suspected abuse. Always report actual or suspected abuse according to your facility's policies and procedures.

Recognizing the problem

Learn to recognize both the events that trigger abuse and the signs and symptoms that mark the abused and the abuser. Early in your relationship with an abused patient, you need to be adept in order to spot the subtle behavioral and interactional clues that signal an abusive situation.

Examine the patient's relationship with the suspected abuser. For example, abused people tend to be passive and fearful. An abused child usually fails to protest if his parent is asked to leave the examining area. An abused adult, on the other hand, usually wants her abuser to stay with her.

Abused persons may react to facility procedures by crying helplessly and incessantly. They also tend to be wary of physical contact, including physical examinations.

Many facilities have a policy, procedure, or protocol to help nurses and other health care providers make observations that aid in the identification of possible abuse victims. Learning these criteria makes spotting victims of abuse a more objective process and prevents cases from going unrecognized.

Assessing the abuser

Sometimes the abuser appears overly agitated when dealing with facility personnel; for example, he may get impatient if they don't carry out procedures instantly. At other times, he may exhibit the opposite behavior: a total lack of interest in the patient's problems.

History lessons

When you take an abuse victim's history, she may be vague about how she was injured and tell different stories to different people. When you ask directly about specific injuries, she may answer evasively or not at all. Sometimes, a victim minimizes or tries to hide her injuries.

Physical clues

Look for characteristic signs of abuse. In most cases of abuse, you'll find old bruises, scars, or deformities the patient can't or won't explain. X-ray examinations may show many old fractures.

Getting on the SOAP box

Always document your findings objectively; try to keep your emotions out of your charting. One way to do this is to use the **SOAP** technique, which calls for these steps:

- In the subjective **(S)** part of the note, record information in the patient's own words.
- In the objective **(O)** part, record your personal observations.
- Under assessment **(A),** record your evaluations and conclusions.
- Under plan **(P),** list sources of facility and community support available to the patient after discharge.

Support for the victim

Many support services have become available for both abusers and their victims. For example, if a female victim is afraid to return to the scene of her abuse, she may find temporary housing in a domestic abuse shelter. If no such shelter is available, she may be able to stay with a friend or family member.

Social workers or community liaison workers may also be able to offer suggestions for shelter. Another possibility is a church, synagogue, or mosque, which may have members willing to take the patient in. If no shelter can be found, the patient may have to stay at the facility for her safety.

Alert the patient to state, county, or city agencies that can offer protection. The police department should be called to collect evidence if the patient wants to press charges against the abuser. If the patient is a child, the law usually requires filing a report with a government family-service agency.

Help for the abuser

You need to evaluate the abuser's ability to handle stress. In some cases, you may be able to refer him to an appropriate local or state agency that can offer help. In most cases, an abuser poses a continued threat to others until he gets help in understanding his behavior and how to change it.

For abusive fathers or mothers, a local chapter of Parents Anonymous (PA) may be helpful. PA, a self-help group made up of former abusers, attempts to help abusive parents by teaching them how to deal with their anger. Besides helping short-circuit abusive behavior, a self-help group takes abusive parents out of their isolation and introduces them to individuals who are capable of understanding their feelings. It also provides help in a crisis, when members may be able to prevent an abusive incident.

Telephone hot lines to crisis intervention services also give abusers someone to talk with in times of stress and crisis and may help prevent abuse. Commonly staffed by volunteers, telephone hot lines provide a link between those who seek help and trained counselors.

These and other kinds of help are also available through family-service agencies and other facilities. By becoming familiar with national and local resources, you'll be able to respond quickly and authoritatively when an abuser or his victim needs your help.

Pump up on practice questions

1. A nurse working at a busy hospital takes steps to challenge an assignment that may not be within the practice limits for nurses in the state where she works. Which of the following statutes defines the limits of each state's nursing practice?

1. Contract law
2. Nurse Practice Act
3. National Labor Relations Act
4. Food, Drug, and Cosmetic Act

Answer: 2. Each state's nurse practice act is the most important law affecting nursing practice. The law outlines expectations for patient care within defined practice limits. Giving care beyond those limits makes the nurse vulnerable to charges of violating the state's nurse practice act. Contract law involves agreements between two or more persons to do some type of remuneration — a "bargain for exchange." The National Labor Relations Act allows nurses the right to unionize. The Food, Drug, and Cosmetic Act restricts interstate shipment of drugs not approved for human use and outlines the process for testing and approving new drugs.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Knowledge

2. The physician prescribes digoxin 4 mg P.O. for a client in atrial fibrillation. How should the nurse proceed?

1. Check the client's apical heart rate, and then administer the dose.
2. Administer 0.4 mg P.O. because the physician most likely meant to write that dosage.
3. Question the physician about the order.
4. Administer the dose, and then monitor the client closely.

Answer: 3. As a licensed professional, the nurse has the legal and ethical responsibility to use her own knowledge and judgment when providing client care. Therefore, the nurse should act independently and ask the physician to clarify the order. The dose prescribed is 10 times the typical dose. If the nurse administers this dose, she could be held accountable for her actions in a court of law.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Analysis

3. A client scheduled for a bronchoscopy needs to sign an informed consent form before the procedure. Which of the following is true about informed consent?

1. The client can't refuse the procedure after the consent is signed.
2. If the client refuses to sign the consent form, another family member can sign for him.
3. If the client refuses to sign the consent form, other treatment will be withdrawn.
4. Informed consent should include an explanation of alternative treatments or procedures.

Answer: 4. Informed consent should include an explanation of alternative treatments or procedures. The client should also be told that he has the right to refuse the treatment or procedure without having other care or support withdrawn and that he can withdraw consent after giving it. The client's next of kin can only sign the consent form if the client is deemed incompetent.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Knowledge

4. A client is admitted to the hospital with a closed head injury. He's unconscious and requires mechanical ventilation. Which of the following documents will most likely be used to make a medical decision for the client?

1. Durable power of attorney for health care
2. Power of attorney
3. Advance directive
4. Living will

Answer: 1. A durable power of attorney for health care designates a person who is authorized to make medical decisions for the client when he isn't competent to do so. This differs from the power of attorney, which requires the client's ongoing consent and deals only with financial concerns. A living will is an advance directive document that specifies a person's wishes regarding medical care if he becomes unable to communicate. It's commonly used in combination with the client's durable power of attorney.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

5. A Jehovah's Witness is admitted to the hospital with upper GI bleeding. The physician orders 2 units of packed red blood cells administered over 2 hours each. When the nurse tells the client about the care plan, the client refuses the transfusion. How should the nurse proceed?

1. Tell the client that the physician's order overrides his objections.
2. Tell the client that he's being ridiculous because he'll die without the transfusion.
3. Refuse to care for the client because you don't agree with his religious beliefs.
4. Tell him that you understand his religious concerns and notify the physician.

Answer: 4. The nurse should tell the client that she understands his religious concern and then notify the physician. The infusion can't be administered against the client's wishes. Doing so would violate the client's right to freedom of religion and his right to refuse treatment. The nurse shouldn't pass judgment on the client or refuse to care for a client based on his religious beliefs.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

6. A nurse administers a dose of penicillin to a client, who suddenly develops hives and difficulty breathing. She notifies the physician and takes emergency measures. Which information should the nurse include in her documentation?

1. Document the date, time, and site in which the dose was administered.
2. In addition to the normal drug charting information, include the client's reaction.
3. In addition to the normal drug charting information, include the client's reaction and any medical or nursing interventions taken.
4. Include the client's reaction and any nursing interventions taken.

Answer: 3. When a client reacts negatively to a properly administered drug the nurse should document the normal drug charting information as well as the client's reaction and any medical or nursing interventions taken.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

7. After a medication error is made on her unit, the nurse-manager should expect to receive:

1. an incident report.
2. an oral report from the nurse.
3. a copy of the medication Kardex.
4. an order change signed by the physician.

Answer: 1. The nurse should complete an incident report and give it to the nurse-manager, who then gives the report to the risk manager. Incident reports are tools used by management to track potentially harmful events and determine how future problems can be avoided. An oral report doesn't serve as legal docu-

mentation. A copy of the medication Kardex isn't sent with the incident report to the risk manager. A physician wouldn't change an order to cover the nurse's mistake.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Knowledge

8. A unit of blood is administered to a client without prior informed consent being obtained. Performing a procedure, such as administering blood products, without receiving informed consent can lead to which of the following charges?

1. Assault and battery
2. Fraud
3. Breach of confidentiality
4. Harassment

Answer: 1. Performing a procedure on a client without informed consent can be grounds for charges of assault and battery. Fraud is to cheat someone. Breach of confidentiality refers to conveying information about the client to people who aren't directly involved in his care. Harassment refers to annoying or disturbing an individual.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

9. The nurse returns from vacation and finds a new blood glucose monitor in use. How should the nurse proceed?

1. Read the blood glucose monitor manual before caring for the client.
2. Inform the charge nurse and ask her to provide an educational session about how to use the blood glucose monitor.
3. Use the blood glucose monitor because it's somewhat like the old blood glucose monitors on the unit.
4. Refuse to care for the client.

Answer: 2. The nurse should inform the charge nurse that she has never used this piece of equipment before and ask her to provide an educational session about using the blood glucose monitor. The nurse should review the manual but shouldn't use the blood glucose monitor without an educational session that allows time to practice using the equipment. The nurse should never use a piece of equipment without formal training. A need to use new equipment doesn't automatically justify refusal to care for the client.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

10. The nurse is caring for a 72-year-old male client who requires insertion of a central venous catheter. Who's responsible for obtaining informed consent?

1. The attending physician
2. The physician who will insert the catheter
3. The charge nurse
4. The nurse assisting with the procedure

Answer: 2. The responsibility for obtaining informed consent typically rests with the person who will perform the treatment or procedure. It isn't the responsibility of the attending physician (unless he's performing the procedure), the charge nurse, or the nurse assisting the physician with the procedure.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

Pump up on more practice questions

1. A client's blood pressure is lower than the specified limits, so the nurse withholds his blood pressure medication. The nurse documents the omission on the medication administration record. Where should she document the reason for withholding the medication if there isn't space in the medication administration record?

1. Patient care Kardex
2. Progress notes
3. Care plan
4. Nowhere

Answer: 2. If the medication administration record doesn't provide space to document the omission, the nurse should document the reason in the progress notes. The patient care Kardex and care plan are used to guide patient care; they aren't appropriate forms for documentation. Any time a drug is omitted, the reason for withholding it must be documented.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

2. A client is admitted to your client care area with a diagnosis of dehydration and pneumonia. After the client is settled in bed, the nurse begins collecting data on his health history. Which of the following techniques should the nurse avoid when conducting the health history interview?

1. Using general leads to questions
2. Asking open-ended questions
3. Restating information
4. Asking persistent questions

Answer: 4. The nurse should avoid asking persistent questions during the history interview. She should make one or two attempts to get information and then stop. She should respect the client's right to privacy. During the interview the nurse should use general leads, ask open-ended questions, and restate information.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Knowledge

3. For a hospitalized client, the physician prescribes meperidine (Demerol), 75 mg I.M., every 3 hours as needed for pain. However, the client refuses to take injections. Which nursing action is most appropriate?

1. Administering the injection as prescribed
2. Calling the physician to request an alternative medication and administration route.
3. Withholding the injection until the client understands its importance
4. Explaining that no other medication can be given until the client receives the injection

Answer: 2. The most appropriate action is to call the physician to request an alternative medication and administration route. By doing so, the nurse is adhering to the client's wishes. Administering an injection without client consent is considered battery and may lead to a lawsuit. Withholding medication without providing an alternative would violate the standards of care. Any attempt to manipulate the client into taking the medication also violates the standards of care.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

4. Nursing licensure and practice are regulated by:

1. nurse practice acts.
2. standards of care.
3. civil law.
4. the American Nurses Association.

Answer: 1. Nurse practice acts regulate nursing licensure and practice. Each state has its own nurse practice act. Standards of care offer guidelines for providing care and criteria for evaluating care. Civil law protects an individual's rights and isn't associated with regulation of nursing licensure or practice. The American Nurses Association, the professional organization for registered nurses in the United States, helps make policy and establish nursing care standards.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Knowledge

5. While documenting on a client's patient care flow sheet, the nurse notices that she made a mistake. How should the nurse proceed?

1. Use correction fluid and continue to document.
2. Draw a single line through the entry.
3. Cross out the error completely.
4. Erase the error.

Answer: 2. The nurse should draw a single line through the entry and write "error" along with her initials and the date and time above or next to the entry. The nurse should never cover a mistake with correction fluid, erase it, or completely cross it out because this looks as if the nurse is trying to hide something.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

6. A nurse tells the primary nurse that she was unable to complete her client's admission database because of the client's deteriorating condition. The primary nurse reports this to the oncoming shift. The initial admission assessment must be completed within how many hours after admission?

1. 12
2. 24
3. 36
4. 48

Answer: 2. The Joint Commission requires an initial nursing assessment to be completed within 24 hours of admission. However, the primary nurse should check her facility's policy because the facility may require the form to be completed in a shorter time frame.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Knowledge

7. A 42-year-old client admitted with an acute myocardial infarction asks to see his chart. What should the nurse do first?

1. Allow the client to view his chart.
2. Contact the nurse-manager and physician for approval.
3. Ask the client if he has concerns about his care.
4. Tell the client that he isn't permitted to view his chart.

Answer: 3. The client has a legal right to see his chart. However, if he asks to see it, the nurse should first ask him if he has any questions about his care and try to clear up any confusion. The client may be confused about his care. The nurse should check her facility's policy to see whether the chart must be read in the nurse's presence. The nurse should

inform the physician and nurse-manager of the client's request.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

8. A client will undergo a thoracotomy in the morning. The physician asks the nurse to witness the client signing the consent form. What should the nurse do?

1. Explain the procedure to the client first.
2. Tell the physician only a registered nurse can witness a consent.
3. Notify her nurse-manager.
4. Make sure the client is competent, awake, and alert before he signs the consent form.

Answer: 4. Before the nurse witnesses a client's consent, she should make sure that the client is competent, awake, and alert and is aware of what he's doing. Although it's important to make sure that the client understands the procedure and the associated risks, it's the physician's responsibility to explain the procedure to the client. It isn't required that a registered nurse witness the consent. There is no need to notify the nurse-manager.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

9. A 92-year-old client falls when he attempts to get out of bed on his own. Which information should the nurse include in her documentation of the incident?

1. Describe what she saw and heard and the actions she took when she reached the client.
2. Mention that an incident report was completed.
3. Describe what she thinks occurred.
4. Describe what the client said occurred.

Answer: 1. The nurse should describe what she saw and heard and the actions she took when she reached the client's bedside, as well as the client's account of the incident. She shouldn't document what she thinks occurred or mention that an incident report was completed after charting the event. This destroys the confidential nature of the report and may result in a lawsuit.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

10. A client asks to be discharged from the health care facility against medical advice (AMA). What should the nurse do?

1. Prevent the client from leaving.
2. Notify the physician.
3. Have the client sign an AMA form.
4. Call a security guard to help detain the client.

Answer: 2. If a client requests a discharge AMA, the nurse should notify the physician immediately. If the physician can't convince the client to stay, the physician will ask the client to sign an AMA form, which releases the facility from legal responsibility for any medical problems the client may experience after discharge. If the physician isn't available, the nurse should discuss the AMA form with the client and obtain the client's signature. A client who refuses to sign the form shouldn't be detained because this would violate the client's rights. After the client leaves, the nurse should document the incident thor-

oughly and notify the physician that the client has left.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Knowledge

11. A nursing assistant is assigned to provide morning care to a client. How should the nurse document care given by the assistant?

1. "Morning care provided by B.C., nursing assistant."
2. "Morning care given."
3. There's no need to document morning care.
4. "Morning care given by Betsy Clarke, NA."

Answer: 4. The nurse should document that morning care was given by the nursing assistant, using the nursing assistant's full name and title.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

12. A nurse discovers that the wrong I.V. fluid has been administered to a client. The hospital's risk manager should receive which of the following items to document the incident?

1. Oral report from the nurse
2. Copy of the patient care Kardex
3. Order change written by the physician
4. Incident report

Answer: 4. The risk manager should receive an incident report when a client might be harmed. The incident report is used to determine how future errors can be avoided. An oral report from the nurse doesn't serve as legal documentation. A copy of the patient care Kardex isn't sent to the risk manager. A physician shouldn't change an order to cover the nurse's error.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Comprehension

13. While eating her lunch, a nurse overhears that a fellow nurse is being sued by a former client. What's the most common tort filed against health care providers by clients?

1. Malpractice
2. Negligence
3. Assault
4. Battery

Answer: 2. Negligence is the most common tort filed by clients against health care providers. Malpractice and assault and battery are criminal charges that are filed against health care providers by law enforcement authorities.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Knowledge

14. A mother brings her 3-year-old child to the emergency department. The mother states that she found a blood smear in her daughter's underwear. The physical examination reveals sexual assault with vaginal penetration. The mother doesn't want the police notified because of the potential publicity. What action should the nurse take?

1. No action is necessary because the mother is the child's legal guardian.
2. Report the findings to the police and have a social worker talk with the mother.
3. Encourage the mother to reconsider her decision.
4. Ask the emergency department physician to talk to the mother.

Answer: 2. The nurse must report the crime to the authorities regardless of the mother's wishes. The emergency department physician may talk to the mother, and the mother may be encouraged to reconsider her wishes; however, the crime must be reported and evidence must be collected.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

15. A mother brings her child to the emergency department after her husband physically abused the child. She's afraid to return home. The nurse can refer the mother to several social service agencies. Which one would be most appropriate?

1. Domestic abuse shelter
2. Welfare bureau
3. Children's Protective Services
4. Homeless shelter

Answer: 1. A domestic abuse shelter can provide services necessary for both mother and child. The other alternatives may result in separation of the child from the mother and cause further trauma. The welfare bureau is a state agency that provides money, food, or shelter for individuals who need it. It doesn't necessarily deal with children who are victims of abuse. Children's Protective Services will investigate the crime and may want to place the child in a foster home or with other relatives during the investigation. Homeless shelters provide shelter and food for people in need. They don't necessarily have resources for abused children and their mothers.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

16. A graduate nurse is being oriented to her assigned unit. A client is admitted with end-stage leukemia. Which statement made by the graduate nurse is incorrect?

1. "The client can inform the physician that he doesn't want cardiopulmonary resuscitation if his heart stops beating."
2. "The client could designate another person to make end-of-life decisions when he's no longer able."
3. "The client can write a living will indicating his end-of-life preferences."
4. "The law states that the client must write a new living will each time he's admitted to the hospital."

Answer: 4. One living will covers all hospitalizations unless the client decides to make changes. The client typically discusses his wishes with the physician, who provides the order for the client care status. A durable power of attorney for health care designates a person to make decisions for the client in the event the client can't make decisions on his own. A living will explains a person's end-of-life care preferences.

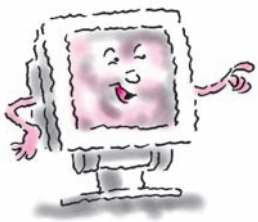
Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Analysis

17. The nurse is collecting data on a client admitted with pneumonia. When should the nurse begin assisting with discharge planning for this client?

1. The day before discharge
2. When the client's condition is stabilized
3. At the time of admission
4. When the physician writes the discharge order

Answer: 3. Discharge planning should begin as soon as the client is admitted. Beginning the planning as soon as possible gives the staff time to allocate the resources the client will require at discharge. Waiting until the day before discharge, until the client stabilizes, or until the discharge order is written doesn't allow adequate time for planning.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Analysis



18. The nurse-manager is checking a client's chart when she notes that there's no record of a narcotic being given to the client even though the nurse on the previous shift signed one out. The client denies receiving anything for pain. Which action should the nurse-manager take first?

1. Notify the pharmacy that the client didn't receive the medication so he doesn't get charged for it.
2. Notify the physician that the client didn't receive the medication.
3. Question the nurse who signed out the narcotic to seek clarification about the missing drug.
4. File an incident report.

Answer: 3. The nurse-manager should use a nonthreatening manner to question the nurse who signed out the narcotic. If the nurse can't give an adequate explanation, the nurse-manager should follow the facility's procedures for providing help to a staff member who might have a substance abuse problem. The physician must be notified that the client didn't receive the medication. The pharmacist should be notified of the discrepancies in the narcotic count. If policy dictates, the nurse-manager should then file an incident report.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

19. A graduate nurse is having difficulty progressing through orientation. Which action by the nurse-manager is most appropriate?

1. Meet with the graduate nurse and formulate a plan to help improve her performance.
2. Speak with the employee relations director about terminating the graduate nurse.
3. Tell the graduate nurse that if her performance doesn't improve by the deadline she'll be terminated.
4. Encourage the graduate nurse to transfer to a less stressful unit.

Answer: 1. The nurse-manager should meet with the graduate nurse and discuss her perceived weaknesses. Together they should develop a plan to improve the nurse's performance. The other responses don't provide the graduate nurse with the opportunity to improve her performance and they don't provide her with support.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

20. Which client care assignment would be most appropriate for a licensed practical nurse?

1. An 83-year-old client with heart failure who was just transferred from the intensive care unit
2. A 35-year-old client admitted the day before with an acute exacerbation of asthma
3. A 44-year-old client with metastatic breast cancer who was prescribed comfort measures
4. A 76-year-old client who underwent an open reduction and internal fixation of her right hip 5 days ago

Answer: 4. The most appropriate assignment for the licensed practical nurse is the 76-year-old client who underwent an open reduction and internal fixation of the hip 5 days ago. This client is stable and requires physical care; therefore, she's most appropriately cared for by the licensed practical nurse. The client who was just transferred from the intensive care unit requires frequent assessment because he may become unstable. The 35-year-old client admitted with acute asthma the day before also requires frequent assessment and should be cared for by a registered nurse. The 44-year-old client being maintained on comfort measures requires frequent assessment and medication titration based on the assessment findings. A registered nurse would be the most appropriate person to provide care for this client.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

21. A group of people has identified the lack of documentation when restraints are used. As a result they recommend a change in the facility's documentation form. These people are most likely members of which committee?

1. Quality control
2. Performance improvement
3. The Joint Commission
4. Unit council

Answer: 2. The performance improvement committee identifies problems that aren't addressed by an established standard and then recommends changes in the facility's policies, procedures, or documentation forms in an effort to improve client care. Quality control is a term used in factory production. The Joint Commission is a private agency that establishes guidelines for the operation of hospitals and other health care facilities. Unit council is a group that represents the nursing unit and voices the concerns of other staff members.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

22. A nurse failed to administer a medication to a client according to accepted standards. Consequently, the client suffered adverse effects. Which of the following terms is used to describe failure to provide the appropriate standard of care?

1. Breach of duty
2. Breach of promise
3. Negligent duty
4. Tort

Answer: 1. Breach of duty means that the nurse has provided care that didn't meet the accepted standard. When investigating breach of duty, the court asks how a reasonable, prudent nurse with comparable training and experience would have acted in comparable circumstances.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Comprehension

23. A staff nurse goes to the nurse-manager because she feels stressed by her job even though she enjoys the challenge. Which suggestion is best to help the nurse?

1. "You should consider a position change."
2. "Take stress management classes."
3. "Spend more time with your family."
4. "Try not to take your work home with you."

Answer: 2. Stress management classes teach nurses how to better manage stress in their lives. They help the nurse identify factors that contribute to her stress, which may help her find alternatives to leaving the nursing job she enjoys. Not spending enough time with her family and not taking her job home with her haven't been identified as contributing factors in this scenario.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

24. The Patient Self-Determination Act of 1990 requires all hospitals to inform clients of advance directives. What should the nurse tell the client about such advance directives as living wills and health care powers of attorney?

1. They provide specific instructions for the client's treatment in certain health care situations.
2. They can't provide do-not-resuscitate (DNR) orders for clients with terminal illnesses.
3. They allow physicians to make decisions about treatment.
4. They permit physicians to give verbal DNR orders.

Answer: 1. Advance directives are signed, witnessed documents that provide specific instructions for treatment if a client can't give those instructions personally when required. Depending on the client's wishes, they may or may not include DNR orders. Advance directives allow the client, not the physician, to make decisions about treatment. They don't permit verbal orders; all physician's orders must be written and signed to be legal.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Knowledge

25. The nurse receives a report on her client assignments at shift change. On which client should the nurse first collect data?

1. A client with a DNR order whose last blood pressure reading was 70/34 mm Hg
2. A client admitted with chest pain 6 hours ago who has been pain-free since admission to the floor
3. A client just admitted with uncontrolled atrial fibrillation
4. A client who suffered a stroke and requires frequent suctioning

Answer: 3. The nurse should begin by collecting data on the most acutely ill client — in this case, the newly admitted client with uncontrolled atrial fibrillation. Although the client with a DNR order has low blood pressure, he's most likely terminally ill and may not need to be seen first. The client admitted with chest pain has been pain-free since admission, so his data collection can be delayed until after the more acute client is seen. The client who suffered a stroke needs frequent nursing care, but his data collection can wait until after the more acutely ill client is seen.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Analysis

26. A client is being discharged after undergoing abdominal surgery and colostomy formation to treat colon cancer. Which nursing action is most likely to promote continuity of care?

