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Wilda Rinehart received her associate degree in nursing from Northeast Mississippi Community College in Booneville, Mississippi. After working as a staff nurse and charge nurse, she became a public health nurse and served in that capacity for a number of years. In 1975, she received her Nurse Practitioner Certification in obstetric-gynecology from the University of Mississippi Medical Center in Jackson, Mississippi. In 1979, she completed her bachelor's of science degree in nursing from Mississippi University for Women and the following year completed her master's degree in nursing from the same university. In 1980, Ms. Rinehart accepted a faculty position at Northeast Mississippi Community College where she has taught medical-surgical nursing and obstetrical nursing. In 1982, she founded Rinehart and Associates Educational Consults. For the past 22 years, she and her associates have worked with nursing graduates and schools of nursing to assist graduates to pass the National Council Licensure Exam for Nursing. She has also worked with faculty who want to improve their item writing skills and as a curriculum consultant. Ms. Rinehart has served as a convention speaker throughout the southeastern United States and as a reviewer of medical-surgical and obstetric texts. She has coauthored NCLEX® review materials and is presently working on DVD and CD review programs. As president of Rinehart and Associates, she serves as coordinator of a company dedicated to improving the quality of health through nursing education.

Dr. Diann Sloan holds an associate degree in nursing from Northeast Mississippi Community College, a bachelor's degree in nursing from the University of Mississippi, and a master's degree in nursing from Mississippi University for Women. In addition to her nursing degrees, she holds a master of science in education degree in counseling psychology from Georgia State University and a doctor of philosophy degree in counselor education, with minors in both psychology and educational psychology, from Mississippi State University. She has completed additional graduate studies in healthcare administration at Western New England College and the University of Mississippi.

As a nurse educator, Dr. Sloan has taught pediatric nursing, psychiatric mental health nursing, and medical surgical nursing in both associate degree and baccalaureate nursing programs. As a member of Rinehart and Associates Nursing Review, Dr. Sloan has conducted test construction workshops for faculty and nursing review seminars for both registered and practical nurse graduates. She has coauthored materials used in the item writing workshops for nursing faculty and Rinehart and Associates Nursing Review. She is a member of Sigma Theta Tau nursing honor society.

Clara Hurd is an associate degree nurse graduate of Northeast Mississippi Community College in Booneville, Mississippi (1975). Her experiences in nursing are clinically based, having served as a staff nurse in medical-surgical nursing. She has worked as an oncology, inten-
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“Testing for Nursing School and NCLEX® Success”, a mini workshop for nursing students to enhance success in nursing school and beyond.
“Fluid and Electrolytes- A Practical Approach”, a mini workshop to increase the student’s knowledge of Fluid and Electrolytes and Acid Base Disorders.

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Dedication

We would like to thank our families for tolerating our late nights and long hours. Also, thanks to Gene Sloan for his help without pay. Special thanks to all the graduates who have attended Rinehart and Associates Review Seminars. Thanks for allowing us to be a part of your success.

We Want to Hear from You!

As the reader of this book, you are our most important critic and commentator. We value your opinion and want to know what we’re doing right, what we could do better, what areas you’d like to see us publish in, and any other words of wisdom you’re willing to pass our way.

As an Associate Publisher for Pearson Education, I welcome your comments. You can email or write me directly to let me know what you did or didn’t like about this book—as well as what we can do to make our books better.

Please note that I cannot help you with technical problems related to the topic of this book. We do have a User Services group, however, where I will forward specific technical questions related to the book.

When you write, please be sure to include this book’s title and author as well as your name, email address, and phone number. I will carefully review your comments and share them with the author and editors who worked on the book.

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Reader Services

Visit our website and register this book at www.examcram.com/register for convenient access to any updates, downloads, or errata that might be available for this book.
Introduction

Welcome to the NCLEX-PN® Exam Cram

This book will help you prepare to take and pass the Licensure Exam for Practical Nurses. This Introduction discusses the NCLEX® exam in general and how the Exam Cram can help you prepare for the test. It doesn’t matter whether this is the first time you’re going to take the exam or if you have taken it previously; this book gives you the necessary information and techniques to obtain licensure.

Exam Cram books help you understand and appreciate the subjects and materials you need to pass. The books are aimed at test preparation and review. They do not teach you everything you need to know about the subject of nursing. Instead they present materials you are likely to encounter on the exam.

Using a simple approach, we help you understand the need-to-know information. First, you learn content as it applies to medical-surgical nursing, psychiatric-mental health nursing, obstetric nursing, and pediatric nursing, with an emphasis on pharmacology, skills, and management of these disorders. In a well-organized format, you learn the pathophysiology of the most common problems affecting clients, the treatment of these disorders, and the nursing care required.

The NCLEX-PN® consists of questions from the cognitive levels of knowledge, comprehension, application, and analysis. The majority of questions are written at the application and analysis levels. Questions incorporate the five stages of the nursing process (assessment, diagnosis, planning, implementation, and evaluation) and the four categories of client needs. Client needs are divided into subcategories that define the content within each of the four major categories. These categories and subcategories are:

- A. Safe, effective care environment:
  - Coordinated care: 12%–18%
  - Safety and infection control: 8%–14%

- B. Health promotion and maintenance: 7%–13%

- C. Psychosocial integrity: 8%–14%
D. Physiological integrity:
- Basic care and comfort: 11%–17%
- Pharmacological and parenteral therapy: 9%–15%
- Reduction of risk: 10%–16%
- Physiological adaptation: 11%–17%

Taking the Computerized Adaptive Test

Computer Adaptive Testing offers the candidate several advantages. The graduate can schedule the exam at a time that is convenient for him. The Pearson VUE testing group is responsible for administering the exam. Because you might not be familiar with the Pearson VUE testing centers, we recommend that you arrive at least 30 minutes early to acclimate yourself to the surroundings and learn what you need to do while testing at the center. If you are late, you will not be allowed to test. Bring two forms of identification with you, one of which must be a picture ID. Be sure that your form of identification matches your application. You will be photographed and fingerprinted upon entering the testing site, so don't let this increase your stress. The allotted time is 5 hours. The candidate can receive results within approximately 7 days (in some states even sooner). Remember that the exam is written at approximately the 10th-grade reading level so keep a good dictionary handy during your studies.

The Cost of the Exam

The candidate wanting to take the licensure exam must fill out two applications, one to the National Council and one to the state in which she wants to be licensed. A separate fee must accompany each application. The fee required by the National Council is $200. State licensing fees vary from state to state. The candidate should contact the state where she wishes to become licensed for a list of fees for that specific state. Licensure applications can be obtained on the National Council’s website at www.ncsbn.org. Several states are members of the multistate licensure compact. This means that, if you are issued a multistate license, you pay only one fee. This information can also be obtained by visiting the National Council’s website. A list of phone numbers and websites is included on this book’s CD, in Appendix C, “Alphabetical Listing of Nursing Boards in the United States and Protectorates.”
How to Prepare for the Exam

Judicious use of this book, either alone or with a review seminar, such as that provided by Rinehart and Associates, will help you to achieve your goal of becoming a practical nurse. As you review for the NCLEX® Exam, we suggest that you find a location where you can concentrate on the material each day. A minimum of 2 hours per day for at least 2 weeks is suggested. We have provided you with exam alerts, tips, notes, and sample questions, both multiple-choice and alternative items. These questions will acquaint you with the type of questions you will see during the exam. We have also formulated a mock exam, with those difficult management and delegation questions, which you can score to determine your readiness to test. Pay particular attention to the Exam Alerts and the Cram Sheet. Using these will help you gain and retain knowledge and help reduce your stress as you prepare to test.

How to Use This Book

Each topical Exam Cram chapter follows a regular structure and includes cues about important or useful information. Here's the structure of a typical chapter:

- **Opening hotlists**—Each chapter begins with a list of terms and concepts you must learn and understand before you can know the subject matter. The hotlists are followed by an introductory section to set the stage for the rest of the chapter.

- **Topical coverage**—After the opening hotlists, each chapter covers a series of topics related to the chapter's subject title.

Even though the book is structured to the exam, these flagged items are often particularly important:

- **Exam Alert**—Exam alerts normally stress concepts, terms, or activities that are related to one or more test questions. Anything found in exam alert format is worthy of greater attention on your part. This is what an exam alert looks like:

  **CAUTION**

  Exam alerts are provided as a heads up that the content mentioned here might appear on the NCLEX-PN® exam.
Notes—Throughout each chapter additional information is provided that, although not directly related to the exam itself, is still useful and will aid your preparation. A sample note is shown here:

**NOTE**
This is how notes are formatted. Notes direct your attention to important pieces of information that relate to nursing and nursing certification.

Tips—A tip might tell you another way of accomplishing something in a more efficient or time-saving manner. An example of a tip is shown here:

**TIP**
This is how tips are formatted. Keep your eyes open for these, and you’ll learn some interesting nursing tips!

Exam Prep Questions—Although we talk about test questions and topics throughout the book, the section at the end of each chapter presents a series of mock test questions and explanations of both correct and incorrect answers.

Practice Exams—This book offers two exams written in the NCLEX® format. These have been provided to help you evaluate your readiness to test. Answers and rationale to these questions have also been provided. We suggest that you score the exam by subtracting the missed items from the total and dividing the total answered correctly by the total number of questions. This will give you the percentage of answers correctly. We suggest that you achieve a score of at least 77% before you schedule your exam.

Glossary—At the end of the book is a glossary that defines critical nursing terms we cover in this book.

The CD—The CD includes a testing engine with many practice questions that you should use repeatedly to practice your test-taking skills and measure your level of learning. You should be able to correctly answer more than 77% of the questions on the practice tests before trying the real exam. The CD also contains Appendix A, “Things You Forgot”; Appendix B, “Need to Know More?”; and Appendix C, “Alphabetical Listing of Nursing Boards in the United States and Protectorates.”
Introduction

Cram Sheet—At the beginning of the book is a tear card we call the Cram Sheet. This is a helpful tool that gives you distilled, compressed facts and is a great tool for last-minute study and review.

About the Book

The topics in this book have been structured using the systems approach to nursing. We believe that a simple approach to learning the disease process, treatments, and diagnostic studies is best. We review material related to diseases of each body system; the related nursing skills; and the diagnostic tests, nutrition, and pharmacology associated with each. We also consider cultural and religious aspects as they relate to the care of clients with specific illnesses.

Aside from being a test preparation book, this book is also useful if you are brushing up on your nursing knowledge. It is an excellent quick reference for the licensed nurse.

Contact the Authors

The authors of this text are interested in you and want you to pass on the first attempt. If, after reviewing with this text, you would like to contact the authors, you can do so at Rinehart and Associates, PO Box 124, Booneville, MS 38829 or by visiting our website at www.nclexreview.net. You can also contact us by phone at 662-728-4622.
Self-Assessment

Before you take this Self-Assessment exam, let’s talk about the concerns you might have:

► Am I required to answer all 205 questions to pass?

No. If you run out of time, the computer looks at the last 60 items. If the candidate is consistently above the pass point on the last 60 items, a passing report is registered.

► What score do I have to make to pass the NCLEX-PN® Exam?

There is not a set score. When you were in nursing school, you might have been required to score 75% or 80% to pass and progress onto the next level. The licensure exam is not scored in percentages. The computer looks for consistency above or below the pass point. When the candidate shows this consistency, the computer stops asking questions.

► How do they develop the test plan?

Every 3 years a survey is sent out to approximately 4,000 newly licensed nurses. These nurses are asked questions based on the Activity Statements for nursing practice. Based on the results of the survey, the test plan is set by the National Council and members of the Licensure Committee. These members are appointed from representative states.

► What types of questions will I be asked?

The majority of questions are multiple-choice; however, alternative items are also a portion of the exam. These items are fill-in-the-blank, identify-a-diagram, place-in-sequence, or check-all-that-apply questions. Some examples of these are shown here:

1. Figure the 8-hour intake and output.
2. Identify the area where the mitral valve is heard the loudest.
3. Place in sequence the tasks that you would use in the skill of washing your hands.
4. Work the math problem.
5. Check all that apply to the care of the client after a cardiac catheterization.
NCLEX-PN Exam Cram, Second Edition

- Will I have a calculator for math problems?
  Yes, a drop-down calculator is provided.

- Will I have something to write on in the testing area?
  Yes, a magic slate or paper will be provided. Don’t worry about them thinking you are cheating. They clean and secure the area after each candidate.

- What if I get sick and cannot take my exam?
  You have a period of time allowed during which you can cancel your appointment and reschedule. If, however, you do not contact your Pearson VUE testing center in that allotted time and do not attend to take the exam, you forfeit your money and must reapply.

- Can I carry a purse or bag into the testing center?
  No, there will be lockers for your use in the testing center. Also, be sure to dress warmly because the area is usually cool.

- Can I take breaks?
  There are optional breaks throughout the test.

- If I should fail, when could I retest?
  The required time for rewriting the exam is 45 days in most states. If you are unsuccessful, you should contact the state where you want to obtain licensure for its required retest time.

Testing Your Exam Readiness

Whether you attend a formal review seminar or use written material such as this book, or use a combination of both, preparation is essential. Costing as much as $400 a try—pass or fail—you should do everything you can to pass on your first attempt. Spend time each day studying and taking exam questions. The more questions you take, the more prepared you will be. I recommend that you consistently score at least 77% on our practice questions before you attempt to take the exam. With these facts in mind, let’s get ready to take the NCLEX-PN® Exam. Good luck!
1

Preparing for the National Council Exam for Licensed Practical Nurses

Terms you’ll need to understand:
✓ Alternative items
✓ Client needs
✓ Computerized Adaptive Testing (CAT)
✓ Distractors
✓ National Council of State Boards of Nursing
✓ Nursing process
✓ Options
✓ Stem
✓ Test item
Preparing for the Exam

As you prepare to take the National Council Licensure Examination, you may feel overwhelmed and frustrated. There is so much material to review and so many decisions to make. Where do I begin? Most graduates feel that way. This chapter will help you to become aware of the NCLEX® test plan and to know the types of questions you will encounter on the exam.

The NCLEX-PN® consists of questions from the cognitive levels of knowledge, comprehension, application, and analysis. The majority of questions are written at the application and analysis levels. Questions incorporate the five stages of the nursing process (assessment, analysis, planning, implementation, and evaluation) and the four categories of client needs. Client needs are divided into subcategories that define the content within each of the four major categories. These categories and subcategories as well as the percentages of questions allocated to each area are

A. Safe, Effective Care Environment
   Coordinated Care: 12%–18%
   Safety and Infection Control: 8%–14%

B. Health Promotion and Maintenance: 7%–13%

C. Psychosocial Integrity: 8%–14%

D. Physiological Integrity
   Basic Care and Comfort: 11%–17%
   Pharmacological and Parenteral Therapy: 9%–15%
   Reduction of Risk Potential: 10%–16%
   Physiological Adaptation: 11%–17%

The Computer Adaptive Test

The Computer Adaptive Test (CAT) provides a means of individualized testing of each candidate seeking licensure. Selecting from a large test bank, the computer chooses questions based on the candidate's ability and competence as demonstrated on the prior question.

The minimum number of questions is 85; the maximum number is 205. The average candidate's exam is comprised of approximately 160 items. You must answer the question that appears on the screen before another question is given, and you cannot skip questions nor return to a previous question. It is imperative that you read each question carefully before selecting a response. We suggest that you cover the answers with your nondominant hand and read the stem before looking at the answers.
Computerized Adaptive Testing offers the candidate several advantages over the former paper pencil exam. The test questions, which are stored in a large test bank and classified by test plan areas and level of difficulty, are then administered to the candidate.

Depending on the answer given by the candidate, the computer presents another question that is either more difficult or less difficult. This allows the computer to determine the candidate’s knowledge of the subject matter more concisely. The pass/fail decision is not based on how many questions the candidate answers correctly but on the difficulty of the questions answered correctly. Even though the candidates may answer different questions and different numbers of questions, the test plan remains the same.

All NCLEX-PN® CAT examinations conform to this test plan. Each time you answer a question correctly, the next question gets harder until you miss a question; then an easier question is given until you answer correctly. This way the computer concludes if a candidate has met the passing standard. If you are clearly above the passing standard at 85 questions, the computer stops asking questions. If you are clearly below the passing standard, the computer stops asking questions. If your ability estimate is close to the passing standard, the computer continues to ask questions until either the maximum number of questions is asked or time expires. Should time expire, the last 60 questions are reviewed. To pass, the candidate must remain above the passing standard on the last 60 items.

The CAT exam offers another advantage. The candidate may schedule the exam at a time that is convenient for him; the candidate usually receives test results in 7 days or sooner. The candidate can rewrite the exam after 45 days in most states. We suggest that you review this text and others and, if necessary, take a review seminar prior to taking the NCLEX®. Allow at least one week to study and prepare for the exam. Remember that you want to take the exam only one time.

**Testing Strategies**

After learning the materials, you might want to utilize a number of testing strategies. These strategies are intended to provide you with additional skills and are not to be considered as a substitute for good study habits or an adequate knowledge of the content. While some attempt to commit information to memory, it has been shown that merely memorizing facts is of little help because few test items rely on simple recall. Most questions that appear as test items above the pass point require the graduate to pull together information from a variety of sources. If you have a thorough knowledge of the content measured by an exam using good testing skills and can apply this knowledge, you will pass the exam. Remember that testing skills, like any other skill, are improved with practice.
Before discussing strategies for successful test-taking, you should be familiar with the following terms:

- **Test item**—The entire question
- **Stem**—The portion of the test item that asks a question or proposes the problem
- **Options**—All potential answers
- **Alternative item**—Items utilizing a diagram, listing in order of priority, checking all that apply, calculating math or intake and output, or filling blanks

### Reading the Question Carefully

Scores are affected by reading ability. Before selecting an answer, ask the following questions:

- What is the question asking?
- Are there keywords?
- Is there relevant information in the stem?
- How would I ask this question (in my own words)?
- How would I answer this question (in my own words)?

After answering these questions, see if there is an option similar to your answer. Is this option the best or most complete answer to the question?

### Look for Keywords

Keywords in the stem should alert you to use care in choosing an answer. Avoid selecting answers that include keywords such as *always, never, all, every, only, must, no, except, and none*. Answers that contain these keywords are seldom correct because they limit and qualify potentially correct answers.

### Watch for Specific Details

Careful reading of details in the stem can provide important clues to the correct option. For example, if the item seeks information on a short-term goal, look for something to be accomplished within the hospital stay; if the item seeks information on a long-term goal, look for something to be accomplished in the home or community. The following list gives you more hints on how to watch for details in the answer stems:
- **Eliminate options that are clearly wrong or incorrect**—By systematically eliminating distractors, you increase the probability of selecting the correct option. With the elimination of each distractor, you increase the probability of selecting the correct option by 25%.

- **Look for similar options**—If a test item contains two or more correct options that are similar in meaning, look for an umbrella term or phrase that encompasses the other correct options. Correct options will include or exclude all the other options.

- **Look at the parts of the options**—If an answer contains two or more parts, you can reduce the number of possible correct answers by identifying one part as incorrect.

- **Identify specific determiners**—Look for the same or similar words in the stem and in the options. The word in the stem that clues you to a similar word in the option or that limits potential options is referred to as a *specific determiner*. The option with the specific determiner is often the correct answer.

- **Identify words in the option that are closely associated with, but not identical to, words in the stem**—An option that contains a word(s) closely associated with a word(s) appearing in the stem is often the correct answer.

- **Be alert for grammatical inconsistencies**—The correct option must be consistent with the form of the question. If the item demands a response in the singular, look for an option in the singular—that is, an option in the plural would be incorrect.

- **Use relevant information from an earlier question**—Test writers often provide information that can be used in subsequent questions. This information can help you make correct selections to later items. Be sure that you review the Cram Sheet before you enter the testing area.

- **Look for the answer that is different from the other options**—If the question asks, “Which finding indicates that the client needs further teaching?” you will find that three answers indicate that the client understands and one indicates that the client does not understand your teaching. This testing strategy will really help you with teaching questions.

- **Look for opposite answers**—When you see opposites, one of these options is usually correct.

- **Do not read into the question**—If you find yourself saying “what if?”, stop and reread the stem. Reading into the question will create errors in judgment.

- **Choose reasonable options**—Choose only an option that is reasonable and obtainable.
Chapter 1: Preparing for the National Council Exam for Licensed Practical Nurses

- Choose an option that focuses on or is directed at the client’s feeling.
- Choose items related to maintaining life—If the item asks for an immediate action or response or for priority, choose the option that is critical to maintaining the life or safety of the client.
- Do not select an option that contains exceptions to the general rule—And don’t select answers that are controversial or that are degrading to the client.
- Look for subjective and objective assessment data—When you see both types of data and all options are correct, the most objective data is correct.

CAUTION
When dealing with legalities of nursing practice, assign the most critical patients to the registered nurse and the most stable patients to the nursing assistant. If skilled nursing care is required, assign the stable client to the licensed practical nurse and self-assign the most critical.

CAUTION
When organizing client care, visit the most critical first. Remember your ABCs: airway, breathing, and circulation.

CAUTION
Remember infection control. Do not coassign or assign to room clients who have active infections with surgical or immune-compromised clients.
Exam Prep Questions

1. The client is scheduled for a glucose tolerance test. Place in ordered response the correct sequence for performance of this test.
   - A. Instruct the client to drink a 75gm glucose solution.
   - B. Tell the client to eat a high carbohydrate diet for three days prior to the exam.
   - C. Instruct the client to remain NPO after midnight.
   - D. Obtain a fasting blood glucose level.
   - E. Obtain a two-hour post-prandial glucose level.

2. The most important information for the nurse to have when planning care for the client with diabetes is the client's
   - A. Family medical history
   - B. Blood glucose history
   - C. 24-hour dietary history
   - D. Medical history

3. The nurse has just received the shift report. Which one of the following clients should be seen first?
   - A. A 14-year-old one day post-appendectomy with a WBC of 6500
   - B. A 5-year-old three days post-fracture of the right tibia with a temperature of 101° Fahrenheit
   - C. An 11-month-old admitted during the previous shift with dehydration and a hematocrit of 40
   - D. An 8-week-old admitted four hours earlier with sub-sternal retractions and an oxygen saturation of 90%

4. Which client should receive a private room?
   - A. A client with diabetes
   - B. A client with Cushing’s disease
   - C. A client with Grave's disease
   - D. A client with gastric ulcers
5. The nurse is making assignments for the day. The staff consist of an RN, an LPN, and a nursing assistant. Which client should be assigned to the nursing assistant?
   ○ A. A client with laparoscopic cholecystectomy
   ○ B. A client with viral pneumonia
   ○ C. A client with suspected ectopic pregnancy
   ○ D. A client with intermittent chest pain

6. The nurse knows that the client with peripheral vascular disease understands her instructions in ways to improve circulation if the client states
   ○ A. “I will massage my legs three times a day.”
   ○ B. “I will elevate the foot of my bed on blocks.”
   ○ C. “I will take a brisk walk for 20 minutes each day.”
   ○ D. “I will prop my feet up when I sit to watch TV.”

   **TIP**

   Look at B and D in the previous question. These are similar answers. Remember that the answer that is different is most often correct. Answer C is the “odd answer” or the answer that is different. Walking will develop muscles and muscles support blood vessels.

7. Which action by the client indicates an acceptance of his recent amputation?
   ○ A. He verbalizes acceptance.
   ○ B. He looks at the operative site.
   ○ C. He asks for information regarding prosthesis.
   ○ D. He remains silent during dressing changes.

8. The client with cancer of the larynx is admitted to the unit with Acute Respiratory Distress Syndrome. Which nursing diagnosis should receive priority?
   ○ A. Alteration in oxygen perfusion
   ○ B. Alteration in comfort/pain
   ○ C. Alteration in mobility
   ○ D. Alteration in sensory perception
9. Treatment of sickle cell crises includes the application of:
   ○ A. A heating pad to the joints
   ○ B. An ice pack to the joints
   ○ C. A CPM device to the lower leg
   ○ D. A TENS unit to the back

**TIP**
In the previous question, notice that A and B are opposites.

10. The client is admitted to the intensive care unit with severe chest pain. Which information provides the nurse with the most data that can be utilized in planning care?
   ○ A. The blood pressure
   ○ B. The vital signs
   ○ C. The pulse oximeter
   ○ D. The EEG

**TIP**
This is an umbrella answer. If you find one answer is included in another answer, that option is most often correct.

**Answer Rationales**

1. Answer: When placing in chronological order, the nurse should: 2. tell the client to increase the amount of carbohydrates for three days prior to the exam; 3. instruct the client to remain NPO after midnight the day of the exam; 4. obtain a fasting blood glucose level; 1. instruct the client to drink a 75 gm glucose solution; and 5. obtain a two-hour post-prandial glucose level. The candidate is asked to place answers in a logical sequence. Think about the natural order of the question.

2. Answer B is correct. The most objective answer is the blood glucose history. Answers A, C, and D are more subjective. This information is reported data.

3. Answer D is correct. There is nothing in answer A that indicates the client is unstable. Answer B is a good choice, but the client three days post-fracture may have a slight temperature, so he should be seen second. Answer C is also a good choice, but if the
child is dehydrated, the hematocrit will be increased due to a decreased blood volume and hemoconcentration.

4. Answer is C is correct. Graves’s disease is hyperthyroidism. These clients have insomnia and any noise will wake them. Lack of sleep makes their condition worse. Answer B is a good choice, but if you answered B, you are reading into the question because the question does not say that the client should be placed in a room with any client who is infected with any microorganism. Answers A and D are vague answers; stay away from vague answers. The answer does not tell us if they are in the hospital for diagnostic studies or for complications of their diseases.

5. Answer A is correct. The client with laser surgery has three or four very small incisions. These clients’ vital signs become stable very quickly, and they are generally discharged within 12–24 hours. We are not, however, suggesting that the nursing assistant be assigned to obtain the post-operative vital signs. This should be done by the nurse. The registered nurse should obtain the first vital signs, and the licensed practical nurse may obtain the remaining vital signs. Answers B, C, and D are all more critical clients and should be assigned to a registered nurse.

6. Answer C is correct. Answer A is totally wrong. If this is done, a clot may be present that can become a pulmonary emboli.

7. Answer B is correct. Any time there is a change in body image, looking at the operative site is the best indicator of acceptance.

8. Answer A is correct. Remember the ABCs: Airway is always first.

9. Answer A is correct. Sickle cell anemia is an autosomal recessive trait found most commonly in African-American individuals. The treatment for this condition is heat, hydration, oxygenation, and pain relief.

10. Answer B is correct. Notice that the vital signs include a blood pressure.
CHAPTER TWO

Simplifying Pharmacology

Terms you'll need to understand:
✓ Adverse reactions ✓ Oral
✓ Agonist ✓ Peak drug level
✓ Allergic response ✓ Pharmacodynamics
✓ Antagonists ✓ Pharmacokinetics
✓ Buccal ✓ Pharmacotherapeutics
✓ Contraindications ✓ Side effects
✓ Enteral administration ✓ Spansules
✓ Enteric coating ✓ Subcutaneous
✓ FDA ✓ Synergistic
✓ Intradermal ✓ Toxicity
✓ Intramuscular ✓ Trough drug level
✓ Nursing implication

Nursing skills you'll need to master:
✓ Making drug calculations ✓ Administering suppositories
✓ Administering oral medication ✓ Interpreting normal lab values
✓ Administering parenteral medication
Pharmacology

For a number of years, I have searched for a way to help students understand and apply knowledge of pharmacology to nursing practice. The graduate nurse is frequently responsible for instructing the client and the client’s family regarding the safe administration of medications. The study of pharmacology is constantly changing as new drugs are constantly being approved for public use by the Food and Drug Administration (FDA). The recent test plan approved by the National Council Licensure Exam devotes 13%–19% of the Physiological Integrity section to pharmacology. This chapter contains useful information to help you look at the classification and generic name of drugs. If you can remember the drug classification, frequently you can understand why the drug was ordered.

Three Areas of Pharmacology

It is important to note that the study of pharmacology includes three areas:

- **Pharmacokinetics**—This is the study of how drugs are absorbed, distributed, metabolized, and excreted by the body. Elderly clients and clients with renal or liver disease frequently have difficulty metabolizing and excreting medications. These clients can develop drug toxicity more easily than those with no renal or liver impairment.

- **Pharmacodynamics**—This is the study of how drugs are used by the body. For example pharmacodynamics of oral hypoglycemics explain how the blood glucose is reduced by stimulating the pancreatic beta cells to produce more insulin, by also making insulin receptor sites more sensitive to insulin, and by increasing the number of insulin receptor cells. These drugs are effective only if the client’s pancreas is producing some insulin.

- **Pharmacotherapeutics**—This is the study of how the client responds to the drug. A client might experience side effects such as gastrointestinal symptoms to a number of medications, including antibiotics. Side effects may cause discomfort but are usually not severe enough to warrant discontinuation of the medication. Demerol (meperidine HCl) is a narcotic analgesic that can cause nausea and vomiting. To prevent these side effects, the physician frequently orders an antiemetic called Phenergan (promethazine) to be given with Demerol. These drugs have a synergistic effect that provides pain relief while preventing the discomfort of side effects.

Adverse effects of medications result in symptoms so severe that it is necessary to reduce the dosage or discontinue the medication completely. Antituberculars and anticonvulsants are two categories of medications that can have adverse effects on the liver. The nurse should carefully assess the client for signs of jaundice that indicate drug-related hepatitis, in which case the medication will be discontinued.
How Nurses Work with Pharmacology

Nurses are expected to utilize their knowledge of pharmacology to

- Recognize common uses, side effects, and adverse effects of the client’s medication
- Challenge medication errors
- Meet the client’s learning needs

Generally, the medication the nurse is expected to administer depends on the area of practice and the assigned client. The following medication classifications are commonly prescribed for adult clients within a medical/surgical setting:

- **Anti-infectives**—Used for the treatment of infections.
- **Antihypertensives**—These lower blood pressure and increase blood flow to the myocardium.
- **Antidiarrheals**—Decrease gastric motility and reduce water content in the intestinal tract.
- **Diuretics**—Decrease water and sodium absorption from the Loop of Henle (loop diuretics) or inhibit antidiuretic hormone (potassium-sparing diuretics).
- **Antacids**—Reduce hydrochloric acid in the stomach. A common side effect of calcium- and aluminum-based antacids is constipation. Magnesium-based antacids frequently cause diarrhea.
- **Antipyretics**—Reduce fever.
- **Antihistamines**—Block the release of histamine in allergic reactions. Common side effects of antihistamines are dry mouth, drowsiness, and sedation.
- **Bronchodilators**—Dilate large air passages and are commonly prescribed for clients with asthma and chronic obstructive lung disease. A common side effect of these is tachycardia.
- **Laxatives**—Promote the passage of stool. Types of laxatives include stool softeners, cathartics, fiber, lubricants, and stimulants.
- **Anticoagulants**—Prevent clot formation by decreasing vitamin K levels and blocking the clotting chain or by preventing platelet aggregation.
- **Antianemics**—Increase factors necessary for red blood cell production. Examples of antianemics include B12, iron, and Epogen (erythropoetin).
Narcotics/analgesics—Relieve moderate to severe pain. Medications in this category include opioids (morphine and codeine), synthetic opioids (meperidine), and NSAIDs (ketorolac).

Anticonvulsants—Used for the management of seizure disorder and the treatment of bipolar disorder. Medications used as anticonvulsants include lorazepam (Ativan), phenobarbital, and phenytoin (Dilantin).

Anticholinergics—Cause the mucous membranes to become dry; therefore, oral secretions are decreased. Anticholinergics such as atropine are often administered preoperatively.

Mydriatics—Dilate the pupils. Mydriatics are used in the treatment of clients with cataracts.

Miotics—Constrict the pupil. Miotics such as pilocarpine HCl are used in the treatment of clients with glaucoma.

**Time-Released Drugs**

The following abbreviations indicate to the nurse that the drug is time-released. These preparations should not be crushed or opened:

- **Dur** = Duration
- **SR** = Sustained release
- **CR** = Continuous release
- **SA** = Sustained action
- **Contin** = Continuous action
- **LA** = Long acting

*Enteric-coated* tablets and caplets are those coated with a thick shell that prevents the medication from being absorbed in the upper GI tract, allowing the medication to be absorbed more slowly. *Spansules* are capsules containing time-released beads that are released slowly. The nurse should not alter the preparation of these types of medications. The physician should be notified to obtain an alternative preparation if the client is unable to swallow a time-released preparation.
Administering Medications

When preparing to administer medications, the nurse must identify the client by reviewing the physician's order. She must also administer the medication by the right route. Many medications are supplied in various preparations. The physician orders the method of administration. The choice of medication administration is dependent on several factors, including the desired blood level, the client's ability to swallow, and the disease or disorder being treated.

The Seven Rights of Administering Medication

The nurse is expected to use the seven rights when administering medications to the client. These include five rights of drug administration, plus two from the Patient's Bill of Rights.

The Patient's Bill of Rights was enacted to protect the client's well-being, both mentally and physically. The client has the right to refuse treatment that may include medications. The nurse must document any treatment provided to the client. Documentation of care given must be made promptly to prevent forgetting any details and to ensure that another nurse does not duplicate medication administration.

The seven rights of medication administration are:

- **Right client**—Identification of the client must be done by asking the client to state his name and checking the identification band.
- **Right route**—The physician orders the prescribed route of administration.
- **Right drug**—Checking both the generic and trade names with the physician's order ensures that the right drug is administered. If the client's diagnosis does not match the drug category, the nurse should further investigate the ordered medication.
- **Right amount**—The nurse is expected to know common dosages for both adults and children.
- **Right time**—The nurse can administer the medication either 30 minutes before the assigned time or 30 minutes after.
- **Right documentation (from the Patient's Bill of Rights and legality issues in nursing)**—This right is different from the others in that it must be done to prevent duplicating drug administration.
- **Right to refuse treatment (from the Patient’s Bill of Rights)**—The client has the right to refuse medication or treatment.
Understanding and Identifying the Various Drugs

It is important to know that drugs generally have several names. The following list explains these different names for you:

- **Chemical name**—This is often a number or letter designation that tells you the chemical makeup of the drug. This name is of little value to the nurse in practice.

- **Generic name**—This is the name given by the company that developed the drug, and it remains the same even after the patent is released and other companies are allowed to market the medication.

- **Trade name**—This is the name given to the drug by the originating company. This name may change after the patent is released.

It is much safer for the nurse to remember the *generic name* rather than the trade name because the trade name will probably change.

**CAUTION**

On the NCLEX exam, both the generic and trade names of medications might be included for clarification. The generic name will be given.

Approximately 80% of the time generic drugs in the same category have common syllables. If you can identify the commonality within the generic names, you can more easily learn the needed information for the NCLEX. Let’s look at some commonly given categories of drugs and see whether we can recognize the commonalities in the names. As you will see, each drug has a common part in its name. This is a hint we want to point out that will help you to quickly identify a particular drug by the common part of the name for that drug category. Let’s begin with the angiotensin-converting agents drug category to see how this works.

**Angiotensin-Converting Enzyme Inhibitors**

This category of drugs is utilized to treat both primary and secondary hypertension. These drugs work by inhibiting conversion of angiotensin I to angiotensin II. Notice that all the generic names include the syllable *pril*. When you see these letters, you will know that they are angiotensin-converting enzyme (ACE) inhibitors. Table 2.1 highlights these in more depth.
Understanding and Identifying the Various Drugs

**TABLE 2.1 Angiotensin-Converting Enzyme Inhibitors**

<table>
<thead>
<tr>
<th>Action/Use</th>
<th>Drug Name*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antihypertensives</td>
<td>Benazepril (Lotensin)</td>
</tr>
<tr>
<td></td>
<td>Lisinopril (Zestril)</td>
</tr>
<tr>
<td></td>
<td>Captopril (Capoten)</td>
</tr>
<tr>
<td></td>
<td>Enalapril (Vasotec)</td>
</tr>
<tr>
<td></td>
<td>Fosinopril (Monopril)</td>
</tr>
<tr>
<td></td>
<td>Moexipril (Univas)</td>
</tr>
<tr>
<td></td>
<td>Quinapril (Acupril)</td>
</tr>
<tr>
<td></td>
<td>Ramipril (Altace)</td>
</tr>
</tbody>
</table>

*The generic name is listed first with the trade name in parentheses.

When working with angiotensin-converting enzyme inhibitors, it is important to know the potential side effects. The following list details the possible side effects/adverse reactions with this drug category:

- Hypotension
- Hacking cough
- Nausea/vomiting
- Respiratory symptoms

The following items are nursing considerations to know when working with ACE inhibitors:

- Monitor the vital signs frequently.
- Monitor the white blood cell count.
- Monitor the electrolyte levels.

**Beta Adrenergic Blockers**

Beta adrenergic blockers are drugs that help lower blood pressure, lower pulse rate, and lower cardiac output. They are also used to treat migraine headaches and other vascular headaches. Certain preparations of the beta blockers are used to treat glaucoma and prevent myocardial infarctions. These drugs act by blocking the sympathetic vasomotor response.

Notice the syllable *olol*. When you see these letters, you will know that these drugs are beta blockers. Table 2.2 highlights these beta blockers in more detail.
TABLE 2.2 Beta Adrenergic Blockers

<table>
<thead>
<tr>
<th>Action/Use</th>
<th>Drug Name*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Act by blocking sympathetic vasomotor response</td>
<td>Acebutolol (Monitan, Rhotral, Sectral)</td>
</tr>
<tr>
<td></td>
<td>Atenolol (Tenormin, Apo-Atenol, Nova-Atenol)</td>
</tr>
<tr>
<td></td>
<td>Esmolol (Brevibloc)</td>
</tr>
<tr>
<td></td>
<td>Propanolol (Inderal)</td>
</tr>
</tbody>
</table>

*The generic name is listed first with the trade name in parentheses.

The potential side effects/adverse reactions of beta adrenergic blockers are listed here:

- Orthostatic hypotension
- Bradycardia
- Nausea/vomiting
- Diarrhea
- Congestive heart failure
- Blood dyscrasias

The following list gives you some nursing interventions for working with clients using beta adrenergic blockers:

- Monitor the client for changes in lab values (protein, BUN, creatinine) that indicate nephrotic syndrome.
- Monitor the client’s blood pressure, heart rate, and rhythm.
- Monitor the client for signs of edema.
- Teach the client to
  - Rise slowly.
  - Report bradycardia, dizziness, confusion, depression, or fever.
  - Taper off the medication.

**Anti-Infectives (Aminoglycosides)**

Anti-infective drugs include bactericidals and bacteriostatics. They interfere with the protein synthesis of the bacteria, causing the bacteria to die. They are active against most aerobic gram-negative bacteria and against some gram-positive organisms.
Notice that these end in *cin*, and many of them end in *mycin*. So, when you see either of these syllables, you know these are anti-infectives. Table 2.3 explains the various anti-infectives.

### TABLE 2.3 Anti-Infective Drugs

<table>
<thead>
<tr>
<th>Action/Use</th>
<th>Drug Name*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interfere with the protein synthesis of the bacteria, causing the bacteria to die</td>
<td>Gentamicin (Garamycin, Alcomycin, Genoptic)</td>
</tr>
<tr>
<td></td>
<td>Kanamycin (Kantrex)</td>
</tr>
<tr>
<td></td>
<td>Neomycin (Mycifradin)</td>
</tr>
<tr>
<td></td>
<td>Streptomycin (Streptomycin)</td>
</tr>
<tr>
<td></td>
<td>Tobramycin (Tobrex, Nebcin)</td>
</tr>
<tr>
<td></td>
<td>Amikacin (Amikin)</td>
</tr>
</tbody>
</table>

*The generic name is listed first with the trade name in parentheses.

The following list highlights some possible side effects/adverse reactions from the use of anti-infectives (aminoglycosides):

- Ototoxicity
- Nephrotoxicity
- Seizures
- Blood dyscrasias
- Hypotension
- Rash

The following are nursing interventions you need to be aware of when working with clients using anti-infectives (aminoglycosides):

- Obtain a history of allergies.
- Monitor intake and output.
- Monitor vital signs during intravenous infusion.
- Maintain a patent IV site.
- Monitor for therapeutic levels.
- Monitor for signs of nephrotoxicity.
- Monitor for signs of ototoxicity.
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- Teach the client to report any changes in urinary elimination.
- Monitor peak and trough levels.

**NOTE**
Tests on peak and trough levels are done to obtain a blood level and determine the dosage needed for the client. They should be done 30–60 minutes after the third or fourth IV dose or 60 minutes after the third or fourth IM dose. Trough levels should be drawn 30 minutes before the next dose. The client should be taught to report any change in renal function or in hearing because this category can be toxic to the kidneys and the auditory nerve.

**CAUTION**
These drugs are frequently used to treat super-infections such as methicillin-resistant staphylococcus aureus (MRSA). Clients with MRSA exhibit the following symptoms: fever, malaise, redness, pain, swelling, perineal itching, diarrhea, stomatitis, and cough.

**Benzodiazepines (Anticonvulsants/Antianxiety)**
These drugs are used for their antianxiety or anticonvulsant effects.

Notice that all these contain the syllables *pam, pate, or lam*. Table 2.4 gives you a breakdown of these drug types.

**CAUTION**
Not all the benzodiazepines contain *pam*; some of them contain *pate* and *lam*, as in *aprazolam* (Xanax); however, they all contain *azo* or *aze*.