1. Notifying the American Cancer Society of the client's diagnosis
2. Requesting Meals on Wheels to provide adequate nutritional intake
3. Referring the client to a home health nurse for follow-up visits to provide colostomy care
4. Asking an occupational therapist to evaluate the client at home

Answer: 3. Many clients are discharged from acute care settings so quickly that they don't receive complete instructions. Therefore, the first priority is to arrange for colostomy care. The American Cancer Society often sponsors support groups, which are helpful when the person is ready, but contacting this organization doesn't take precedence over ensuring proper colostomy care. Requesting Meals on Wheels and an occupational therapy evaluation are important but can occur later in rehabilitation.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Analysis

27. A client with terminal breast cancer is being cared for by a long-time friend who's a physician. The client has identified her twin sister as the agent in her durable power of attorney for health care. The client loses decision-making capacity, and the twin sister says to the nurse, "There will be a different physician caring for my sister now. I've dismissed her friend." In response, the nurse should:

1. inform the sister that she doesn't have the power to assign a different physician.
2. ask the dismissed physician if the client ever stated she wanted a different physician.
3. abide by the wishes of the sister who is the durable power of attorney agent for health care.
4. politely ignore the sister's statement and continue to call the dismissed physician for orders.

Answer: 3. A durable power of attorney for health care transfers all rights that the individual normally has regarding health care decisions to the designated agent. It's within the power of the twin sister to change the physician caring for her terminally ill twin. The dismissed physician has no power to interfere with the wishes of the durable power of attorney for health care. It would be inappropriate and unprofessional of the nurse to ignore the wishes of the client's agent.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

28. A client refuses to take his 9 p.m. medication. How should the nurse document this on the medication administration record?

1. Leave the space blank where her initials would typically be written.
2. Circle the time the drug was to be administered.
3. Cross out the time the drug was to be administered.
4. Circle the time the drug was to be administered and record the reason for omission in the progress notes.

Answer: 4. The nurse should circle the time the drug was to be administered and record the reason for omission in the progress notes. Leaving the space blank would be perceived as mistakenly omitting the dose. Crossing out the time the dose was to be administered suggests that the nurse has something to hide and would be questioned in a court of law should litigation proceed.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

29. The nurse-manager notices that a staff nurse isn't providing tracheostomy care to a client according to policy. The nurse's method isn't harmful to the client. How should the nurse-manager proceed?

1. Pull the nurse aside in a private area and tell her that she should review the procedure for tracheostomy care.
2. Do nothing because the nurse's method wasn't harmful to the client.
3. Stop the nurse immediately and tell her she isn't following the facility procedure for tracheostomy care.
4. Wait until the nurse is at the nurses' station with her peers and tell her she should review the procedure because she wasn't performing tracheostomy care correctly.

Answer: 1. The nurse-manager should pull the nurse aside and tell her that she wasn't performing tracheostomy care according to the established procedure and should review the policy as soon as possible. The nurse-manager shouldn't ignore the nurse's actions because the nurse is performing a procedure that deviates from the accepted policy. Because the nurse isn't harming the client, the nurse-manager can wait until the nurse completes her care and then speak to her in a private location; the nurse-manager shouldn't correct the nurse in front of the client. The

nurse-manager shouldn't correct the nurse in front of her peers because this would embarrass the nurse and isn't professional behavior.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Analysis

30. A nurse attends an inservice on confidentiality issues. Which of the following scenarios can be interpreted as a breach in client confidentiality?

1. The nurse provides the consulting physician with an update of the client's hospital course.
2. The critical care nurse updates the floor nurse about a client transferred to the critical care unit 2 days ago.
3. The physician notifies the client's family about the client's diagnosis of epilepsy against the client's wishes.
4. The physician notifies the client's sister because the client has threatened to kill his sister.

Answer: 2. Providing information to a staff nurse who's no longer involved in the client's care can be interpreted as a breach in client confidentiality. Only those directly involved in the client's care, such as a consulting physician, can be given information about the client. Under certain circumstances, the physician or nurse may disclose confidential information. For example, the courts allow disclosure when the welfare of a person or a group of people is at stake. Not informing the client's family that he has been diagnosed with epilepsy may place them, the client, or others in danger should the client decide to drive. Not disclosing the client's intent to murder his sister could also place her in grave danger.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Analysis

Appendices and index

Alternate-format questions review

Fundamentals of nursing

1. A teenage boy suffers a broken leg as a result of a car accident. He's taken to the emergency department, where a plaster cast is applied. Before he's discharged, the nurse provides him with instructions regarding cast care. Which instructions are appropriate? Select all that apply.

☐ 1. Support the wet cast with pillows until it dries.
☐ 2. Use a hair dryer to speed the drying process.
☐ 3. Use the fingertips when moving the wet cast.
☐ 4. Apply powder to the inside of the cast after it dries.
☐ 5. Notify the physician if the leg itches under the cast.
☐ 6. Avoid putting straws or hangers inside the cast.

Answer: 1, 6. Supporting the wet cast with pillows prevents the cast from changing shape and interfering with the alignment of the fractured bone. The nurse should instruct the client not to place sharp objects, such as straws and hangers, down the inside of the cast to avoid the risk of impairing the skin and causing infection. Using a hair dryer isn't advised because it dries the cast unevenly, can cause burns to the tissue, can crack the cast, and can cause poor alignment of the injured bone. The palms, not the fingertips, should be used when handling the wet cast because fingertips can dent the cast, thus causing pressure points that can affect the skin's integrity. Powder shouldn't be used because it can cake under the cast. Itching is a common occurrence with casts because skin cells are unable to slough as they normally would and the dry skin causes itching. Normally, the physician isn't called for this problem.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Comprehension

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2. A client with an I.V. line in place complains of pain at the insertion site. Examination of the site reveals a vein that's red, warm, and hard. Which actions should the nurse take? Select all that apply.

☐ 1. Slow the infusion rate.
☐ 2. Discontinue the infusion.
☐ 3. Restart the infusion distal to the discontinued I.V. site.
☐ 4. Restart the infusion in the opposite arm.
☐ 5. Apply warm soaks to the I.V. site.
☐ 6. Document the appearance of the I.V. site, the nurse's actions, and the client's response to the situation.

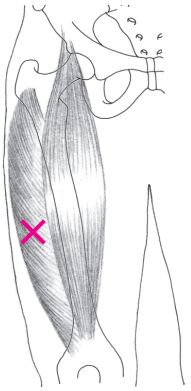
Answer: 2, 4, 5, 6. Redness, warmth, pain, and a hard, cordlike vein at the I.V. insertion site suggest that the client has phlebitis. The nurse should remove the I.V. line and insert a new I.V. catheter proximal to or above the discontinued I.V. site or in the other arm. Applying warm soaks to the site reduces inflammation. The nurse should document the appearance of the I.V. site, actions taken, and the client's response to the situation. When phlebitis is present, slowing the infusion rate won't reduce the phlebitis. Restarting the infusion at a site distal to the phlebitis may contribute to the inflammation.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

3. A nurse is administering an I.M. injection into the vastus lateralis muscle of a client. Identify the area where the nurse will inject the medication.

Answer: The vastus lateralis is an I.M. injection site located in the middle third of the outer aspect of the thigh, from one handbreadth below the greater trochanter to one handbreadth above the knee.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application



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4. When administering an injection into the deltoid muscle, what's the maximum amount of milliliters of medication that a nurse can administer? Record your answer using a whole number.

_____ milliliters

Answer: 2. The deltoid muscle is usually the site for injecting a small amount of medication. Administration of more than 2 ml into the deltoid muscle increases the risk of brachial artery and nerve damage.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Knowledge

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5. A nurse transcribes the following physician's order onto a client's medication record:

Physician's Order Sheet

3/15/08	1300	Administer 10 gtt of timolol
		maleate (Timoptic) ophthalmic
		solution daily. _____ John Bloom, MD

Which components of the medication order should the nurse question? Select all that apply.

☐ 1. Number of drops
☐ 2. Route
☐ 3. Type of medication
☐ 4. Signature
☐ 5. Frequency of administration
☐ 6. Date

Answer: 1, 2. To ensure that medication errors don't occur, it's important for the nurse to follow the six rights to safe medication administration: right drug, right dose, right route, right time, right client, and right documentation. The number of drops ordered is too great to be instilled into the eye. The medication wouldn't be effective because the dose is too large and would overflow. Normally, physicians order 1 or 2 drops to be instilled into the eyes. In addition, the physician's order doesn't include the administration route.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Analysis

6. A nurse is collecting data on a client who has a rash on his chest and upper arms. Which questions should the nurse ask to obtain more information about the client's rash? Select all that apply.

☐ 1. "When did the rash start?"
☐ 2. "Are you allergic to any medications, foods, or pollen?"
☐ 3. "How old are you?"
☐ 4. "What have you been using to treat the rash?"
☐ 5. "Have you recently traveled outside of the country?"
☐ 6. "Do you smoke cigarettes or drink alcohol?"

Answer: 1, 2, 4, 5. Finding out when a rash first appeared helps the physician make a diagnosis and determine the stage of the rash in the disease process. Obtaining an allergy history is necessary because rashes related to allergies can occur when a client changes medications, eats new foods, or has contact with allergens in the air (such as pollen). How the client has been treating the rash is important because topical ointments and oral medications may make the rash worse. Recent travel outside of the country exposes the client to foreign foods and environments that can contribute to the onset of a rash. The client's age and smoking or drinking habits have no real value in determining the cause of a rash.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

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7. An elderly client who's 5′4″ (162.5 cm) and weighs 145 lb (65.8 kg) is admitted to a long-term care facility. The admitting nurse takes this report: The client sits for long periods in his wheelchair and has bowel and bladder incontinence. He's able to feed himself and has a fair appetite, eating best at breakfast and poorly later in the day. He doesn't have family members living nearby and is often noted to be crying and depressed. He also frequently requires large doses of sedatives. Which factors place the client at risk for developing a pressure ulcer? Select all that apply.

☐ 1. Weight
☐ 2. Incontinence
☐ 3. Sitting for long periods
☐ 4. Sedation
☐ 5. Crying and depression
☐ 6. Poor eating habits

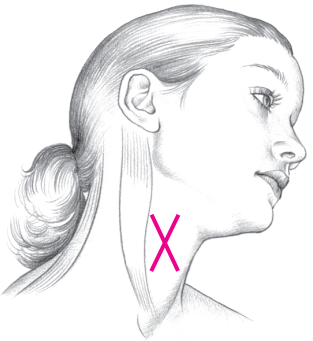
Answer: 2, 3, 4. Inactivity, immobility, incontinence, and sedation are all risk factors for developing pressure ulcers. The client's weight and poor eating habits at lunch and dinner aren't directly related to the risk of developing pressure ulcers. However, a calorie count should be taken to see if the client is receiving adequate calories and fluids because poor nutrition can contribute to pressure ulcers. The client's crying and depression have no direct bearing on this client's risk for developing a pressure ulcer. However, clients with depression commonly aren't as active, so his activity levels should be closely monitored.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

8. A nurse finds a client lying on the floor of a hospital corridor. After determining unconsciousness and breathlessness and providing two ventilations, the nurse checks the client's carotid artery for a pulse. Identify the area where the nurse can best palpate the carotid pulse.

Answer: The carotid artery is located in the neck in the groove between the trachea and the sternocleidomastoid muscle. It's the artery of choice for determining a pulse in this situation because it's usually the most accessible.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge



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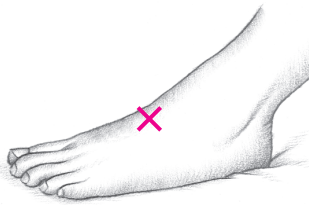
9. A diabetic client comes to the clinic for medical attention because of numbness and tingling in his lower extremities. A nurse obtains the client's vital signs and palpates the dorsalis pedis pulse. Identify the area where the nurse should place her fingers to palpate the dorsalis pedal pulse.

Answer: The dorsalis pedal pulse is located on the top portion of the foot. Because clients with diabetes have complications related to circulation in the lower extremities, health care providers should palpate dorsalis pedal pulses and check capillary refill.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge



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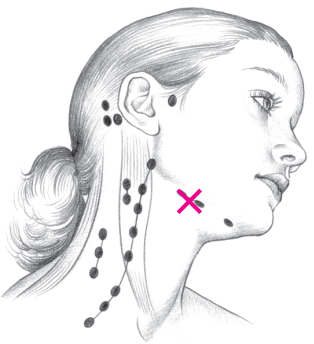
10. An adolescent client seeks medical attention because of a sore throat and probable mononucleosis. The nurse palpates the client's submandibular lymph nodes for enlargement. Identify the area where the nurse should palpate to best feel these nodes.

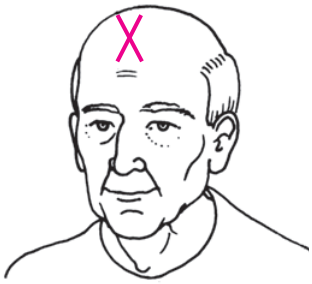
Answer: The submandibular lymph nodes are located beneath the mandible, or lower jaw, halfway to the chin. These nodes may be enlarged in a client with a throat infection or mononucleosis.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge



11. An elderly client comes to the clinic complaining of hearing loss. A nurse performs Weber's test to evaluate the client's ability to hear. Identify the location where the nurse should place the tuning fork to perform this test.

Answer: To perform Weber's test, the tuning fork should be struck and then placed on the midline of the head. Weber's test determines if sound is heard equally in both ears. If the client hears the sound louder in one ear, he probably has unequal hearing loss that requires further intervention.



Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

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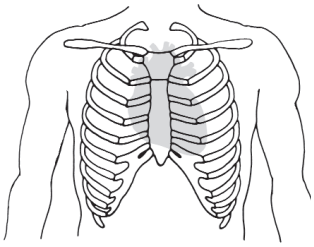
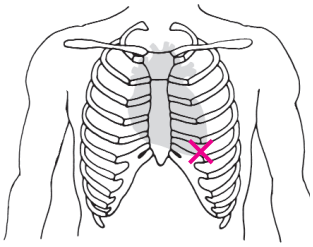
12. A 40-year-old client is admitted with a diagnosis of new-onset atrial fibrillation. To obtain an accurate pulse count, the nurse counts the apical heart rate. Identify the area where the nurse should place the stethoscope to best hear the apical rate.



Answer: The apical heart rate is best heard at the point of maximal impulse, which is generally in the fifth intercostal space at the midclavicular line.



Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

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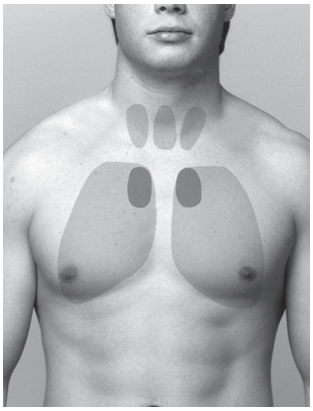
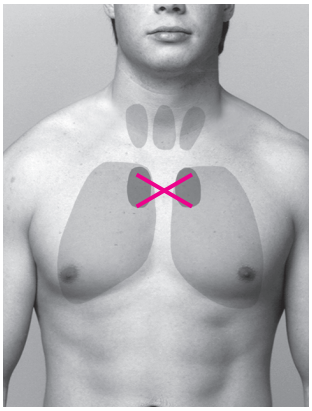
13. A 35-year-old client is admitted to the hospital for routine outpatient surgery. Before surgery, a nurse auscultates the client's chest for breath sounds. Identify the area where the nurse should expect to hear bronchovesicular breath sounds.

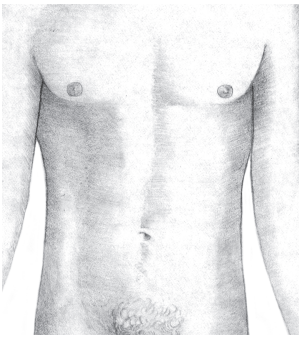


Answer: Bronchovesicular breath sounds are best heard next to the upper third of the sternum and between the scapulae. These breath sounds are equal in length during inspiration and expiration.



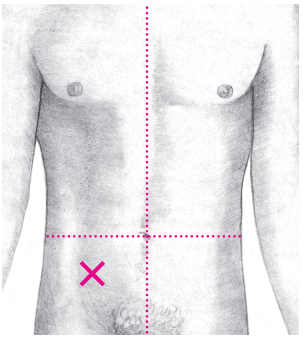
Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

14. An adolescent boy comes to the emergency department seeking medical attention for severe pain located in the area of the appendix. Identify the area where the nurse would expect the pain to localize.



Answer: Pain and tenderness during an acute attack of appendicitis localize in the right lower quadrant, midway between the umbilicus and the crest of the ilium.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Knowledge



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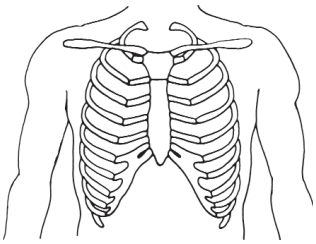
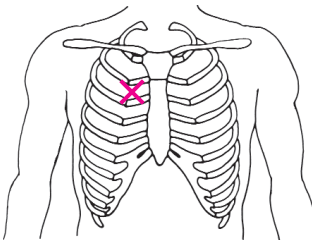
15. An elderly client is admitted to the hospital for a fractured hip. He has a history of aortic stenosis. Identify the area where the nurse should place the stethoscope to best hear the murmur.



Answer: The murmur of aortic stenosis is low-pitched, rough, and rasping. It's loudest in the second intercostal space, to the right of the sternum.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application



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16. A 52-year-old client with a history of hypertension has just had a total hip replacement. The physician orders hydrochlorothiazide (Hydro-Chlor) 35 mg oral solution by mouth, once per day. The label on the solution reads hydrochlorothiazide 50 mg/5 ml. To administer the correct dose, how many milliliters should the nurse pour? Record your answer using one decimal place.

_____ milliliters

Answer: 3.5. The correct formula to calculate a drug dosage is:

Dose on hand ÷ Quantity on hand = Dose desired ÷ X

Therefore:

50 mg ÷ 5 ml = 35 mg ÷ X
X = 3.5 ml

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

Medical-surgical nursing

1. A nurse is evaluating a client who's at risk for cardiac tamponade because of chest trauma sustained in a motorcycle accident. What's the client's pulse pressure if his blood pressure is 108/82 mm Hg? Record your answer using a whole number.

_____ mm Hg

Answer: 26. Pulse pressure is the difference between systolic and diastolic pressures. Normally, systolic pressure exceeds diastolic pressure by approximately 40 mm Hg. Narrowed pulse pressure, a difference of less than 30 mm Hg, is a sign of cardiac tamponade.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

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2. The nurse is caring for a client who just had a cardiac catheterization through a femoral access site. Which nursing interventions should be included in the client's care plan for the next 8 hours? Select all that apply.

☐ 1. Maintain pressure over the femoral access site.
☐ 2. Allow the client to sit upright for meals.
☐ 3. Check the dressing and access site for bleeding.
☐ 4. Monitor vital signs every 4 hours.
☐ 5. Keep the extremity straight.
☐ 6. Allow use of the bedside commode.

Answer: 1, 3, 5. Pressure should be applied at the access site to control bleeding and promote clot formation. The dressing and access site must be observed frequently for bleeding and hematoma formation. When the femoral access site is used, the head of the bed may not be raised greater than 30 degrees and the affected leg must be kept extended. Therefore, the client may not sit upright for meals or use the bedside commode. After this procedure, the nurse should monitor vital signs every 15 minutes for the first hour, every 30 minutes for the next 2 hours, and every 4 hours after that.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

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3. A nurse is preparing a teaching plan for a client who recently underwent surgery for insertion of a permanent pacemaker. Which instructions should the nurse include in the teaching plan? Select all that apply.

☐ 1. Check your heart rate for 1 minute daily.
☐ 2. Check your respiratory rate for 1 minute daily.
☐ 3. Report bulging at the insertion site.
☐ 4. Report redness, swelling, or discharge at the insertion site.
☐ 5. Stay away from airport metal detectors.
☐ 6. Avoid magnetic resonance imaging (MRI) studies.

Answer: 1, 4, 6. A client with an implanted pacemaker should check his heart rate daily and report rates that are too fast or too slow. The nurse should instruct him to inspect the insertion site and report signs and symptoms of infection, such as redness, swelling, and discharge. MRI studies are contraindicated in a client with a permanent pacemaker because the magnet may move the metal pacemaker within the body, causing injury. It isn't necessary to obtain a respiratory rate to assess functioning of a pacemaker. A slight bulge at the site of pacemaker insertion is normal. It's safe for a client with a pacemaker to go through an airport metal detector, but the pacemaker may activate the metal detector. The client should carry his pacemaker identification card to show to security personnel.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

4. Which signs and symptoms should the nurse expect to find in a client with angina? Select all that apply.

☐ 1. Chest tightness
☐ 2. General muscle aching
☐ 3. Chest pressure
☐ 4. Jaw pain
☐ 5. Slowed respiratory rate
☐ 6. Bradycardia

Answer: 1, 3, 4. Chest tightness, chest pressure, and jaw pain are all symptoms of angina. General muscle aching isn't associated with angina. Respirations and heart rate typically increase, not decrease, with anginal attacks.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

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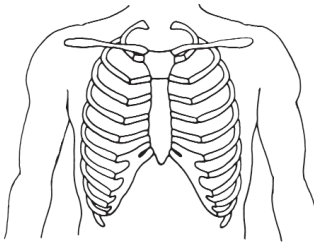
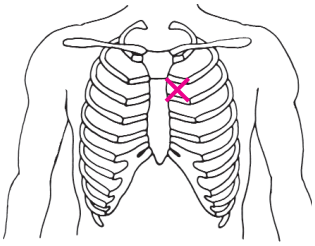
5. A nurse is performing a cardiac evaluation on a client with hypertension. Identify the area where the nurse should place the stethoscope to best auscultate the pulmonic valve.



Answer: Typically, the pulmonic valve is best heard at the second intercostal space, at the left sternal border.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application



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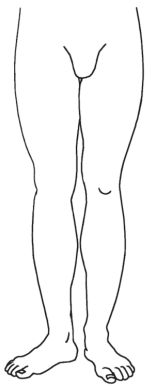
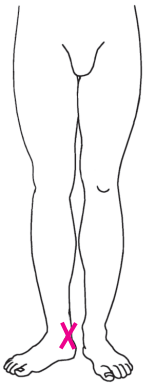
6. A nurse is checking the peripheral pulses of a client who underwent cardiac catheterization through the right groin. Identify the area where the nurse should palpate the right posterior tibial artery.



Answer: The posterior tibial pulse is located behind and just below the medial malleolus of the foot.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application



7. A client in the terminal stage of cancer is being transferred to hospice care. Which information should the nurse include in the teaching plan regarding hospice care? Select all that apply.

☐ 1. Care focuses on controlling symptoms and relieving pain.
☐ 2. A multidisciplinary team provides care.
☐ 3. Services are provided based on the client's ability to pay.
☐ 4. Hospice care is provided only in hospice centers.
☐ 5. Bereavement care is provided to the family.
☐ 6. Care is provided in the home independent of physicians.

Answer: 1, 2, 5. Hospice care focuses on controlling symptoms and relieving pain at the end of life. Care is provided by a multidisciplinary team that may consist of nurses, physicians, chaplains, aides, and volunteers. After the client's death, hospice provides bereavement care to the grieving family. Hospice care is provided based on need, not on ability to pay. It's provided in various settings, including hospice centers, homes, hospitals, and long-term care facilities. Care is provided under the direction of a physician, who's a key member of the hospice care team.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

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8. A client with laryngeal cancer has undergone laryngectomy and is receiving radiation therapy to the head and neck. The nurse should monitor the client for which adverse effects of external radiation? Select all that apply.

☐ 1. Xerostomia
☐ 2. Stomatitis
☐ 3. Thrombocytopenia
☐ 4. Cystitis
☐ 5. Dysgeusia
☐ 6. Leukopenia

Answer: 1, 2, 5. Radiation of the head and neck commonly causes stomatitis (irritation of the oral mucous membranes), xerostomia (dry mouth), and dysgeusia (a diminished sense of taste). Thrombocytopenia (reduced platelet count) and leukopenia (reduced white blood cell count) may occur after systemic radiation. Cystitis may occur after radiation of the genitourinary system.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

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9. A client with bladder cancer has undergone surgical removal of the bladder and construction of an ileal conduit. Which data collection findings indicate that the client is developing complications? Select all that apply.

☐ 1. Urine output is greater than 30 ml/hr.
☐ 2. The stoma appears dusky.
☐ 3. The stoma protrudes from the skin.
☐ 4. Mucus shreds are in the urine collection bag.
☐ 5. Edema of the stoma is present during the first 24 hours postoperatively.
☐ 6. The client experiences sharp abdominal pain and rigidity.