**TABLE 2.4 Benzodiazepines (Anticonvulsants/Sedative/Antianxiety) Drugs**

<table>
<thead>
<tr>
<th>Action/Use</th>
<th>Drug Name*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sedative-hypnotic; also used as an anticonvulsant; has antianxiety effects</td>
<td>Clonazepam (Klonopin)</td>
</tr>
<tr>
<td></td>
<td>Diazepam (Valium)</td>
</tr>
<tr>
<td></td>
<td>Chlordiazepoxide (Librium)</td>
</tr>
<tr>
<td></td>
<td>Lorazepam (Ativan)</td>
</tr>
<tr>
<td></td>
<td>Flurazepam (Dalmane)</td>
</tr>
</tbody>
</table>

*The generic name is listed first with the trade name in parentheses.*
The following list gives you some possible side effects and adverse reactions from the use of this classification:

- Drowsiness
- Lethargy
- Ataxia
- Depression
- Restlessness
- Slurred speech
- Bradycardia
- Hypotension
- Diplopia
- Nystagmus
- Nausea/vomiting
- Constipation
- Incontinence
- Urinary retention
- Respiratory depression
- Rash
- Urticaria

The following are some nursing interventions to know when working with the client taking benzodiazepines:

- Monitor respirations.
- Monitor liver function.
- Monitor kidney function.
- Monitor bone marrow function.
- Monitor for signs of chemical abuse.
Phenothiazines (Antipsychotic/Antiemetic)

These drugs are used as antiemetics or neuroleptics. These drugs are also used to treat psychosis in those clients with schizophrenia. Some phenothiazines such as Phenergan (promethazine) and Compazine (prochlorperazine), are used to treat nausea and vomiting.

**CAUTION**

Because they are irritating to the tissue, Z-track method should be used when administering phenothiazines by intramuscular injection. If the client is allergic to one of the phenothiazines, he probably is allergic to all of them. If the client experiences an allergic reaction or extrapyramidal effects, a more severe reaction, the client should be given Benadryl (diphenhydramine hydrochloride) or Congentin (benztropine mesylate).

Notice that all these contain the syllable *zine* (see Table 2.5).

<table>
<thead>
<tr>
<th>Action/Use</th>
<th>Drug Name*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used as antiemetics or major tranquilizer</td>
<td>Chlopromazine (Thorazine)</td>
</tr>
<tr>
<td></td>
<td>Prochlorperazine (Compazine)</td>
</tr>
<tr>
<td></td>
<td>Trifluoperazine (Stelazine)</td>
</tr>
<tr>
<td></td>
<td>Promethazine (Phenergan)</td>
</tr>
<tr>
<td></td>
<td>Hydroxyzine (Vistaril)</td>
</tr>
<tr>
<td></td>
<td>Fluphenazine (Prolixin)</td>
</tr>
</tbody>
</table>

*The generic name is listed first with the trade name in parentheses.

The following list gives you some possible side effects and adverse reactions from the use of phenothiazines:

- Extrapyramidal effects
- Drowsiness
- Sedation
- Orthostatic hypotension
- Dry mouth
- Agranulocytosis
- Photosensitivity
- Neuroleptic malignant syndrome
Understanding and Identifying the Various Drugs

**Glucocorticoids**

These drugs are used in the treatment of conditions requiring suppression of the immune system and in Addison’s disease. These drugs have anti-inflammatory, anti-allergenic, and anti-stress effects. They are used for replacement therapy for adrenal insufficiency (Addison’s disease); as immunosuppressive drugs in post-transplant clients; and to reduce cerebral edema associated with head trauma, neurosurgery, and brain tumors.

Notice that all these contain *sone* or *cort* (see Table 2.6).

**TABLE 2.6 Glucocorticoid Drugs**

<table>
<thead>
<tr>
<th>Action/Use</th>
<th>Drug Name*</th>
</tr>
</thead>
<tbody>
<tr>
<td>These drugs are used to decrease the inflammatory response to allergies and inflammatory diseases or to decrease the possibility of organ transplant rejection.</td>
<td>Prednisolone (Delta-Cortef, Prednisol, Prednisolone)</td>
</tr>
<tr>
<td></td>
<td>Prednisone (Apo-Prednisone, Deltasone, Metocorten, Orasone, Panasol-S)</td>
</tr>
<tr>
<td></td>
<td>Betamethasone (Celestone, Selestoject, Betnesol)</td>
</tr>
<tr>
<td></td>
<td>Dexamethasone (Decadron, Deronil, Dexon, Mymethasone, Dalalone)</td>
</tr>
<tr>
<td></td>
<td>Cortisone (Cortone)</td>
</tr>
<tr>
<td></td>
<td>Hydrocortisone (Cortef, Hydrocortone Phosphate, Cortifoam)</td>
</tr>
<tr>
<td></td>
<td>Methylprednisolone (Solu-cortef, Depo-Medrol, Depopred, Medrol, Rep-Pred)</td>
</tr>
<tr>
<td></td>
<td>Triamcinolone (Amcort, Aristocort, Atolone, Kenalog, Triamolone)</td>
</tr>
</tbody>
</table>

*The generic name is listed first with the trade name in parentheses.

The following list gives you some possible side effects and adverse reactions from the use of this drug type:

- Acne
- Poor wound healing
- Ecchymosis
- Bruising
- Petechiae
- Depression
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- Flushing
- Sweating
- Mood changes (depression)
- Hypertension
- Osteoporosis
- Diarrhea
- Hemorrhage

**NOTE**

These drugs can cause Cushing's syndrome. Signs of Cushing's syndrome include moon faces, edema, elevated blood glucose levels, purple striae, weight gain, buffalo hump, and hirsutism.

The following are nursing interventions used when working with the client taking glucocorticoids:

- Monitor glucose levels.
- Weigh the client daily.
- Monitor blood pressure.
- Monitor for signs of infection.

**Antivirals**

These drugs are used for their antiviral properties. They inhibit viral growth by inhibiting an enzyme within the virus. Herpetic lesions respond to these drugs. Clients with acquired immune deficiency syndrome (AIDS) are often treated with this category of drugs either alone or in combination with other antiviral drugs. These drugs are also used to treat herpetic lesions (HSV-1, HSV-2), varicella infections (chickenpox), herpes zoster (shingles), herpes simplex (fever blisters), encephalitis, cytomegalovirus (CMV), and respiratory syncytial virus (RSV).

Notice that all these drug names contain *vir*. Table 2.7 lists some of these drug types.
TABLE 2.7 Antiviral Drugs

<table>
<thead>
<tr>
<th>Action/Use</th>
<th>Drug Name*</th>
</tr>
</thead>
<tbody>
<tr>
<td>These drugs are used for their antiviral effects.</td>
<td>Acyclovir (Zovirax)</td>
</tr>
<tr>
<td></td>
<td>Ritonavir (Norvir)</td>
</tr>
<tr>
<td></td>
<td>Saquinovir (Invirase, Fortovase)</td>
</tr>
<tr>
<td></td>
<td>Indinavir (Crixivan)</td>
</tr>
<tr>
<td></td>
<td>Abacavir (Ziagen)</td>
</tr>
<tr>
<td></td>
<td>Cidofovir (Vistide)</td>
</tr>
<tr>
<td></td>
<td>Ganciclovir (Cytovene, Vitraset)</td>
</tr>
</tbody>
</table>

*The generic name is listed first with the trade name in parentheses.

The following list gives some side effects and adverse effects that are usually associated with this drug category:

- Nausea
- Vomiting
- Diarrhea
- Oliguria
- Proteinuria
- Vaginitis
- Central nervous side effects (these are less common):
  - Tremors
  - Confusion
  - Seizures
  - Severe, sudden anemia

The following nursing intervention are used when working with client taking antivirals:

- Tell the client to report a rash because this can indicate an allergic reaction.
- Watch for signs of infection.
- Monitor the creatinine level frequently.
- Monitor liver profile.
- Monitor bowel pattern before and during treatment.
Cholesterol-Lowering Agents

This drug type is used to help the client lower cholesterol and triglyceride levels and to decrease the potential for cardiovascular disease. Notice that all these contain the syllable *vas-tatin*. It should be noted that many advertisements call these “statin” drugs. These drugs should not be confused with the statin drugs used for their antifungal effects. These can include nystatin (trade name Mycostatin or Nilstat). Table 2.8 lists some of the cholesterol-lowering agents.

**TABLE 2.8 Cholesterol-Lowering Drugs**

<table>
<thead>
<tr>
<th>Action/Use</th>
<th>Drug Name*</th>
</tr>
</thead>
<tbody>
<tr>
<td>These drugs are used to lower cholesterol.</td>
<td>Atorvastatin (Lipitor)</td>
</tr>
<tr>
<td></td>
<td>Fluvastatin (Lescol)</td>
</tr>
<tr>
<td></td>
<td>Lovastatin (Mevacor)</td>
</tr>
<tr>
<td></td>
<td>Pravastatin (Pravachol)</td>
</tr>
<tr>
<td></td>
<td>Simvastatin (Zocar)</td>
</tr>
<tr>
<td></td>
<td>Rosuvastatin (Crestor)</td>
</tr>
</tbody>
</table>

*The generic name is listed first with the trade name in parentheses.

**CAUTION**

This category should not be taken with grapefruit juice and should be taken at night. The client should have regular liver studies to determine the presence of liver disease.

Here is a list of side effects and adverse reactions that could occur with the use of cholesterol-lowering agents:

- Rash
- Alopecia
- Dyspepsia
- Liver dysfunction
- Muscle weakness (myalgia)
- Headache

**CAUTION**

Rhabdomyolysis, a muscle-wasting syndrome, has been linked with the use of cholesterol-lowering agents. The client should be instructed to report unexplained muscle soreness and weakness to the physician because these may be signs of rhabdomyolysis.
The following nursing interventions are used when working with the client taking cholesterol lowering agents:

- A diet low in cholesterol and fat should be included in therapy.
- Monitor cholesterol levels.
- Monitor liver profile.
- Monitor renal function.
- Tell the client to report visual changes because cataracts can occur in clients taking vasoconstritors.
- Monitor for muscle pain and weakness.

**Angiotensin Receptor Blockers**

These drugs block vasoconstrictor- and aldosterone-secreting angiotensin II. They are used to treat primary or secondary hypertension and are an excellent choice for clients who complain of the coughing associated with ACE inhibitors. Notice that all these contain *sartan*. Table 2.9 lists some of these drugs.

<table>
<thead>
<tr>
<th>TABLE 2.9 Angiotensin Receptor Blocker Drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action/Use</strong></td>
</tr>
<tr>
<td>These drugs are used to lower blood pressure and increase cardiac output.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

*The generic name is listed first with the trade name in parentheses.

The following list gives some side effects and adverse effects for the use of angiotensin receptor blockers:

- Dizziness
- Insomnia
- Depression
- Angina pectoris
- Second-degree AV block
- Conjunctivitis
Diarrhea
Nausea/vomiting
Impotence
Muscle cramps
Neutropenia
Cough

The following nursing interventions are used when working with a client taking an angiotensin receptor blocker agents:

- Monitor blood pressure and pulse.
- Monitor BUN.
- Monitor creatinine.
- Monitor electrolytes.
- Tell the client to report edema in feet and legs daily.
- Monitor hydration status.

**Cox 2 Enzyme Blockers**

This category of drugs is used to treat osteoarthritis and rheumatoid arthritis. This drug category is considered to be nonsteroidal anti-inflammatory drugs (NSAIDs). Notice that all these drugs contain the syllable *cox*. Table 2.10 highlights two of these drugs.

<table>
<thead>
<tr>
<th>Action/Use</th>
<th>Drug Name*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-inflammatory drugs used to treat arthritis and pain associated with this condition.</td>
<td>Celecoxib (Celebrex)</td>
</tr>
<tr>
<td></td>
<td>Valdecoxib (Bextra) off market</td>
</tr>
</tbody>
</table>

*The generic name is listed first with the trade name in parentheses.

The following list gives some side effects and adverse effects for cox 2 enzyme blockers:

- Fatigue
- Anxiety
- Depression
Dizziness  
Tachycardia  
Tinnitus  
Nausea  
Gastroenteritis  
Stomatitis  
Sudden GI bleeding

Some nursing interventions are used when working with the client taking a COX-2 enzyme inhibitor:

- The client should be taught to report changes in bowel habits that indicate GI bleeding.
- Monitor platelet count.
- Tell the client to report easy bruising.

**CAUTION**

This drug category has been associated with an increased risk of heart attacks and strokes.

### Histamine 2 Antagonists

These drugs are used in the treatment of gastroesophageal reflux disease (GERD), acid reflux, and gastric ulcers. They inhibit histamine 2 (H2) release in the gastric parietal cells, therefore inhibiting gastric acids.

Notice that all these contain the syllable *tidine* (see Table 2.11).

#### TABLE 2.11 Histamine 2 Antagonist Drugs

<table>
<thead>
<tr>
<th>Action/Use</th>
<th>Drug Name*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block histamine 2 receptor sites, decreasing acid production; used to treat gastric ulcers and GERD</td>
<td>Cimetidine (Tagamet)</td>
</tr>
<tr>
<td></td>
<td>Famotidine (Pepcid)</td>
</tr>
<tr>
<td></td>
<td>Nizatidine (Axid)</td>
</tr>
<tr>
<td></td>
<td>Rantidine (Zantac)</td>
</tr>
</tbody>
</table>

*The generic name is listed first with the trade name in parentheses.
The following list gives some side effects and adverse effects associated with histamine 2 antagonist:

- Confusion
- Bradycardia/tachycardia
- Diarrhea
- Psychosis
- Seizures
- Agranulocytosis
- Rash
- Alopecia
- Gynecomastia
- Galactorrhea

Following are some nursing interventions taking H2 antagonist:

- Monitor the blood urea nitrogen levels.
- Administer the medication with meals.
- If taking the medication with antacids, take antacids one hour before or after taking these drugs.
- Cimetidine may be prescribed in one large dose at bedtime.
- Sucralfate decreases the effects of histamine 2 receptor blockers.

**Proton Pump Inhibitors**

These drugs suppress gastric secretion by inhibiting the hydrogen/potassium ATPase enzyme system. They are used in the treatment of gastric ulcers, indigestion, and GERD (gastroesophageal reflux disease).

Notice that all these drugs contain the syllable *prazole* and should be given prior to meals. Table 2.12 highlights proton pump inhibitor drugs.
TABLE 2.12 Proton Pump Inhibitors

<table>
<thead>
<tr>
<th>Action/Use</th>
<th>Drug Name*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used in the treatment of GERD, gastric ulcers, and esophagitis</td>
<td>Esomeprazole (Nexium)</td>
</tr>
<tr>
<td></td>
<td>Lansoprazole (Prevacid)</td>
</tr>
<tr>
<td></td>
<td>Pantoprazole (Protonix)</td>
</tr>
<tr>
<td></td>
<td>Rabeprazole (AciPhex)</td>
</tr>
</tbody>
</table>

*The generic name is listed first with the trade name in parentheses.

The following list gives some side effects and adverse effects associated with proton pump inhibitors:

- Headache
- Insomnia
- Diarrhea
- Flatulence
- Rash
- Hyperglycemia

Some nursing interventions to use when working with the client taking proton pump inhibitors are as follows:

- Do not crush pantoprazole (Protonix). Use a filter when administering IV pantoprazole.
- May take before meals for best absorption.
- Monitor liver function.

Anticoagulants

These drugs are used in the treatment of thrombolytic disease. These drugs are used to treat pulmonary emboli, myocardial infarction, deep-vein thrombosis, after coronary artery bypass surgery, and for other conditions requiring anticoagulation.

Notice that all these drugs contain the syllable *parin* and are heparin derivatives. The client should have a PTT checked to evaluate the bleeding time when giving heparin. The antidote for heparin is protamine sulfate. Table 2.13 lists these.
#### TABLE 2.13 Anticoagulant Drugs

<table>
<thead>
<tr>
<th>Action/Use</th>
<th>Drug Name*</th>
</tr>
</thead>
<tbody>
<tr>
<td>These drugs are used to treat clotting disorders and to thin the blood.</td>
<td>Heparin sodium (Hepalean)</td>
</tr>
<tr>
<td></td>
<td>Enoxaparin sodium (Lovenox)</td>
</tr>
<tr>
<td></td>
<td>Dalteparin sodium (Fragmin)</td>
</tr>
</tbody>
</table>

*The generic name is listed first with the trade name in parentheses.

The following list gives side effects and adverse effects of heparin derivatives:

- Fever
- Diarrhea
- Stomatitis
- Bleeding
- Hematuria
- Dermatitis
- Alopecia
- Pruritus

Nursing intervention to use in caring for the client taking an anticoagulant (heparin derivative) consists of the following:

- Blood studies (hematocrit and occult blood in stool) should be checked every three months.
- Monitor PTT often for heparin (therapeutic levels are 1.5–2.0 times the control). There is no specific bleeding time done for enoxaparin (Lovenox).
- Monitor platelet count.
- Monitor for signs of bleeding.
- Monitor for signs of infection.

#### More Drug Identification Helpers

These are some of the commonly given medications that allow you to utilize the testing technique of commonalities. Looking at these similarities will help you manage the knowledge needed to pass the NCLEX and better care for your clients.
Here are some other clues that may help you in identifying drug types:

- **Caine** = anesthetics (Lidocaine)
- **Mab** = monoclonal antibodies (Palivazumab)
- **Ceph or cef** = cephalosporins (Cefatazime)
- **Cillin** = penicillins (Ampicillin)
- **Cycline** = tetracycline (Tetracycline)
- **Stigmine** = cholinergics (Phyostigmine)
- **Phylline** = bronchodilators (Aminophylline)
- **Cal** = calciums (Calcimar)
- **Done** = opioids

**CAUTION**

Do not give tetracycline to pregnant women or small children. It stains the teeth dark and stunts the growth of small children.

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**Herbals**

Herbals are not considered by some to be medications. They are not regulated by the FDA and can be obtained without a prescription. They do, however, have medicinal properties. Herbals are included on the NCLEX in the category of pharmacology.

- **Feverfew**—This is used to prevent and treat migraines, arthritis, and fever. This herbal should not be taken with Coumadin, aspirin, NSAIDs, thrombolytics, or antiplatelet medications because it will prolong the bleeding time.

- **Ginseng**—This is used as an anti-inflammatory. It has estrogen effects, enhances the immune system, and improves mental and physical abilities. This herbal decreases the effects of anticoagulants and NSAIDs. This herbal also should not be taken by clients taking corticosteroids because the combination of these two can result in extremely high levels of corticosteroids. High doses cause liver problems.

- **Ginkgo**—This improves memory and can be used to treat depression. It also improves peripheral circulation. Ginkgo should not be taken with MAO inhibitors, anticoagulants, or antiplatelets. It increases the bleeding time in clients taking NSAIDs, cephalosporins, and valproic acid.

- **Echinacea**—This is used to treat colds, fevers, and urinary tract infections. This herbal may interfere with immunosuppressive agents, methotrexate, and ketoconizole.
Kava-kava—This herb is used to treat insomnia and mild muscle aches and pains. This herbal increases the effects of central nervous system (CNS) suppressants and decreases the effects of levodopa. It can also increase the effect of MAOIs.

St. John's Wort—This is used to treat mild to moderate depression. This herbal increases adverse CNS effects when used with alcohol or antidepressant medications.

Ma Huang—This is used to treat asthma and hay fever, for weight loss, and to increase energy levels. This herbal increases the effect of MAOIs, sympathomimetics, theophylline, and cardiac glycosides.

Drug Schedules
It is important for the nurse to be aware of the drug schedules; several questions might be asked on the NCLEX regarding safety.

Schedule I—Research use only (for example, LSD).

Schedule II—Requires a written prescription for each refill. No telephone renewals are allowed (for example, narcotics, stimulants, and barbiturates).

Schedule III—Requires a new prescription after six months or five refills; it can be a telephone order (for example, codeine, steroids, and antidepressants).

Schedule IV—Requires a new prescription after six months (for example, benzodiazepines).

Schedule V—Dispensed as any other prescription or without prescription if state law allows (for example, antidiarrheals and antitussives).

Pregnancy Categories for Drugs
These drug categories might also be included on the NCLEX exam. It is important for the nurse to know which categories the pregnant client should avoid:

Category A—No risk to fetus.

Category B—Insufficient data to use in pregnancy.

Category C—Benefits of medication could outweigh the risks.

Category D—Risk to fetus exist, but the benefits of the medication could outweigh the probable risks.

Category X—Avoid use in pregnancy or in those who may become pregnant. Potential risks to the fetus outweigh the potential benefits.
Exam Prep Questions

1. Which instruction should be given to the client taking alendronate sodium (Fosamax)?
   - A. Take the medication before arising.
   - B. Force fluids while taking this medication.
   - C. Remain upright for 30 minutes after taking this medication.
   - D. Take the medication in conjunction with estrogen.