Answer: 2, 3, 6. A dusky appearance of the stoma indicates decreased blood supply; a healthy stoma should appear beefy-red. Protrusion indicates prolapse of the stoma. Sharp abdominal pain and rigidity suggests peritonitis. Urinary output greater than 30 ml/hr is a sign of adequate renal perfusion — a normal finding. Stomal edema is a normal finding during the first 24 hours after surgery. Because mucous membranes are used to create the conduit, mucus in the urine is expected.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

10. A client receiving chemotherapy for breast cancer develops myelosuppression. Which instructions should the nurse include in the discharge teaching plan? Select all that apply.

☐ 1. Avoid people who have recently received attenuated vaccines.
☐ 2. Avoid activities that may cause bleeding.
☐ 3. Wash your hands frequently.
☐ 4. Increase your intake of fresh fruits and vegetables.
☐ 5. Avoid crowded places, such as shopping malls.
☐ 6. Treat a sore throat with over-the-counter products.

Answer: 1, 2, 3, 5. Chemotherapy can cause myelosuppression (reduced numbers of red blood cells, white blood cells, and platelets). Clients receiving chemotherapy should avoid people who have recently been vaccinated because such interaction may exaggerate myelosuppression. Frequent hand-washing is the best way to prevent the spread of infection. In addition, because of their reduced platelet counts, chemotherapy clients should avoid activities that can cause trauma and bleeding. Because of their reduced ability to fight infection, they should also avoid crowded places and people with colds during the flu season. Fresh fruits and vegetables should be avoided because these foods can harbor bacteria that aren't easily removed by washing. Signs and symptoms of infection, such as a sore throat, fever, or cough, should be immediately reported to a physician.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

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11. As part of a routine screening for colorectal cancer, a client must undergo fecal occult blood testing. Which foods should the nurse instruct the client to avoid 48 to 72 hours before the test and throughout the collection period? Select all that apply.

☐ 1. High-fiber foods
☐ 2. Red meat
☐ 3. Turnips
☐ 4. Horseradish
☐ 5. Tomatoes
☐ 6. Apples

Answer: 2, 3, 4. The nurse should instruct the client to maintain a high-fiber diet and to refrain from eating red meat, poultry, fish, turnips, and horseradish for 48 to 72 hours before the test and throughout the collection period.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

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12. A 58-year-old client with osteoarthritis is admitted to the hospital with peptic ulcer disease. Which findings are commonly associated with peptic ulcer disease? Select all that apply.

☐ 1. Localized, colicky periumbilical pain
☐ 2. History of using nonsteroidal anti-inflammatory drugs
☐ 3. Epigastric pain that's relieved by antacids
☐ 4. Tachycardia
☐ 5. Nausea and weight loss
☐ 6. Low-grade fever

Answer: 2, 3, 5. Peptic ulcer disease is characterized by nausea, hematemesis, melena, weight loss, and left-sided epigastric pain — occurring 1 to 2 hours after eating — that's relieved with antacids. Nonsteroidal anti-inflammatory drug use is also associated with peptic ulcer disease. Appendicitis begins with generalized or localized colicky periumbilical or epigastric pain, followed by nausea, a few episodes of vomiting, low-grade fever, and tachycardia.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

13. A client undergoes a barium swallow fluoroscopy that confirms gastroesophageal reflux disease (GERD). Based on this diagnosis, the client should be instructed to take which actions? Select all that apply.

☐ 1. Follow a high-fat, low-fiber diet.
☐ 2. Avoid caffeine and carbonated beverages.
☐ 3. Sleep with the bed flat.
☐ 4. Stop smoking.
☐ 5. Take antacids 1 hour before and 3 hours after meals.
☐ 6. Limit alcohol consumption to one drink per day.

Answer: 2, 4, 5. The nurse should instruct the client with GERD to follow a low-fat, high-fiber diet. Caffeine, carbonated beverages, alcohol, and smoking should be avoided because they promote symptoms of GERD. In addition, the client should take antacids as prescribed (typically 1 hour before and 3 hours after meals and at bedtime). Lying down with the head of bed elevated, not flat, reduces intra-abdominal pressure, thereby reducing the symptoms of GERD.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

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14. A client with constipation is prescribed an irrigating enema. Which steps should the nurse take when administering an enema? Select all that apply.

☐ 1. Assist the client into the left-lateral Sims' position.
☐ 2. Lubricate the distal end of the rectal catheter.
☐ 3. Warm the solution to 110° F (43.3° C).
☐ 4. Insert the tube 1″ to 1½″ (2.5 to 3.8 cm)
☐ 5. Administer 250 to 500 ml of irrigating solution.
☐ 6. Be sure to keep the solution container lower than 18″ (46 cm) above bed level.

Answer: 1, 2, 6. To administer an enema, the nurse should prepare the prescribed type and amount of solution. The standard volume of an irrigating enema for an adult is 750 to 1,000 ml. For an adult, the solution should be 100° F (37.8° C) to 105° F (40.6° C) to help reduce client discomfort. The nurse should help the client into left-lateral Sims' position. After lubricating the distal end of the rectal catheter, the nurse should insert the tube 2″ to 3″ (5 to 7.6 cm). During infusion, the solution bag shouldn't be higher than 18″ above bed level.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

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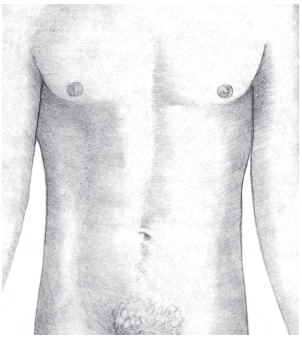
15. A 53-year-old client had a colonoscopy for colorectal cancer screening. A polyp was removed during the procedure. Which nursing interventions are necessary when caring for the client immediately after colonoscopy? Select all that apply.

☐ 1. When the client recovers from sedation, tell him he must follow a clear liquid diet.
☐ 2. Instruct the client that he shouldn't drive for 24 hours.
☐ 3. Observe the client closely for signs and symptoms of bowel perforation.
☐ 4. Monitor vital signs frequently until they're stable.
☐ 5. Inform the client that there may be blood in his stool and that he should report excessive blood immediately.
☐ 6. Tell the client to report excessive flatus.

Answer: 3, 4, 5. After a colonoscopy, the nurse should closely observe the client for signs and symptoms of bowel perforation (malaise, rectal bleeding, abdominal pain and distention, fever, and mucopurulent drainage). The nurse should monitor vital signs frequently, until they become stable. Because a polyp was removed during the procedure, the nurse should inform the client that he may see some blood in his stool and that he should immediately report excessive bleeding. The nurse should tell the client that he might pass large amounts of flatus resulting from air insufflated to distend the colon but it isn't necessary to report it. When the client has recovered from sedation, he may resume his usual diet; a clear liquid diet isn't necessary. The client shouldn't drive for 12 hours after being sedated.

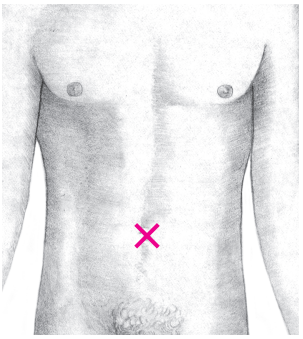
Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

16. A client with cirrhosis is ordered to have a daily measurement of his abdominal girth. Identify the anatomical landmark where the tape measure should be placed when obtaining this measurement.



Answer: Abdominal girth should be measured at the umbilicus to obtain the most accurate measurement. Using any landmark wouldn't provide the correct measurement for the client's abdominal girth.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application



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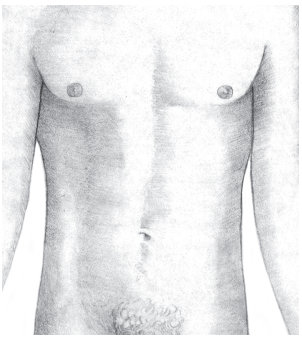
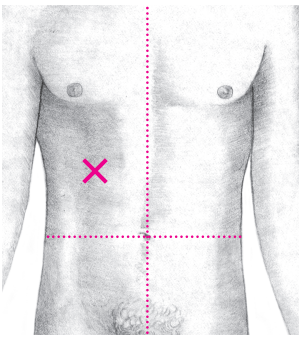
17. Locate the abdominal quadrant where the nurse would expect to palpate the liver.



Answer: The liver is located in the right upper abdominal quadrant.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge



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18. Which nursing interventions are effective in preventing pressure ulcers? Select all that apply.

☐ 1. Clean the skin with warm water and a mild cleaning agent; then apply a moisturizer.
☐ 2. Slide the client when turning him and avoid lifting.
☐ 3. Avoid raising the head of the bed more than 90 degrees.
☐ 4. Turn and reposition the client every 1 to 2 hours unless contraindicated.
☐ 5. If the client uses a wheelchair, seat him on a rubber or plastic doughnut.
☐ 6. Use pillows to position the client and increase his comfort.

Answer: 1, 4, 6. Nursing interventions that are effective in preventing pressure ulcers include cleaning the skin with warm water and a mild cleaning agent, and then applying a moisturizer; lifting — rather than sliding — the client when turning him to reduce friction and shear; avoiding raising the head of the bed more than 30 degrees, except for brief periods; repositioning and turning the client every 1 to 2 hours unless contraindicated; and using pillows to position the client and increase his comfort. If the client uses a wheelchair, the nurse should offer a pressure-relieving cushion as appropriate. She shouldn't seat him on a rubber or plastic doughnut because these devices can increase localized pressure at vulnerable points.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Application

19. Despite conventional treatment, a client's psoriasis has worsened. His physician prescribes methotrexate 25 mg by mouth as a single weekly dose. The pharmacy dispenses 5 mg scored tablets. How many tablets should the nurse instruct the client to consume to achieve the prescribed dose? Record your answer using a whole number.

_____ tablets

Answer: 5. The correct formula to calculate a drug dose is:

Dose on hand ÷ Quantity on hand = Dose desired ÷ X

The physician prescribed a desired dose of 25 mg dose. The pharmacy dispenses 5 mg tablets, which is the dose on hand. To solve the equation:

5 mg ÷ 1 tablet = 25 mg ÷ X tablets

X = 5 tablets

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

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20. Which instructions should be included in the teaching plan for a 19-year-old client with acne vulgaris. His physician has prescribed tretinoin, benzoyl peroxide, and tetracycline. Select all that apply.

☐ 1. Expect your skin to look red and start to peel after treatment.
☐ 2. Take tetracycline on an empty stomach.
☐ 3. Use tretinoin and benzoyl peroxide together in the morning and at night.
☐ 4. Maintain the prescribed treatment because it's more likely to improve acne than a strict diet and excessive scrubbing with soap and water.
☐ 5. Apply tretinoin at least 30 minutes after washing your face and at bedtime.
☐ 6. Avoid exposure to sunlight and don't use a sunscreen.

Answer: 2, 4. The nurse should instruct the client receiving tretinoin that his skin should look pink and dry after treatment. If the skin appears red or starts to peel, the preparation may have to be weakened or applied less often. The client should be instructed to take tetracycline on an empty stomach. Because the prescribed regimen includes tretinoin and benzoyl peroxide, the nurse should instruct the client to use one preparation in the morning and the other at night. Tretinoin should be applied 30 minutes after washing the face and at least 1 hour before bedtime. The nurse should also make sure that the client understands that the prescribed treatment is more likely to improve acne than a strict diet and excessive scrubbing with soap and water. The nurse should advise the client to avoid exposure to sunlight or to use a sunscreen.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

21. A 35-year-old client is brought to the emergency department with second- and third-degree burns over 15% of his body. His admission vital signs are blood pressure 100/50 mm Hg, heart rate 130 beats/minute, and respiratory rate 26 breaths/minute. Which nursing interventions are appropriate for this client? Select all that apply.

☐ 1. Clean the burns with hydrogen peroxide.
☐ 2. Cover the burns with saline-soaked towels.
☐ 3. Begin an I.V. infusion of lactated Ringer's solution.
☐ 4. Place ice directly on the burns.
☐ 5. Administer 6 mg of morphine I.V.
☐ 6. Administer tetanus prophylaxis, as ordered.

Answer: 3, 5, 6. Immediate interventions for this client should aim to stop the burning and relieve the pain. The nurse should begin I.V. therapy with a crystalloid such as lactated Ringer's solution to prevent hypovolemic shock and to maintain cardiac output. She should administer pain medication, as ordered. Typically, 2 to 25 mg of morphine or 5 to 15 mg of meperidine are administered I.V. in small increments. Tetanus prophylaxis should be administered, as ordered. The nurse shouldn't use hydrogen peroxide or povidone-iodine solution to clean the burns because these preparations can further damage tissue. The nurse should avoid the use of saline-soaked towels because they may lead to hypothermia. Ice shouldn't be placed directly on burn wounds because the cold may cause further thermal damage.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

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22. The nurse is planning care for a client with human immunodeficiency virus (HIV). Which statement by the nurse indicates her understanding of HIV transmission? Select all that apply.

☐ 1. "I will wear a gown, mask, and gloves during all client contact."
☐ 2. "I don't need to wear any personal protective equipment because of decreased risk of occupational exposure."
☐ 3. "I will wear a mask if the client has a cough caused by an upper respiratory infection."
☐ 4. "I will wear a mask, gown, and gloves when the splashing of bodily fluids is likely."
☐ 5. "I will wash my hands after client care."

Answer: 4, 5. Standard precautions include wearing gloves for any known or anticipated contact with tissue, mucous membranes, nonintact skin, and blood and other body fluids. If the task or procedure may result in the splashing or splattering of blood or other body fluids on the face, the nurse should also wear a mask and a face shield or goggles. If the task or procedure may result in the splashing or splattering of blood or other body fluids, the nurse should wear a fluid-resistant gown or apron. The nurse should wash her hands before and after client care and after removing gloves. A gown, mask, and gloves aren't necessary for client care unless contact with bodily fluids, tissue, mucous membranes, or nonintact skin is expected. Nurses have an increased, not decreased, risk of occupational exposure to blood-borne pathogens. HIV isn't transmitted in sputum unless blood is present.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Application

23. A nurse is preparing a client with systemic lupus erythematosus (SLE) for discharge. Which instructions should the nurse include in the teaching plan? Select all that apply.

☐ 1. Stay out of direct sunlight.
☐ 2. Avoid limiting activity between flare-ups.
☐ 3. Monitor body temperature.
☐ 4. Taper the corticosteroid dosage as order by the physician when symptoms are under control.
☐ 5. Apply cold packs to relieve joint pain and stiffness.

Answer: 1, 3, 4. The client with SLE should stay out of direct sunlight and avoid other sources of ultraviolet light because they may precipitate severe skin reactions and exacerbate the disease. The client should monitor his temperature, because fever can signal an exacerbation, which he should report to his physician. Corticosteroids must be tapered gradually after symptoms are relieved because they can suppress the function of the adrenal glands. Abruptly stopping corticosteroids can cause adrenal insufficiency, a potentially life-threatening condition. Fatigue can cause a flare-up of SLE, so encourage the client to pace activities and plan rest periods. The client may apply either heat or cold—not just cold—to relieve joint pain.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

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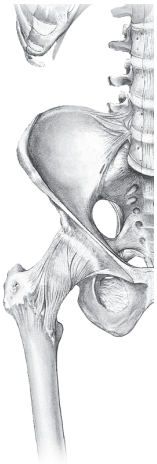
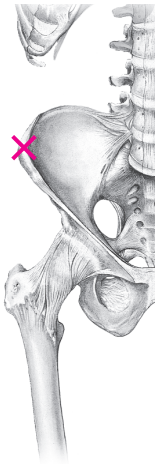
24. A nurse is preparing a client for bone marrow biopsy to rule out leukemia. The nurse explains that the sample will be taken from the anterior iliac crest. Identify this area.



Answer: A bone marrow biopsy may be taken from the anterior or posterior iliac crests, sternum, vertebral spinous process, rib, or tibia.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension



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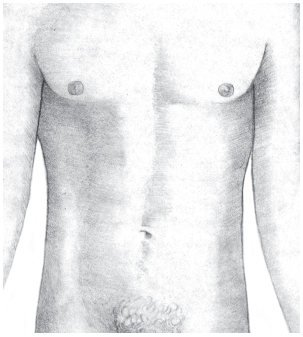
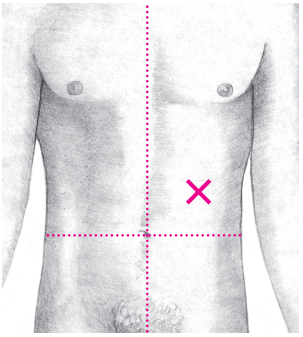
25. A client with leukemia has enlarged lymph nodes, liver, and spleen. Identify the quadrant of the abdomen where the nurse would palpate the enlarged spleen.



Answer: The spleen is located in the left upper quadrant of the abdomen, posterior to the stomach.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension



26. After falling off a ladder and suffering a brain injury, a client develops syndrome of inappropriate antidiuretic hormone (SIADH). Which findings indicate effectiveness of the treatment he's receiving? Select all that apply.

☐ 1. Decrease in body weight
☐ 2. Rise in blood pressure and drop in heart rate
☐ 3. Absence of wheezing in the lungs
☐ 4. Increased urine output
☐ 5. Decreased urine osmolarity

Answer: 1, 4, 5. SIADH is an abnormality in which the body produces an abundance of antidiuretic hormone. The predominant feature, water retention, may be accompanied by oliguria, edema, and weight gain. Evidence of successful treatment includes a reduction in weight, an increase in urine output, and a decrease in urine concentration (urine osmolarity).

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

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27. A 48-year-old female client is seen in the clinic for newly diagnosed hypothyroidism. Which topics should the nurse include in a client teaching plan? Select all that apply.

☐ 1. Importance of a high-protein, high-calorie diet
☐ 2. Importance of a high-fiber, low-calorie diet
☐ 3. Plan for a thyroidectomy
☐ 4. Use of stool softeners
☐ 5. Use of thyroid hormone replacements
☐ 6. Review of the procedure for thyroid radiation therapy

Answer: 2, 4, 5. Treatment for hypothyroidism includes a high-fiber, low-calorie diet because weight gain and constipation are two symptoms of the disorder. Stool softeners are prescribed to prevent constipation, and thyroid hormone replacements are needed to supplement the underfunctioning thyroid gland. A high-protein, high-calorie diet is commonly used for clients with hyperthyroidism, along with thyroidectomy or irradiation of the thyroid gland.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

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28. A client who has been seen in the clinic is scheduled for an outpatient thyroid scan in 2 weeks. Which instructions should the nurse include in her client teaching so that this client will be prepared? Select all that apply.

☐ 1. Stop using iodized salt or iodized salt substitutes 1 week before the scan.
☐ 2. Stop eating seafood 1 week before the scan.
☐ 3. Don't consume food or fluids after midnight on the night before the scan.
☐ 4. Don't take the prescribed thyroid medication on the day of the scan.
☐ 5. Don't take the prescribed thyroid medication until the results of the scan are known.
☐ 6. Maintain bed rest for 24 hours after the scan.

Answer: 1, 2, 4. A thyroid scan visualizes the distribution of radioactive dye in the thyroid gland. Interventions before the scan include stopping the ingestion of iodine, which is found in iodized salt, salt substitutes, and seafood. The client should also be instructed not to take medication that would interfere with the scan. The client doesn't have to refrain from consuming food or fluids after midnight if the scan is done on an outpatient basis. The radioactive dye is administered intravenously. Routinely prescribed medications can be taken after the scan. Bed rest is maintained with a thyroid biopsy, not a scan.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

29. A client is admitted to the hospital with signs and symptoms of diabetes mellitus. Which finding is the nurse most likely to observe in this client? Select all that apply.

☐ 1. Excessive thirst
☐ 2. Weight gain
☐ 3. Constipation
☐ 4. Excessive hunger
☐ 5. Urine retention
☐ 6. Frequent, high-volume urination

Answer: 1, 4, 6. Classic signs of diabetes mellitus include polydipsia (excessive thirst), polyphagia (excessive hunger), and polyuria (excessive urination). Because the body is starving from the lack of glucose the cells are using for energy, the client has weight loss, not weight gain. Clients with diabetes mellitus usually don't present with constipation.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Analysis

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30. A 56-year-old female client is being discharged after having a thyroidectomy. Which discharge instructions are appropriate for this client? Select all that apply.

☐ 1. Report signs and symptoms of hypoglycemia.
☐ 2. Take thyroid replacement medications, as ordered.
☐ 3. Watch for changes in body functioning, such as lethargy, restlessness, sensitivity to cold, and dry skin, and report them to the physician.
☐ 4. Avoid over-the-counter (OTC) medications.
☐ 5. Carry injectable dexamethasone at all times.

Answer: 2, 3. After removal of the thyroid gland, the client needs to take thyroid replacement medication. The client needs to report to the physician changes in body functioning, such as lethargy, restlessness, cold sensitivity, and dry skin. These changes may indicate the need to increase the medication dose. The thyroid gland doesn't regulate the serum glucose level; therefore, the client wouldn't need to recognize the signs and symptoms of hypoglycemia. A client with Addison's disease should avoid OTC medications and carry injectable dexamethasone.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

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31. A client is seen in the clinic with suspected parathyroid hormone (PTH) deficiency. Part of the diagnosis of this condition includes the analysis of serum electrolyte levels. The nurse would expect which electrolyte levels to be abnormal in a client with PTH deficiency? Select all that apply.

☐ 1. Sodium
☐ 2. Potassium
☐ 3. Calcium
☐ 4. Chloride
☐ 5. Glucose
☐ 6. Phosphorous

Answer: 3, 6. A client with PTH deficiency is likely to have abnormal serum calcium and phosphorous levels because PTH regulates these two electrolytes. PTH deficiency doesn't affect sodium, potassium, chloride, or glucose levels.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Analysis

32. A client is placed on hypocalcemia precautions after removal of a cancerous parathyroid gland. The nurse should observe the client for which symptoms? Select all that apply.

☐ 1. Numbness
☐ 2. Aphasia
☐ 3. Tingling
☐ 4. Muscle twitching and spasms
☐ 5. Polyuria
☐ 6. Polydipsia

Answer: 1, 3, 4. When the parathyroid gland is removed, the body may not produce enough parathyroid hormone to regulate calcium and phosphorous levels. The symptoms of hypocalcemia include peripheral numbness, tingling, and muscle spasms. Aphasia isn't a symptom of calcium depletion. Polyuria and polydipsia are symptoms of diabetes mellitus.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

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33. A 45-year-old female client is admitted to the hospital with Cushing's syndrome. Which nursing interventions are appropriate for this client? Select all that apply.

☐ 1. Check for peripheral edema.
☐ 2. Stress the need for a high-calorie, high-carbohydrate diet.
☐ 3. Measure intake and output.
☐ 4. Encourage oral fluid intake.
☐ 5. Weigh the client daily.
☐ 6. Instruct the client to avoid foods high in potassium.

Answer: 1, 3, 5. Because weight gain and edema are common symptoms of Cushing's syndrome, appropriate interventions include checking for peripheral edema, measuring intake and output, and weighing the client daily. A low-calorie, low-carbohydrate, high-protein diet is ordered for a client with this disorder. Fluid restriction is commonly prescribed as well. Treatment of Cushing's syndrome includes the administration of potassium replacements; therefore, restricting foods high in potassium wouldn't be appropriate.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

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34. A client with type 2 diabetes mellitus needs instruction on proper foot care. Which instructions should the nurse include in client teaching? Select all that apply.

☐ 1. Be sure to use scissors to trim toenails.
☐ 2. Wear cotton socks.
☐ 3. Apply foot powder after bathing.
☐ 4. Go barefoot only when you know your home environment.
☐ 5. See a podiatrist regularly to have your feet checked.
☐ 6. Wear loose-fitting shoes.

Answer: 2, 3, 5. Foot care for a client with diabetes mellitus includes keeping the feet dry and applying foot powder and wearing cotton socks to absorb moisture. The podiatrist should check the client's feet regularly to detect problems early. Explain to the client that he can prevent injury to his feet by not cutting his toenails with scissors, walking barefoot, or wearing loose-fitting shoes.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

35. A client is preparing for discharge from the hospital after undergoing an above-the-knee amputation. Which instructions should the nurse include in the teaching plan for this client? Select all that apply.

☐ 1. Massage the stump away from the suture line.
☐ 2. Don't apply heat to ease pain.
☐ 3. Report twitching, spasms, or phantom limb pain immediately.
☐ 4. Avoid exposing the skin around the stump to excessive perspiration.
☐ 5. Be sure to perform the prescribed exercises.
☐ 6. Rub the stump with a dry washcloth for 4 minutes three times per day if the stump is sensitive to touch.

Answer: 4, 5, 6. The nurse should advise the client to avoid exposing the skin around his stump to excessive perspiration, which can be irritating. She should tell him to perform prescribed exercises to help minimize complications. In addition, the nurse should tell the client that if the stump is sensitive to touch, he should rub it with a dry washcloth for 4 minutes three times per day. The nurse should tell the client to massage the stump toward — not away from — the suture line to mobilize the scar and to prevent its adherence to bone. The client may experience twitching, spasms, or phantom limb pain while his muscles adjust to the amputation. This is a normal reaction and need not be reported. The nurse should advise the client that he can ease these symptoms with heat, massage, or gentle pressure.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

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36. A client is diagnosed with gout. Which foods should the nurse instruct the client to avoid? Select all that apply.

☐ 1. Green leafy vegetables
☐ 2. Liver
☐ 3. Cod
☐ 4. Chocolate
☐ 5. Sardines
☐ 6. Eggs
☐ 7. Whole milk

Answer: 2, 3, 5. The client with gout should avoid foods that are high in purines, such as liver, cod, and sardines. Other foods that should be avoided include anchovies, kidneys, sweetbreads, lentils, and alcoholic beverages, especially beer and wine. Green leafy vegetables, chocolate, eggs, and whole milk aren't high in purines and, therefore, aren't restricted in the diet of a client with gout.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

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37. A client is about to undergo total hip replacement surgery. Before the surgery, the nurse conducts a preoperative teaching session with him. The nurse can tell that her teaching has been effective when the client verbalizes the importance of which actions? Select all that apply.

☐ 1. Keeping his legs apart while lying in bed
☐ 2. Periodically tightening his leg muscles
☐ 3. Internally rotating his feet
☐ 4. Bending to pick items up from the floor
☐ 5. Sleeping in a back- or side-lying position

Answer: 1, 2, 5. After hip replacement surgery, the client should avoid internally rotating his feet and bending more than 90 degrees. These activities can compromise the hip joint. The client should lie with his legs abducted. Leg strengthening exercises, such as periodically tightening the leg muscles, are recommended to maintain muscle strength and reduce the risk of thrombus formation. A back- or side-lying position is acceptable; however, some physicians tell their clients not to lie on the side where the hip was replaced.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

38. A client who was involved in a motor vehicle accident has a fractured femur. The nurse caring for the client identifies *Acute pain* as one of the nursing diagnoses in his care plan. Which nursing interventions are appropriate? Select all that apply.

☐ 1. Tell the client which pain management option to use.
☐ 2. Encourage the client to use as little pain medication as possible to avoid addiction.
☐ 3. Avoid alternative and supplementary pain control techniques.
☐ 4. Evaluate the client's perception of pain.
☐ 5. Ask the client about methods he previously used to alleviate pain.

Answer: 4, 5. The nurse should begin by evaluating the client's perception of pain, including characteristics, and methods he previously found effective in managing pain. These interventions provide a baseline from which the nurse can plan interventions and evaluate their success. The nurse should allow the client to decide which pain control management techniques to use to help increase his feeling of being in control of his situation. Analgesics should be administered as needed to relieve pain. Addiction shouldn't be a concern at this time. After receiving analgesics, the client should indicate that he feels more comfortable, by reporting pain as a score of 3 or less on a scale of 0 to 10 (0 being without pain). The nurse should teach the client alternative and supplementary pain control techniques, such as imagery, distraction, and heat and cold application. These techniques provide the client with options for dealing with pain.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

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39. A client with a history of epilepsy is admitted to the medical-surgical unit. While assisting the client from the bathroom, the nurse observes the start of a tonic-clonic seizure. Which nursing interventions are appropriate for this client? Select all that apply.

☐ 1. Assist the client to the floor.
☐ 2. Turn the client to his side.
☐ 3. Place a pillow under the client's head.
☐ 4. Give the prescribed dose of oral phenytoin (Dilantin).
☐ 5. Insert an oral suction device to remove secretions in the mouth.

Answer: 1, 2, 3. During a seizure, the nurse should assist the client to the floor to reduce the risk of falling and turn the client on his side to help clear the mouth of oral secretions. If available, it's appropriate to place a pillow under client's head to protect him from injury. It's inappropriate to introduce anything into the mouth during a seizure because of the risk of choking or compromising the airway; therefore, oral medications and suction devices shouldn't be used.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

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40. The nurse is assigned to care for a client with early stage Alzheimer's disease. Which nursing interventions should be included in the client's care plan? Select all that apply.

☐ 1. Make frequent changes in the client's routine.
☐ 2. Engage the client in complex discussions to improve memory.
☐ 3. Furnish the client's surroundings with familiar possessions.
☐ 4. Assist the client with activities of daily living (ADLs) as necessary.
☐ 5. Assign tasks in simple steps.

Answer: 3, 4, 5. A client with Alzheimer's disease experiences progressive deterioration in cognitive functioning. Familiar possessions may help to orient the client. The client should be encouraged to perform ADLs as much as possible but may need assistance with certain activities. Using a step-by-step approach helps the client complete tasks independently. A client with Alzheimer's disease functions best with consistent routines. Complex discussions don't improve the memory of a client with Alzheimer's disease.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

41. A client is brought to the intensive care unit after undergoing intracranial surgery to remove a tumor from the left cerebral hemisphere. Which nursing interventions are appropriate for the client's postoperative care? Select all that apply.

☐ 1. Place a pillow under the client's head so that his neck is flexed.
☐ 2. Turn the client on his right side.
☐ 3. Place pillows under the client's legs to promote hip flexion and venous return.
☐ 4. Maintain the client in the supine position.
☐ 5. Apply a soft collar to keep the client's neck in a neutral position.

Answer: 2, 5. The client should be turned on his right side because lying on the left side would cause the brain to shift into the space previously occupied by the tumor. A soft collar keeps the neck in a neutral position, allowing for adequate perfusion and venous drainage of the brain. Placing a pillow under the head flexes the neck and impairs circulation to the brain. Flexion of the hip increases intracranial pressure and, therefore, is contraindicated. Exclusive use of the supine position isn't indicated.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

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42. The nurse is planning care for a client with multiple sclerosis. Which problems should the nurse expect the client to experience? Select all that apply.

☐ 1. Vision disturbances
☐ 2. Coagulation abnormalities
☐ 3. Balance problems
☐ 4. Immunity compromise
☐ 5. Mood disorders

Answer: 1, 3, 5. Multiple sclerosis, a neuromuscular disorder, may cause vision disturbances, balance problems, and mood disorders. Multiple sclerosis doesn't cause coagulation abnormalities or immunity problems.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

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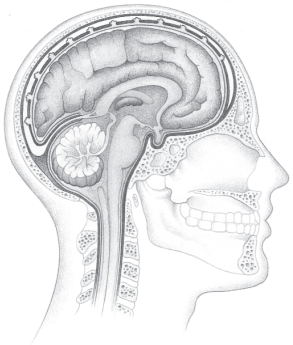
43. The nurse is teaching a client with trigeminal neuralgia how to minimize pain episodes. Which comments by the client indicate that he understands the instructions? Select all that apply.

☐ 1. "I'll eat food that's very hot."
☐ 2. "I'll try to chew my food on the unaffected side."
☐ 3. "I can wash my face with cold water."
☐ 4. "Drinking fluids at room temperature should reduce pain."
☐ 5. "If tooth brushing is too painful, I'll try to rinse my mouth instead."

Answer: 2, 4, 5. The facial pain of trigeminal neuralgia is triggered by mechanical or thermal stimuli. Chewing food on the unaffected side and rinsing the mouth rather than brushing teeth reduce mechanical stimulation. Drinking fluids at room temperature reduces thermal stimulation. Eating hot food and washing the face with cold water are likely to trigger pain.

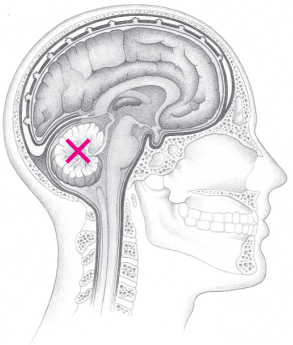
Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

44. A client is experiencing problems with balance and fine and gross motor function. Identify that area of the client's brain that's malfunctioning.



Answer: The cerebellum is the portion of the brain that controls balance and fine and gross motor function.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension



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45. The nurse is caring for a client with pneumonia. The physician orders 600 mg of ceftriaxone (Rocephin) oral suspension to be given once per day. The medication label indicates that the strength is 125 mg/5 ml. How many milliliters of medication should the nurse pour to administer the correct dose? Record your answer using a whole number.

_____ milliliters

Answer: 24. The correct formula to calculate a drug dosage is:

Dose on hand ÷ Quantity on hand = Dose desired ÷ X

Therefore:

125 mg ÷ 5 ml = 600 mg ÷ X
X = 24 ml

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

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46. The nurse is caring for a client who's scheduled for a bronchoscopy. Which interventions should the nurse perform to prepare the client for this procedure? Select all that apply.

☐ 1. Explain the procedure.
☐ 2. Withhold food and fluids for 2 hours before the test.
☐ 3. Provide a clear liquid diet for 6 to 12 hours before the test.
☐ 4. Confirm that a signed informed consent form has been obtained.
☐ 5. Ask the client to remove his dentures.
☐ 6. Administer atropine and a sedative.

Answer: 1, 4, 5, 6. All procedures must be explained to the client to obtain informed consent and to reduce anxiety. A signed informed consent form is required for all invasive procedures. Dentures need to be removed for bronchoscopy because they may become dislodged during the procedure. Atropine is administered before bronchoscopy to decrease secretions. A sedative may be given to relax the client. Food and fluids are restricted for 6 to 12 hours before the test to avoid the risk of aspiration during the procedure.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

47. A client has just undergone a bronchoscopy. Which nursing interventions are appropriate after this procedure? Select all that apply.

☐ 1. Keep the client flat for at least 2 hours.
☐ 2. Provide sips of water to moisten the client's mouth.
☐ 3. Withhold food and fluids until the gag reflex returns.
☐ 4. Monitor for hemoptysis and frank bleeding.
☐ 5. Resume food and fluids when the client's voice returns.
☐ 6. Monitor the client's vital signs.

Answer: 3, 4, 6. To prevent aspiration, the client shouldn't receive food or fluids until his gag reflex returns. Although a small amount of blood in the sputum is expected if a biopsy was performed, frank bleeding indicates hemorrhage and should be reported to the physician immediately. Vital signs should be monitored after the procedure because a vasovagal response may cause bradycardia, laryngospasm can affect respirations, and fever may develop within the 24 hours of the procedure. To reduce the risk of aspiration, the client should be placed in a semi-Fowler's or side-lying position after the procedure until his gag reflex returns. The client doesn't lose his voice after a bronchoscopy, so voice shouldn't be used as a gauge for resuming food and fluid intake.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

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48. The nurse is caring for a client with pneumonia. The nurse should expect to observe which signs and symptoms when caring for the client? Select all that apply.

☐ 1. Dry cough
☐ 2. Fever
☐ 3. Bradycardia
☐ 4. Pericardial friction rub
☐ 5. Use of accessory muscles during respiration
☐ 6. Crackles or rhonchi

Answer: 2, 5, 6. The client with pneumonia may have a fever, use accessory muscles for breathing, and exhibit crackles or rhonchi on auscultation. Other signs and symptoms of pneumonia include fever, malaise, pleuritic pain, pleural friction rub, dyspnea, tachypnea, tachycardia, and a cough that produces rusty green or bloody sputum (in pneumococcal pneumonia) or yellow-green sputum (in bronchopneumonia). A dry cough, bradycardia, and a pericardial friction rub aren't manifestations of pneumonia.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

49. The nurse is caring for a client with tuberculosis. Which precautions should the nurse take when providing care for this client? Select all that apply.

☐ 1. Wear gloves when handling tissues containing sputum.
☐ 2. Wear a face mask at all times.
☐ 3. Keep the client in strict isolation.
☐ 4. When the client leaves the room for tests, have all people in contact with him wear a mask.
☐ 5. Keep the client's door open to allow fresh air into room and prevent social isolation.
☐ 6. Wash hands after direct contact with the client or contaminated articles.

Answer: 1, 2, 6. The nurse should always wear gloves when handling items contaminated with sputum or body secretions. All staff and visitors must wear face masks when coming in contact with the client in his room; masks must be discarded before leaving the client's room. Hand washing is required after direct contact with the client or contaminated articles. Strict isolation isn't required if the client adheres to special respiratory precautions. The client, not the people in contact with him, must wear a mask when he leaves the room for tests. The client should be in a negative-pressure, private room, and the door should remain closed at all times to prevent the spread of infection.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Application

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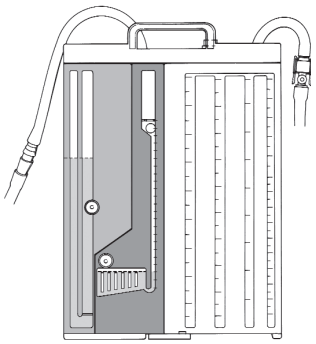
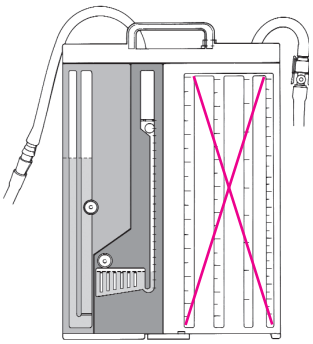
50. The nurse is caring for a client who has a chest tube connected to a three-chamber drainage system without suction. Identify the chamber that collects drainage from the client.

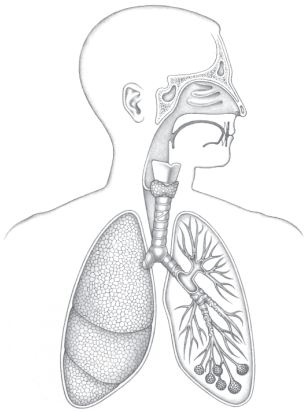


Answer: The drainage chamber is on the right. It has three calibrated columns that show the amount of drainage collected. When the first column fills, drainage empties into the second; when the second column fills, drainage flows into the third. The water-seal chamber is located in the center. The suction-control chamber is on the left.



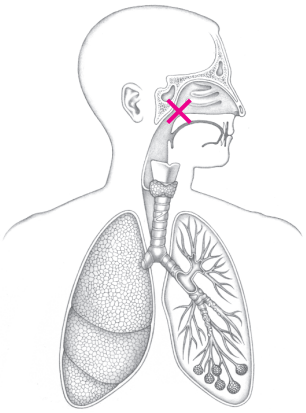
Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

51. The nurse is about to perform nasopharyngeal suctioning on a client who recently had a stroke. Identify the area where the tip of the suction catheter should be placed.



Answer: When performing nasopharyngeal suctioning, the tip of the catheter is introduced into the naris and advanced to the pharynx. The tip remains above the posterior wall of the mouth.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application



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52. A client is admitted with chronic obstructive pulmonary disease (COPD). Which signs and symptoms are characteristic of COPD? Select all that apply.

☐ 1. Decreased respiratory rate
☐ 2. Dyspnea on exertion
☐ 3. Barrel chest
☐ 4. Shortened expiratory phase
☐ 5. Clubbed fingers and toes
☐ 6. Fever

Answer: 2, 3, 5. Typical findings for clients with COPD include dyspnea on exertion, a barrel chest, and clubbed fingers and toes. Clients with COPD are usually tachypneic with a prolonged expiratory phase. Fever isn't associated with COPD, unless an infection is also present.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

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53. The nurse is caring for a client who has a urinary tract infection (UTI). Which statements should the nurse expect the client to make? Select all that apply.

☐ 1. "I urinate large amounts."
☐ 2. "I need to urinate frequently."
☐ 3. "It burns when I urinate."
☐ 4. "My urine smells sweet."
☐ 5. "I need to urinate urgently."

Answer: 2, 3, 5. Typical findings for a client with a UTI include urinary frequency, burning on urination, and urinary urgency. The client with a UTI typically reports that he voids frequently in small amounts, not large amounts. The client with a UTI complains of foul-smelling, not sweet-smelling, urine.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

54. The nurse is teaching a client how to collect a 24-hour urine specimen for creatinine clearance. Which directions should the nurse give the client? Select all that apply.

☐ 1. "Save the first voiding and record the time."
☐ 2. "Discard the first voiding and record the time."
☐ 3. "Clean the perineal area before each voiding."
☐ 4. "Refrigerate the urine sample or keep it on ice."
☐ 5. "At the end of 24 hours, void and save the urine."
☐ 6. "At the end of 24 hours, void and discard the urine."

Answer: 2, 4, 5. When collecting a 24-hour urine sample, the client should void, discard the urine, and record the time. This assures that the client starts the collection period with an empty bladder. At the end of the 24-hour collection period, the client should void and save the urine. The first voiding isn't used because it isn't known how long the urine has been in the bladder. The urine sample should be refrigerated or kept on ice to keep it fresh. The perineum should be cleaned before obtaining a clean-catch urine specimen for culture and sensitivity. It isn't necessary to clean the perineum for a 24-hour urine sample.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

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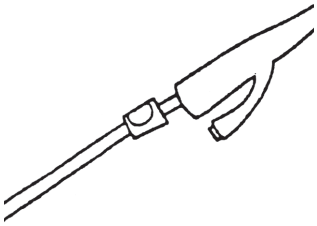
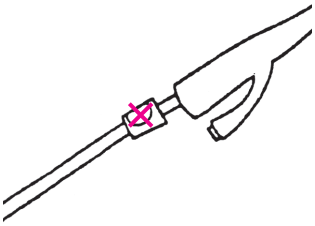
55. The nurse is collecting a sterile urine sample for culture and sensitivity from an indwelling urinary catheter. Identify the area on the indwelling urinary catheter where the nurse should insert the sterile syringe to obtain the urine sample.



Answer: A sterile urine specimen is obtained from an indwelling urinary catheter by clamping the catheter briefly, cleaning the rubber port with an alcohol wipe, and using a sterile syringe and needle to withdraw the urine.



Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

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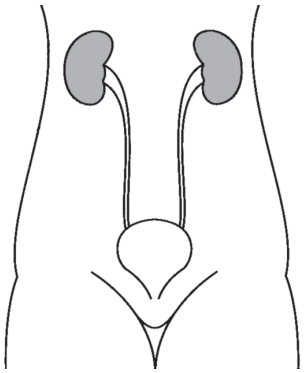
56. The nurse is completing an intake and output record for a client who's receiving continuous bladder irrigation after transurethral resection of the prostate. How many milliliters of urine should the nurse record as output for her shift if the client received 1,800 ml of normal saline irrigating solution and the output in the urine drainage bag is 2,400 ml? Record your answer using a whole number.

_____ milliliters

Answer: 600. To calculate urine output, subtract the amount of irrigation solution infused into the bladder from the total amount of fluid in the drainage bag.

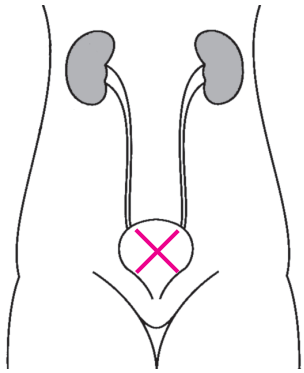
Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

57. The nurse is caring for a client with a cystostomy for urine drainage. Identify the area where the nurse should check for cystostomy placement.



Answer: In a cystostomy, a catheter is inserted percutaneously through the suprapubic area into the bladder.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Comprehension



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58. The nurse is caring for a client who's receiving furosemide (Lasix) for heart failure. The nurse should monitor the client for which adverse effects of the drug? Select all that apply.

☐ 1. Hypertension
☐ 2. Hyperkalemia
☐ 3. Transient deafness
☐ 4. Leukopenia
☐ 5. Pancreatitis

Answer: 3, 4, 5. Some of the adverse effects associated with furosemide therapy include, orthostatic hypotension (not hypertension), hypokalemia (not hyperkalemia), transient deafness, leukopenia, and pancreatitis.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

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59. A client who suffered a stroke has an enteral feeding tube in place. Which nursing interventions are appropriate when administering phenytoin (Dilantin) to this client? Select all that apply.

☐ 1. Withhold enteral feedings for 1 hour before and 1 hour after phenytoin administration.
☐ 2. Monitor phenytoin levels closely
☐ 3. Tell the client that switching brands after discharge might help reduce costs
☐ 4. Stress the importance of good oral hygiene
☐ 5. Inform the client that the drug may color urine pink, red, or reddish brown

Answer: 1, 2, 4, 5. The nurse should withhold enteral feedings for 1 hour before and 1 hour after phenytoin administration. She should monitor phenytoin levels closely to prevent toxicity. The nurse should also instruct the client to avoid switching brands or dosage forms; stress the importance of good oral hygiene; and inform the client that phenytoin may color urine pink, red, or reddish brown.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

60. A client with deep vein thrombosis has an I.V. infusion of heparin sodium infusing at 1,500 U/hour. The concentration in the bag is 25,000 U/500 ml. How many milliliters of solution should the nurse document as intake from this infusion for an 8-hour shift? Record your answer using a whole number.

_____ millliliters

Answer: 240. First, calculate how many units are in each milliliter of the medication:

$$25{,}000 \text{ U} \div 500 \text{ ml} = 50 \text{ U} \div \text{ml}$$

Next, calculate how many milliliters the client receives each hour:

$$1 \text{ ml}/50 \text{ U} \times 1{,}500 \text{ U/hour} = 30 \text{ ml/hour}$$

Lastly, multiply by 8 hours:

$$30 \text{ ml/hour} \times 8 \text{ hours} = 240 \text{ ml}$$

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Analysis

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61. The nurse suspects that her adult client is in cardiac arrest. According to the American Heart Association, the nurse should perform the actions listed below. Order these actions in the sequence that the nurse should perform them.

Unordered responses

1. Activate the emergency response system.
2. Evaluate responsiveness.
3. Call for a defibrillator.
4. Provide two slow breaths.
5. Check for a pulse.
6. Check for breathing.

Answer:

Ordered responses

2. Evaluate responsiveness.
1. Activate the emergency response system.
3. Call for a defibrillator.
6. Check for breathing.
4. Provide two slow breaths.
5. Check for a pulse.

According to the American Heart Association, the nurse should first evaluate responsiveness. If the client is unresponsive, the nurse should activate the emergency response system, and then call for a defibrillator. Next, the nurse should check for breathing by opening the airway and then looking, listening, and feeling for respirations. If respirations aren't present, the nurse should administer two slow breaths, then check for a pulse. If no pulse is present, the nurse should start chest compressions.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

62. A client is prescribed lisinopril (Zestril) for treatment of hypertension. The nurse should teach him about which common adverse effects of angiotensin-converting enzyme (ACE) inhibitors? Select all that apply.

☐ 1. Constipation
☐ 2. Dizziness
☐ 3. Headache
☐ 4. Hyperglycemia
☐ 5. Hypotension
☐ 6. Impotence

Answer: 2, 3, 5. Dizziness, headache, and hypotension are all common adverse effects of lisinopril and other ACE inhibitors. Lisinopril may cause diarrhea, not constipation. Lisinopril isn't known to cause hyperglycemia or impotence.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

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63. The nurse is counseling a 52-year-old client about risk factors for hypertension. Which risk factors should the nurse list for primary hypertension? Select all that apply.

☐ 1. Obesity
☐ 2. Head injury
☐ 3. Stress
☐ 4. Hormonal contraceptives
☐ 5. High intake of sodium or saturated fat

Answer: 1, 3, 5. Obesity, stress, high intake of sodium or saturated fat, and family history are all risk factors for primary hypertension. Diabetes mellitus, head injury, and hormonal contraceptives are risk factors for secondary hypertension.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

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64. A 28-year-old client is admitted with inflammatory bowel syndrome (Crohn's disease). Which therapies should the nurse expect to be part of the care plan? Select all that apply.

☐ 1. Lactulose therapy
☐ 2. High-fiber diet
☐ 3. High-protein milkshakes
☐ 4. Corticosteroid therapy
☐ 5. Antidiarrheal medications

Answer: 4, 5. Corticosteroids, such as prednisone, reduce the signs and symptoms of diarrhea, pain, and bleeding by decreasing inflammation. Antidiarrheals, such as diphenoxylate (Lomotil), combat diarrhea by decreasing peristalsis. Lactulose is used to treat chronic constipation and would aggravate the symptoms. A high-fiber diet and milk and milk products are contraindicated in clients with Crohn's disease because they may promote diarrhea.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Analysis

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65. The nurse is awaiting the arrival of a client from the emergency department who has a left ventricular myocardial infarction and is being admitted. In caring for this client, the nurse should be alert for which signs and symptoms of left-sided heart failure? Select all that apply.

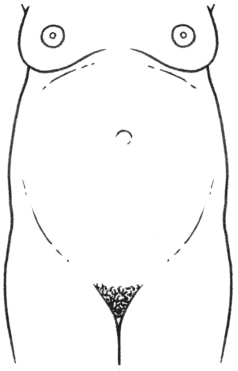
☐ 1. Jugular vein distention
☐ 2. Hepatomegaly
☐ 3. Dyspnea
☐ 4. Crackles
☐ 5. Tachycardia
☐ 6. Right upper quadrant pain

Answer: 3, 4, 5. Signs and symptoms of left-sided heart failure include dyspnea, orthopnea, and paroxysmal nocturnal dyspnea. Other signs and symptoms are fatigue, nonproductive cough and crackles, hemoptysis, point of maximal impulse displaced toward the left anterior axillary line, tachycardia and S_3 and S_4 heart sounds, and cool, pale skin. Jugular vein distention, hepatomegaly, and right upper quadrant pain are all signs of right-sided heart failure.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

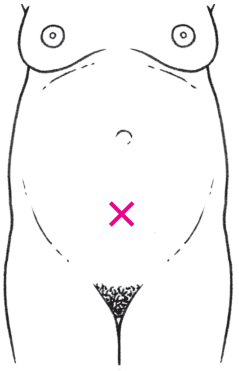
Maternal-infant nursing

1. The nurse is assisting with a prenatal assessment on a client who's 32 weeks pregnant. She performs Leopold's maneuvers and determines that the fetus is in the cephalic position. Identify where the nurse should place the Doppler to auscultate fetal heart sounds.