2. The client is discharged from the unit with a prescription for Evista (raloxifene HCl). Which of the following is a side effect of this medication?
   - A. Leg cramps
   - B. Hot flashes
   - C. Urinary frequency
   - D. Cold extremities

3. An elderly diabetic who has been maintained on metformin (Glucophage) is scheduled for a cardiac catheterization. Which instruction should be given to the client?
   - A. Take the medication as ordered prior to the exam.
   - B. Limit the amount of protein in the diet prior to the exam.
   - C. Discontinue the medication prior to the exam.
   - D. Take the medication with only water prior to the exam.

4. The client's mother contacts the clinic regarding medication administration stating, "My daughter can't swallow this capsule. It's too large." Investigation reveals that the medication is a capsule marked SR. The nurse should instruct the mother to:
   - A. Open the capsule and mix the medication with ice cream.
   - B. Crush the medication and administer it with 8 oz. of liquid.
   - C. Call the pharmacist and request an alternative preparation of the medication.
   - D. Stop the medication and inform the physician at the follow-up visit.
5. A 5-year-old is being treated for an acute attack of asthma using racemic epinephrine (epinephrine hydrochloride) nebulizer stat. Which finding indicates an adverse effect of this medication?
   ○ A. Excitability
   ○ B. Tremors
   ○ C. Heart rate 150
   ○ D. Nausea

6. The client is being treated with intravenous Vancomycin for MRSA when the nurse notes redness of the client’s neck and chest. Place in ordered sequence the actions to be taken by the nurse:
   ○ A. Call the doctor.
   ○ B. Stop the IV infusion of Vancomycin.
   ○ C. Administer Benadryl as ordered.
   ○ D. Take the vital signs.

7. A client with leukemia is receiving oral prednisolone (Prednisone). An expected side effect of the prolonged use of prednisone is:
   ○ A. Weight loss
   ○ B. Decreased appetite
   ○ C. Hirsutism
   ○ D. Integumentary bronzing

8. Which laboratory result would concern the nurse caring for a client who is receiving furosemide (Lasix)?
   ○ A. Potassium of 2.5
   ○ B. Sodium 140
   ○ C. Glucose 110
   ○ D. Calcium of 8

9. Which instruction should be given to a client taking Lugol’s solution prior to a thyroidectomy?
   ○ A. Take at bedtime.
   ○ B. Take the medication with juice.
   ○ C. Report changes in appetite.
   ○ D. Avoid the sunshine while taking the medication.
10. A client is admitted to the recovery room following an exploratory laparotomy. Which medication should be kept nearby?

- A. Nitroprusside (Nipride)
- B. Naloxone hydrochloride (Narcan)
- C. Flumazenil (Romazicon)
- D. Diphenhydramine (Benadryl)

11. A client with renal failure has an order for erythropoietin (Epogen) to be given subcutaneously. The nurse should teach the client to report:

- A. Severe headache
- B. Slight nausea
- C. Decreased urination
- D. Itching

**Answer Rationales**

1. Answer C is correct. Alendronate sodium is a drug used to treat osteoporosis. Let's use testing strategies for this question. Look at answers A and C; these are opposites. When you are in the bed, you are lying down. The drug should not be given while lying down nor should it be taken with medication or with estrogen. In answer C, you are upright. This drug causes gastric reflux, so you should remain upright and take it with only water. Notice the clue in the name of the drug: *fosa*, as in fossils. All the drugs in this category contain the syllable *dronate*.

2. Answer B is correct. This drug is in the same category as the chemotherapeutic agent tamoxifene (Novaldex) used for breast cancer. In the case of Evista, this drug is used to treat osteoporosis. Notice that the *E* stands for estrogen. This drug has an agonist effect, so it binds with estrogen and can cause hot flashes. This drug does not cause leg cramps, urinary frequency, or cold extremities, so answers A, C, and D are incorrect.

3. Answer C is correct. Glucophage can cause renal problems. The dye used in cardiac catheterizations is also detrimental to the kidneys. The client should be placed on sliding scale insulin for 48 hours after the dye procedure or until renal function returns. Note the syllable *phage*, as seen in the syllable *phagia*, which means eating. Also note that answers A and C are opposites. Answer A is incorrect because the medication should be withheld; answer B is incorrect because limiting the amount of protein in the diet prior to the exam has no correlation to the medication. Taking the medication with water is not necessary, so answer D is incorrect.

4. Answer C is correct. SR means sustained release. These medications cannot be altered. In answers A and B, crushing or opening the capsule is not allowed. In answer D, the doctor should be notified immediately.
5. Answer C is correct. Adverse effects of epinephrine include hypertension and tachycardia. Answers A, B, and D are expected side effects of racemic epinephrine.

6. The correct order is B, D, A, C.

7. Answer C is correct. Notice that the testing strategy “odd item out” can be used in this question. Answers A, B, and D are symptoms of Addison’s disease. Answer C is the answer that is different from the rest. Hirsutism, or facial hair, is a side effect of cortisone therapy.

8. Answer A is correct. Furosemide (Lasix) is a loop diuretic. Note that most of the loop diuretics end in _ide_. In answers B, C, and D, the findings are all within normal limits.

9. Answer B is correct. Lugol’s solution is a soluble solution of potassium iodine and should be given with juice because it is bitter to taste. In answer A the medication can be taken at another time, so it is incorrect. Reporting changes in appetite is unnecessary, so answer C is incorrect. Answer D is incorrect because it is also unnecessary.

10. Answer B is correct. During the post-operative period, narcotics are given. Narcan is the antidote to narcotics, so answer B is correct. Nipride is utilized to lower blood pressure, so answer A is incorrect. Romazicon is the antidote for the benzodiazepines, so answer C is incorrect. Benadryl is an antihistamine, so answer D is incorrect.

11. Answer A is correct. Severe headache can indicate impending seizure activity. Slight nausea is expected when beginning the therapy, so answer B is incorrect. The client with renal failure already has itching and decreased urination, so answers C and D are incorrect.
CHAPTER THREE

Caring for the Client with Disorders of the Respiratory System

Terms you’ll need to understand:

✓ Acute respiratory failure
✓ Apnea
✓ Asthma
✓ Atelectasis
✓ Bronchitis
✓ Continuous positive airway pressure (CPAP)
✓ Cor pulmonale
✓ Cyanosis
✓ Dyspnea
✓ Emphysema
✓ Empyema
✓ Hemoptysis
✓ Hypoxemia
✓ Hypoxia
✓ Pleural effusion
✓ Pleurisy
✓ Pneumonia
✓ Pulmonary embolus
✓ Tachypnea

Nursing skills you’ll need to master:

✓ Assessing breath sounds
✓ Providing tracheostomy care
✓ Collecting sputum
✓ Teaching proper use of an inhaler
✓ Performing postural drainage
✓ Assisting with thoracentesis
✓ Obtaining a throat culture
✓ Performing venopuncture
✓ Administering medication
✓ Managing chest tubes
✓ Maintaining oxygen therapy
Acute Respiratory Failure

Acute respiratory failure can be defined as the lungs' failure to meet the body's oxygen requirements. One acute respiratory condition you need to be familiar with is acute respiratory distress syndrome, commonly known as ARDS.

Acute Respiratory Distress Syndrome

Acute respiratory distress syndrome, commonly known as ARDS or noncardiogenic pulmonary edema, occurs mostly in otherwise healthy persons. ARDS can be the result of anaphylaxis, aspiration, pulmonary emboli, inhalation burn injury, acute pancreatitis, or complications from abdominal or thoracic surgery. ARDS may be diagnosed by a chest x-ray that will reveal emphysematous changes and infiltrates that give the lungs a characteristic appearance described as “ground glass.” Assessment of the client with ARDS reveals

- Hypoxia
- Sternal and costal retractions
- Presence of rales or rhonchi
- Diminished breath sounds
- Refractory hypoxemia

Care of the client with ARDS involves

- Use of assisted ventilation
- Monitoring of arterial blood gases
- Attention to nutritional needs
- Frequent change in position, placement in high Fowler's position, prone positioning, or use of specialized beds to minimize consolidation of infiltrates in large airways
- Investigational therapies, include the use of vitamins C and E, aspirin, interleukin, and surfactant replacements

Pulmonary Embolus

Pulmonary embolus refers to the obstruction of the pulmonary artery or one of its branches by a clot or some other undissolved matter, such as fat or a gaseous substance. Clots can originate anywhere in the body but are most likely to migrate from a vein deep in the legs, pelvis, kidney, or arms. Fat emboli are associated with fractures of the long bones, particularly the femur.
Air emboli, which are less common, can occur during the insertion or removal of a central line. Common risk factors for the development of pulmonary embolus include immobilization, fractures, trauma, and history of clot formation.

**TIP**

Remember the three Fs associated with fat emboli:
- Fat
- Femur
- Football player

Most fat emboli come from fractured femurs; most fractured femurs occur in young men 18–25, the age of most football players.

Symptoms of a pulmonary embolus depend on the size and location of the clot or undissolved matter. Symptoms include
- Chest pain
- Dyspnea
- Syncope
- Hemoptysis
- Tachycardia
- Hypotension
- Sense of apprehension
- Petechiae over the chest and axilla
- Distended neck veins

Diagnostic tests to confirm the presence of pulmonary embolus include chest x-ray, pulmonary angiography, lung scan, and ECG to rule out myocardial infarction. Management of the client with a pulmonary embolus includes
- Placing the client in high Fowler’s position
- Administering oxygen via mask
- Giving medication for chest pain
- Using thrombolytics/anticoagulants
Antibiotics are indicated for those with septic emboli. Surgical management using umbrella-type filters is indicated for those who cannot take anticoagulants as well as for the client who has recurrent emboli while taking anticoagulants. Clients receiving anticoagulant therapy should be observed for signs of bleeding. PT, INR, and PTT are three tests used to track the client’s clotting time. You can refer to Chapter 13, “Caring for the Client with Disorders of the Cardiovascular System,” for a more complete discussion of these tests.

**CAUTION**

Streptokinase is made from beta strep; therefore, clients with a history of strep infections may respond poorly to anticoagulant therapy with streptokinase because they might have formed antibodies.

Streptokinase is not clot specific; therefore, the client may develop a tendency to bleed from incision or injection sites.

**Chronic Obstructive Pulmonary Disease**

*COPD* exists when prolonged disease or injury has made the lungs less capable of meeting the body’s oxygen needs. Examples of COPD include chronic bronchitis, emphysema, and asthma.

**Chronic Bronchitis**

*Cystic bronchitis*, an inflammation of the bronchi, leads to chronic lung infections. These infections are characterized by productive cough and dyspnea. Both chronic bronchitis and emphysema can result from cigarette smoking and have similar symptoms requiring similar interventions.

**Emphysema**

*Emphysema* is the irreversible overdistention of the airspaces of the lungs, which results in destruction of the alveolar walls. Clients with emphysema are classified as *pink puffers* or *blue bloaters*. Pink puffers may complain of exertional dyspnea without cyanosis. Blue bloaters develop chronic hypoxia, cyanosis, polycythemia, cor pulmonale, pulmonary edema, and eventually respiratory failure.

Physical assessment reveals the presence of a barrel chest, use of accessory muscles, coughing with the production of thick mucoid sputum, prolonged expiratory phase with grunting respirations, peripheral cyanosis, and digital clubbing.

In identifying emphysema, a chest x-ray reveals hyperinflation of the lungs with flattened diaphragm. Pulmonary studies show that the residual volume is increased while vital capacity is decreased. Arterial blood gases reveal hypoxemia.
Many symptoms of chronic bronchitis and emphysema are the same; therefore, medications for the client with chronic bronchitis and emphysema include bronchodilators, steroids, antibiotics, and expectorants. Oxygen should be administered via nasal cannula at 2–3 liters/minute. Close attention should be given to nutritional needs, avoidance of respiratory irritants, prevention of respiratory infections, providing oral hygiene, and teaching regarding medications.

**CAUTION**

When administering antibiotics, a separate IV line should be established for the administration of aminophylline—a bronchodilator—because incompatibilities can exist with some antibiotics and the administration of a bronchodilator. If only one access is established, the SAS (saline, administer drug, saline) procedure should be used.

**CAUTION**

The client receiving aminophylline should be placed on cardiorespiratory monitoring because aminophylline affects heart rate, respiratory rate, and blood pressure. In this scenario, toxicity can occur rapidly. Toxic symptoms include nausea, vomiting, tachycardia, palpitations, hypotension, shock, coma, and death.

**CAUTION**

The therapeutic range for aminophylline is as follows: 10–20 mcg/ml.

**Asthma**

Asthma is the most common respiratory condition of childhood. *Intrinsic (nonallergenic) asthma* is precipitated by exposure to cold temperatures or infection. *Extrinsic (allergenic or atopic) asthma* is often associated with childhood eczema. Both asthma and eczema are triggered by allergies to certain foods or food additives. Introducing new foods to the infant one at a time helps decrease the development of these allergic responses. Easily digested, hypoallergenic foods and juices should be introduced first. These include rice cereal and apple juice.

Symptoms of asthma include expiratory wheeze; shortness of breath; and a dry, hacking cough, which eventually produces thick, white, tenacious sputum. In some instances an attack may progress to status asthmaticus, leading to respiratory collapse and death.

Management of the client with asthma includes maintenance therapy with mast cell stabilizers and leukotriene modifiers. Treatment of acute asthmatic attacks includes the administration of
oral or inhaled short-term or long-term B2 agonist and anti-inflammatories as well as supplemental oxygen. Methylxanthines, such as aminophylline, are rarely used for the treatment of asthma. These drugs, which can cause tachycardia and dysrhythmias, are administered as a last resort. Antibiotics are frequently ordered when a respiratory infection is present.

Acute Respiratory Infections

Acute respiratory infections, such as pneumonia, are among the most common causes of death from infectious diseases in the United States. Pneumonia is the fifth major cause of death in persons over age 65.

Pneumonia

Pneumonia is an inflammation of the parenchyma of the lungs. Causative organisms include bacteria, viruses, and fungi. Some of these organisms are listed here:

- Pneumococcus
- Group A beta hemolytic streptococcus
- Staphylococcus
- Pseudomonas
- Influenza types A and B
- Cytomegalovirus
- Aspergillusfungiatus
- Pneumocystis carinii

Presenting symptoms depend on the causative organism. The client with viral pneumonia tends to have milder symptoms, whereas the client with bacterial pneumonia might have chills and fever as high as 103°F. Clients with cytomegalovirus, pneumocystis carinii, or aspergillus will be acutely ill. General symptoms of pneumonia include

- Hypoxia
- Tachypnea
- Tachycardia
- Chest pain
- Malaise
Fever
Confusion in the elderly

Care of the client with pneumonia depends on the causative organism. The management of bacterial pneumonias includes antibiotics, antitussives, antipyretics, and oxygen. Antibiotics that may be ordered include penicillin G, tetracycline, garamycin, and erythromycin. Viral pneumonias do not respond to antimicrobial therapy but are treated with antiviral therapy. Fungal pneumonias are treated with antifungal antibiotic therapy. Additional therapies for the client with pneumonia include providing for fluid and nutritional needs, obtaining frequent vital signs, and providing oral hygiene. Supplemental oxygen and chest percussion and drainage should be performed as ordered by the physician.

Some medications used in the treatment of pneumonia require special attention:
- **Tetracycline**—Should not be given to women who are pregnant or to small children because of the damage it can cause to developing teeth and bones.
- **Garamycin**—An aminoglycoside, it is both ototoxic and nephrotoxic. It is important to monitor the client for signs of toxicity. Serum peak and trough levels are obtained according to hospital protocol. Peak levels for garamycin are drawn 30 minutes after the third or fourth IV or IM dose. Trough levels for garamycin are drawn 30 minutes before the third or fourth IV or IM dose. The therapeutic range for garamycin is 4–10 mcg/ml.

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**Pleurisy**

Pleurisy, an inflammation of the pleural sac, can be associated with upper respiratory infection, pulmonary embolus, thoracotomy, chest trauma, or cancer. Symptoms include
- Sharp pain on inspiration
- Chills
- Fever
- Cough
- Dyspnea

Chest x-ray reveals the presence of air or fluid in the pleural sac. Management of the client with pleurisy includes the administration of analgesics, antitussives, antibiotics, and oxygen therapy. The presence of pleural effusion can require the client to have a thoracentesis. It is the nurse’s responsibility to prepare the client and monitor for signs of complications related
to the procedure. The nurse should assess the client’s vital signs, particularly changes in respi-
rations and blood pressure, which can reflect impending shock from fluid loss or bleeding. The
nurse should also observe the client for signs of a pneumothorax.

**Tuberculosis**

*Tuberculosis (TB)* is a highly contagious respiratory infection caused by the mycobacterium
tuberculosis. It is transmitted by droplets from the respiratory tract. Airborne precautions, as
outlined by the Centers for Disease Control (CDC), should be used when caring for the client
with tuberculosis.

**NOTE**

Standard precautions and transmission-based precautions are provided in Appendix A, “Things You
Forgot,” which is on the CD.

Diagnosis includes the administration of the Mantoux skin test, which is read in 48–72 hours.
The presence of a positive Mantoux test indicates exposure to TB but not active infection. A
chest x-ray should be ordered for those with a prior positive skin test. A definite diagnosis of
TB is made if the sputum specimen is positive for the tubercle bacillus. Factors that can cause
a false positive TB skin test include nontuberculous mycobacterium and inoculation with BCG
vaccine. Factors that can cause a false negative TB skin test include anergy (a weakened
immune system), recent TB infection, age, vaccination with live viruses, overwhelming TB,
and poor testing technique. Management of the client with TB includes the use of ultraviolet
light therapy and the administration of antimycobacterial drugs. Medication regimens can
consist of several drugs including isoniazid, rifampin, and pyrazinamide. The use of multiple
drug therapy has reduced treatment time from two years to as little as six months; however,
drug resistant forms may require longer treatment periods. Clients are no longer considered
infectious after three negative sputum samples have been obtained. Surgical management may
include a wedge resection or lobectomy.

**Emerging Infections**

The CDC (1994) defines *emerging infections* as diseases of infectious origin with human inci-
dences occurring within the past two decades. Emerging illnesses are likely to increase in inci-
dence in the near future. Two respiratory conditions listed as emerging infections are Severe
Acute Respiratory Syndrome (SARS) and Legionnaire’s disease.
Severe Acute Respiratory Syndrome

*Severe Acute Respiratory Syndrome* (SARS) is caused by a coronavirus. Symptoms include

- Fever
- Dry cough
- Hypoxemia
- Pneumonia

In identifying SARS, a chest x-ray reveals “ground glass” infiltrates with bilateral consolidation occurring sometimes within 24–48 hours, thus suggesting the rapid development of acute respiratory failure. SARS has occurred with greater frequency in Asia, although cases have also been confirmed in Canada, Switzerland, and Germany.

The SARS virus can be found in nasopharyngeal and oropharyngeal secretions, blood, and stool. Diagnostic tests for SARS include

- Sputum cultures for Influenza A, B, and RSV
- Serum tests to detect antibodies IgM and IgG
- Reverse transcriptase polymerase chain reaction tests performed to detect RNA of SARS CoV

Two tests on two different specimens must be positive to confirm the diagnosis. Test results are considered negative if no SARS CoV antibodies are found 28 days after the onset of symptoms.

The client suspected of having SARS should be cared for using airborne and contact precautions. Management includes the use of antibiotics to treat secondary or atypical pneumonia. Antivirals or retrovirals can be used to inhibit replication. Respiratory support, closed system for suctioning, and the use of surfactant replacement may be ordered.

Legionnaire’s Disease

*Legionnaire’s disease* is caused by gram negative bacteria found in both natural and manmade water sources. Bacterial growth is greater in stored water maintained at temperatures ranging from 77° to 107° F. Risk factors include

- Immunosuppression
- Diabetes
- Pulmonary disease
Legionnaire's involves the lungs and other organs. The symptoms include

- Productive cough
- Dyspnea
- Chest pain
- Diarrhea
- Fever

Diagnostic tests include a urinary antigen test that remains positive after initial antibiotic therapy. Management includes the use of antibiotics, oxygen, provision of nutrition, and hydration. The drug of choice for treating Legionnaire's disease is azithromycin.