Answer: When the fetus is in the cephalic position (head down), fetal heart tones are best auscultated midway between the symphysis pubis and the umbilicus. When the fetus is in the breech position, fetal heart sounds are best heard at or above the level of the umbilicus.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Analysis



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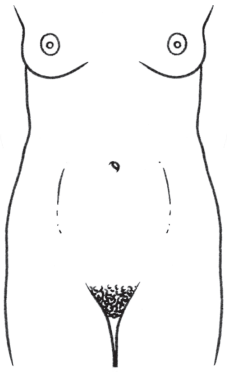
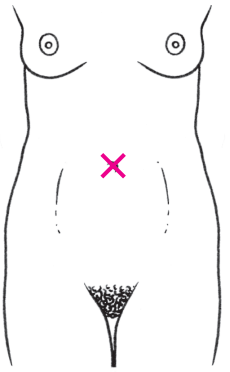
2. To measure fundal height, the nurse is palpating the uterus of a client who's 20 weeks pregnant. Identify the area on the abdomen where the nurse should expect to feel the uterine fundus.



Answer: At 20 weeks, fundal height should be at approximately the umbilicus. Fundal height should be measured from the symphysis pubis to the top of the uterus. Serial measurements assess fetal growth over the course of the pregnancy. Between weeks 18 and 34, the centimeters measured correlate approximately with the week of gestation.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension



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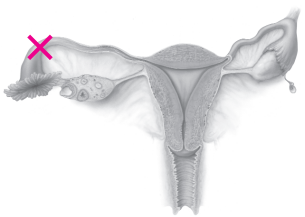
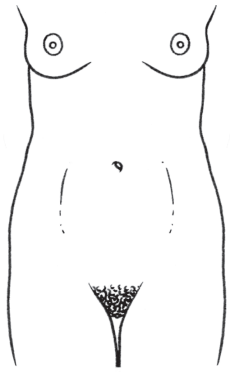
3. The nurse is teaching a course on the anatomy and physiology of reproduction. In the illustration of the female reproductive organs, identify the area where fertilization occurs.

Answer: After ejaculation, the sperm travel by flagellar movement through the fluids of the cervical mucus into the fallopian tube to meet the descending ovum in the ampulla. This is where fertilization occurs.



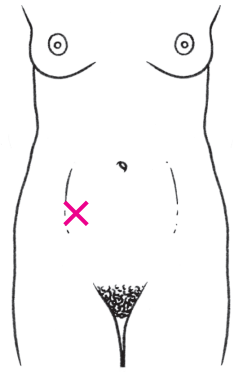
Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

4. In early pregnancy, some clients complain of abdominal pain or pulling. Identify the area most commonly associated with this pain.



Answer: As the uterus grows in early pregnancy, it deviates physically to the right. This shift, or dextrorotation, is due to the presence of the rectosigmoid colon in the left lower quadrant. As a result, many women complain of pain in the right lower quadrant.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Analysis



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5. The nurse is assisting in monitoring a client who's receiving oxytocin (Pitocin) to induce labor. The nurse should be alert to which maternal adverse reactions? Select all that apply.

☐ 1. Hypertension
☐ 2. Jaundice
☐ 3. Dehydration
☐ 4. Fluid overload
☐ 5. Uterine tetany
☐ 6. Bradycardia

Answer: 1, 4, 5. Adverse effects of oxytocin in the mother include hypertension, fluid overload, and uterine tetany. Oxytocin's antidiuretic effect increases renal reabsorption of water, leading to fluid overload — not dehydration. Jaundice and bradycardia are adverse effects that may occur in the neonate. Tachycardia — not bradycardia — is reported as a maternal adverse effect.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

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6. The nurse is caring for a client who has been diagnosed with abruptio placentae. What signs and symptoms of abruptio placentae should the nurse expect to find when she's collecting data on this client? Select all that apply.

☐ 1. Vaginal bleeding
☐ 2. Decreased fundal height
☐ 3. Uterine tenderness on palpation
☐ 4. Soft abdomen on palpation
☐ 5. Hypotonic, small uterus
☐ 6. Abnormal fetal heart tones

Answer: 1, 3, 6. Painful vaginal bleeding, uterine tenderness on palpation, and abnormal or absent heart tones are signs of abruptio placentae. Fundal height increases during abruptio placentae as a result of blood becoming trapped behind the placenta. The abdomen would feel hard and boardlike on palpation as blood permeates the myometrium and causes uterine irritability. The uterus would also be hypertonic and enlarged.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

7. A nurse is assigned to assist with the admission of a client who's in labor. Which actions are appropriate? Select all that apply.

☐ 1. Asking about the estimated date of delivery (EDD)
☐ 2. Estimating fetal size
☐ 3. Taking maternal and fetal vital signs
☐ 4. Asking about the woman's last menses
☐ 5. Administering an analgesic
☐ 6. Asking about the amount of time between contractions

Answer: 1, 3, 6. The nurse should ask about the EDD and then compare the response to the information in the prenatal record. If the fetus is preterm, special precautions and equipment are necessary. Maternal and fetal vital signs should be obtained to evaluate the well-being of the client and fetus. Determining how far apart the contractions are provides the health care team with valuable baseline information. The physician estimates the size of the fetus. It wouldn't be appropriate for the nurse to ask about the client's last menses. This information should be collected at the first prenatal visit. It would be premature to administer an analgesic, which could slow or stop labor contractions.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

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8. The nurse is assisting in caring for a client who has just given birth to a neonate through vaginal delivery. The nurse is monitoring for signs of placental separation. Which signs indicate that the placenta has separated? Select all that apply.

☐ 1. Shortening of the umbilical cord
☐ 2. Sudden, sharp abdominal pain
☐ 3. Sudden gush of vaginal blood
☐ 4. Change in shape of the uterus
☐ 5. Lengthening of the umbilical cord

Answer: 3, 4, 5. Signs of placental separation include lengthening of the umbilical cord, a sudden gush of blood from the vagina, a firmly contracted uterus, and change in uterine shape from discoid to globular. Sudden, sharp abdominal pain could indicate uterine rupture.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

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9. When examining a client who gave birth 3 hours ago, the nurse finds that the client has completely saturated a perineal pad within 15 minutes. Which actions should the nurse take? Select all that apply.

☐ 1. Begin an I.V. infusion of lactated Ringer's solution.
☐ 2. Check the client's vital signs.
☐ 3. Palpate the client's fundus.
☐ 4. Place the client in high Fowler's position.
☐ 5. Administer a pain medication.

Answer: 2, 3. Checking vital signs provides information about the client's circulatory status and identifies significant changes that may need to be reported to the physician. By palpating the client's fundus, the nurse also gains valuable assessment data. A boggy uterus may lead to excessive bleeding. Starting an I.V. infusion requires a physician's order. Placing the client in high Fowler's position may lower the blood pressure and be harmful to the client. Administration of a pain medication doesn't address the current problem.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

10. The nurse observes several interactions between a mother and her new son. Which behaviors by the mother would the nurse identify as evidence of mother-infant attachment? Select all that apply.

☐ 1. Talks and coos to her son
☐ 2. Cuddles her son close to her
☐ 3. Doesn't make eye contact with her son
☐ 4. Requests the nurse to take the baby to the nursery for feedings
☐ 5. Encourages the father to hold the baby
☐ 6. Takes a nap when the baby is sleeping

Answer: 1, 2. Talking to, cooing to, and cuddling her son are positive signs that the mother is adapting to her new role. Avoiding eye contact is a sign that the mother isn't bonding with her baby. Eye contact, touching, and speaking are important to establish attachment with an infant. Feeding the baby is an important role of a new mother and facilitates attachment. Encouraging the dad to hold the baby facilitates attachment between the newborn and the father. Resting while the infant is sleeping conserves needed energy and allows the mother to be alert and awake when her infant is awake; however it isn't evidence of bonding.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

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11. The nurse is instructing the client on breast-feeding. Which instructions should she include to help the mother prevent mastitis? Select all that apply.

☐ 1. "Wash your nipples with soap and water."
☐ 2. "Change the breast pads frequently."
☐ 3. "Expose your nipples to air part of each day."
☐ 4. "Wash your hands before handling your breast and breast-feeding."
☐ 5. "Make sure that the baby grasps only the nipple."
☐ 6. "Release the baby's grasp on the nipple before removing him from the breast."

Answer: 2, 3, 4, 6. Mastitis is an infection commonly associated with a break in the skin surface of the nipple. However, measures to prevent cracked and fissured nipples help to prevent this condition. Changing breast pads frequently and exposing the nipples to air part of the day help keep the nipples dry and prevent irritation. If the client washes her hands before handling her breasts, she can reduce the chance of accidentally introducing organisms into the breasts. Releasing the baby's grasp on the nipple before removing the baby from the breast also reduces the chance of irritation. Nipples should be washed with water only. Soap can remove the body's natural oils and increases the chance of cracking. The baby should grasp both the nipple and areola.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

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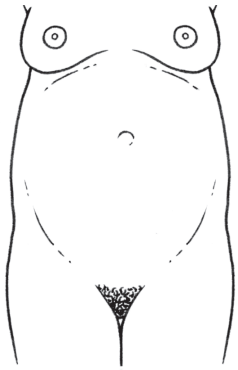
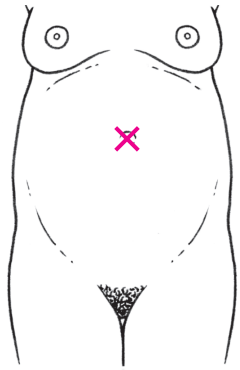
12. The nurse is palpating the uterine fundus of a client who delivered 8 hours ago. At what level in the abdomen would the nurse expect to feel the fundus?



Answer: The nurse should be able to feel the uterus at the level of the umbilicus from 1 hour after birth to approximately 24 hours after birth.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension



13. The nurse is assisting in developing a care plan for a client with an episiotomy. Which interventions would be included for the nursing diagnosis *Acute pain related to perineal sutures*? Select all that apply.

☐ 1. Apply an ice pack intermittently to the perineal area for 3 days.
☐ 2. Avoid the use of topical pain gels.
☐ 3. Administer sitz baths three to four times per day.
☐ 4. Encourage the client to do Kegel exercises.
☐ 5. Limit the number of times the perineal pad is changed.

Answer: 3, 4. Sitz baths help decrease inflammation and tension in the perineal area. Kegel exercises improve circulation to the area and help reduce edema. Ice packs should be applied to the perineum for only the first 24 hours; after that time, heat should be used. Topical pain gels should be applied to the suture area to reduce discomfort, as ordered. The perineal pad should be changed frequently to prevent irritation caused by the discharge.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

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14. In the nursery, the nurse is performing a neurologic assessment on a 1-day-old neonate. Which findings would indicate possible asphyxia in utero? Select all that apply.

☐ 1. The neonate grasps the nurse's finger when she puts it in the palm of his hand.
☐ 2. The neonate does stepping movements when held upright with his sole touching a surface.
☐ 3. The neonate's toes don't curl downward when his soles are stroked.
☐ 4. The neonate doesn't respond when the nurse claps her hands above him.
☐ 5. The neonate turns toward an object when the nurse touches his cheek with it.
☐ 6. The neonate displays weak, ineffective sucking.

Answer: 3, 4, 6. Failure of the toes to curl downward when the soles are stroked and lack of response to a loud sound can be evidence that neurological damage from asphyxia has occurred. The normal responses would be that the toes curl downward with stroking and the arms and legs extend in response to a loud noise. Weak, ineffective sucking is another sign of neurologic damage; a neonate should root and suck when the side of his cheek is stroked. A neonate should also grasp a person's finger when it's placed in the palm of his hand, do stepping movements when held upright with the soles touching a surface, and turn toward object when his cheek is touched.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

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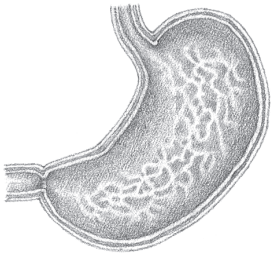
15. Which instructions should the nurse provide on discharge from the facility to the parents of a neonate who has been circumcised? Select all that apply.

☐ 1. The infant must void before being discharged home.
☐ 2. Apply petroleum jelly to the glans of the penis with each diaper change.
☐ 3. Tub baths for the infant are acceptable while the circumcision heals.
☐ 4. Report blood on the front of the diaper.
☐ 5. The circumcision requires care for 2 to 4 days after discharge.

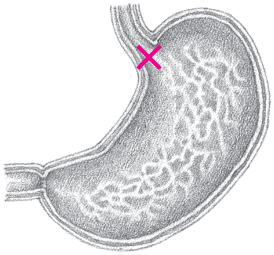
Answer: 1, 2, 5. It's necessary for a circumcised infant to void prior to discharge to ensure that the urethra isn't obstructed. A lubricating ointment, such as petroleum jelly, should be applied to the glans with each diaper change. Typically, the penis heals within 2 to 4 days and circumcision care is needed only during that period. Parents should avoid giving the neonate tub baths until the circumcision heals to prevent infection; only sponge baths are appropriate. A small amount of bleeding is expected after circumcision; parents should report only large amounts of bleeding to the physician.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

16. A 14-day-old neonate is admitted for aspiration pneumonia. The results of a barium swallow confirm a diagnosis of gastroesophageal reflux with resulting aspiration pneumonia. Identify the area of the stomach that's weakened, contributing to the reflux.



Answer: Gastroesophageal reflux is a neuromotor disturbance in which the cardiac sphincter is lax and allows easy regurgitation of gastric contents into the esophagus, causing possible aspiration into the lungs. The cardiac sphincter is located between the stomach and the esophagus.



Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation.
Cognitive level: Comprehension

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17. The nurse is eliciting reflexes in a neonate during a physical examination. Identify the area the nurse would touch to elicit a plantar grasp reflex.

Answer: Touching the sole of the foot near the base of the digits elicits a plantar grasp reflex and causes flexion or grasping. This reflex disappears around age 9 months.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

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18. The nurse notes that at 5 minutes after birth, a neonate is pink, has a vigorous cry, cries when his soles are slapped, has a heart rate of 136 beats/minute. He's actively moving his arms and legs. What 5-minute Apgar score should the nurse record for this neonate?

Flow Chart

Sign	Apgar score		
	0	***1***	***2***
Heart rate	Absent	Less than 100 beats/minute (slow)	More than 100 beats/minute
Respiratory effort	Absent	Slow, irregular	Good crying
Muscle tone	Flaccid	Some flexion and resistance to extension of extremities	Active motion
Reflex irritability	No response	Grimace or weak cry	Vigorous cry
Color	Pallor, cyanosis	Pink body, blue extremities	Completely pink

☐ 1. 6
☐ 2. 7
☐ 3. 8
☐ 4. 10

Answer: 4. The Apgar score quantifies neonatal heart rate, respiratory effort, muscle tone, reflexes, and color. Each category is assessed 1 minute after birth and again 5 minutes later. Scores in each category range from 0 to 2, as shown at left. This neonate has a heart rate above 100 beats/minute, which equals 2; is pink in color, which equals 2; is actively moving his arms and legs, which equals 2; has a vigorous cry, which equals 2; and has a good response to slapping the soles, which equals 2. Therefore, the nurse should record a total Apgar score of 10.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

19. The nurse is demonstrating cord care to a mother of a neonate. Which actions should the nurse teach the mother? Select all that apply.

☐ 1. Keep the diaper below the cord.
☐ 2. Tug gently on the cord to remove it as it begins to dry.
☐ 3. Apply antibiotic ointment to the cord twice daily.
☐ 4. Only sponge-bathe the infant until his cord falls off.
☐ 5. Clean the length of the cord with alcohol several times daily.
☐ 6. Wash the cord with mild soap and water.

Answer: 1, 4, 5. The diaper should be positioned below the cord to allow for it to air dry and to prevent urine from getting on it. Instruct the parents to sponge-bathe the infant until the cord falls off; soap and water shouldn't be used. The entire cord should be cleaned with alcohol, using a cotton-tipped applicator or another appropriate method. Tell the parents not to pull on the cord; they should allow it to fall off naturally. Antibiotic ointments are contraindicated unless signs of infection are present.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Application

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20. A pregnant client at 32 weeks' gestation has mild preeclampsia. She's discharged to go home with instructions to remain on bed rest. She should also be instructed to call her physician if she experiences which symptoms? Select all that apply.

☐ 1. Headache
☐ 2. Increased urine output
☐ 3. Blurred vision
☐ 4. Difficulty sleeping
☐ 5. Epigastric pain
☐ 6. Severe nausea and vomiting

Answer: 1, 3, 5, 6. Headache, blurred vision, epigastric pain, and severe nausea and vomiting can indicate worsening maternal disease. Decreased, not increased, urine output is a concern because it could indicate renal impairment. Difficulty sleeping, a common complaint during the third trimester, is only a concern if it's caused by any of the other symptoms on the list.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

21. Assessment of a client progressing through labor reveals the following findings. Order the findings in the most likely sequence in which they would have occurred.
Unordered responses

1. Uncontrollable urge to push
2. Cervical dilation of 7 cm
3. 100% cervical effacement
4. Strong Braxton-Hicks contractions
5. Mild contractions lasting 20 to 40 seconds

Answer:
Ordered responses

4. Strong Braxton-Hicks contractions
5. Mild contractions lasting 20 to 40 seconds
2. Cervical dilation of 7 cm
3. 100% cervical effacement
1. Uncontrollable urge to push

Strong Braxton-Hicks contractions typically occur before the onset of true labor and are considered a preliminary sign of labor. During the latent phase of the first stage of labor, contractions are mild, lasting approximately 20 to 40 seconds. As the client progresses through labor, contractions increase in intensity and duration. In addition, cervical dilation occurs. Cervical dilation of 7 cm indicates that the client has entered the active phase of the first stage of labor. Together with cervical dilation, cervical effacement occurs. Effacement of 100% characterizes the transition phase of the first stage of labor. Progression into the second stage of labor is noted by the client's uncontrollable urge to push.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

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22. The nurse is evaluating a client who's 34 weeks pregnant for premature rupture of the membranes (PROM). Which findings indicate that PROM has occurred? Select all that apply.

☐ 1. Fernlike pattern when vaginal fluid is placed on a glass slide and allowed to dry
☐ 2. Acidic pH of fluid when tested with nitrazine paper
☐ 3. Presence of amniotic fluid in the vagina
☐ 4. Cervical dilation of 6 cm
☐ 5. Alkaline pH of fluid when tested with nitrazine paper
☐ 6. Contractions occurring every 5 minutes

Answer: 1, 3, 5. The fernlike pattern that occurs when vaginal fluid is placed on a glass slide and allowed to dry, presence of amniotic fluid in the vagina, and alkaline pH of fluid are all signs of ruptured membranes. The fernlike pattern seen when the fluid is allowed to dry on a slide is a result of the high sodium and protein content of the amniotic fluid. The presence of amniotic fluid in the vagina results from the expulsion of the fluid from the amniotic sac. Cervical dilation and regular contractions are signs of progressing labor but don't indicate PROM.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

23. A mother with a past history of varicose veins has just delivered her first baby. The nurse suspects that the mother has developed a pulmonary embolus. Which data would lead to this nursing judgment? Select all that apply.

☐ 1. Sudden dyspnea
☐ 2. Chills, fever
☐ 3. Diaphoresis
☐ 4. Hypertension
☐ 5. Confusion

Answer: 1, 3, 5. Sudden dyspnea with diaphoresis and confusion are classic signs and symptoms of dislodgment of a thrombus (stationary blood clot) from a varicose vein becoming an embolus (moving clot) that lodges itself into the pulmonary circulation. Chills and fever would indicate an infection. A client with an embolus could be hypotensive, not hypertensive.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

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24. At 5 minutes of age, a neonate is pink with acrocyanosis, has his knees flexed and fists clinched, has a whimpering cry, has a heart rate of 128, and withdraws his foot when slapped on the sole. What 5-minute Apgar score would the nurse record for this neonate?

Flow Chart

Sign	Apgar score		
	0	***1***	***2***
Heart rate	Absent	Less than 100 beats/minute (slow)	More than 100 beats/minute
Respiratory effort	Absent	Slow, irregular	Good crying
Muscle tone	Flaccid	Some flexion and resistance to extension of extremities	Active motion
Reflex irritability	No response	Grimace or weak cry	Vigorous cry
Color	Pallor, cyanosis	Pink body, blue extremities	Completely pink

☐ 1. 6
☐ 2. 7
☐ 3. 8
☐ 4. 10

Answer: 3. Apgar consists of a 0 to 2 point scoring system for a neonate immediately following birth and at 5 minutes of age. The nurse evaluates the neonate for heart rate, respiratory effort, muscle tone, reflex irritability, and color. This neonate has a heart rate above 100, which equals 2; pink color with acrocyanosis, which equals 1; is well-flexed, which equals 2; has a weak cry, which equals 1; and has a good response to slapping the soles of the feet, which equals 2. Therefore, the nurse should record a total Apgar score of 8.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

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25. A nurse is administering vitamin K (AquaMEPHYTON) to a neonate after delivery. The medication comes in a concentration of 2 mg/ml and the ordered dose is 0.5 mg to be given subcutaneously. How many milliliters should the nurse administer? Record your answer using two decimal places.

_____ milliliters

Answer: 0.25. Use the following formula to calculate drug dosages:

Dose on hand ÷ Quantity on hand = Dose desired ÷ X

Plug in the values and the equation is as follows:

2 mg ÷ ml = 0.5 mg ÷ X
X = 0.25 ml

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Analysis

Pediatric nursing

1. The physician orders digoxin 0.1 mg orally every morning for a 6-month-old infant with heart failure. Digoxin is available in a 400 mcg/ml concentration. How many milliliters of digoxin should the nurse give? Record your answer using two decimal places.

_____ milliliters

Answer: 0.25. To convert mg to mcg:

1,000 mcg ÷ 1 mg = X mcg ÷ 0.1 mg

X = 100 mcg

To calculate drug dose:

Dose on hand ÷ Quantity on hand = Dose desired ÷ X

400 mcg ÷ ml = 100 mcg ÷ X

X = 0.25 ml

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

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2. The nurse is preparing to administer chloramphenicol (Chloromycetin Otic) to a 2-year-old with an infection of the external auditory canal. The order reads, "2 gtt right ear t.i.d." Which steps should the nurse take to administer this medication? Select all that apply.

☐ 1. Wash her hands and arrange supplies at the bedside.
☐ 2. Warm the medication to body temperature.
☐ 3. Lie the child on his right side with his left ear facing up.
☐ 4. Examine the ear canal for drainage.
☐ 5. Gently pull the pinna up and back and instill the drops into the external ear canal.

Answer: 1, 2, 4. The nurse should prepare to instill the eardrops by washing her hands, gathering the needed supplies, and arranging them at the bedside. To avoid adverse effects resulting from eardrops that are too cold (such as vertigo, nausea, and pain), the medication should be warmed to body temperature in a bowl of warm water. The nurse should test the temperature of the drops by placing a drop on her wrist. Before instilling the drops, the ear canal should be examined for drainage that may reduce the medication's effectiveness. The child should be placed on his left side with his right ear facing up. For an infant or a child younger than age 3, gently pull the auricle down and back because the ear canal is straighter in children of this age-group.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

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3. The nurse is caring for a 1-month-old infant who fell from the changing table during a diaper change. Which signs and symptoms of increased intracranial pressure (ICP) is the nurse likely to find in a 1-month-old infant? Select all that apply.

☐ 1. Bulging fontanels
☐ 2. Decreased blood pressure
☐ 3. Increased pulse
☐ 4. High-pitched cry
☐ 5. Headache
☐ 6. Irritability

Answer: 1, 4, 6. Full, tense, bulging fontanels; a high-pitched cry; and irritability are signs and symptoms of increased ICP in a 1-month-old. With increased ICP, blood pressure rises while heart rate falls. The infant may have a headache, but the nurse is unable to evaluate this finding in an infant.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

4. The nurse is evaluating a 10-month-old infant during a checkup. Which developmental milestones would the nurse expect the infant to display? Select all that apply.

☐ 1. Holding head erect
☐ 2. Self-feeding
☐ 3. Demonstrating good bowel and bladder control
☐ 4. Sitting on a firm surface without support
☐ 5. Bearing the majority of his weight on his legs
☐ 6. Walking alone

Answer: 1, 4, 5. By age 3 months, an infant should be able to hold his head erect. By age 10 months, he should be able to sit on a firm surface without support and bear the majority of his weight on his legs (for example, he can walk while holding on to furniture). Feeding himself and controlling his bowels and bladder are developmental milestones of toddlers. By age 12 months, the infant should be able to stand alone and may take his first steps.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

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5. The nurse is teaching cardiopulmonary resuscitation (CPR) to the parents of a 1-month-old infant being discharged with an apnea monitor. Which steps are appropriate for performing CPR on an infant? Select all that apply.