**Diagnostic Tests for Review**

These are simply some of the tests that are useful in diagnosing pulmonary disorders. You should review the normal lab values as well as any special preparations for the client undergoing those tests. In addition, think about the care given to clients after the procedures have been completed. For instance, the client who has undergone a bronchoscopy will have a depressed gag reflex, which increases the chance of aspiration. No food or fluid should be given until the gag reflex returns. The tests for diagnosing pulmonary disorders are as follows:

- CBC
- Chest x-ray
- Pulmonary function tests
- Lung scan
- Bronchoscopy

**Pharmacology Categories for Review**

The client with a respiratory disorder should be managed with several categories of medications. The client with an acute respiratory condition, such as bacterial pneumonia, is given an antibiotic to fight the infection, antipyretic medication for fever and body aches, and an antitussive for relief of cough. The client with a chronic respiratory condition may receive many of the same medications, with the addition of a steroid or bronchodilator. The following list...
Pharmacology Categories for Review

contains the most commonly prescribed categories of medications used to treat clients with respiratory conditions:

- Antibiotics
- Antivirals
- Antituberculars
- Antitussives
- Bronchodilators
- Expectorants
- Leukotriene modifiers
- Mast-cell stabilizers
- Steroids
Exam Prep Questions

1. When performing an assessment on the client with emphysema, the nurse finds that the client has a barrel chest. The alteration in the client's chest is due to:
   - A. Collapse of distal alveoli
   - B. Hyperinflation of the lungs
   - C. Long-term chronic hypoxia
   - D. Use of accessory muscles

2. The nurse notes that a client with COPD demonstrates more dyspnea in certain positions. Which position is most likely to alleviate the client's dyspnea?
   - A. Lying supine with a single pillow
   - B. Standing or sitting upright
   - C. Side lying with the head elevated
   - D. Lying with head slightly lowered

3. When reviewing the chart of a client with long standing lung disease, the nurse should pay close attention to the results of which pulmonary function test?
   - A. Residual volume
   - B. Total lung capacity
   - C. FEV1/FVC ratio
   - D. Functional residual capacity

4. The physician has ordered O₂ at 3 liters/minute via nasal cannula. O₂ amounts greater than this are contraindicated in the client with COPD because:
   - A. Higher concentrations result in severe headache.
   - B. Hypercapnic drive is necessary for breathing.
   - C. Higher levels will be required later for pO₂.
   - D. Hypoxic drive is needed for breathing.
5. The client taking a bronchodilator tells the nurse that he is going to begin a smoking cessation program when he is discharged. The nurse should tell the client to notify the doctor if his smoking pattern changes because he will:
   ○ A. Need his medication dosage adjusted
   ○ B. Require an increase in antitussive medication
   ○ C. No longer need annual influenza immunization
   ○ D. Not derive as much benefit from inhaler use

6. Lab results indicate that the client's serum aminophylline level is 17 mcg/ml. The nurse recognizes that the aminophylline level is:
   ○ A. Within therapeutic range
   ○ B. Too high and should be reported
   ○ C. Questionable and should be repeated
   ○ D. Too low to be therapeutic

7. The morning weight for a client with emphysema indicates that the client has gained 5 pounds in less than a week, even though his oral intake has been modest. The client's weight gain may reflect which associated complication of COPD?
   ○ A. Polycythemia
   ○ B. Cor pulmonale
   ○ C. Left ventricular failure
   ○ D. Compensated acidosis

8. The nurse is teaching the client the appropriate way to use an inhaler. Which action indicates the client needs additional teaching?
   ○ A. The client takes a deep breath while depressing the inhaler.
   ○ B. The client places the inhaler mouthpiece beyond his lips.
   ○ C. The client inhales with lips tightly sealed to mouthpiece.
   ○ D. The client exhales slowly using purse lipped breathing.
9. The client with COPD may lose weight despite having adequate caloric intake. When counseling the client in ways to maintain an optimal weight, the nurse should tell the client to:
   - A. Continue the same caloric intake and increase the amount of fat intake
   - B. Increase his activity level to stimulate his appetite
   - C. Increase the amount of complex carbohydrates and decrease the amount of fat intake
   - D. Decrease the amount of complex carbohydrates while increasing calories, protein, vitamins, and minerals

10. The client has been receiving garamycin 65 mg IVPB every 8 hours for the past 6 days. Which lab result indicates an adverse reaction to the medication?
   - A. WBC 7500
   - B. Serum glucose 92
   - C. Protein 3.5
   - D. Serum Creatinine 2.0

**Answer Rationales**

1. Answer B is correct. Clients with emphysema develop a barrel chest due to the trapping of air in the lungs, causing them to hyperinflate. Answers C and D are common in those with emphysema but do not cause the chest to become barrel shaped. Answer A does not occur in emphysema.

2. Answer B is correct. The client with chronic obstructive pulmonary disease has increased difficulty breathing when lying down. His respiratory effort is improved by standing or sitting upright or by having the bed in high Fowler's position. Answers A, C, and D do not alleviate the client's dyspnea; therefore they are incorrect.

3. Answer C is correct. The FEV1/FVC ratio indicates disease progression. As COPD worsens, the ratio of FEV1 to FVC becomes smaller. Answers A and B reflect loss of elastic recoil due to narrowing and obstruction of the airway. Answer D is increased in clients with obstructive bronchitis.

4. Answer D is correct. In clients with COPD, respiratory effort is stimulated by hypoxemia. Answers A and C are incorrect because higher levels would rob the client of the drive to breathe. Answer B is an incorrect statement.

5. Answer A is correct. Changes in smoking patterns should be discussed with the physician because they have an impact on the amount of medication needed. Answer B is incorrect because clients with COPD are placed on expectorants, not antitussives. Answer C is incorrect because an annual influenza vaccine is recommended for all those with lung disease. Answer D is incorrect because benefits from inhaler use should be increased when the client stops smoking.
6. Answer A is correct. The therapeutic range for aminophylline is 10–20 mcg/ml. Answers B and D are incorrect. There are no indications that the results are questionable; therefore, repeating the test as offered by answer C is incorrect.

7. Answer B is correct. Cor pulmonale, or right sided heart failure, is a possible complication of emphysema. Answers A and D do not cause weight gain, so they’re incorrect. Answer C would be reflected in pulmonary edema, so it’s incorrect.

8. Answer C is correct. Keeping the lips tightly sealed encourages nasal breathing, which interferes with the inhaler’s effectiveness. Answers A, B, and D indicate correct use of the inhaler.

9. Answer D. The client with COPD needs additional calories, protein, vitamins, and minerals. Answer A is incorrect because the client needs more calories but not more fat. Answer B is not feasible, will increase the O₂ demands, and will result in further weight loss. Answer C leads to excess acid production and an increased respiratory workload.

10. Answer D is correct. The serum creatinine is elevated, indicating renal impairment. Answers A, B, and C are within normal limits.
CHAPTER FOUR

Caring for the Client with Disorders of the Renal and Genitourinary System

Terms you'll need to understand:
✓ Anuria
✓ Arteriovenous graft
✓ Cutaneous ureterostomy
✓ Cystectomy
✓ Cystitis
✓ Dialysis
✓ Dysuria
✓ End stage renal failure
✓ Fistula
✓ Glomerulonephritis
✓ Hematuria
✓ Ileal conduit
✓ Ileal reservoir
✓ Nephrectomy
✓ Nephrotic syndrome
✓ Oliguria
✓ Polyarteritis nodosa
✓ Scleroderma
✓ Systemic lupus erythematosus

Nursing skills you'll need to master:
✓ Performing urinary catheterization
✓ Administering medication
✓ Performing bladder irrigation
✓ Assessing and caring for AV shunt
✓ Performing peritoneal dialysis
✓ Performing stoma care
✓ Collecting urine specimen (clean catch, sterile, 24 hour)
✓ Assisting with renal biopsy
✓ Caring for central lines
The renal system includes the kidneys and the urinary tract. Disorders of this system can be divided into conditions that affect the kidneys and conditions that affect the urinary tract, which includes the ureters and bladder. Renal disorders are of particular significance because the kidneys contribute to our health in a number of ways. The kidneys play a primary role in maintaining fluid volume and electrolyte balance, filtering waste for elimination, maintaining blood pressure, synthesizing red blood cells, and metabolizing vitamin D. Disorders of the ureters and bladder affect the storage and elimination of urine. Although these disorders are not as serious as renal disorders, those affected experience significant physical and emotional changes. In this chapter we review the most common conditions affecting urinary elimination.

**Acute Glomerulonephritis**

*Acute glomerulonephritis* is an antigen-antibody response occurring from one to two weeks following infection with Group A \( \beta \)-hemolytic *Streptococcus*. Other causes include systemic lupus erythematosus, scleroderma, and polyarteritis nodosa.

Signs and symptoms include

- Dark, smoke-colored urine
- Hypertension
- Headache
- Nausea and vomiting
- Oliguria

Routine urinalysis typically reveals elevations in specific gravity, hematuria, and proteinuria. Blood studies reveal elevations in blood urea nitrogen (BUN), creatinine, and erythrocyte sedimentation rates. A positive antistreptolysin (ASO) titer indicates prior infection with Group A \( \beta \)-hemolytic *Streptococcus*. Two additional studies may be ordered to determine the extent of kidney damage. These studies are a 24-hour urine to check for creatinine clearance and a renal biopsy, which shows cellular changes in the glomerular tissue.

**CAUTION**

Know the normal ranges for urine specific gravity, BUN, and serum creatinine.

The management of the client with acute glomerulonephritis includes the use of

- Antibiotics
- Antihypertensives
Chronic Glomerulonephritis

Chronic glomerulonephritis refers to a long-term inflammation of the glomerular capillaries. The condition may follow an episode of acute glomerulonephritis or a milder antigen-antibody reaction.

Signs and symptoms include

- Proteinuria
- Pedal edema
- Weight loss
- Nocturia
- Gastrointestinal complaints
- Anemia
- Peripheral neuropathy
- Gout
- Hypertension
- Increased serum creatinine
- Increased BUN
- Normal or below normal urine specific gravity

Management of the client with chronic glomerulonephritis is largely symptomatic. Medications include diuretics, antihypertensives, and antianemics. Hyperkalemia is treated with sodium polystyrene sulfonate (Kayexelate), which can be given alone or with sorbitol. Strict monitoring of fluid intake and output and restriction of dietary protein and sodium are essential in the prevention of fluid overload.

- Steroids
- Bed rest
- Strict monitoring of fluid intake and output
- Limited intake of sodium and protein
- Assess for signs of edema and circulatory overload
End Stage Renal Disease

End stage renal disease (ESRD) is a progressive, irreversible deterioration in renal function in which the kidneys are no longer able to maintain metabolic as well as fluid and electrolyte balance. Urea and other nitrogenous wastes are retained in the blood stream, necessitating management by peritoneal dialysis, hemodialysis, or renal transplant.

Peritoneal Dialysis

Peritoneal dialysis involves the instillation of dialysate via a flexible catheter implanted into the peritoneal cavity. Osmotic pressure allows waste products to be returned with the dialysate. Strict adherence to sterile technique is essential to prevent infection and peritonitis.

Symptoms of peritonitis include

- Fever
- Abdominal discomfort
- Return of cloudy dialysate

Hemodialysis

Hemodialysis is accomplished by using a dialyzer, which serves as a synthetic semipermeable membrane. Vascular access is obtained through the use of a subclavian, jugular, or femoral catheter as well as the placement of a fistula or arteriovenous graft.

CAUTION

Do not check blood pressure or perform venous sticks in the extremity with a vascular access because damage can occur to the access site. The presence of a bruit indicates the access site is patent.

CAUTION

Do not administer rapid-acting antihypertensives prior to hemodialysis because some are not removed by dialysis and the client is more likely to experience shock. Check with the physician to see which medications can be given to the client scheduled for hemodialysis.
Renal Transplants

Renal transplants can be obtained from a cadaver or living, compatible donor. The transplanted kidney is placed within the pelvis to provide greater protection against traumatic injury. Following transplantation, the client is placed on lifetime therapy with immunosuppressives, biologic response modifiers, and monoclonal antibodies. Commonly used medications administered after renal transplant include:

- Azathioprine (Immuran)
- Corticosteroids (Prednisone)
- Cyclosporine (Sandimmune, Neoral)
- Tacrolimus (Prograf)
- Sirolimus (Rapimmune)

Mycophenolate (CellCept) has been approved by the FDA solely for the prevention of renal transplant rejection.

Nephrotic Syndrome

Nephrotic syndrome can be caused by glomerulonephritis, systemic illness, or an acute allergic response. Diagnosis is based on the client’s symptoms, renal function tests, and 24-hour urine test for creatinine clearance.

Nephrotic syndrome involves a collection of symptoms that include:

- Marked proteinuria
- Generalized edema
- Hypoalbuminemia
- Hypercholesterolemia

Management of the client with nephrotic syndrome includes:

- Bed rest
- Prevention of skin breakdown
- Daily weights
- Strict intake and output
Moderate protein intake with sodium restrictions
Medications, including steroids and immunosuppressives

**Urinary Calculi**

Urinary calculi (urolithiasis, kidney stones) can result from immobility, cancer, increased intake of vitamin D, or overactivity of the parathyroid. Urinary calculi are more common in men, particularly in those 30–50 years of age, and occur in all age groups with greater frequency in the spring and summer months. Kidney stones are more commonly made up of calcium, magnesium, phosphorus, or oxalate.

Symptoms associated with kidney stones include
- Flank pain
- Fever
- Nausea and vomiting
- Changes in urinary output

Diagnostic measures include x-ray with contrast, blood studies, and a 24-hour urine test.

Management of the client with kidney stones includes
- Use of IV fluids
- Pain management
- Lithotripsy
- Straining the urine to detect passage of the stone
- Surgical management
- Dietary alterations for those with recurring calcium, uric acid, or oxalate stones

**Urinary Tract Infections**

Urinary tract infections (UTIs) are caused by pathologic microorganisms of the urinary tract. UTIs represent 40% of hospital-acquired infections, with most of those being due to contamination during catheterization or instrumentation. Ascending infection with fecal material (E. coli) accounts for over one half of all UTIs. Symptoms of UTIs depend on whether the infection affects the bladder (cystitis) or the kidney (pyelonephritis). Symptoms of UTI include
Management of the client with a UTI includes the use of specific antibiotics, urinary anti-spasmodics, and increased fluids.

Benign Prostatic Hyperplasia

One of the most common pathological conditions in men over age 50 is benign prostatic hyperplasia (BPH). Enlargement of the prostate can obstruct the vesicle neck or prostatic urethra, leading to incomplete emptying of the bladder and urinary retention. Retention of urine causes dilation of the ureters and kidneys and contributes to the development of urinary tract infections.

Signs and symptoms of BPH include

- Increased frequency of urination
- Nocturia
- Urinary urgency
- Hesitancy in starting urination
- Decrease in the volume and force of urinary stream
- Feeling of bladder fullness
- Recurrent urinary tract infections

Diagnostic tests include urinalysis, renal function tests, digital rectal exam, and complete blood studies.

Medical management of BPH includes the use of antiandrogens including finasteride (Proscar), as well as herbal therapy with saw palmetto. Alpha-adrenergic receptors blockers such as terazosin (Hytrin) help reduce the obstructive symptoms.

Surgical management includes removal of the prostate. The most common surgical procedure for BPH is a transurethral prostatectomy (TURP). The most common complication following a TURP is hemorrhage; therefore, it is imperative that the urinary output is assessed for amount and color.
Bladder Cancer

Malignancies of the bladder are the fourth leading cause of cancer in the United States. Risk factors in bladder cancer include

- Recurrent bacterial UTI
- High cholesterol intake
- Pelvic radiation
- Environmental carcinogens, including certain dyes
- Smoking

Symptoms of bladder cancer include visible painless hematuria, infection, dysuria, and frequency. Pelvic and back pain are common with metastasis.

Diagnostic tests include cystoscopy, CT scan, biopsy, and ultrasonography. Management of the client with bladder cancer depends on the grade, degree of local invasion, and client’s age as well as physical and mental status. Surgical management includes cystectomy with the creation of a urinary diversion.

Types of urinary diversions that may be performed following a cystectomy are ileal conduit, ileal reservoir, ureterostomy, and ureterosigmoidostomy. It is important for the nurse to review these because some require the client to wear an external appliance and some do not.
Chemotherapeutic management includes a combination of methotrexate, 5-flouracil, vincristine, and doxorubicin. In cases where cystectomy is not performed, the client may be treated by intravesicle therapy with BCG. Clients receiving intravesicle therapy can continue to eat and drink before therapy but should avoid urinating for at least two hours after instillation of the medication. This allows sufficient exposure time to the medication. Afterward, the client is encouraged to drink additional fluids to remove drug residue.

**Diagnostic Tests for Review**

Routine diagnostic tests, including CBC and urinalysis, are ordered for the client with disorders of the renal and urinary system. Specific tests such as intravenous pyelogram and CT scan are ordered to detect structural abnormalities. The complete metabolic panel reflects changes in electrolytes that result from renal disease. The tests are as follows:

- CBC
- Complete metabolic panel
- Urinalysis
- Intravenous pyelogram
- CT scan

**Pharmacology Categories for Review**

Renal disorders affect many other organ systems including the cardiovascular system and hematopoietic system. Clients with renal disease will receive medication from a number of different categories depending on their condition. These medications include:

- Antibiotics
- Antihypertensives
- Antineoplastic
- Antispasmodics
- Diuretics
- Immunosuppressives
Exam Prep Questions

1. A client hospitalized with acute glomerulonephritis has a positive ASO titer. The nurse understands that the client's current illness is due to a:
   - A. History of uncontrolled hypertension
   - B. Prior bacterial infection
   - C. Prolonged elevation in blood glucose
   - D. Drug reaction that led to muscle breakdown

2. The physician has prescribed hydralazine (Apresoline) for a client with acute glomerulonephritis. Which finding indicates that the drug is having the desired effect?
   - A. The client's appetite has improved.
   - B. Creatinine levels have returned to normal.
   - C. The client's blood pressure has decreased.
   - D. Urinary output is amber in color.

3. A client with acute glomerulonephritis requests a snack. Which snack is most therapeutic?
   - A. Orange juice
   - B. Banana
   - C. Applesauce
   - D. Warm broth

4. The physician has ordered Prednisone 50 mg daily to promote diuresis in a client with nephrotic syndrome. The nurse should administer the medication:
   - A. In a single dose at bedtime
   - B. With a snack or glass of milk
   - C. With water to promote absorption
   - D. Prior to arising in the morning
Exam Prep Questions

5. A client receiving Gentamycin (garamycin) IVPB has a morning peak level of 12 micrograms/ml. The nurse should:
   - A. Notify the physician because the level is too high.
   - B. Administer the medication at the scheduled time.
   - C. Request an order to administer the medication IM.
   - D. Repeat the level 30 minutes before the next dose.

6. The nurse is teaching the client with an ileal conduit regarding skin care to prevent excoriation. The nurse should tell the client to empty the collection bag:
   - A. Every hour
   - B. When it is half full
   - C. Once daily
   - D. When it is one third full

7. A client with end stage renal disease has been managed by peritoneal dialysis. Which finding should be reported to the doctor immediately?
   - A. The amount of dialysate return is less than that instilled.
   - B. The client complains of abdominal pain and nausea.
   - C. The dialysate return is colorless in appearance.
   - D. The client has lost two pounds in the last week.

8. The nurse notes dark red bleeding and a few clots in the catheter of a client two days after a TURP. The nurse should first:
   - A. Prepare the client for a return to surgery.
   - B. Apply traction to the urethral catheter.
   - C. Document the findings as normal.
   - D. Decrease the client's IV rate.

9. A client is admitted with a tentative diagnosis of bladder cancer. Which finding most likely contributed to the development of bladder cancer?
   - A. Two PPD cigarette use for 25 years
   - B. Frequent urinary tract infections
   - C. Employment in the textile industry
   - D. A history of renal calculi
The nurse is providing dietary instructions to a client with oxylate renal calculi. The nurse should tell the client to avoid which of the following snacks:

- A. Strawberries
- B. Cheese
- C. Chicken nuggets
- D. Banana

**Answer Rationales**

1. Answer B is correct. A positive antistreptolysin titer indicates infection with Group A β-hemolytic *Streptococcus*, a bacteria. Answers A and C are not associated with acute glomerulonephritis so they are incorrect. Answer D, rhabdomyolysis, is not associated with infection making it incorrect.

2. Answer C is correct. Hydralazine is an antihypertensive. A decrease in BP indicates the medication is working. Answers A, B, and D indicate that the overall condition of the client is improving, but they are not the result of hydralazine.

3. Answer C is correct. Applesauce would provide vitamins and carbohydrates. Answers A and B are high in potassium, and answer D is a liquid that is high in sodium. Clients with AGN have elevated levels of potassium and sodium that require dietary restrictions, so answers A, B, and D are incorrect.

4. Answer B is correct. Prednisone, a steroid, should be given with a snack or meal to prevent gastric irritation. Answer C would cause pain and gastric upset, making it incorrect. Answers A and D do not include providing food with the medication, so they are incorrect.

5. Answer A is correct. The therapeutic range for Garamycin is 4–10 micrograms/ml. Because the drug is both ototoxic and nephrotoxic, the physician should be notified. Answers B and C are incorrect because they would increase the peak level. Answer D refers to the time for drawing a trough level, making it incorrect.

6. Answer D is correct. Emptying the collection when it is one third full prevents the likelihood of the urine leaking. Answer A isn’t necessary or feasible, so it is incorrect. Waiting until it is half full or more as suggested in answers B and C increases the likelihood that the collection bag will lose contact with the skin, allow for soiling and contributing to excoriation; therefore B and C are incorrect.

7. Answer B is correct. Abdominal pain, nausea, fever, and return of cloudy dialysate are indications of peritonitis, which requires immediate antibiotic therapy. Diminished or slow return of dialysate, as mentioned in answer A, is managed by having the client turn from side to side to facilitate return flow, so it is incorrect. Answers C and D reflect good management, making them incorrect.

8. Answer B is correct. The appearance of dark red blood with a few clots indicates a venous bleed. Traction to the urethral catheter and increasing the client’s fluid intake should be tried first before...
calling the doctor. Answer A would be indicated for the client with an arterial bleed, which is characterized by bright red bleeding and many clots, so it is incorrect. Answer C is not the best because documentation should reflect exactly what was assessed and the nurse’s action, so it’s incorrect. Answer D is incorrect because increasing fluids will help keep the catheter free of clots.

9. Answer A is correct. Cigarette smoking is the most significant factor in the development of bladder cancer. Answers B and C might have contributed but are not as likely as answer A; therefore, they are incorrect. Answer D involves the kidneys, not the bladder, so it is incorrect.

10. Answer A is correct. Strawberries, peanuts, rhubarb, and spinach are food sources high in oxylate. Answers B, C, and D are suitable snacks for the client with oxylate renal calculi, so they are incorrect.

Suggested Reading and Resources

- University of Utah Health Sciences Center: www-medlib.med.utah.edu.
CHAPTER FIVE

Caring for the Client with Disorders of the Hematopoietic System

Terms you'll need to understand:

✓ Dyspnea
✓ Fatigue
✓ Hemarthrosis
✓ Hemolysis
✓ Jaundice
✓ Leukopenia
✓ Otitis media
✓ Pallor
✓ Paresthesia
✓ Pruritis
✓ Tachypnea
✓ Thrombocytopenia
✓ Tinnitus
✓ Upper respiratory infections

Nursing skills you'll need to master:

✓ Performing Z track IM technique
Anemia

When anemia occurs, people have a decrease in the number of red blood cells or a decrease in the ability of these red blood cells to carry oxygen. The causes and symptoms of anemia are listed here:

- Increased red blood cell destruction
- Blood loss
- Poor dietary iron intake
- Poor absorption
- Parasites

Symptoms of anemia:

- Fatigue
- Pallor
- Tachypnea
- Cardiac changes
- Dyspnea

**CAUTION**

Children with persistent anemia may experience frequent bouts of otitis media and upper respiratory infections.

Pernicious Anemia

In pernicious anemia the intrinsic factor is missing, resulting in an inability to absorb vitamin B12. Pernicious anemia is common in the elderly and clients who have had a gastric resection. Symptoms of pernicious anemia include

- Pallor
- Jaundice
- Smooth, beefy red tongue
- Fatigue
- Weight loss
Anemia

- Paresthesia
- Reduced vibratory and position senses
- Ataxia

The treatment for this is the administration of injections of vitamin B12.

**CAUTION**

For the exam, you should know the names for the various B vitamins:
- B1 (thiamine)
- B2 (riboflavin)
- B3 (niacin)
- B6 (pyridoxine)
- B9 (folic acid)
- B12 (cyanocobalamin)

Aplastic Anemia

This type of anemia occurs when there is depression of the blood-forming elements of the bone marrow. The symptoms of aplastic anemia are as follows:
- Decreased erythrocytes
- Leukopenia
- Thrombocytopenia

Some of the causes of aplastic anemia are
- Drug toxicity
- Radiation exposure

Treatments of aplastic anemia include
- Identifying and removing the offending agent
- Performing a bone marrow transplant
Sickle Cell Anemia

A client with sickle cell anemia has red blood cells that have an abnormal crescent shape, causing an impairment in tissue perfusion. Low oxygen levels can cause the client’s cells to sickle. Due to this, these cells cannot properly circulate through the system. The most common crisis these clients have is vasocclusive crisis, in which the client has a lack of oxygen to a specific area, causing hypoxia and necrosis to that area. Because of the mother’s normal blood, these clients are rarely diagnosed prior to age 6 months. The treatment for sickle cell anemia is listed here:

- **H**—Heat
- **H**—Hydration
- **O**—Oxygen
- **P**—Pain relief

**CAUTION**
The vasocclusive crisis is the only crisis type that causes the client to have pain.

**CAUTION**
Morphine is the drug of choice for acute pain in sickle cell anemia. Meperidine is contraindicated due to the possibility of central nervous system stimulation in these clients.

Iron Deficiency Anemia

There is a simple lack of iron in this disorder. The cause may be the result of poor dietary intake of iron sources. The symptoms of iron deficiency anemia are the same as general anemia. There are a few for severe, prolonged anemia that are different (included here):

- Brittle nails
- Corner of the mouth ulcers
- Sore tongue

The treatment for iron deficiency anemia is as follows:

- Increasing dietary intake of iron (good sources of iron include egg yolk; green, leafy vegetables; iron-fortified cereals; peanut butter; raisins; and liver)
- Administering iron supplements by mouth or intramuscularly
Cooley’s Anemia (Thalassemia Major)

This disorder is inherited as an autosomal recessive disorder. This client’s red blood cells are destroyed prematurely. Note that this disease is mainly found by lab results. The treatment for Cooley’s anemia includes frequent blood transfusions.

Hemophilia

In this disorder an abnormal clotting pattern occurs, resulting in an ineffective clot. Hemophilia is inherited as a sex-linked disorder. The mother passes this disorder to her male children. Clients lacking factor VIII have hemophilia A; clients lacking factor IX have hemophilia B. The symptoms of hemophilia include

- Bleeding and bruising easily
- Hemorrhaging from minor cuts
- Joint hemorrhages
- Post-operative hemorrhaging

The complications are as follows:

- Internal bleeding
- Intracranial bleeding
- Hemarthrosis

Cryoprecipitates are no longer used because HIV and hepatitis cannot be removed. Treatment of hemophilia includes the following: DDAVP for mild hemophilia and Von Willebrand disease, purified factor VIII concentrate (monoclonal), and recombinant factor VIII concentrate (which is sold as a drug, not as a drug product). These three products are the only recommended treatments for controlling the bleeding associated with hemophilia.
Polycythemia Vera

This disorder is characterized by thicker than normal blood. With polycythemia vera, there is an increase in the client’s hemoglobin of 18g/dl, RBC of 6 million/mm, or hematocrit at 55% or greater. The following are some symptoms of polycythemia vera:

- Enlarged spleen
- Dizziness
- Tinnitus
- Fatigue
- Paresthesia
- Dyspnea
- Pruritis
- Burning sensation in fingers and toes

Treatments of polycythemia vera include

- Phlebotomy
- Hydration
- Anticoagulant therapy

Diagnostic Tests for Review

The diagnostic tests for the client with hematopoietic disorders are the same as any other routine hospitalization of a client (CBC, urinalysis, and chest x-ray). Specific tests, such as the Schilling test for B12 deficiency, are used to evaluate certain disorders. These tests need to be reviewed prior to taking an exam for a better understanding of the disease process:

- Schilling test
- CBC with differential
- Hemoglobin electrophoresis
Pharmacology for Review

The client with a hematopoietic disorder will receive a number of medications to stimulate red blood cell production and replace needed vitamins or nutrients. Analgesics are also a requirement for the pain associated with some diseases. You’ll need to review certain drug classifications prior to the test for knowledge of their effects, side effects, and adverse reactions:

- Antianemics
- Analgesics
- Vitamins
Exam Prep Questions

1. A client with sickle cell disease is admitted with a diagnosis of pneumonia. Which nursing intervention would be most helpful to prevent a vasoocclusive crisis?
   - A. Obtaining blood pressures every 2 hours
   - B. Administering pain medication every 3–4 hours as ordered
   - C. Monitoring arterial blood gas results
   - D. Administering IV fluids at an ordered rate of 200ml/hr

2. Which clinical manifestation, noted in a client with pernicious anemia, would indicate that the client has been noncompliant with B12 injections?
   - A. Hyperactivity in the evening hours
   - B. Weight gain of 5 pounds in one week
   - C. Paresthesia of hands and feet
   - D. Diarrhea stools several times a day

3. A client with Anemia has been prescribed liquid iron. Which would the nurse include in the teaching plan?
   - A. Take the medication through a straw.
   - B. Administer this drug mixed with coffee.
   - C. The drug causes the urine to turn black.
   - D. The drug must be stored in the refrigerator.

4. The nurse caring for a client with iron deficiency has performed dietary teaching of foods high in iron. The nurse recognizes that teaching has been effective when the client selects which meal plan?
   - A. Hamburger, French fries, and orange juice
   - B. Sliced veal, spinach salad, whole-wheat roll
   - C. Vegetable lasagna, Caesar salad, toast
   - D. Bacon, lettuce, and tomato sandwich, potato chips, and tea
5. The nurse is administering iron by the Z track method. Which technique would the nurse utilize to prevent tracking of the medication?
   - A. Inject the medication in the deltoid muscle.
   - B. Use a 22-gauge needle.
   - C. Omit aspirating for blood prior to injecting.
   - D. Draw up 0.2 ml of air after the proper medication dose.

6. The nurse caring for a client with anemia recognizes which clinical manifestation as one specific for a hemolytic type of anemia?
   - A. Jaundice
   - B. Anorexia
   - C. Tachycardia
   - D. Fatigue

7. A client with leukemia has been receiving injections of Neulasta (pegfilgrastim). Which laboratory value reveals that the drug is producing the desired effect?
   - A. Hemoglobin of 13.5g/dl
   - B. White blood cell count of 6,000/mm³
   - C. Platelet count of 300,000/mm³
   - D. Iron level of 75ug/dl

8. The nurse is performing discharge teaching on a client with polycythemia vera. Which would be included in the teaching plan?
   - A. Avoid large crowds.
   - B. Keep the head of the bed elevated at night.
   - C. Wear socks and gloves when going outside.
   - D. Know the signs and symptoms of thrombosis.
9. A 15-year-old client with iron deficiency anemia and a ruptured ectopic pregnancy needs a blood transfusion prior to surgery. The client’s mother is a Jehovah’s Witness and refuses to sign the blood permit. Which nursing action is most appropriate?
   - A. Give the blood without the mother’s permission.
   - B. Coax the mother to change her mind.
   - C. Allow the client to sign the permit.
   - D. Notify the physician of the mother’s refusal.

10. The physician has ordered a minimal bacteria diet on a client with neutropenia. Which seasoning is not permitted for this client?
   - A. Salt
   - B. Lemon juice
   - C. Pepper
   - D. Ketchup

**Answer Rationales**

1. Answer D is correct. Hydration is needed to prevent slowing of blood flow and occlusion. It is important to perform the assessments in answers A, B, and C, but D is the best intervention for the prevention of the crisis.

2. Answer C is correct. B12 is an essential component for proper functioning of the peripheral nervous system. Clients without proper B12 will have symptoms such as paresthesia due to the deficiency. Answers A and D don’t occur with pernicious anemia. The client would have weight loss rather than weight gain as in answer B.

3. Answer A is correct. Liquid iron should be administered through a straw to prevent dental staining. Answers B, C, and D are not correct instructions for taking liquid iron, so they are incorrect.

4. Answer B is correct. This selection is the one with the highest iron content. Other foods high in iron include Cream of Wheat, oatmeal, liver, collard greens, mustard greens, clams, chili with beans, brown rice, and dried apricots. Answers A, C, and D are not high in iron.

5. Answer D is correct. The 0.2 ml of air that would be administered after the medication with an intramuscular injection would allow the medication to be dispersed into the muscle. In the answer A, the muscle is small. Answer C is an incorrect procedure, and answer B doesn’t help with prevention of tracking.

6. Answer A is correct. The destruction of red blood cells causes the release of bilirubin, leading to the yellow hue of the skin. Answers C and D occur with anemia but are not specific to hemolytic.
7. Answer B is correct. Neulasta is given to increase the white blood cell count in patients with leukopenia. This white blood cell count is within the normal range, showing an improvement. Answers A, C, and D are not specific to the drug’s desired effect.

8. Answer D is correct. Patients with polycythemia have an increased risk for thrombosis and must be aware of the symptoms. Answers A, B, and C do not relate to this disorder.

9. Answer D is correct. This is the only option that is appropriate for the nurse to legally use at this point. The doctor is performing the surgery and must be notified of the mother’s refusal. Answers A and C are not legal options, and answer B is inappropriate.

10. Answer C is correct. Ground pepper is an unprocessed food and will not be allowed due to the possible bacteria. Answers A, B, and D would be processed.

Suggested Reading and Resources

CHAPTER SIX

Caring for the Client with Disorders of Fluid and Electrolyte Balance and Acid/Base Balance

Terms you’ll need to understand:
✓ Acidosis
✓ Active transport
✓ Alkalosis
✓ Diffusion
✓ Electrolyte
✓ Filtration
✓ pH

Nursing skills you’ll need to master:
✓ Evaluating pH in clients
Basic Knowledge of Fluid and Electrolyte Balance

Although fluid and electrolyte balance and acid/base balance are separate entities, they are directly related to one another. For example, dehydration results in a decrease in the pH or metabolic acidosis, whereas overhydration results in an increase in the pH or metabolic alkalosis. To understand how this happens, let’s review the basics of fluid movement across the cell membrane.

Fluid constantly moves in and out of the cell through a process known as osmosis. This fluid is compartmentalized into intracellular fluid (fluid that is within the cell) and extracellular fluid (fluid that is outside the cell). Two thirds of the body’s fluid is intracellular. The remaining one third, or extracellular fluid, is divided between the intravascular and interstitial spaces.

Diffusion is the process whereby molecules move from an area of higher concentration to an area of lower concentration. Diffusion is affected by the amount and type of molecular particles. These molecular particles are removed from body fluid as they pass through semipermeable membranes in a process known as filtration.

Molecular particles can also pass from an area of lower concentration to one of higher concentration by a process known as active transport. Diffusion and active transport allow positively charged particles, called cations, and negatively charged particles, called anions, to pass in and out of the cell. These particles are also known as electrolytes because they are positively or negatively charged. As these cations and anions concentrate, they result in changes in the pH. Some examples of anions are bicarb (HCO₃⁻), chloride (Cl⁻), proteins, phosphates, and sulfates. Examples of cations are sodium (Na⁺), potassium (K⁺), magnesium (Mg⁺⁺), and calcium (Ca⁺⁺).

An acid is a substance that releases a hydrogen (H⁺) ion when dissolved in water, and a base is a substance that binds with a hydrogen ion when released in water. Therefore, when there is a decrease in bicarbonate hydrogen ions (HCO₃⁻) or an accumulation of carbonic acid, acidosis exists; when there is an increase in bicarbonate hydrogen ions (HCO₃⁻) or a loss of carbonic acid, alkalosis exists.

Within this chapter we will discuss how these factors affect acid/base balance (pH) and the regulation of electrolytes. You will also discover the disease processes that contribute to these alterations.
Regulation of pH and Its Effect on Fluid and Electrolytes

The body maintains its pH by keeping the ratio of HCO₃⁻ (bicarb) to H₂CO₃ (carbonic acid) at a proportion of 20:1. HCO₃⁻ or bicarbonate is base, whereas carbonic acid is acidic. This relationship constantly changes and is compensated for by the kidneys and lungs. The normal pH is 7.35–7.45, with the ideal pH being 7.40. If the carbonic acid concentration increases, acidosis occurs and the client’s pH falls below 7.40. A pH below 7.35 is considered uncompensated acidosis. If the HCO₃⁻ concentration increases, alkalosis occurs and the client’s pH is above 7.40. A pH above 7.45 is considered uncompensated alkalosis.

How the Body Regulates pH

Two buffer systems in the body assist in regulating pH:

- **Kidneys**—By retaining or excreting NaHCO₃ (sodium bicarb) or by excreting acidic urine or alkaline urine. They also help by reabsorbing NaHCO₃⁻ and secreting free H⁺ ions.
- **Lungs**—By retaining carbonic acid in the form of CO₂ (carbon dioxide) or by rapid respirations excreting CO₂.

When there is a problem with either the lungs’ or kidneys’ capability to compensate, an alteration in this balance results.

Let’s discuss the alteration in acid/base balance as it affects electrolytes and pH.

**Metabolic Acidosis**

*Metabolic acidosis* results from a primary gain of carbonic acid or a loss of bicarbonate HCO₃⁻ with a pH below 7.40.

**Causes of Metabolic Acidosis**

The following list are some causes of metabolic acidosis:

- **Certain disease states**—Disease states that create excessive metabolism of fats in the absence of usable carbohydrates, leading to the accumulation of ketoacids.
- **Diabetes mellitus**—Lack of usable insulin, leading to hyperglycemia and ketoacidosis.
- **Anorexia**—Leading to cell starvation.
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- **Lactic acidosis**—Due to muscle and cell trauma, such as myocardial infarction.
- **Renal failure**—Leading to waste accumulation in the body and elevated levels of creatinine, BUN, uric acid, and ammonia. All these substances are acidic.
- **Diarrhea**—With a loss of HCO₃⁻. This loss of HCO₃⁻ and fluid leads to dehydration. When the client is dehydrated, acidosis is likely.
- **Excessive ingestion**—Ingestion of aspirin or other acids.
- **Overuse of diuretics**—Particularly nonpotassium-sparing diuretics.
- **Overwhelming systemic infections**—Also called sepsis. Overwhelming infections lead to cell death and nitrogenous waste accumulation.
- **Terminal stages of Addison’s disease**—Adrenal insufficiency results in a loss of sodium and water. This leads to a decrease in blood pressure and hypovolemic shock.

**Symptoms of Metabolic Acidosis**

The following list highlights symptoms of metabolic acidosis that a nurse needs to be aware of for both the exam and for on-the-job observations:

- **Neurological**—Headache, lethargy, drowsiness, loss of consciousness, coma, death
- **Gastrointestinal**—Anorexia, nausea, vomiting, diarrhea, fruity breath
- **Respiratory**—Hyperventilation (due to stimulation of the hypothalamus)
- **Renal**—Polyuria and increased acid in the urine
- **Lab values**—Decreased pH, decreased PaCO₂, decreased serum CO₂, often increased potassium

**Care of the Client with Metabolic Acidosis**

Metabolic acidosis is rarely present without an underlying disease process. Treatment involves early diagnosis and treatment of the causative factors:

- **Monitor the potassium level (K+) and treat accordingly**—Because potassium (K+) is an intracellular cation, changes in potassium levels commonly occur with metabolic acidosis. The symptoms of hyperkalemia are malaise, generalized weakness, muscle irritability, flaccid paralysis, nausea, and diarrhea. If the potassium is excreted through the kidneys, hypokalemia can result. The symptoms of hypokalemia are diminished reflexes, weak pulse, depressed U waves on the ECG, shallow respirations, shortness of breath, and vomiting.
Respiratory Acidosis

Nursing care of the client with metabolic acidosis includes frequent monitoring of vital signs and attention to the quality of pulses, and intake and output. Those with diabetes should be taught the importance of frequent blood glucose checks.

Respiratory Acidosis

Respiratory acidosis occurs when there is a decrease in the rate of ventilation to the amount of carbonic acid production. Hypoventilation leads to CO₂ accumulation and a pH value less than 7.35. Loss of the lungs as a buffer system causes the kidneys to compensate. In chronic respiratory acidosis, the kidneys attempt to compensate by retaining HCO₃⁻.

Causes of Respiratory Acidosis

The following list highlights causes of respiratory acidosis you need to know. All these involve accumulation of carbonic acid (CO₂) and/or a lack of oxygenation:

- **Treat diabetes**—Treat with insulin for hyperglycemia; treat with glucose for hypoglycemia.
- **Treat hypovolemia**—Treat with a volume expander and blood transfusions and treat shock.
- **Treat renal failure**—Treatment includes dialysis or transplant and dietary modification. The diet for renal failure clients should control protein, sodium, and fluid. Supplemental calories and carbohydrates are suggested.
- **Treat lactic acidosis**—Treatment includes oxygen and NaHCO₃.
- **Treat Addison’s disease**—Treatment includes cortisone preparations, a high sodium diet, and fluids for shock.

If administering potassium, always check renal function prior to administration. The kidney assists in regulating potassium. If the client has renal disease, a life-threatening hyperkalemia can result. Because potassium is bitter to taste, it should be administered with a juice such as orange juice, grape juice, tomato juice, or apple juice. Ascorbic acid also helps with absorption of the potassium. If administering an IV, always control infusion by using an IV pump or controller. An infusion that is too rapid can result in cardiac arrhythmias. If giving IV, dilute the potassium with IV fluids to prevent hyperkalemia and burning of the vein.
Over sedation or anesthesia.