☐ 1. Open the airway by hyperextending the head.
☐ 2. Pinch the nose before delivering a breath.
☐ 3. Check for a pulse by palpating the brachial artery.
☐ 4. Place the heel of one hand on lower third of sternum to perform compressions.
☐ 5. Compress the sternum ½″ to 1″.
☐ 6. Give 15 compressions to 2 breaths.

Answer: 3, 5, 6. When performing CPR on an infant, check for a brachial pulse by palpating the inside of the upper arm, midway between the elbow and shoulder. To provide compressions to an infant, compress the sternum ½″ to 1″ at a ratio of 15 compressions to 2 breaths. Tilting the head of an infant too far back can block, rather than open, the airway. To deliver a breath to an infant, the rescuer should cover the infant's mouth and nose with her mouth. When performing chest compressions on an infant, the tips of the middle and ring fingers should be placed on the sternum, one finger's width below the nipple line.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

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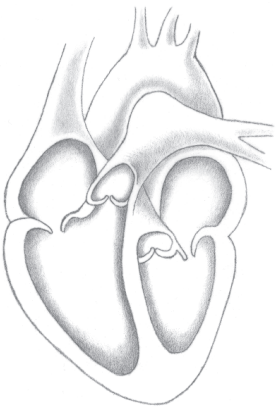
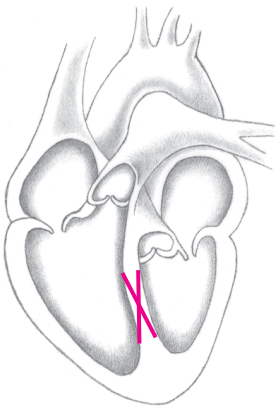
6. The nurse is providing preoperative teaching to the parents of a 9-month-old infant who's having surgery to repair a ventricular septal defect. Identify the area of the heart where the defect is located.

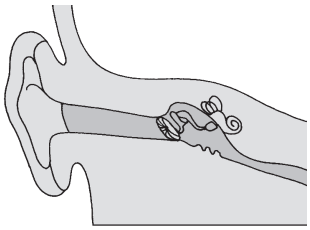


Answer: A ventricular septal defect is a hole in the septum between the ventricles. The defect can be anywhere along the septum but is most commonly located in the middle of the septum.

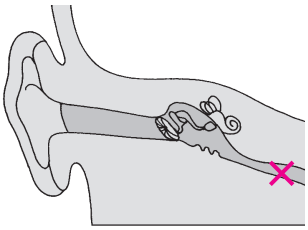


Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Comprehension

7. An 11-month-old is diagnosed with his second ear infection. The mother asks why children experience more ear infections than adults. The nurse shows the mother a diagram of the ear and explains the differences in the anatomy of a child. Identify the portion of the infant's ear that allows fluid to stagnate and act as a medium for bacteria.



Answer: The eustachian tube in an infant is shorter and wider than in an adult or an older child. It also slants horizontally. Because of these anatomical features, nasopharyngeal secretions can enter the middle ear more easily, stagnate, and tend to cause infections.



Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Comprehension

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8. The nurse is teaching the parents of an infant undergoing the repair of his cleft lip. Which instructions should the nurse give? Select all that apply.

☐ 1. Offer a pacifier as needed.
☐ 2. Lay the infant on his back or side to sleep.
☐ 3. Sit the infant up for each feeding.
☐ 4. Loosen the arm restraints every 4 hours.
☐ 5. Clean the suture line after each feeding by dabbing it with saline solution.
☐ 6. Give the infant extra care and support.

Answer: 2, 3, 5, 6. An infant with a repaired cleft lip should be put to sleep on his back or side to prevent trauma to the surgery site. He should be fed in an upright position with a syringe and attached tubing to prevent stress to the suture line from sucking. To prevent crusts and scarring, the suture line should be cleaned after each feeding by dabbing it with half-strength hydrogen peroxide or saline solution. The infant should receive extra care and support because he can't meet emotional needs by sucking. Extra care and support may also prevent crying, which stresses the suture line. Pacifiers shouldn't be used during the healing process because they stress the suture line. Arm restraints are used to keep the infant's hands away from the mouth and should be loosened every 2 hours.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Application

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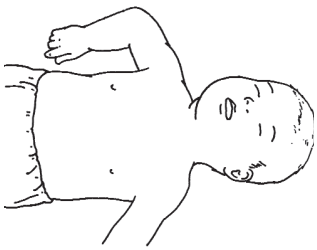
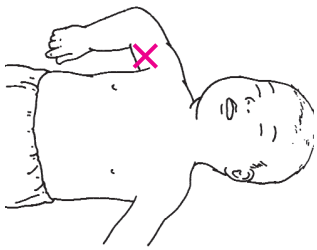
9. A 10-month-old is found floating face down in a swimming pool. A neighbor, who's a nurse, checks for the presence of respirations and a pulse. Identify the area that's most appropriate to check for a pulse.



Answer: An infant's pulse is most accessible at the brachial artery. The brachial artery is located inside the upper arm between the elbow and the shoulder. Cardiopulmonary resuscitation guidelines recommend using this area to assess for a pulse.



Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

10. A nurse at the family clinic receives a call from the mother of a 5-week-old infant. The mother states that her child was diagnosed with colic at the last checkup. Unfortunately, the symptoms have remained the same. Which teaching instructions are appropriate? Select all that apply.

☐ 1. Position the infant on his back after feedings.
☐ 2. Soothe the child by humming and rocking.
☐ 3. Immediately bring the infant to the emergency department.
☐ 4. Burp the infant adequately after feedings.
☐ 5. Provide small but frequent feedings to the infant.
☐ 6. Offer a pacifier if it isn't time for the infant to eat.

Answer: 2, 4, 5, 6. Colic consists of recurrent paroxysmal bouts of abdominal pain and is fairly common in infants. It usually disappears by age 3 months. Rocking, riding in a car, humming, and offering a pacifier may be used to comfort the infant. Decrease gas formation by frequent burping, give smaller feedings more frequently, and position the infant in an upright seat are also appropriate instructions. The infant shouldn't be positioned on his back after feedings because this increases gas formation. Colic is a manageable condition in the home. The infant doesn't need to be taken to the emergency department unless the symptoms worsen, a temperature accompanies the symptoms, or vomiting occurs with the symptoms.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

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11. The nurse is admitting a 14-month-old to the pediatric floor with a diagnosis of croup. Which characteristics would the nurse expect the toddler to have if he's developing normally? Select all that apply.

☐ 1. Strong hand grasp
☐ 2. Tendency to hold one object while looking for another
☐ 3. Recognition of familiar voices (smiles in recognition)
☐ 4. Presence of Moro reflex
☐ 5. Weight that's triple the birth weight
☐ 6. Closed anterior fontanelle

Answer: 1, 2, 3, 5. A strong hand grasp is demonstrated within the first month of life. Holding one object while looking for another is accomplished by the 20th week. Within the first year of life, the toddler masters smiling at familiar faces and voices, the Moro reflex disappears, and birth weight triples. The anterior fontanel closes at approximately age 18 months.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

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12. A 13-month-old is admitted to the pediatric unit with a diagnosis of gastroenteritis. The toddler has experienced vomiting and diarrhea for the past 3 days, and laboratory tests reveal that he's dehydrated. Which nursing interventions are correct to prevent further dehydration? Select all that apply.

☐ 1. Encourage the child to eat a balanced diet.
☐ 2. Give clear liquids in small amounts.
☐ 3. Give milk in small amounts.
☐ 4. Encourage the child to eat unsalted soups and broths.
☐ 5. Monitor the I.V. solution per the physician's order.
☐ 6. Withhold all solid food and liquids until the symptoms pass.

Answer: 2, 4, 5. A child experiencing nausea and vomiting wouldn't be able to tolerate a regular diet. He should be given sips of clear liquids, and the diet should be advanced as tolerated. Soups and broths without salt are appropriate clear liquids. Milk shouldn't be given because it can worsen the child's diarrhea. I.V. fluids should be monitored to maintain the fluid status and help to rehydrate the child. Solid foods may be withheld throughout the acute phase; however, clear fluids should be encouraged in small amounts (3 to 4 tablespoons every half hour).

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

13. A toddler is ordered 350 mg of amoxicillin (Augmentin) by mouth, four times per day. The pharmacy sends a bottle of amoxicillin with a concentration of 250 mg/5 ml. How many milliliters should the nurse administer per dose? Record your answer using a whole number.

_____ milliliters

Answer: 7. The formula used to calculate drug dosages:

Dose on hand ÷ Quantity on hand = Dose desired ÷ X

The equation in this example:

250 mg ÷ 5 ml = 350 mg ÷ X.

X = 7 ml

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

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14. A 3-year-old is admitted to the pediatric unit with pneumonia. He has a productive cough and appears to have difficulty breathing. The parents tell the nurse that the toddler hasn't been eating or drinking much and has been very inactive. Which interventions to improve airway clearance should be included by the nurse in the care plan? Select all that apply.

☐ 1. Restrict fluid intake.
☐ 2. Perform chest physiotherapy as ordered.
☐ 3. Encourage coughing and deep breathing.
☐ 4. Keep the head of the bed flat.
☐ 5. Perform postural drainage.
☐ 6. Maintain humidification with a cool mist humidifier.

Answer: 2, 3, 5, 6. Chest physiotherapy and postural drainage work together to help break up congestion and then drain secretions. Coughing and deep breathing are also effective to remove congestion. A cool mist humidifier helps loosen thick mucus and relax airway passages. Fluids should be encouraged—not restricted. The child should be placed in semi-Fowler's to high Fowler's position to facilitate breathing and promote optimal lung expansion.

Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

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15. The nurse is observing the parents of a 4-year-old who has been admitted to the hospital. Which actions indicate that the parents understand how to best minimize anxiety during their child's hospitalization? Select all that apply.

☐ 1. The parents bring the child's favorite toy to the hospital.
☐ 2. The parents explain all procedures to the child in great detail.
☐ 3. The parents remain at the child's side during the hospitalization.
☐ 4. The parents bring the child's siblings for a brief visit.
☐ 5. The parents leave the room when the child undergoes a painful procedure.
☐ 6. The parents punish the child if the child isn't cooperative.

Answer: 1, 3, 4. The most effective means of minimizing the child's anxiety during hospitalization is to have the parents stay with him. Having a familiar toy helps the child to deal with the anxiety of unfamiliar surroundings. Sibling visitation can also help to ease the child's anxiety. Explaining a procedure to a young child in great detail only maximizes fear. Parents can be effective in calming and comforting a child during painful procedures, so they should remain in the room. Rewards, not punishment, should be offered to a preschool child.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

16. A 5-year-old is admitted to the hospital for a tonsillectomy. After the surgery, the physician orders a clear liquid diet. The nurse is correct in giving the child which items? Select all that apply.

☐ 1. Cream of chicken soup
☐ 2. Orange juice
☐ 3. Ice cream
☐ 4. Apple juice
☐ 5. Lime gelatin
☐ 6. Chicken broth

Answer: 4, 5, 6. Clear liquids include clear broth, gelatin, clear juices, water, and ice chips. Cream of chicken soup, orange juice, and ice cream are included in a full liquid diet.
Client needs category: Physiological integrity
Client needs subcategory: Basic care and comfort
Cognitive level: Application

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17. The school nurse is conducting registration for a first grader. Which immunizations should the school nurse verify the child has had on entering school? Select all that apply.

☐ 1. Hepatitis B series
☐ 2. Diphtheria-tetanus-pertussis series
☐ 3. *Haemophilus influenzae* type b series
☐ 4. Varicella zoster
☐ 5. Pneumonia vaccine
☐ 6. Inactivated poliovirus series

Answer: 1, 2, 3, 6. Hepatitis B series, diphtheria-tetanus-pertussis series, *H. influenzae* type b series, and inactivated poliovirus series are immunizations that the child should receive before entering first grade. The varicella zoster vaccine is administered only if the child hasn't had chickenpox. Pneumonia vaccine isn't required or routinely given to children.
Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Knowledge

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18. A preschool child is in danger of becoming dehydrated as a result of vomiting and diarrhea. The nurse realizes that dehydration can be prevented if intake is sufficient to produce an hourly urine output of 3 ml/kg/hr. The preschooler weighs 44 lb. What's the minimum urine output in milliliters that should be achieved in an 8-hour shift in order to prevent dehydration? Record your answer using a whole number.

_____ milliliters

Answer: 480. First, convert the child's weight from pounds to kilograms. There are 2.2 kg in 1 lb. Thus, $44 \div 2.2 = 20$, and $3 \text{ ml} \times 20 \text{ kg} \times 8 \text{ hours} = 480$.
Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Comprehension

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19. An 11-year-old boy is brought to a rural clinic listless and pale. The parents state that the child had a "bad sore throat" 2 weeks ago and that they had him gargle with salt water. The parents report that they saw improvement but now the child has flulike symptoms. The child is diagnosed with rheumatic fever. Which signs and symptoms are associated with rheumatic fever? Select all that apply.

☐ 1. Nausea and vomiting
☐ 2. Polyarthritis
☐ 3. Chorea
☐ 4. High-grade fever
☐ 5. Carditis
☐ 6. Rash

Answer: 2, 3, 5, 6. Characteristic manifestations of rheumatic fever include polyarthritis, chorea, carditis, and a red rash. The child doesn't usually experience nausea and vomiting. He may have a minor low-grade fever in the afternoon.
Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Application

20. When talking with an 10-year-old child about death, the nurse should incorporate which guidelines? Select all that apply.

☐ 1. Logical explanations aren't appropriate.
☐ 2. The child will be curious about the physical aspects of death.
☐ 3. The child will know that death is inevitable and irreversible.
☐ 4. The child will be influenced by the attitudes of the adults in their lives.
☐ 5. Teaching about death and dying shouldn't start before age 11.
☐ 6. Telling a child that death is the same as going to sleep as a way of relieving fear is appropriate.

Answer: 2, 3, 4. By age 9 or 10, most children know that death is universal, inevitable, and irreversible. School-age children are curious about the physical aspects of death and may wonder what happens to the body. Their cognitive abilities are advanced and they respond well to logical explanations. They should be encouraged to ask questions. The adults in their environment influence their attitudes towards death. Adults should be encouraged to include children in the family rituals and should be prepared to answer questions that might seem shocking. Teaching about death should begin early in childhood. Comparing death to sleep can be frightening for children and cause them to fear falling asleep.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

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21. A 7-year-old client is admitted to the hospital for treatment of facial cellulitis. He's admitted for observation and for administration of a 10-day course of I.V. antibiotics. Which interventions would help this client cope with the insertion of a peripheral I.V. line? Select all that apply.

☐ 1. Explain the procedure to the child immediately before it begins.
☐ 2. Apply a topical anesthetic to the I.V. site before the procedure.
☐ 3. Ask the child which hand he uses for drawing.
☐ 4. Explain the procedure to the child using abstract terms.
☐ 5. Don't let the child see the equipment to be used in the procedure.
☐ 6. Tell the child that the procedure won't hurt.

Answer: 2, 3. Topical anesthetics reduce the pain of a venipuncture. The cream should be applied about 1 hour before the procedure and requires a physician's order. Asking which hand the child draws with helps to identify the dominant hand. The I.V. should be inserted into the opposite extremity so that the child can continue to play and to do homework with a minimum amount of disruption. Younger school-age children don't have the capability for abstract thinking. The procedure should be explained using simple words. Definitions of unfamiliar terms should be provided. The child should have the procedure explained to him well before it takes place so that he has time to ask questions. Although the topical anesthetic will relieve some pain, there's usually some pain or discomfort involved in venipuncture, so the child shouldn't be told otherwise.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

22. A 6-year-old female is brought to the pediatrician's office by her mother for evaluation. The child recently started wetting the bed and running a low-grade fever. A urinalysis is positive for bacteria and protein. A diagnosis of a urinary tract infection (UTI) is made and the child is prescribed antibiotics. Which interventions are appropriate? Select all that apply.

☐ 1. Limit fluids for the next few days to decrease the frequency of urination.
☐ 2. Determine the mother's understanding of a UTI and its causes.
☐ 3. Instruct the mother to administer the antibiotic as prescribed — even if the symptoms diminish.
☐ 4. Provide instructions only to the mother, not the child.
☐ 5. Explain that the child shouldn't use of bubble bath.
☐ 6. Tell the mother to have the child wipe from the back to the front after voiding and defecation.

Answer: 2, 3, 5. Determining the mother's understanding of UTI and its causes provides the nurse with a baseline for teaching. The full course of antibiotics must be given to eradicate the organism and prevent recurrence, even if the child's signs and symptoms decrease. Bubble bath can irritate the vulva and urethra and contribute to the development of a UTI. Fluids should be encouraged, not limited, in order to prevent urinary stasis and help flush the organism out of the urinary tract. Instructions should be given to the child at her level of understanding to help her better understand the treatment and promote compliance. The child should wipe from the front to the back, not back to front, to minimize the risk of contamination after elimination.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

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23. Which symptom reported by an adolescent's parents indicates that the adolescent is abusing amphetamines? Select all that apply.

☐ 1. Restlessness
☐ 2. Fatigue
☐ 3. Excessive perspiration
☐ 4. Talkativeness
☐ 5. Watery eyes
☐ 6. Excessive nasal drainage

Answer: 1, 3, 4. Amphetamines are central nervous system stimulants. Symptoms of amphetamine abuse include marked nervousness, restlessness, excitability, talkativeness, and excessive perspiration.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

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24. A nurse is conducting an infant nutrition class for parents. Which foods should the nurse tell parents they can introduce during the first year of life? Select all that apply.

☐ 1. Sliced beef
☐ 2. Pureed fruits
☐ 3. Whole milk
☐ 4. Rice cereal
☐ 5. Strained vegetables
☐ 6. Fruit drinks

Answer: 2, 4, 5. The first food provided to a neonate is breast milk or formula. Between ages 4 and 6 months, rice cereal can be introduced, followed by pureed or strained fruits and vegetables. Then parents may introduce strained or ground meat. Meats must be chopped or ground before feeding them to an infant to prevent choking. Infants shouldn't be given whole milk until they are at least 1 year old. Fruit drinks provide no nutritional benefit and shouldn't be encouraged.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

25. A parent is planning to enroll her 9-month-old infant in a day-care facility. The parent asks the nurse what to look for to help ensure that the day-care facility is adhering to good infection-control measures. How should the nurse reply? Select all that apply.

☐ 1. The facility keeps boxes of gloves in the director's office.
☐ 2. Diapers are discarded into covered receptacles.
☐ 3. Toys are kept on the floor for the children to share.
☐ 4. Disposable papers are used on the diaper-changing surfaces.
☐ 5. Facilities for hand washing are located in every classroom.
☐ 6. Soiled clothing and cloth diapers are sent home in labeled paper bags.

Answer: 2, 4, 5. A parent can assess infection-control measures by appraising steps taken by the facility to prevent the spread of potential diseases. Placing diapers in covered receptacles, covering the diaper-changing surfaces with disposable papers, and ensuring that sinks are available for personnel to wash their hands after activities are all indicators that infection-control measures are being followed. Gloves should be readily available to personnel; therefore, they should be kept in every room — not in an office. Toys typically are shared by numerous children; however, this contributes to the spread of germs and infections. All soiled clothing and cloth diapers should be placed in a sealed plastic bag before the infant is sent home each day.

Client needs category: Safe, effective care environment
Client needs subcategory: Safety and infection control
Cognitive level: Application

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26. The nurse is preparing a dose of amoxicillin for a 3-year-old child with acute otitis media. The child weighs 33 lb. The dosage prescribed is 50 mg/kg/day in divided doses every 8 hours. The concentration of the drug is 250 mg/5 ml. How many milliliters should the nurse administer? Record your answer using a whole number.

_____ milliliters

Answer: 5. To calculate the child's weight in kilograms, the nurse should use the following formula:

$$2.2 \text{ lb} \div 1 \text{ kg} = 33 \text{ lb} \div X \text{ kg}$$
$$X = 33 \div 2.2$$
$$X = 15 \text{ kg}$$

Next, the nurse should calculate the daily dosage for the child:

$$50 \text{ mg/kg/day} \times 15 \text{ kg} = 750 \text{ mg/day}$$

To determine the divided daily dosage, the nurse should know that "every 8 hours" means three times per day. So, she should perform that calculation in this way:

$$\text{Total daily dosage} \div 3 \text{ times per day} = \text{Divided daily dosage}$$
$$750 \text{ mg/day} \div 3 = 250 \text{ mg}$$

The drug's concentration is 250 mg/5 ml, so the nurse should administer 5 ml.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies.
Cognitive level: Application

27. A 44-lb preschool child is being treated for inflammation. The physician orders 0.2 mg/kg/day of dexamethasone (Decadron) by mouth to be administered every 6 hours. The elixir comes in a strength of 0.5 mg/5 ml. How many milliliters of dexamethasone should the nurse give this client per dose? Record your answer using a whole number.

_____ milliliters

Answer: 10. To perform this dosage calculation, the nurse should first convert the child's weight from pounds to kilograms:

$$44 \text{ lb} \div 2.2 \text{ lb/kg} = 20 \text{ kg}$$

Then she should calculate the total daily dose for the child:

$$20 \text{ kg} \times 0.2 \text{ mg/kg/day} = 4 \text{ mg}$$

Next, the nurse should calculate the amount to be given at each dose:

$$4 \text{ mg} \times 4 \text{ doses} = 1 \text{ mg/dose}$$

The available elixir contains 0.5 mg of the drug per 5 ml. Therefore, to give 1 mg of the drug, the nurse should administer 10 ml to the child for each dose.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Analysis

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28. The nurse is teaching an adolescent with inflammatory bowel disease about treatment with corticosteroids. Which adverse effects are concerns for this client? Select all that apply.

☐ 1. Acne
☐ 2. Hirsutism
☐ 3. Mood swings
☐ 4. Osteoporosis
☐ 5. Growth spurts
☐ 6. Adrenal suppression

Answer: 1, 2, 3, 4, 6. Adverse effects of corticosteroids include acne, hirsutism, mood swings, osteoporosis, and adrenal suppression. Steroid use in children and adolescents may cause delayed growth, not growth spurts.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

Psychiatric and mental health nursing

1. The nurse has developed a relationship with a client who has an addiction problem. Which information would indicate that the therapeutic interaction is in the working stage? Select all that apply.

☐ 1. The client addresses how the addiction has contributed to family distress.
☐ 2. The client reluctantly shares the family history of addiction.
☐ 3. The client verbalizes difficulty identifying personal strengths.
☐ 4. The client discusses the financial problems related to the addiction.
☐ 5. The client expresses uncertainty about meeting with the nurse.
☐ 6. The client acknowledges the addiction's effects on the children.

Answer: 1, 3, 6. Options 1, 3, and 6 are examples of the nurse-client working phase of an interaction. In the working phase, the client explores, evaluates, and determines solutions to identified problems. Options 2, 4, and 5 address what happens during the introductory phase of the nurse-client interaction.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

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2. After receiving a referral from the occupational health nurse, a client comes to the mental health clinic with a tentative diagnosis of obsessive-compulsive disorder. The client explains that his compulsion to wash his hands is interfering with his job. Which interventions are appropriate when caring for a client with this disorder? Select all that apply.

☐ 1. Don't allow the client time to carry out the ritualistic behavior.
☐ 2. Support the use of appropriate defense mechanisms.
☐ 3. Encourage the client to suppress his anxious feelings.
☐ 4. Explore the patterns leading to the compulsive behavior.
☐ 5. Listen attentively, but don't offer feedback.
☐ 6. Encourage activities, such as listening to music.

Answer: 2, 4, 6. Client care should focus on reducing the anxiety, fear, and guilt associated with this disorder. This can be accomplished by allowing the client to carry out ritualistic behavior until he can be distracted to some other activity. The client should also be encouraged to use appropriate defense mechanisms and express his feelings of anxiety. Exploring patterns that lead to the compulsive behavior may also be effective. The nurse should always listen attentively to the client and offer feedback. Activities such as listening to music may divert the client's attention from unwanted thoughts.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

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3. After being examined by the forensic nurse in the emergency department, a rape victim is prepared for discharge. The nature of the attack puts the client is at risk for posttraumatic stress disorder (PTSD). Which symptoms are associated with PTSD? Select all that apply.

☐ 1. Recurrent, intrusive recollections or nightmares
☐ 2. Gingival and dental problems
☐ 3. Sleep disturbances
☐ 4. Flight of ideas
☐ 5. Unusual talkativeness
☐ 6. Difficulty concentrating

Answer: 1, 3, 6. Clients diagnosed with PTSD typically experience recurrent, intrusive recollections or nightmares, sleep disturbances, difficulty concentrating, chronic anxiety or panic attacks, memory impairment, and feelings of detachment or estrangement that destroy interpersonal relationships. Gingival and dental problems are associated with bulimia. Flight of ideas and unusual talkativeness are characteristic of the acute manic phase of bipolar affective disorder.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Comprehension

4. A physician prescribes clomipramine (Anafranil) for a client diagnosed with obsessive-compulsive disorder. What instructions should the nurse include when teaching the client about this medication? Select all that apply.