- Head injury (particularly those affecting the respiratory center). This type of head injury leads to an increase in intracranial pressure and suppression of the respirations.

- Paralysis of the respiratory muscles (for example, Guillain-Barré, myasthenia gravis, or spinal cord injury).

- Upper airway obstruction.

- Acute lung conditions (such as pulmonary emboli, pulmonary edema, pneumonia, or atelectasis).

- Chronic obstructive lung disease.

- Prolonged overbreathing of CO₂.

**CAUTION**

When the client has been given general anesthesia followed by narcotic administration, there is a risk of narcotic overdose. The nurse should keep naloxone hydrochloride (Narcan) available as the antidote for narcotic overdose. Flumazenil (Romazicon) is the antidote for the client who is admitted with an overdose of benzodiazepines such as diazepam (Valium).

**Symptoms of Respiratory Acidosis**

The following list gives the symptoms of respiratory acidosis you need to know:

- **Neurological**—Dull sensorium, restlessness, apprehension, hypersomnolence, coma

- **Respiratory**—Initially increased respiratory rate, perspiration, increased heart rate; later, slow respirations and periods of apnea or Cheyne-Stokes respirations (breathing marked by periods of apnea lasting 10–60 seconds followed gradually by hyperventilation) with resulting cyanosis

**CAUTION**

Cyanosis is a late sign of hypoxia. Early signs are tachycardia and tachypnea.

**Caring for the Client with Respiratory Acidosis**

Care of the client with respiratory acidosis includes attention to signs of respiratory distress, maintaining a patent airway, encouraging fluids to thin secretions, and chest physiotherapy.
Metabolic Alkalosis

Metabolic alkalosis results from a primary gain in HCO₃⁻ or a loss of acid that results in a pH level above 7.45.

Causes of Metabolic Alkalosis

The following list highlights causes of metabolic alkalosis that you need to be aware of:

- Vomiting or nasogastric suction that may lead to loss of hydrochloric acid
- Fistulas high in the gastrointestinal tract that may lead to a loss of hydrochloric acid
- Steroid therapy or Cushing’s syndrome (hypersecretion of cortisol) that may lead to sodium, hydrogen (H+) ions, and fluid retention
- Ingestion or retention of a base (for example, calcium antacids or NaHCO₃)

Symptoms of Metabolic Alkalosis

Symptoms of metabolic alkalosis include

- **Neurological**—Fidgeting and twitching tremors related to hypokalemia or hyperkalemia
- **Respiratory**—Slow, shallow respirations in an attempt to retain CO₂
- **Cardiac**—Atrial tachycardia and depressed T waves related to hypokalemia
- **Gastrointestinal**—Nausea, vomiting, and diarrhea causing loss of hydrochloric acid
- **Lab changes**—pH levels above 7.45, normal or increased CO₂, increased NaHCO₃
Caring for the Client with Metabolic Alkalosis

The following items are necessary care items a nurse should know for treating clients with metabolic alkalosis:

- Administering potassium replacements
- Observing for dysrhythmias
- Observing intake and output
- Assessing for neurological changes

**CAUTION**

A positive Trousseau’s sign indicates hypocalcemia and is done by applying a blood pressure cuff to the arm and observing for carpo-pedal spasms. Another assessment tool is the Chvostek’s sign, which is done by tapping the facial nerve (C7) and observing for facial twitching. This test also indicates hypocalcemia.

Respiratory Alkalosis

Respiratory alkalosis is related primarily to the excessive blowing off of CO₂ through hyperventilation. Causes of respiratory alkalosis include:

- Hypoxia
- Anxiety
- High altitudes

Symptoms of Respiratory Alkalosis

The following list details symptoms of respiratory alkalosis that you will need to know as a nurse and for the exam:

- **Neurological**—Numbness and tingling of hands and feet, tetany, seizures, and fainting
- **Respiratory**—Deep, rapid respirations
- **Psychological**—Anxiety, fear, and hysteria
- **Lab changes**—Increased pH, decreased PaCO₂, decreased K⁺ levels, and normal or decreased CO₂ levels
Care of the Client with Respiratory Alkalosis

The following list includes steps for caring for clients suffering from respiratory alkalosis:

- To correct respiratory alkalosis, the nurse must determine the cause for hyperventilation. Some causes for hyperventilation are stress and high altitudes. Treatments include:
  - Stress reduction
  - Sedation
  - Breathing in a paper bag to facilitate retaining CO₂ or using a re-breathing bag
  - Decreasing the tidal volume and rate of ventilator settings

CAUTION

Use the following acronym to help you with respiratory and metabolic questions on the exam:

ROME: Respiratory Opposite, Metabolic Equal

This means, in respiratory disorders the pH is opposite to the CO₂ and HCO₃, and in metabolic disorders the pH is equal to or moves in the same direction as the CO₂ and HCO₃. Here's an explanation:

- Respiratory acidosis—pH down, CO₂ up, HCO₃ up
- Metabolic acidosis—pH down, CO₂ down, HCO₃ down
- Respiratory alkalosis—pH up, CO₂ down, HCO₃ down
- Metabolic alkalosis—pH up, CO₂ up, HCO₃ up

Normal Electrolyte Values

It is important for you to know these normal electrolyte values. You need to be aware of these so that you can associate alterations in them with the acid/base balance. Note that you are likely to encounter questions on the exam that use these values:

- **Sodium (Na⁺) 135–145 meq/L**—Maintains acid/base balance, maintains extracellular volume, and maintains urine concentration
- **Potassium (K⁺) 3.5–5.5 meq/L**—Regulates protein synthesis, glycolysis, and glycogen synthesis
- **Calcium (Ca++) 4.5–5.5 meq/L or 8.5–10.5 mg/L**—Helps with the strength and density of bones and teeth, normal clotting, and muscle contractility
- **Chloride (Cl⁻) 95–105 meq/L**—Assists the formation of hydrochloric acid, maintenance of acid/base balances, and maintaining osmotic pressure
Phosphorus (Ph+) 2.5–4.5 mg/dL—Assists with activation of B complex, cell development, CHO, fat and protein metabolism, and formation and activation of ATP (adenosine triphosphate—creb cycle)

Magnesium (Mg++) 1.5–2.5 meq/L—Helps with muscle contraction, DNA synthesis, and activation of ATP and B complex

Changes Associated with Aging

The following list gives you factors related to fluid and electrolyte balance and acid/base balance with aging clients:

- Presence of chronic health problems such as diabetes mellitus or renal failure
- Poor appetite
- Medications such as diuretics taken by the client
- Skin breakdown
- Osteoporosis
- Lack of muscle mass
Exam Prep Questions

1. The client is admitted to the unit with a potassium level of 2.4 meq/L. The client with a potassium level of 2.4 meq/L would exhibit symptoms of:
   - A. Peaked T waves
   - B. U waves
   - C. Muscle rigidity
   - D. Rapid respirations

2. The client is admitted with hypokalemia. An IV of normal saline is infusing at 80 ml/hour with 10 meq of KCl/hour. Prior to beginning the infusion, the nurse should:
   - A. Check the sodium level.
   - B. Check the magnesium level.
   - C. Check the creatinine level.
   - D. Check the calcium level.

3. The client is admitted to the labor and delivery unit with preeclampsia. An IV of magnesium sulfate is begun per pump. Which finding would indicate hypermagnesemia?
   - A. Urinary output of 60 ml per hour
   - B. Respiration of 30 per minute
   - C. Absence of the knee-jerk reflex
   - D. Blood pressure of 150/80

4. The client presents to the unit with complaints of shortness of breath. A tentative diagnosis of respiratory acidosis related to pneumonia is made. Which finding would support this diagnosis?
   - A. pH of 7.45, CO₂ of 45, HCO₃ of 26
   - B. pH of 7.35, CO₂ of 46, HCO₃ of 27
   - C. pH of 7.34, CO₂ of 30, HCO₃ of 22
   - D. pH of 7.44, CO₂ of 32, HCO₃ of 25
5. The client with Cushing's disease will most likely exhibit signs of:
   - A. Hypokalemia
   - B. Hyponatremia
   - C. Hypocalcaemia
   - D. Hypermagnesemia

6. The nurse is responsible for teaching the client regarding dietary choices to provide needed magnesium. Which food is a good source of magnesium?
   - A. Apple
   - B. Spinach
   - C. Liver
   - D. Squash

7. The client with hyperparathyroidism will exhibit signs of:
   - A. Hypokalemia
   - B. Hyponatremia
   - C. Hypercalcemia
   - D. Hyperphosphatemia

8. A client with metabolic acidosis associated with diabetes mellitus is admitted to the unit. A blood glucose of 250 mg/dl is present. Which symptom will most likely accompany ketoacidosis?
   - A. Oliguria
   - B. Polydipsia
   - C. Perspiration
   - D. Tremors

9. An elderly client is admitted to the unit with a temperature of 100.2°, urinary specific gravity of 1.032, and a dry tongue. The nurse should anticipate an order for:
   - A. An antibiotic
   - B. An analgesic
   - C. A diuretic
   - D. An IV of normal saline
10. Which diet selection contains the most potassium and should be removed from the tray of the client with renal failure?

☐ A. Peach
☐ B. Baked potato
☐ C. Marshmallows
☐ D. Bread

Answer Rationales

1. Answer B is correct. The normal potassium level is 3.5–5.5 meq/dl. Answer A is incorrect because it indicates an elevated potassium level. Answer C is incorrect because the muscles will be flaccid with hypokalemia. Answer D is incorrect because the respirations will be shallow not rapid.

2. Answer C is correct. The client receiving potassium needs to be evaluated for renal function because regulation of potassium is primarily done within the kidneys. It is not necessary to check the sodium, magnesium, or calcium level prior to beginning potassium, so answers A, B, and D are incorrect.

3. Answer C is correct. The signs of toxicity to magnesium are oliguria (less than 30 ml/hour urinary output), respirations less than 12 per minute, and absence of the deep tendon reflexes. In answer A the urinary output is within normal limits. If it falls below 30, you should further evaluate for toxicity. In answer B if the respirations fall below 12, the infusion should be discontinued and oxygen support maintained. The blood pressure is within normal limits in answer D.

4. Answer B is correct. The client with respiratory acidosis will have a pH that is decreased and CO₂ excretion will be inhibited due to the respiratory problems. The HCO₃⁻ will also be increased because the kidneys are the compensating organ. Answer A is alkalosis, answer C is metabolic acidosis, and answer D is compensated alkalosis.

5. Answer B is correct. The client with Cushing's has hyperadrenal function. These clients retain sodium and water. They do not typically lose potassium or calcium or retain magnesium.

6. Answer B is correct. Dark green vegetables and legumes contain large amounts of magnesium. The other food choices do not provide significant sources of magnesium.

7. Answer C is correct. The client with hyperparathyroidism will have elevated calcium levels. Calcium is pulled from the bone into the serum. These clients frequently have renal calculi and osteoporosis. They do not have hypokalemia, hyponatremia, or hyperphosphatemia. They will have hypercalcemia and hypophosphatemia.

8. Answer B is correct. A blood glucose level of 250 mg/dl is elevated. Symptoms of hyperglycemia are polyuria, polydipsia, and polyphagia. The client will also have a decreased sensorium and tachypnea. Answers A, C, and D are all symptoms of hypoglycemia (testing technique: odd man out).
9. Answer D is correct. The client is hypovolemic and hyponatremic. The slight elevation in the temperature might be related to the dehydration. The normal specific gravity is 1.010–1.020; therefore, this finding shows urinary concentration. There is not enough data to support a need for an antibiotic, as in answer A, an analgesic as in B, or a diuretic as in C.

10. Answer B is correct. The skin of the potato contains large amounts of potassium, and potassium should be limited in the client with renal failure. A peach contains some potassium, but not as much as the baked potato, so answer A is incorrect. The marshmallows and bread contain minimal amounts of potassium, so answers C and D are incorrect.

Suggested Reading and Resources


CHAPTER SEVEN

Caring for the Client with Burns

Terms you’ll need to understand:

✓ Allograft
✓ Autograft
✓ Biosynthetic graft
✓ Burn shock
✓ Consensus formula
✓ Contracture
✓ Debridement
✓ Donor site
✓ Emergent phase of burn injury
✓ Eschar
✓ Heterograft
✓ Homograft
✓ Intermediate phase of burn injury
✓ Jobst garment
✓ Lund and Browder method
✓ Palm method
✓ Parkland formula
✓ Rehabilitative phase of burn injury
✓ Rule of Nines
✓ Total body surface area (TBSA)

Nursing skills you’ll need to master:

✓ Performing sterile dressing change
✓ Administering medications
✓ Transfusing blood and blood products
✓ Performing tracheostomy suction and care
✓ Monitoring central venous pressure
✓ Caring for central lines
✓ Assessing a burn injury using the Rule of Nines
✓ Calculation of IV fluid requirements using the Parkland formula and the Consensus formula
Although the incidence of burn injury has declined, burns still account for about 2,000,000 injuries each year in the United States. According to the American Burn Association (2000), more than 51,000 persons require hospital care each year for treatment of their injuries. Those with burns greater than 25% total body surface area (TBSA) are at risk of dying from smoke inhalation and other complications associated with burns. Young children and the elderly are particularly vulnerable to local and systemic effects of burns because their skin is naturally thinner. Burns are the third leading cause of death in children under age 14 and are in the top 10 of causes of death for all age groups.

Burns generally occur from one of three major sources:

- Thermal injuries (hot liquid, open flame)
- Electrical injuries (household current, lightning)
- Chemical injuries (alkaline or acid liquids or powders)

Radiation injuries are most likely to occur with industrial accidents where radioactive energy is produced or in situations where radioactive isotopes are used. More discussion on radiation injuries can be found in Chapter 18, “Emergency Nursing.”

Most burns are thermal injuries that occur in the home. Cooking accidents from hot grease or stove fires result in a significant number of injuries, as do scalds from bath water that is too hot.

**CAUTION**

To prevent burns, hot water heaters should be set no higher than 120° Fahrenheit.

Carbon monoxide, sulfur oxides, cyanide, chlorine, and other toxins are released from household contents during a fire. Inhalation of these gases damages the lower airway, resulting in the collapse of the alveoli and increasing the possibility of acute respiratory distress syndrome.

**Burn Classifications**

Before discussing caring for the client with burns, we must first look at how burns are classified. Treatment of the client with burns is dictated by whether the injury is classified as a *minor burn*, *moderate burn*, or *major burn*. These classifications are dependent on the degree of tissue involved and the total body surface area affected by the injury. Burns are further classified in terms of the depth of tissue destroyed or the *thickness* of the burn injury. The following list gives you an idea of the different degrees of burns, the symptoms experienced with the injury, and the expected time of healing:
Superficial partial thickness (first degree)—Tissue damage is confined to the epidermis and possibly a portion of the dermis. This is the type of injury produced by sunburn or a low-intensity flash. The skin appears red but blanches with pressure. Blisters may or may not be present. The client usually complains of tingling, increased skin sensitivity, and pain that is relieved by the application of cool water or lotions containing aloe. The injury heals within a week. Although the skin peels, there is no scarring.

Deep partial thickness (second degree)—Tissue damage involves the epidermis, upper dermis, and portions of the deeper dermis. Deep partial thickness injury is common in scalds and flash flames. The area involved appears blistered with weeping and edema. The client experiences pain and increased skin sensitivity, which increases with exposure to air. The use of sterile sheets and overbed cradles minimizes contact with the air and makes the client more comfortable. Morphine sulfate or other opiate analgesics are given intravenously to control pain.

Full thickness (third degree)—Tissue damage involves the epidermis and entire dermis. The damage usually extends into subcutaneous tissue, including connective tissue, muscle, and bone. Full thickness burns result from prolonged exposure to hot liquids or open flame, electrical current, or exposure to chemical agents. Depending on the source of the injury, the affected area can appear dry, pale white, edematous, leathery, or charred. Destruction of nerve endings leaves the affected areas relatively pain free. Complicating the care of the client with full thickness injury is the development of hypovolemic burn shock, hyperkalemia, and anemia. Electrical injuries, which appear as whitish areas at the points of entry and exit, can result in changes in heart rhythm or complete cardiac standstill.

CAUTION

Pain medication is given intravenously to provide quick, optimal relief and to prevent overmedication as edema subsides and fluid shift is resolving.

Deep partial thickness injury generally heals in two to four weeks, although infection can delay healing. Infection can also take a deep partial thickness injury to a full thickness injury.

Full thickness (third degree)—Tissue damage involves the epidermis and entire dermis. The damage usually extends into subcutaneous tissue, including connective tissue, muscle, and bone. Full thickness burns result from prolonged exposure to hot liquids or open flame, electrical current, or exposure to chemical agents. Depending on the source of the injury, the affected area can appear dry, pale white, edematous, leathery, or charred. Destruction of nerve endings leaves the affected areas relatively pain free. Complicating the care of the client with full thickness injury is the development of hypovolemic burn shock, hyperkalemia, and anemia. Electrical injuries, which appear as whitish areas at the points of entry and exit, can result in changes in heart rhythm or complete cardiac standstill.

CAUTION

The cardiac status of a client with electrical burns should be closely monitored for at least 24 hours following the injury to detect changes in electrical conduction of the heart.
A second means of classifying burns is based on the percentage of tissue injured. Three methods are used to determine the total body surface area injured in a burn:

- **The Rule of Nines**—The Rule of Nines assigns percentages of 9 to major body surfaces. The breakdown is as follows: head = 9%, anterior trunk = 18%, posterior trunk = 18%, arms = 9% each, legs = 18% each, and perineum = 1%. The rule is demonstrated in Figure 7.1.

- **Lund and Browder method**—The Lund and Browder method of determining TBSA is more precise because it takes into account that anatomic parts, especially the head and legs, change with growth. Special charts divide the body into very small parts and provide for an estimate of the proportion of TBSA burned. The Lund and Browder method is used to estimate TBSA in children.
The palm method—The percentage affected by scattered burns may best be calculated using the palm method. The size of the client’s palm represents approximately 1% of the TBSA.

Minor burn injury involves a second degree burn or less than 15% of TBSA in adults and less than 10% in children. Or, it can involve a third degree burn of less than 2% TBSA but not involving areas requiring special care (face, eyes, ears, perineum, and joints of hands and feet). Minor burns do not include electrical burn injury, inhalation injury, those clients with concurrent illness or trauma, or age-related considerations.

Moderate burn injury involves second degree burns of 15%–20% TBSA in adults, 10%–20% in children, or third degree burns less than 10% TBSA that do not involve special care areas. Moderate burns, like minor burns, do not include electrical or inhalation injury, nor those with concurrent illness, trauma, or age-related considerations.

Major burn injury involves second degree burns greater than 25% TBSA in adults, 20% in children, or all third degree burns greater than 10% TBSA. Major burns include all burns involving the structures of the head and face, hands, feet, and perineum as well as electrical and inhalation injury, concurrent illness, and trauma regardless of age.

It will be beneficial to review your nursing textbooks for local and systemic reactions to burns because these injuries affect all body systems and cardiovascular and renal function in particular.

Nursing Care for Burn Victims

Caring for a burned client represents a unique challenge to even the most experienced nursing staff because few injuries pose a greater threat to the client’s physical and emotional well-being. There are three phases of burn injury, each requiring various levels of client care. The three phases are

- Emergent
- Intermediate
- Rehabilitative
Psychological Care of a Burn Patient

Although interventions are focused on meeting the client’s physiological needs during the emergent period, the nurse should keep in mind that the nature of the injury represents a time of extreme crisis for both the client and his family. Every effort should be made to provide emotional support by providing understandable explanations of procedures and making sure that the client is kept as comfortable as possible. When necessary, appropriate referrals should be made to clergy and other professionals. Interventions directed at stabilizing the client’s condition as well as the type of emotional support will change as the client moves through the emergent, intermediate, and rehabilitative phases of injury.

The Emergent Phase

The emergent phase begins with the onset of burn injury and lasts until the completion of fluid resuscitation or a period of about the first 24 hours. During the emergent phase, the priority of client care involves maintaining an adequate airway and treating the client for burn shock.

Emergency care of burns at the site of injury includes:

- Extinguishing the burn source
- Soaking the burn with cool water to relieve pain and to limit local tissue edema
- Removing jewelry and nonadherent clothing
- Covering the wound with a sterile (or at least clean) dressing to minimize bacterial contamination
- Brushing off chemical contaminants, removing contaminated clothing, and flushing the area with running water

CAUTION

The eyes should be irrigated with water immediately if a chemical burn occurs. Follow-up care with an ophthalmologist is important because burns of the eyes can result in corneal ulceration and blindness.