☐ 1. Avoid hazardous activities that require alertness or good coordination until adverse central nervous system (CNS) effects are known.
☐ 2. Avoid alcohol and other depressants.
☐ 3. Use saliva substitutes or sugarless candy or gum to relieve dry mouth.
☐ 4. Take the drug on an empty stomach.
☐ 5. Avoid using over-the-counter products, except antihistamines and decongestants, without medical approval.
☐ 6. Discontinue the medication if adverse reactions are troublesome.

Answer: 1, 2, 3. Clomipramine, a tricyclic antidepressant used to treat obsessive-compulsive disorder, may cause adverse CNS effects. Therefore, the nurse should warn the client to avoid hazardous activities that require alertness or good coordination until its effects are known. The nurse should instruct the client to avoid alcohol and other depressants. Dry mouth, a common adverse effect of this medication, can be relieved with saliva substitutes or sugarless candy or gum. The nurse should tell the client to take the medication with meals (not on an empty stomach), especially during the adjustment period, to minimize adverse GI effects. Later, the entire daily dose can be taken at bedtime. The nurse should encourage the client to continue therapy, even if adverse reactions are troublesome. The client shouldn't stop taking the medication without medical approval.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

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5. A nurse caring for a client with generalized anxiety disorder identifies a nursing diagnosis of *Anxiety*. The short-term goal identified is that the client will identify his physical, emotional, and behavioral responses to anxiety. Which nursing interventions will help the client achieve this goal? Select all that apply.

☐ 1. Avoid talking about the client's sources of stress.
☐ 2. Advise the client that consuming one glass of red wine per day may lessen his anxiety.
☐ 3. Explain to the client that expressing his feelings through journal writing may increase his anxiety.
☐ 4. Observe the client for overt signs of anxiety.
☐ 5. Help the client connect anxiety with uncomfortable physical, emotional, or behavioral responses.
☐ 6. Introduce the client to new strategies for coping with anxiety, such as relaxation techniques and exercise.

Answer: 4, 5, 6. The nurse should observe the client for overt signs of anxiety to determine his anxiety level and establish care priorities. She should also help the client connect anxiety with uncomfortable physical, emotional, or behavioral responses. To modify the automatic response to stress, the client needs to connect the anxiety experience with the unpleasant symptoms. The nurse should also introduce the client to new coping strategies, such as relaxation techniques and exercise, which can enable him to take personal responsibility for making changes. The nurse should work with the client to identify sources of stress — not avoid talking about it. The nurse should advise the client to avoid using caffeine, nicotine, and alcohol to cope with anxiety. Nicotine and caffeine are stimulants; alcohol acts as a depressant but, over time, requires increased use to achieve the desired effect. The increased use may lead to alcohol abuse. The nurse should encourage the client to use a journal to record feelings, behaviors, stressful events, and coping strategies used to address anxiety. Documentation may help the client become aware of his anxiety and the ways it affects his overall functioning.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

6. The nurse is caring for a client who talks freely about feeling depressed. During an interaction, the nurse heard the client state, "Things will never change." What other indications of hopelessness would the nurse look for? Select all that apply.

☐ 1. Bouts of anger
☐ 2. Periods of irritability
☐ 3. Preoccupation with delusions
☐ 4. Feelings of worthlessness
☐ 5. Intense interpersonal relationships

Answer: 1, 2, 4. Clients who are depressed and express hopelessness also tend to manifest inappropriate expressions of anger, periods of irritability, and feelings of worthlessness. Options 3 and 5 are usually seen in clients with schizophrenia; they aren't typically seen in those who express hopelessness

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

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7. The nurse interviews the family of a client who's hospitalized with severe depression and suicidal ideation. Which family assessment information is essential to formulating an effective care plan? Select all that apply.

☐ 1. Physical pain
☐ 2. Personal responsibilities
☐ 3. Employment skills
☐ 4. Communication patterns
☐ 5. Role expectations
☐ 6. Current family stressors

Answer: 4, 5, 6. When working with the family of a depressed client, it's helpful for the nurse to be aware of the family's communication style, the role expectations for its members, and current family stressors. This information can help identify family difficulties and teaching points that could benefit the client and his family. Information concerning physical pain, personal responsibilities, and employment skills wouldn't be helpful because these areas aren't directly related to their experience of having a depressed family member.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

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8. A client is prescribed sertraline (Zoloft), a selective serotonin reuptake inhibitor. Which information about this drug's adverse effects would the nurse include when creating a medication teaching plan? Select all that apply.

☐ 1. Agitation
☐ 2. Agranulocytosis
☐ 3. Sleep disturbance
☐ 4. Intermittent tachycardia
☐ 5. Dry mouth
☐ 6. Seizures

Answer: 1, 3, 5. Common adverse effects of Zoloft include agitation, sleep disturbance, and dry mouth. Agranulocytosis, intermittent tachycardia, and seizures are adverse effects of clozapine (Clozaril).

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Knowledge

9. The nurse is evaluating a client to determine whether he's suffering from dementia or depression. Which information helps the nurse to suspect dementia? Select all that apply.

☐ 1. The progression of symptoms is slow.
☐ 2. The client answers questions with, "I don't know."
☐ 3. The client acts apathetic and pessimistic.
☐ 4. The family can't identify when the symptoms first appeared.
☐ 5. The client's basic personality has changed.
☐ 6. The client has great difficulty paying attention to others.

Answer: 1, 4, 5, 6. Common characteristics of dementia include a slow onset of symptoms, difficulty identifying when the symptoms first occurred, noticeable changes in the client's personality, and impaired ability to pay attention to other people. Options 2 and 3 are symptoms of depression, not dementia.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

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10. A client has been diagnosed with an adjustment disorder of mixed anxiety and depression. Which nursing diagnoses are associated with a client who has an adjustment disorder? Select all that apply.

☐ 1. Activity intolerance
☐ 2. Impaired social interaction
☐ 3. Self-esteem disturbance
☐ 4. Disturbed personal identity
☐ 5. Acute confusion
☐ 6. Impaired memory

Answer: 2, 3. A client with an adjustment disorder is likely to have impaired social interaction and self-esteem disturbance. The other nursing diagnoses aren't related to the diagnosis of adjustment disorder.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

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11. A physician prescribes lithium for a client diagnosed with bipolar disorder. The nurse needs to provide appropriate teaching for the client on this drug. Which topics should the nurse cover? Select all that apply.

☐ 1. The potential for addiction
☐ 2. Signs and symptoms of drug toxicity
☐ 3. The potential for tardive dyskinesia
☐ 4. Information about a low-tyramine diet
☐ 5. The need to consistently monitor blood levels
☐ 6. Changes in his mood may take 7 to 21 days

Answer: 2, 5, 6. Client teaching should cover the signs and symptoms of drug toxicity as well as the need to report them to the physician. The nurse should instruct the client to monitor his lithium levels on a regular basis to avoid toxicity. She should explain that 7 to 21 days may pass before the client notes a change in his mood. Lithium doesn't have addictive properties. Tyramine is a potential concern to clients taking monoamine-oxidase inhibitors.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

12. The nurse is monitoring a client who appears to be hallucinating. She notes paranoid content in the client's speech and he appears agitated. The client is gesturing at a figure on the television. Which nursing interventions are appropriate? Select all that apply.

☐ 1. In a firm voice, instruct the client to stop the behavior.
☐ 2. Reinforce that the client isn't in any danger.
☐ 3. Acknowledge the presence of the hallucinations.
☐ 4. Instruct other team members to ignore the client's behavior.
☐ 5. Immediately implement physical restraint procedures.
☐ 6. Use a calm voice and simple commands.

Answer: 2, 3, 6. Using a calm voice, the nurse should reassure the client that he's safe. She shouldn't challenge the client; rather, she should acknowledge his hallucinatory experience. It isn't appropriate to request that the client stop the behavior. Implementing restraints isn't warranted at this time. Although the client is agitated, no evidence exists that the client might harm himself or others.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

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13. A client with schizophrenia is taking the atypical antipsychotic medication clozapine (Clozaril). Which signs and symptoms indicate the presence of adverse effects associated with this medication? Select all that apply.

☐ 1. Sore throat
☐ 2. Pill-rolling movements
☐ 3. Polyuria
☐ 4. Fever
☐ 5. Polydipsia
☐ 6. Orthostatic hypotension

Answer: 1, 4. Sore throat, fever, and the sudden onset of other flulike symptoms are signs of agranulocytosis. The condition is caused by the lack of a sufficient number of granulocytes (a type of white blood cell), which causes susceptibility to infection. The client's white blood cell count should be monitored at least weekly throughout the course of treatment. Pill-rolling movements can occur in a client who's experiencing extrapyramidal adverse effects associated with antipsychotic medication that has been prescribed for much longer than a medication such as clozapine. Polydipsia (excessive thirst) and polyuria (increased urine) are common adverse effects of lithium. Orthostatic hypotension is an adverse effect of tricyclic antidepressants.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Application

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14. A delusional client approaches the nurse, stating, "I'm the Easter Bunny," and insisting that the nurse refer to him as such. The belief appears to be fixed and unchanging. Which nursing interventions should the nurse implement when working with this client? Select all that apply.

☐ 1. Consistently use the client's name in interaction.
☐ 2. Smile at the humor of the situation.
☐ 3. Agree that the client is the Easter Bunny.
☐ 4. Logically point out why the client couldn't be the Easter Bunny.
☐ 5. Provide an as-needed medication.
☐ 6. Provide the client with structured activities.

Answer: 1, 6. Continued reality-based orientation is necessary, so the nurse should use the client's name in any interaction. Structured activities can help the client refocus and resolve his delusion. The nurse shouldn't contribute to the delusion by going along with the situation or smiling at the humor of the circumstances. Logical arguments and an as-needed medication aren't likely to change the client's beliefs.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

15. A physician starts a client on the antipsychotic medication haloperidol (Haldol). The nurse is aware that this medication has extrapyramidal adverse effects. Which measures should the nurse take while the client is receiving Haldol? Select all that apply.

☐ 1. Closely monitor the client's vital signs, especially temperature.
☐ 2. Provide the client with the opportunity to pace.
☐ 3. Monitor blood glucose levels.
☐ 4. Provide hard candy for the client.
☐ 5. Monitor for signs and symptoms of urticaria.

Answer: 1, 2, 4. Neuroleptic malignant syndrome is a life-threatening extrapyramidal adverse effect of antipsychotic medications such as Haldol. It's associated with a rapid increase in temperature. The most common extrapyramidal adverse effect, akathisia, is a form of psychomotor restlessness that can often be relieved by pacing. Haldol and the anticholinergic medications that are provided to alleviate its extrapyramidal effects can result in dry mouth. Having the client suck on hard candy can help alleviate this problem. Haldol doesn't affect blood glucose levels. Urticaria isn't usually associated with Haldol administration.

Client needs category: Physiological integrity
Client needs subcategory: Pharmacological therapies
Cognitive level: Analysis

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16. Which interventions would be supportive for a client with a nursing diagnosis of *Imbalanced nutrition: Less than body requirements related to dysfunctional eating patterns?* Select all that apply.

☐ 1. Provide small, frequent feedings.
☐ 2. Monitor weight gain.
☐ 3. Allow the client to skip meals until the antidepressant levels are therapeutic.
☐ 4. Encourage journaling to promote the expression of feelings.
☐ 5. Monitor the client at mealtimes and for an hour after meals.
☐ 6. Encourage the client to eat three substantial meals a day.

Answer: 1, 2, 4, 5. Smaller meals may be better tolerated by the client and will gradually increase her daily caloric intake. The nurse should monitor the client's weight because an anorexic will hide weight loss. Anorexics are emotionally restrained and afraid of their feelings, so journaling can be a powerful tool that assists in recovery. Anorexic clients are obsessed with gaining weight and will skip all meals if given the opportunity. Because of self-starvation, they seldom can tolerate large meals three times a day.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Analysis

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17. While collecting data on a client who was diagnosed with impulse control disorder (and displays violent, aggressive, and assaultive behavior), the nurse can expect to find which assessments? Select all that apply.

☐ 1. The client functions well in other areas of his life.
☐ 2. The degree of aggressiveness is out of proportion to the stressor.
☐ 3. The client often uses a stressor to justify his violent behavior.
☐ 4. The client has a history of parental alcoholism and a chaotic, abusive family life.
☐ 5. The client shows no remorse about his inability to control his behavior.

Answer: 1, 2, 4. A client with an impulse control disorder who displays violent, aggressive, and assaultive behavior generally functions well in other areas of his life. The degree of the client's aggressiveness is disproportionate to the stressor, and the client commonly has a history of parental alcoholism, as well as a chaotic family life. The client often verbalizes sincere guilt and remorse for the aggressive behavior.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

18. The parents of a client with attention deficit hyperactivity disorder (ADHD) are taught strategies to assist their child in coping with this childhood psychiatric disorder. Which items would the nurse include in the teaching plan. Select all that apply.

☐ 1. Assist the child to express feelings of frustration.
☐ 2. Orient the child to his surroundings.
☐ 3. Set limits on the child's behavior.
☐ 4. Prepare for a decline in the child's physical functioning.
☐ 5. Monitor the child's bodily functions.
☐ 6. Use restraints on the child when behavior is out of control.

Answer: 1, 3, 5. Discussion of feelings and frustrations about the behavior helps to prevent the child's acting out. Setting limits prevents escalation of inappropriate behaviors. Internal states of thirst, hunger, and fatigue can precipitate a hyperactive response. Clients with ADHD don't need to be oriented to their surroundings and don't necessarily have a pattern of declining physiological functioning. Neither physical nor chemical restraints are ever used on clients with ADHD.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

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19. The nurse is speaking with an adolescent diagnosed with conduct disorder. While working on the goal of meeting personal needs without manipulating others, the nurse would implement which strategies? Select all that apply.

☐ 1. Discuss rules and consequences for not following the rules.
☐ 2. Establish a behavioral contract.
☐ 3. Allow the client some opportunities to make choices.
☐ 4. Prevent the client from going into social withdrawal.
☐ 5. Encourage the client to verbalize negative feelings to others.
☐ 6. Discuss with the client how others can generate anxiety in the client.

Answer: 1, 2, 3. The nurse establishes a consistent, predictable environment to reduce manipulative behavior. A behavioral contract is used to reinforce problem solving and encourage the use of social skills. When clients are allowed to make some choices, there are opportunities for them to have some control over their lives. Clients with conduct disorder typically aren't shy and withdrawn in social situations. Verbalization of negative feelings to others can escalate and result in acting out. Clients with conduct disorders tend to be the ones who generate stress for others.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

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20. The nurse is explaining to a family that their father is in the late stages of Alzheimer's disease. Which characteristics would the nurse explain to the family? Select all that apply.

☐ 1. Periods of confusion have increased.
☐ 2. The client is unable to recognize family members.
☐ 3. The client demonstrates periods of forgetfulness about his personal effects.
☐ 4. The client experiences difficulty eating and loses weight.
☐ 5. The client has difficulty performing his usual activities of daily living (ADLs).
☐ 6. The client communicates less and less and sometimes only with sounds.

Answer: 2, 4, 6. In the late stage of Alzheimer's disease, the client is unable to recognize self or significant others. He'll have difficulty swallowing, and he may have difficulty with eating and some weight loss. In addition, the client will have minimal communication and will resort to communicating only with sounds. Increasing periods of confusion are symptoms of the early stage of Alzheimer's disease, as is forgetfulness and noticeable changes in the client's performance of ADLs.

Client needs category: Health promotion and maintenance
Client needs subcategory: None
Cognitive level: Application

21. A client with the diagnosis of schizophrenia demonstrates disorganized thinking. Which nursing interventions would be effective for this client? Select all that apply.

☐ 1. Consult with others when the client's verbalizations aren't understood.
☐ 2. Speak to the client in simple, direct language.
☐ 3. Explain all procedures before carrying them out.
☐ 4. Discuss any upsetting thoughts that the client has.
☐ 5. Determine how the use of denial inhibits accurate self-expression.
☐ 6. Keep client expectations to a minimum.

Answer: 2, 3, 4. Speaking to the client in a simple and direct manner decreases anxiety and mistrust. It also promotes his ability to accomplish daily activities. By being informed about what will be happening, the client can feel more secure and can cooperate without experiencing a high degree of stress. It's important for the client to talk about problems that occur because of the presence of disturbing thoughts. When the nurse doesn't understand what the client says, she must acknowledge this situation and address it directly with the client. Clients with disorganized thinking commonly aren't reality based, rather than in denial of what's happening. The client responds better if expectations are made clear and consistent, and well-defined rules for the unit are reinforced by the nurse.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

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22. A client with the diagnosis of schizophrenia is working on the goal of establishing acceptable social skills. Which nursing interventions would be effective for this client? Select all that apply.

☐ 1. Create opportunities for the client to socialize in small-group settings.
☐ 2. Encourage the client to role play with the nurse before social activities.
☐ 3. Teach the client how to express his feelings in socially acceptable ways.
☐ 4. Have family members visit and provide opportunities for interaction.
☐ 5. Use group therapy as a way to promote socialization with peers.
☐ 6. Talk to the client about the people that he would like to interact with socially.

Answer: 1, 2, 3, 4, 6. By having contact with a small group of people, the client can begin to experience brief peer interactions. Role-playing helps the client practice what to say and how to express himself appropriately. The suitable expression of feelings can be difficult for a client who tends to stay away from social situations. Family members can be valuable resources in assisting the client with practicing communication and social skills. Having the client focus on people and situations that are of interest helps make his experience in learning realistic and meaningful. Therapy groups usually have eight to ten people in the group. The client needs one-on-one and small group interactions to practice social skills.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

23. The nurse evaluates a bipolar client's activity level while the client is in the community room. The observation includes the client's pacing around the room, scanning the environment, and rubbing both hands together. Which signs and symptoms would the nurse chart to communicate the client's behaviors to the health care team? Select all that apply.

☐ 1. Psychomotor agitation
☐ 2. Psychophysiologic insomnia
☐ 3. Tardive dyskinesia
☐ 4. Withdrawal syndrome
☐ 5. Excessive distractibility
☐ 6. Decreased verbalizations

Answer: 1, 5, 6. Psychomotor agitation is defined by constant motion, such as pacing, wringing hands, biting nails, and other types of energetic body movements. The client with bipolar disorder can be easily distracted. The client is releasing pent-up emotions through physical movement rather than through verbalization of concerns or problems. Psychophysiologic insomnia refers to difficulty attaining or maintaining sleep; it doesn't relate to the physiological symptoms of depression. Tardive dyskinesia refers to involuntary movements associated with the adverse effects of antipsychotic medications. Withdrawal syndrome occurs when there's an abrupt stoppage of a substance that the client has become dependent upon as a result of prolonged use.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Analysis

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24. The nurse is teaching the family of a client who has a diagnosis of generalized anxiety disorder. Which information will the nurse include in the teaching plan? Select all that apply.

☐ 1. Teach the family members methods to handle their anxiety.
☐ 2. Teach the family how to prevent the client from becoming paranoid.
☐ 3. Help the family assess their own level of functioning.
☐ 4. Develop a family plan for emergency intervention.
☐ 5. Encourage family members not to take on the client's responsibilities.
☐ 6. Discuss the family's ability to solve problems.

Answer: 1, 3, 5, 6. By assisting the family members in handling their anxiety effectively, they'll communicate less anxiety to the client. The level of family functioning can either positively or negatively influence the individual client's level of functioning. It isn't useful for the family to take on the client's responsibilities. It's better for the client to learn how to handle stress and the tasks that need to be done. If the family has sufficient problem-solving ability, they can role-model problem-solving behavior for the client. Clients who experience generalized anxiety don't necessarily become paranoid. A plan for emergency intervention typically isn't required if the client is closely monitored, and urgent situations are handled promptly.

Client needs category: Safe, effective care environment
Client needs subcategory: Coordinated care
Cognitive level: Application

25. The nurse is working with a client who has a diagnosis of pain disorder. Which nursing interventions would help the client understand the relationship between pain and emotional problems? Select all that apply.

☐ 1. Acknowledge the client's pain instead of challenging it.
☐ 2. Use open-ended questions to guide the client through the pain experience.
☐ 3. Talk about sources of anxiety in the client's life.
☐ 4. Explain situations that may cause the client's pain.
☐ 5. Assist the client in determining if anxiety accentuates the pain.
☐ 6. Help the client work on organizing his thoughts about the pain experience.

Answer: 1, 3, 5. The nurse must accept the client's pain, as this enables a relationship to occur instead of creating a situation where the client uses energy to defend the pain. Discussion about the client's anxiety will help the client identify stressors and recognize the need for a plan to deal with them. It's important for the client to recognize the connection between escalating anxiety and pain. Although open-ended questions are useful in therapeutic conversations, the interaction must focus on the specific physical and emotional stressors that influence the client's pain. It isn't therapeutic to tell the client what's causing the pain disorder. Clients with pain disorders don't necessarily have difficulty organizing their thoughts and expressing themselves.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

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26. The nurse is co-leading a group for clients with sexual disorders. Several group members are undergoing legally mandated treatment because they were diagnosed with paraphilias. Which assessment data would the nurse expect to find in their charts? Select all that apply.

☐ 1. Preoccupation with body image
☐ 2. Pain during intercourse
☐ 3. Social isolation
☐ 4. Performance anxiety
☐ 5. Ineffective coping
☐ 6. Abnormal sexual fantasies

Answer: 1, 3, 5, 6. Preoccupation with body image, social isolation, ineffective coping related to individual or family dysfunction, and abnormal sexual fantasies are all characteristics associated with paraphilias. Pain during intercourse is associated with sexual pain disorders, not with paraphilias. Performance anxiety is typically associated with sexual desire and arousal disorders, not with paraphilias.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

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27. The nurse is having a therapeutic conversation with a female client with bulimia nervosa. What are some of the communication strategies that the nurse should use while interacting with this client? Select all that apply.

☐ 1. Verbalize interest in the client's current physical health problems.
☐ 2. Talk about the client's fear of losing self control.
☐ 3. Discuss ways to promote a positive sense of self.
☐ 4. Describe the medications that can alleviate bulimia nervosa.
☐ 5. Facilitate hope for developing a functional lifestyle.

Answer: 2, 3, 5. The client needs to have the nurse communicate empathetically about her fear of losing control. By discussing with the client ways to build a positive sense of self, the nurse changes the client's focus away from negative thought and feelings. A discussion about the client's physical health problems isn't as useful to the client as a discussion about her negative feelings about herself. There are no medications that can alleviate bulimia nervosa. Sometimes antidepressant or antianxiety medications may be prescribed if anxiety or depression are present.

Client needs category: Physiological integrity
Client needs subcategory: Reduction of risk potential
Cognitive level: Analysis

28. The family of a client who had outpatient surgery calls the nurse and asks about alcohol withdrawal symptoms. The family states that it has been 14 hours since the client's last alcoholic drink. The nurse explains the progression of alcohol withdrawal symptoms and assists the family in obtaining treatment for the client.

Place all of the symptoms listed below in ascending chronological order. Use all of the options.

Unordered responses

1. Elevated blood pressure
2. Restlessness and irritability
3. Hand tremors
4. Transient hallucinations

Answer:

Ordered responses

3. Hand tremors
1. Elevated blood pressure
2. Restlessness and irritability
4. Transient hallucinations

In 4 to 12 hours after the client stops drinking alcohol, he's likely to experience alcohol withdrawal symptoms. The first withdrawal symptoms are typically coarse tremors of the hands. Next, changes in vital signs occur, such as elevated blood pressure and tachycardia. The client becomes increasingly anxious, restless, and irritable. The symptoms of transient hallucinations, seizures, and delirium tremens are the final symptoms to occur in the withdrawal process if the client isn't treated for his condition.

Client needs category: Physiological integrity
Client needs subcategory: Physiological adaptation
Cognitive level: Analysis

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29. A client with a diagnosis of anorexia nervosa is speaking to the nurse about her stressful life. The nurse and the client agree to work on coping skills. Which strategies would the nurse include in the teaching? Select all that apply.

☐ 1. Work with the client to discuss her fears and develop a treatment program.
☐ 2. Encourage the client to develop realistic expectations of herself.
☐ 3 Have the client identify any trauma experienced, and assist her in obtaining legal support.
☐ 4. Teach relaxation techniques and have the client practice them daily.
☐ 5. Develop a behavioral contract to ensure the use of healthy coping skills when stress occurs.
☐ 6. Have the client develop hobbies or other pleasant ways to spend some of her time.

Answer: 2, 4, 6. Having appropriate expectations allows the client to become realistic about her needs and develop appropriate goals. Use of relaxation techniques helps to relieve stress and allows the client to become more comfortable in handling daily life stressors. The client needs pleasant activities to redirect her energies away from her preoccupation with food, body image, and fear of becoming fat. Clients with fears should be evaluated for a desensitization treatment program. Although identification of trauma is an important part of the nursing assessment, this client requires that the nurse focus on developing skills to enable the client to lead a healthy lifestyle. A behavioral contract would be used to assist the client to meet the goal of weight gain, not the goal of developing healthy coping skills.

Client needs category: Psychosocial integrity
Client needs subcategory: None
Cognitive level: Application

Physiologic changes in aging

Aging is characterized by the loss of some body cells and reduced metabolism in other cells. These processes cause a decline in body function and changes in body composition. This chart will help you recognize the gradual changes in body function that normally accompany aging so you can adjust your assessment techniques accordingly.

Area of assessment	Age-related changes
Nutrition	• Protein, vitamin, and mineral requirements usually unchanged • Energy requirements possibly decreased by about 200 calories per day because of diminished activity • Loss of calcium and nitrogen (in patients who aren't ambulatory) • Diminished absorption of calcium and vitamins B_1 and B_2 due to reduced pepsin and hydrochloric acid secretion • Decreased salivary flow and decreased sense of taste (may reduce appetite) • Diminished intestinal motility and peristalsis of the large intestine • Brittle teeth due to thinning of tooth enamel • Loss of teeth • Decreased biting force • Diminished gag reflex • Limited mobility (may affect ability to obtain or prepare food)
Skin	• Facial lines resulting from subcutaneous fat loss, dermal thinning, decreasing collagen and elastin, and 50% decline in cell replacement • Delayed wound healing due to decreased rate of cell replacement • Decreased skin elasticity (may seem almost transparent) • Brown spots on skin due to localized melanocyte proliferation • Dry mucous membranes and decreased sweat gland output (as the number of active sweat glands declines) • Difficulty regulating body temperature because of decrease in size, number, and function of sweat glands and loss of subcutaneous fat
Hair	• Decreased pigment, causing gray or white hair • Thinning as the number of melanocytes declines • Pubic hair loss resulting from hormonal changes • Facial hair increase in postmenopausal women and decrease in men

Area of assessment	Age-related changes
Eyes and vision	• Baggy and wrinkled eyelids due to decreased elasticity, with eyes sitting deeper in sockets • Thinner and yellow conjunctivae; possible pingueculae (fat pads) • Decreased tear production due to loss of fatty tissue in lacrimal apparatus • Corneal flattening and loss of luster • Fading or irregular pigmentation of iris • Smaller pupil, requiring three times more light to see clearly; diminished night vision and depth perception • Scleral thickening and rigidity; yellowing due to fat deposits • Vitreous degeneration, revealing opacities and floating debris • Lens enlargement; loss of transparency and elasticity, decreasing accommodation • Impaired color vision due to deterioration of retinal cones • Decreased reabsorption of intraocular fluid, predisposing to glaucoma
Ears and hearing	• Atrophy of the organ of Corti and the auditory nerve (sensory presbycusis) • Inability to distinguish high-pitched consonants • Degenerative structural changes in the entire auditory system
Respiratory system	• Nose enlargement from continued cartilage growth • General atrophy of tonsils • Tracheal deviation due to changes in the aging spine • Increased anteroposterior chest diameter as a result of altered calcium metabolism and calcification of costal cartilage • Lung rigidity; decreased number and size of alveoli • Kyphosis • Respiratory muscle degeneration or atrophy • Declining diffusing capacity • Decreased inspiratory and expiratory muscle strength; diminished vital capacity • Lung tissue degeneration, causing decrease in lungs' elastic recoil capability and increase in residual capacity • Poor ventilation of the basal areas (from closing of some airways), resulting in decreased surface area for gas exchange and reduced partial pressure of oxygen • Oxygen saturation decreased by 5% • 30% reduction in respiratory fluids, heightening risk of pulmonary infection and mucus plugs • Lower tolerance for oxygen debt

Area of assessment	Age-related changes
Cardiovascular system	• Slightly smaller heart size • Loss of cardiac contractile strength and efficiency • 30% to 35% diminished cardiac output by age 70 • Heart valve thickening, causing incomplete closure (systolic murmur) • 25% increase in left ventricular wall thickness between ages 30 and 80 • Fibrous tissue infiltration of the sinoatrial node and internodal atrial tracts, causing atrial fibrillation and flutter • Vein dilation and stretching • 35% decrease in coronary artery blood flow between ages 20 and 60 • Increased aortic rigidity, causing increased systolic blood pressure disproportionate to diastolic, resulting in widened pulse pressure • Electrocardiogram changes: increased PR interval, QRS complex, and QT interval; decreased amplitude of QRS complex; shift of QRS axis to the left • Heart rate takes longer to return to normal after exercise • Decreased strength and elasticity of blood vessels, contributing to arterial and venous insufficiency • Decreased ability to respond to physical and emotional stress
GI system	• Diminished mucosal elasticity • Reduced GI secretions, affecting digestion and absorption • Decreased motility, bowel wall and anal sphincter tone, and abdominal wall strength • Liver changes: decreases in weight, regenerative capacity, and blood flow • Decline in hepatic enzymes involved in oxidation and reduction, causing less efficient metabolism of drugs and detoxification of substances
Renal system	• Decline in glomerular filtration rate • 53% decrease in renal blood flow secondary to reduced cardiac output and atherosclerotic changes • Decrease in size and number of functioning nephrons • Reduction in bladder size and capacity • Weakening of bladder muscles, causing incomplete emptying and chronic urine retention • Diminished kidney size • Impaired clearance of drugs • Decreased ability to respond to variations in sodium intake
Male reproductive system	• Reduced testosterone production, resulting in decreased libido as well as atrophy and softening of testes • 48% to 69% decrease in sperm production between ages 60 and 80 • Prostate gland enlargement, with decreasing secretions • Decreased volume and viscosity of seminal fluid • Slower and weaker physiologic reaction during intercourse, with lengthened refractory period

Area of assessment	Age-related changes
Female reproductive system	• Declining estrogen and progesterone levels (about age 50) cause: – cessation of ovulation; atrophy, thickening, and decreased size of ovaries – loss of pubic hair and flattening of labia majora – shrinking of vulval tissue, constricted introitus, and loss of tissue elasticity – vaginal atrophy; thin and dry mucus lining; more alkaline pH of vaginal environment – shrinking uterus – cervical atrophy, failure to produce mucus for lubrication, thinner endometrium and myometrium – pendulous breasts; atrophy of glandular, supporting, and fatty tissue – nipple flattening and decreased size – more pronounced inframammary ridges.
Neurologic system	• Degenerative changes in neurons of central and peripheral nervous system • Slower nerve transmission • Decrease in number of brain cells by about 1% per year after age 50 • Hypothalamus less effective at regulating body temperature • 20% neuron loss in cerebral cortex • Slower corneal reflex • Increased pain threshold • Decrease in stage III and IV of sleep, causing frequent awakenings; rapid eye movement sleep also decreased
Immune system	• Decline beginning at sexual maturity and continuing with age • Loss of ability to distinguish between self and nonself • Loss of ability to recognize and destroy mutant cells, increasing incidence of cancer • Decreased antibody response, resulting in greater susceptibility to infection • Tonsillar atrophy and lymphadenopathy • Lymph node and spleen size slightly decreased • Some active blood-forming marrow replaced by fatty bone marrow, resulting in inability to increase erythrocyte production as readily as before in response to such stimuli as hormones, anoxia, hemorrhage, and hemolysis • Diminished vitamin B_{12} absorption, resulting in reduced erythrocyte mass and decreased hemoglobin level and hematocrit

Area of assessment	Age-related changes
Musculoskeletal system	• Increased adipose tissue • Diminished lean body mass and bone mineral contents • Decreased height from exaggerated spinal curvature and narrowing intervertebral spaces • Decreased collagen formation and muscle mass • Increased viscosity of synovial fluid, more fibrotic synovial membranes
Endocrine system	• Decreased ability to tolerate stress • Blood glucose concentration increases and remains elevated longer than in a younger adult • Diminished levels of estrogen and increasing levels of follicle-stimulating hormone during menopause, causing coronary thrombosis and osteoporosis • Reduced progesterone production • 50% decline in serum aldosterone levels • 25% decrease in cortisol secretion rate

Positioning clients

This chart lists various positions in which clients may be placed. These positions may be used for client comfort, but proper positioning also maintains functional body alignment and client safety, promotes respiration and circulation, relieves pressure, and aids in administering treatment.

Position	Implementation	Rationale	Indications
Elevation of extremity	Use the bed controls to elevate the lower extremities, or use pillows to elevate the upper and lower extremities.	• Promotes circulation and comfort • Enables examinations and procedures	• Thrombophlebitis • After cast application • Edema • After surgery on extremity
Dorsal recumbent (supine)	Place the client on his back with his knees slightly flexed. Place a pillow beneath his head for comfort.	• Immobilizes the spine	• Spinal cord injury • Urinary catheter insertion • Vaginal examination
Fowler's	Elevate the head of the bed to 45 degrees, and raise the bed section under the client's knees, flexing them slightly.	• Enables examination • Immobilizes the spine • Promotes drainage, cardiac output, and ventilation • Prevents aspiration of food and secretions	• Head injury, cranial surgery, increased intracranial pressure (ICP) • After abdominal surgery • Dyspnea • Vomiting • After thyroidectomy • After eye surgery
High Fowler's	Elevate the head of the bed to 90 degrees, and raise the bed section under the client's knees, flexing them slightly.	• Promotes drainage, cardiac output, and ventilation • Prevents aspiration of food and secretions	• Head injury, cranial surgery, increased ICP • Dyspnea, respiratory distress • Feeding (during and after meals) • Hiatal hernia
Lateral (side-lying)	Place the client on his side, with weight being mostly supported by the lateral aspect of the lower scapula and the lower ileum. Support with pillows.	• Promotes safety • Prevents atelectasis, pressure ulcers, and aspiration of food and secretions	• After abdominal surgery • Coma • Pressure ulcer • Enema or rectal irrigation

Position	Implementation	Rationale	Indications
Lithotomy	Place the client on his back (either flat or with the head slightly elevated). His knees should be flexed at right angles and his feet placed in stirrups.	• Enables examination of the pelvis	• Perineal or rectal procedure
Prone	Place the client on his stomach with the head turned to one side. Position his arms at the side or above the head. Make sure that his legs are extended.	• Enables examination of the back and spine • Promotes gas exchange	• Immobilization • Acute respiratory distress syndrome • After lumbar puncture or myelogram
Reverse Trendelenburg's	Elevate the head of the bed and lower the client's feet.	• Provides counterbalance for traction • Promotes blood flow to the lower extremities	• Cervical traction • After lower extremity vessel surgery
Semi-Fowler's	Elevate the head of the bed to 30 degrees, and raise the bed section under the client's knees, flexing them slightly.	• Promotes drainage, cardiac output, and ventilation • Prevents aspiration of food and secretions	• Head injury, cranial surgery, increased ICP • After abdominal surgery • Dyspnea • Vomiting • After thyroidectomy • After eye surgery
Sims'	Position the client on his side with a small pillow beneath his head. Flex one knee toward his abdomen, with the other knee only slightly flexed. Place one arm behind his body and the other in a comfortable position. Support with pillows.	• Enables examination of the back and rectum • Prevents pressure ulcers and atelectasis	• Coma • Rectal injuries
Trendelenburg's	Position the client supine with his feet elevated 30 to 40 degrees higher than his head.	• Promotes postural drainage and venous return	• Shock • Cystic fibrosis

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Maryland Board of Nursing
4140 Patterson Ave.
Baltimore, MD 21215-2254
Phone: (410) 585-1900
Fax: (410) 358-3530
Web site: *www.mbon.org*

Massachusetts
Massachusetts Board of Registration in Nursing
Commonwealth of Massachusetts
239 Causeway St., 2nd Floor
Boston, MA 02114
Phone: (617) 973-0800
Fax: (617) 973-0984
Web site: *www.mass.gov/dpl/boards/rn/*

Michigan
Michigan IDCH/Bureau of Health Professions
Ottawa Towers North
611 W. Ottawa, 1st Floor
Lansing, MI 48933
Phone: (517) 335-0918
Fax: (517) 373-2179
Web site: *www.michigan.gov/healthlicense*

Minnesota
Minnesota Board of Nursing
2829 University Ave. SE, Suite 200
Minneapolis, MN 55414-3253
Phone: (612) 617-2770
Fax: (612) 617-2190
Web site: *www.nursingboard.state.mn.us*

Mississippi
Mississippi Board of Nursing
1935 Lakeland Dr., Suite B
Jackson, MS 39216
Phone: (601) 987-4188
Fax: (601) 364-2352
Web site: *www.msbn.state.ms.us*

Missouri
Missouri State Board of Nursing
3605 Missouri Blvd.
P.O. Box 656
Jefferson City, MO 65102-0656
Phone: (573) 751-0681
Fax: (573) 751-0075
Web site: *www.pr.mo.gov/nursing.asp*

Montana
Montana State Board of Nursing
301 South Park, Suite 401
P.O. Box 200513
Helena, MT 59620-0513
Phone: (406) 841-2345
Fax: (406) 841-2305
Web site: *www.nurse.mt.gov*

Nebraska
Nebraska Board of Nursing
301 Centennial Mall South
Lincoln, NE 68509-4986
Phone: (402) 471-4376
Fax: (402) 471-1066
Web site: *www.hhs.state.ne.us/crl/nursing/nursingindex.htm*

Nevada
Nevada State Board of Nursing
Licensure and Certification
2500 W. Sahara Ave., Suite 207
Las Vegas, NV 89102-4292
Phone: (702) 486-5800
Fax: (702) 486-5803
Web site: *www.nursingboard.state.nv.us*

New Hampshire
New Hampshire Board of Nursing
21 S. Fruit St., Suite 16
Concord, NH 03301-2431
Phone: (603) 271-2323
Fax: (603) 271-6605
Web site: *www.state.nh.us/nursing*

New Jersey
New Jersey Board of Nursing
P.O. Box 45010
124 Halsey St., 6th Floor
Newark, NJ 07101
Phone: (973) 504-6430
Fax: (973) 648-3481
Web site: *www.state.nj.us/lps/ca/medical/nursing.htm*

New Mexico
New Mexico Board of Nursing
6301 Indian School NE, Suite 710
Albuquerque, NM 87110
Phone: (505) 841-8340
Fax: (505) 841-8347
Web site: *www.bon.state.nm.us/index.html*

New York
New York State Board of Nursing
Education Bldg.
89 Washington Ave., 2nd floor, West Wing
Albany, NY 12234-1000
Phone: (518) 474-3817 ext. 280
Fax: (518) 474-3706
Web site: *www.nysed.gov/prof/nurse.htm*

North Carolina
North Carolina Board of Nursing
3724 National Drive, Suite 201
Raleigh, NC 27602
Phone: (919) 782-3211
Fax: (919) 781-9461
Web site: *www.ncbon.com*

North Dakota
North Dakota Board of Nursing
919 S. 7th St., Suite 504
Bismarck, ND 58504-5881
Phone: (701) 328-9777
Fax: (701) 328-9785
Web site: *www.ndbon.org*

Ohio
Ohio Board of Nursing
17 S. High St., Suite 400
Columbus, OH 43215-7410
Phone: (614) 466-3947
Fax: (614) 466-0388
Web site: *www.nursing.ohio.gov*

Oklahoma
Oklahoma Board of Nursing
2915 N. Classen Blvd., Suite 524
Oklahoma City, OK 73106
Phone: (405) 962-1800
Fax: (405) 962-1821
Web site: *www.youroklahoma.com/nursing*

Oregon
Oregon State Board of Nursing
17938 S.W. Upper Boones Ferry Rd.
Portland, OR 97224
Phone: (971) 673-0685
Fax: (971) 673-0684
Web site: *www.osbn.state.or.us*

Pennsylvania
Pennsylvania State Board of Nursing
P.O. 2649
Harrisburg, PA 17105-2649
Phone: (717) 783-7142
Fax: (717) 783-0822
Web site:
www.dos.state.pa.us/bpoa/cwp/view.asp?a=1104&9=432869

Rhode Island
Rhode Island Board of Nurse Registration and Nursing Education
105 Cannon Bldg., Three Capitol Hill
Providence, RI 02908
Phone: (401) 222-5700
Fax: (401) 222-3352
Web site: *www.health.ri.gov*

South Carolina
South Carolina State Board of Nursing
110 Centerview Drive, Suite 202
Columbia, SC 29210
Phone: (803) 896-4550
Fax: (803) 896-4525
Web site: *www.llr.state.sc.us/pol/nursing*

South Dakota
South Dakota Board of Nursing
4305 S. Louise Ave., Suite 201
Sioux Falls, SD 57106-3115
Phone: (605) 362-2760
Fax: (605) 362-2768
Web site: *www.state.sd.us/doh/nursing*

Tennessee
Tennessee State Board of Nursing
227 French Landing, Suite 300
Heritage Place Metro Center
Nashville, TN 37243
Phone: (615) 532-5166
Fax: (615) 741-7899
Web site: *www.health.state.tn.us/Boards/Nursing/index.htm*

Texas
Texas Board of Nurse Examiners
333 Guadalupe, Suite 3-460
Austin, TX 78701
Phone: (512) 305-7400
Fax: (512) 305-7401
Web site: *www.bon.state.tx.us*

Utah
Utah State Board of Nursing
Heber M. Wells Bldg., 4th Floor
160 E. 300 South
Salt Lake City, UT 84111
Phone: (801) 530-6628
Fax: (801) 530-6511
Web site: *www.dopl.utah.gov/licensing/nursing.html*

Vermont
Vermont State Board of Nursing
Office of Professional Regulation
National Life Bldg. North Fl.2
Montpelier, VT 0563402
Phone: (802) 828-2396
Fax: (802) 828-2484
Web site: *www.vtprofessionals.org/opr1/nurses*

Virginia
Virginia Board of Nursing
Department of Health Professions
Perimeter Center
9960 Maryland Dr., Suite 300
Richmond, VA 23233
Phone: (804) 367-4515
Fax: (804) 527-4455
Web site: *www.dhp.virginia.gov/nursing*

Washington
Washington State Nursing Care Quality Assurance Commission
Department of Health
HPQA #6
310 Israel Rd. SE
Tumwater, WA 98501-7864
Phone: (360) 236-4700
Fax: (360) 236-4738
Web site: *fortress.wa.gov/doh/hpqa1/hps6/Nursing/default.htm*

West Virginia
West Virginia Board of Examiners for Licensed Practical Nurses
101 Dee Drive
Charleston, WV 25311-1620
Phone: (304) 558-3572
Fax: (304) 558-4367
Web site: *www.lpnboard.state.wv.us*

Wisconsin
Wisconsin Department of Regulation and Licensing
1400 E. Washington Ave., Rm. 173
Madison, WI 53708
Phone: (608) 266-0145
Fax: (608) 261-7083
Web site: *www.drl.state.wi.us*

Wyoming
Wyoming State Board of Nursing
1810 Pioneer Ave.
Cheyenne, WY 82001
Phone: (307) 777-7601
Fax: (307) 777-3519
Web site: *nursing.state.wy.us*

NANDA
Nursing diagnoses

Here is a list of the 2007-2008 current nursing diagnoses classifications according to their domains.

DOMAIN

Health promotion

- Effective therapeutic regimen management
- Health-seeking behaviors (specify)
- Impaired home maintenance
- Ineffective community therapeutic regimen management
- Ineffective family therapeutic regimen management
- Ineffective health maintenance
- Ineffective therapeutic regimen management
- Readiness for enhanced immunization status
- Readiness for enhanced nutrition
- Readiness for enhanced therapeutic regimen management

DOMAIN

Nutrition

- Deficient fluid volume
- Excess fluid volume
- Imbalanced nutrition: Less than body requirements
- Imbalanced nutrition: More than body requirements
- Impaired swallowing
- Ineffective infant feeding pattern
- Readiness for enhanced fluid balance
- Risk for deficient fluid volume
- Risk for imbalanced fluid volume
- Risk for imbalanced nutrition: More than body requirements
- Risk for impaired liver function
- Risk for unstable blood glucose level

DOMAIN

Elimination and Exchange

- Bowel incontinence
- Constipation
- Diarrhea
- Functional urinary incontinence
- Impaired gas exchange
- Impaired urinary elimination
- Overflow urinary incontinence
- Perceived constipation
- Readiness for enhanced urinary elimination
- Reflex urinary incontinence
- Risk for constipation
- Risk for urge urinary incontinence
- Stress urinary incontinence
- Total urinary incontinence
- Urge urinary incontinence
- Urinary retention

DOMAIN

Activity/Rest

- Activity intolerance
- Bathing/hygiene self-care deficit
- Decreased cardiac output
- Deficient diversional activity
- Delayed surgical recovery
- Dressing/grooming self-care deficit
- Dysfunctional ventilatory weaning response
- Energy field disturbance
- Fatigue
- Feeding self-care deficit
- Impaired bed mobility
- Impaired physical mobility
- Impaired spontaneous ventilation
- Impaired transfer ability
- Impaired walking
- Impaired wheelchair mobility
- Ineffective breathing pattern
- Ineffective tissue perfusion (specify type: renal, cerebral, cardiopulmonary, gastrointestinal, peripheral)
- Insomnia
- Readiness for enhance self-care
- Readiness for enhanced sleep
- Risk for activity intolerance
- Risk for disuse syndrome
- Sedentary lifestyle
- Sleep deprivation
- Toileting self-care deficit

DOMAIN

Perception/Cognition

- Acute confusion
- Chronic confusion
- Deficient knowledge (specify)
- Disturbed sensory perception (specify: visual, auditory, kinesthetic, gustatory, tactile)
- Disturbed thought processes
- Impaired environmental interpretation syndrome
- Impaired memory
- Impaired verbal communication
- Readiness for enhanced communication
- Readiness for enhanced decision making
- Readiness for enhanced knowledge (specify)
- Risk for acute confusion
- Unilateral neglect
- Wandering

DOMAIN

Self-perception

- Chronic low self-esteem
- Disturbed body image
- Disturbed personal identity
- Hopelessness
- Powerlessness
- Readiness for enhanced hope
- Readiness for enhanced power
- Readiness for enhanced self-concept
- Risk for compromised human dignity
- Risk for loneliness
- Risk for powerlessness
- Risk for situational low self-esteem
- Situational low self-esteem

DOMAIN

Role relationships

- Caregiver role strain
- Dysfunctional family processes: Alcoholism
- Effective breast-feeding
- Impaired parenting
- Impaired social interaction
- Ineffective breast-feeding
- Ineffective role performance
- Interrupted breast-feeding
- Interrupted family processes
- Parental role conflict
- Readiness for enhanced family processes
- Readiness for enhanced parenting
- Risk for caregiver role strain
- Risk for impaired parent/infant/child attachment
- Risk for impaired parenting

DOMAIN

Sexuality

- Ineffective sexuality patterns
- Sexual dysfunction

DOMAIN

Coping/Stress tolerance

- Anxiety
- Autonomic dysreflexia
- Chronic sorrow
- Complicated grieving
- Compromised family coping
- Death anxiety
- Decreased intracranial adaptive capacity
- Defensive coping
- Disabled family coping
- Disorganized infant behavior
- Fear
- Grieving
- Ineffective community coping
- Ineffective coping
- Ineffective denial
- Post-trauma syndrome
- Rape-trauma syndrome
- Rape-trauma syndrome: Compound reaction
- Rape-trauma syndrome: Silent reaction
- Readiness for enhanced community coping
- Readiness for enhanced coping (individual)
- Readiness for enhanced family coping
- Readiness for enhanced organized infant behavior
- Relocation stress syndrome
- Risk for autonomic dysreflexia
- Risk for complicated grieving
- Risk for disorganized infant behavior
- Risk for post-trauma syndrome
- Risk for relocation stress syndrome
- Risk-prone health behavior
- Stress overload

DOMAIN

Life principles

- Decisional conflict (specify)
- Impaired religiosity
- Moral distress
- Noncompliance (specify)
- Readiness for enhanced decision making
- Readiness for enhanced hope
- Readiness for enhanced religiosity
- Readiness for enhanced spiritual well-being
- Risk for impaired religiosity
- Risk for spiritual distress
- Spiritual distress

DOMAIN

Safety/Protection

- Contamination
- Hyperthermia
- Hypothermia
- Impaired dentition
- Impaired oral mucous membrane
- Impaired skin integrity
- Impaired tissue integrity
- Ineffective airway clearance
- Ineffective protection
- Ineffective thermoregulation
- Latex allergy response
- Readiness for enhanced immunization status
- Risk for aspiration
- Risk for contamination
- Risk for falls
- Risk for imbalanced body temperature
- Risk for impaired skin integrity
- Risk for infection
- Risk for injury
- Risk for latex allergy response
- Risk for other-directed violence
- Risk for perioperative positioning injury
- Risk for peripheral neurovascular dysfunction
- Risk for poisoning
- Risk for self-directed violence
- Risk for self-mutilation
- Risk for sudden infant death syndrome
- Risk for suffocation
- Risk for suicide
- Risk for trauma
- Self-mutilation

DOMAIN

Comfort

- Acute pain
- Chronic pain
- Nausea
- Readiness for enhanced comfort
- Social isolation

DOMAIN

Growth/Development

- Adult failure to thrive
- Delayed growth and development
- Risk for delayed development
- Risk for disproportionate growth

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