Major Burns in the Emergent Phase

If the injury is determined to be a major burn injury, the following additional interventions will be taken during the emergent phase of burn care. Assessment of the following needs to take place during this phase:

- Airway
- Breathing
- Circulation
Important steps in treating a burn client include:

- **Treat airway and breathing**—Traces of carbon around the mouth or nose, blisters in the roof of the mouth, or the presence of respiratory stridor indicate the client has respiratory damage. Endotracheal intubation with assisted ventilation might be required to achieve adequate oxygenation.

- **Ensure proper circulation**—Compromised circulation is evident by slowed capillary refill, a drop in normal blood pressure, and decreased urinary output. These symptoms signal impending burn shock.

These interventions come next:

- Insertion of a large bore catheter for administering IV fluids
- Calculation of TBSA involved
- Calculation of fluid needs according to one of the fluid resuscitation formulas

**CAUTION**

It is important to remember that the actual burns might not be the biggest survival issue facing burn clients. Carbon monoxide from inhaled smoke can develop into a critical problem as well. Carbon monoxide combines with hemoglobin to form carboxyhemoglobin, which binds to available hemoglobin 200 times more readily than with oxygen. Carbon monoxide poisoning causes a vasodilating effect, making the client have a characteristic cherry red appearance. Interventions for carbon monoxide poisoning focus on early intubation and mechanical ventilation with 100% oxygen.

In the hours immediately following a major burn injury, loss of capillary permeability allows intravascular fluid to flood into the extracellular space. During the emergent or resuscitative phase, efforts are directed at preventing or reversing burn shock using fluid replacement formulas. Although there are a number of acceptable formulas for calculating fluid requirements, the Parkland formula and Consensus formula are most often used.

**The Parkland Formula**

The Parkland formula provides a large volume of IV fluid in the first 24 hours to prevent deepening hypovolemic shock and further acidosis. After the first 24 hours, the amount of fluid infused should be titrated according to the urinary output, with the goal of maintaining the output between 30 ml and 50 ml per hour.

The following example steps you through a calculation of TBSA using the Rule of Nines and the fluid requirements using the Parkland formula:
A client receives full thickness burns of the arms, chest, back, and head at 0600 hours. The client weighs 180 pounds. Using the Parkland formula, how much fluid should the client receive by 1400?

**Parkland formula:**

\[ \text{Ringer's Lactate} \times 4 \text{ ml} \times \text{kg body weight} \times \% \text{TBSA} \]

Half of the amount is to be infused in the first 8 hours. The remainder is to be infused over the next 16 hours.

With this information, what steps should you follow? The steps given below will help you calculate this if you have difficulty:

1. Calculate the TBSA using the Rule of Nines:
   
   arms (9% each arm) = 18% + chest (18%) + back (18%) + head (9%) = 63%

2. Convert the client’s weight from pounds to kilograms:
   
   180 pounds ÷ 2.2 pounds = 81.8 kg (round to 82 kg)

3. Calculate using the Parkland formula for fluid resuscitation:
   
   \[ 4 \text{ ml} \times 82 \text{ kg} \times 63 = 20,664 \text{ ml in 24 hours} \]

   According to the Parkland formula, half the calculated volume of Lactated Ringer’s solution is to infuse in the first 8 hours; one fourth is to infuse in the second 8 hours; and one fourth is to infuse in the remaining 8 hours.

4. The injury occurred at 0600; the first 8 hours will end at 1400. Therefore, the client should receive one half the total amount or 10,332 ml.

**The Consensus Formula**

Here’s how you use the Consensus formula (for comparison with use of the Parkland formula):

**Consensus formula:**

\[ \text{Ringer's Lactate or other balanced saline solution} \times 2 \text{ ml–4 ml} \times \text{kg body weight} \times \% \text{TBSA} \]

Half of the amount is to be infused over the first 8 hours. The remainder of the amount is to be infused over the next 16 hours.

**CAUTION**

Fluid replacement formulas are calculated from the time of injury rather than from the time of arrival in the emergency room.
With this information, what steps should you follow? The steps given here will help you calculate this if you have difficulty:

1. Calculate the TBSA using the Rule of Nines:
   arms (9% each arm) = 18% + chest (18%) + back (18%) + head (9%) = 63%

2. Convert the client's weight from pounds to kilograms:
   180 pounds ÷ 2.2 pounds (2.2 pounds = 1 kg) = 81.8 kg (rounded to 82 kg)

3. Calculate using the Consensus formula for fluid resuscitation:
   \[ 2 \text{ ml} \times 82 \times 63 = 10,332 \text{ ml} \]
   \[ 4 \text{ ml} \times 82 \times 63 = 20,664 \text{ ml} \]
   On the low end (2 ml), the amount to infuse over 24 hours would be 10,332 ml, with half to be infused in the first 8 hours and the remainder to be infused over the next 16 hours.
   On the high end (4 ml), the amount to infuse over 24 hours would be 20,664 ml, with half to be infused in the first 8 hours and the remainder to be infused over the next 16 hours.

**Additional Interventions**
These additional interventions are taken after assessment of airway and establishing IV access for fluid replacement. Airway and maintaining fluid volume take priority over all the other interventions:

- Administering a tetanus booster
- Inserting a urinary catheter for determining hourly output
- Inserting a nasogastric tube attached to low suction to minimize aspiration

**NOTE**
Enteral feedings are usually instituted within the first 24 hours to meet the client's increased caloric needs and maintain the integrity of the intestinal mucosa thereby minimizing systemic sepsis.

- Elevating burned extremities to lessen edema formation
The Intermediate Phase

The intermediate phase of burn care begins about 48–72 hours following the burn injury. Changes in capillary permeability and a return of osmotic pressure bring about diuresis or increased urinary output. If renal and cardiac functions do not return to normal, the added fluid volume, which prevented hypovolemic shock, might now produce symptoms of congestive heart failure. Assessment of central venous pressure provides information regarding the client's fluid status.

NOTE

The central venous pressure (CVP) is read with the client in a supine position with the manometer level with the fourth intercostal space midaxillary line (often referred to as the phlebostatic axis). The normal CVP varies but the general range is between 5–12 mm H₂O. Increased CVP indicates fluid volume overload; decreased CVP indicates fluid volume deficit.

Additional complications found during the intermediate phase include infections, the development of Curling's ulcer, paralytic ileus, anemia, disseminated intravascular coagulation, and acute respiratory failure.

NOTE

Infections represent a major threat to the post-burn client. Bacterial infections (staphylococcus, proteus, pseudomonas, escherichia coli, and klebsiella) are common due to optimal growth conditions posed by the burn wound; however, the primary source of infection appears to be the client's own intestinal tract. As a rule, systemic antibiotics are avoided unless an actual infection exists.

During the intermediate phase, attention is given to removing the eschar and other cellular debris from the burned area. Debridement, the process of removing eschar, can be done placing the client in a tub or shower and gently washing the burned tissue away with mild soap and water or by the use of enzymes, substances that digest the burned tissue. Santyl (collagenase) is an important debriding agent for burn wounds.

CAUTION

Enzymatic debridement should not be used for burns greater than 10% TBSA, for burns near the eyes, or for burns involving muscle.

Following debridement, the wound is treated with a topical antibiotic and a dressing is applied (more on dressings is covered in the next section). Commonly used topical antibiotics include
silver sulfadiazine (Silvadene); mafenide acetate (Sulfamylon); and silver nitrate, which can be used in an aqueous solution of 0.5% or Acticoat, a prepared dressing impregnated with silver nitrate. Silver nitrate has bacteriostatic properties that inhibit bacterial growth. Mafenide acetate, although painful, is useful in preventing *Pseudomonas* infections. Silvadene cools and soothes the burn wound but does not prevent infection.

**Dressings for Burns**

Dressings for burns include standard wound dressings (sterile gauze) and biologic or biosynthetic dressings (grafts, amniotic membranes, cultured skin, and artificial skin).

**Standard Wound Dressings**
The use of standard wound dressings makes the client more comfortable by preventing exposure of the wound to air. These dressings are usually applied every shift or once a day.

**Biologic or Biosynthetic Dressings**

Biologic dressings are obtained from either human tissue (homograft or allograft) or animal tissue (heterograft or xenograft). These dressings, which are temporary, are used for clients with partial thickness or granulating full thickness injuries. The type of biologic dressing used depends on the type of wound and availability of the graft.

Homografts or allografts are taken from cadaver donors and obtained through a skin bank. These grafts are expensive and there is a risk of blood-borne infection. Heterografts or xenografts are taken from animal sources. The most common heterograft is pigskin because of its compatibility with human skin.

**CAUTION**

Certain religious and ethnic groups would be offended if offered a porcine (pigskin) graft.

Amniotic membrane is used for full thickness burns because it adheres immediately to the wound. It is also an effective covering for partial thickness burns until reepithelialization occurs. Amniotic membrane is low in cost, and its size allows for coverage of large wounds.

Cultured skin can be obtained by using a biopsy of epidermal cells taken from unburned portions of the client’s body. The cells are grown in a laboratory and grafted to generate permanent skin. The process is long and costly, and extreme care is needed to prevent damage and loss of the graft.

Artificial skin (Integra) made of synthetic material and animal collagen becomes a part of the client’s skin. The graft site is pliable, there is less hypertrophic scarring, and its use is helping
to eliminate the need for compression dressings like the Jobst garment during the rehabilitative phase of care.

Permanent grafts include the autograft or skin transferred from an unburned area of the client’s body to the burn wound. The client generally experiences more pain from the donor site than from the burn wound because the donor site has many pain receptors. The client should receive pain medication, and both the donor site and graft site should be carefully monitored for signs of infection.

The Rehabilitative Phase

The last stage in caring for a client with burn injury is the rehabilitative stage. Technically, this stage begins with closure of the burn and ends when the client has reached the optimal level of functioning. In actuality, it begins the day the client enters the hospital and can continue for a lifetime. In the emergent and intermediate phases, the focus is on establishing and maintaining physiological equilibrium. In the rehabilitative phase, the focus is on helping the client return to preinjury life. If that is not possible, the focus is on helping the client adjust to the changes the injury has imposed.

Diagnostic Tests for Review

The following are routine tests done on most all hospital admissions. For this client, it is a way of monitoring the hemodynamic changes (development of anemia and so on) as well as changes in renal function. The chest x-ray lets the nurse know whether there has been an inhalation injury, a development of pneumonia, changes associated with ARDS, and so on. The complete metabolic panel gives information on electrolyte status, guiding the type of IV fluid to use, as well as whether additional electrolytes are needed. Here are the tests that should be performed:

- CBC
- Complete metabolic panel
- Urinalysis
- Chest x-ray

Pharmacology Categories for Review

A client with burn injuries is particularly vulnerable to infection because he has lost the first line of defense, the skin. In fact, post-burn infection is a major cause of morbidity and mortality; therefore, it is helpful to review topical antibiotics used to treat those with burns. Other
complications of burns include anemia and stress ulcers. A review of medications used to treat anemia as well as medications to prevent ulcers and the bleeding that can occur will be helpful. Narcotic analgesics—particularly opiate derivatives—are used in controlling pain and providing sedation during the emergent and intermediate phases of burn care. A review of these categories, as seen in the following list, will better prepare you to care for a client with burns:

- Topical antibiotics
- Antianemics
- Antacids
- Narcotic analgesics
Exam Prep Questions

1. The nurse is caring for a client with an electrical burn. Which structures have the greatest risk for soft tissue injury?
   - A. Fat, tendons, and bones
   - B. Skin and hair
   - C. Nerves, muscle, and blood vessels
   - D. Skin, fat, and muscle

2. Which laboratory result would be expected during the emergent phase of a burn injury?
   - A. Glucose 100 mg/dl
   - B. Potassium 3.5 mEq/l
   - C. Sodium 142 mEq/l
   - D. Albumin 4.2 gm/dl

3. An African American client is admitted with full thickness burns over 40% of his body. In addition to the CBC and complete metabolic panel, the physician is likely to request which additional bloodwork?
   - A. Erythrocyte sedimentation rate
   - B. Indirect Coombs
   - C. C reactive protein
   - D. Sickledex

4. A client weighing 76 kg is admitted at 0600 with a TBSA burn of 40%. Using the Parkland formula, the client’s 24-hour intravenous fluid replacement should be:
   - A. 6,080 ml
   - B. 9,120 ml
   - C. 12,160 ml
   - D. 15,180 ml
5. On the third post-burn day, the nurse finds that the client’s hourly urine output is 26 ml. The nurse should continue to assess the client and notify the doctor for an order to:
   ○ A. Decrease the rate of the intravenous infusion.
   ○ B. Change the type of intravenous fluid being administered.
   ○ C. Change the urinary catheter.
   ○ D. Increase the rate of the intravenous infusion.

6. A Jewish client requires grafting to promote burn healing. Which graft is most likely to be unacceptable to the client?
   ○ A. Isograft
   ○ B. Autograft
   ○ C. Homograft
   ○ D. Xenograft

7. During the rehabilitative phase, the client’s burns become infected with pseudomonas. The topical dressing most likely to be ordered for the client is:
   ○ A. Silver sulfadiazine (Silvadene)
   ○ B. Povidone (Betadine)
   ○ C. Mafenide acetate (Sulfamylon)
   ○ D. Silver nitrate

8. The CVP reading of a client with partial thickness burns is 6 mm H₂O. The nurse recognizes that the client:
   ○ A. Needs additional fluids
   ○ B. Has a normal CVP reading
   ○ C. May show signs of congestive failure
   ○ D. Would benefit from a diuretic

9. The physician has prescribed Protonix (pantoprazole) for a client with burns. The nurse recognizes that the medication will help prevent the development of:
   ○ A. Curling’s ulcer
   ○ B. Myoglobinuria
   ○ C. Hyperkalemia
   ○ D. Paralytic ileus
10. The nurse has just completed the dressing change for a client with burns to the lower legs and ankles. The nurse should place the client’s ankles in which position?

- A. Internal rotation
- B. Abduction
- C. Dorsiflexion
- D. Hyperextension

Answer Rationales

1. Answer A is correct. Fat, tendon, and bone have the most resistance. The higher the resistance, the greater the heat generated by the current, thereby increasing the risk for soft tissue injury. Answer B has intermediate resistance, so it is incorrect. Answer C is incorrect because it has very low resistance. Answer D has low to intermediate resistance, so it is incorrect.

2. Answer A is correct. Glucose levels rise as a result of the stress response during the emergent phase. Answers B, C, and D are within normal range. K+ and Na+ would be elevated, whereas albumin would be lowered during the emergent period due to increased permeability.

3. Answer D is correct. Sickle cell anemia and sickle cell trait are more prevalent in African American clients. The Sicklecx test detects the presence of sickle cell anemia and sickle cell trait. Trauma can trigger a sickle cell crisis, which would complicate the treatment of the client. Answers A and C indicate inflammation, so they are incorrect. Answer B is incorrect because it detects circulating antibodies against RBCs.

4. Answer C is correct. The Parkland formula is 4 ml × kg × TBSA = 24-hr. fluid requirement, or 4 × 76 × 40 = 12,160 ml. Answer A is the fluid requirement for the first 8 hours after burn injury, so it’s incorrect. Answer B is incorrect because it’s the fluid requirement for 16 hours after burn injury. Answer D is an excessive amount given the client’s weight and TBSA, so it’s incorrect.

5. Answer D is correct. The urinary output should be maintained between 30 ml and 50 ml per hour. The first action should be to increase the IV rate to prevent increased acidosis. Answer A would lead to diminished output, so it is incorrect. There is no indication that the type of IV fluid is not appropriate as is suggested by answer B, making it incorrect. Answer C would not increase the client’s output and would place the client at greater risk for infection, so it is incorrect.

6. Answer D is correct. Xenografts are taken from nonhuman sources. The most common sources are porcine, or pigskin, which would be offensive to both Jews and Muslims. Answer A refers to a graft taken from an identical twin, making it incorrect. Answer B
is incorrect because it refers to a graft taken from the client’s own skin. Answer C refers to a graft taken from a cadaver, making it incorrect.

7. Answer C is correct. Sulfamylon is effective in treating wounds infected with *pseudomonas*. The client should receive pain medication prior to dressing changes because the medication produces a burning sensation when applied to the wound. Answers A, B, and D are incorrect because they are used in the treatment of burns but are not effective against *pseudomonas* infections.

8. Answer B is correct. The normal CVP reading is 5–12 mm H₂O. Answer A is incorrect because the client does not need additional fluids. Answers C and D would be appropriate only if the CVP reading were greater than 12 mm H₂O.

9. Answer A is correct. Curling’s ulcer, a stress ulcer, is a common occurrence in clients with burns. Protonix, a proton pump inhibitor, is effective in preventing ulcer formation. Answers B, C, and D are common in clients with burns but are not prevented by the use of Protonix, so they are incorrect.

10. Answer C is correct. Placing the ankles in dorsiflexed position helps prevent contractures. Answers A, B, and D will lead to contractures that may require surgical intervention, so they are incorrect.

**Suggested Reading and Resources**

- Burn Recovery Center: www.burn-recovery.org.
Caring for the Client with Sensorineural Disorders

### Terms you’ll need to understand:

- Aqueous humor
- Astigmatism
- Canal of Schlemm
- Cataract
- Conductive hearing loss
- Conjunctiva
- Cornea
- Decibel
- Glaucoma
- Hyperopia
- Intraocular pressure
- Legally blind
- Lens
- Macular degeneration
- Meniere’s syndrome
- Mydriatic
- Myopia
- Myotic
- Otitis media
- Otosclerosis
- Ototoxic
- Presbycusis
- Presbyopia
- Retinal detachment
- Sensorineural hearing loss

### Nursing skills you’ll need to master:

- Performing sterile dressing change
- Administering eye drops, eye ointments, and ear drops
- Use of an earwick
- Inserting and removing eye prosthesis
- Performing eye and ear irrigations
- Caring for hearing aids
Most of us will agree that the abilities to see, hear, taste, perceive touch, and smell are pretty important. Without the ability to smell, food would have little, if any, taste. The sense of touch lets us know when we experience something pleasurable or have been injured. No one would argue that this is unimportant. But of all the senses, the abilities to see and hear are considered most important, for they keep us informed about the world around us. In this chapter, we review problems affecting vision and hearing.

**Disorders of the Eyes**

Disorders of the eyes can be divided into the following categories:

- **Intraocular disorders**—Examples include cataracts and glaucoma.
- **Retinal disorders**—Examples of these are hypertensive retinopathy, diabetic retinopathy, and macular degeneration.
- **Refractive errors**—Examples include myopia, hyperopia, presbyopia, and astigmatism.
- **Traumatic injury**—Examples include hyphema, contusions, foreign bodies, lacerations, and penetrating injuries.

**Intraocular Disorders**

Intraocular disorders arise from within the eyeball. The primary intraocular disorders you need to understand are cataracts and glaucoma. These two diseases are discussed in the following sections.

**Cataracts**

*Cataracts*, opacities in the lens of the eye, result in the distortion of images projected onto the retina. Cataracts are associated with aging, trauma, disease of the eye, prolonged use of steroids, and exposure to sunlight or ultraviolet light. Congenital cataracts of the newborn are characterized by the absence of the red reflex.

**CAUTION**

An infant should be able to visually follow a moving object by 3 months of age. If unable to do so, the infant should have the vision evaluated by an ophthalmologist.

Symptoms of cataracts include

- Blurred, hazy vision
- Glare from bright lights
Yellow, white, or gray discoloration of the pupil

Gradual loss of vision

Cataract surgery is generally performed in an outpatient surgery center. The client is given a sedative to lessen anxiety. Medications such as Diamox (acetazolamide) are given to reduce intraocular pressure. Mydriatic eye drops such as Neo-Synephrine (phenylephrine) are used in combination with cycloplegics such as Cyclogyl (cyclophenolate HCl) to paralyze the muscles of accommodation. After the client is in the operative area, an intravenous injection of Versed (midazolam) can be given to induce light anesthesia followed by local anesthesia.

Removal of the affected lens is usually accomplished by an extracapsular cataract extraction (ECCE). The anterior portion of the lens is opened and removed along with the lens cortex and nucleus. The posterior lens capsule is left in place to provide support for the intraocular lens implant. Antibiotic steroid drops or ointments are instilled in the operative eye and a sterile patch and shield are applied.

Post-operatively the client is maintained in a semi-Fowler’s position to prevent stress on the implant. Clients are usually discharged within 2–3 hours following surgery. Before discharging the client, the nurse should instruct the client:

- To avoid activities that would increase intraocular pressure, such as bending from the waist, blowing the nose, wearing tight shirt collars, closing the eyes tightly, and placing the head in dependent position
- To report sharp, sudden pain in the operative eye
- To report bleeding, increased discharge, or lid swelling in the operative eye
- To report decreasing vision, flashes of light, or visual floaters
- To take a tub bath or to face away from the shower head when bathing
- In the proper way to administer eye medication
- To wear the protective shield when sleeping

**Glaucoma**

*Glaucoma* refers to a group of diseases that result in an increase in intraocular pressure. The three types of glaucoma and their characteristics are

- **Primary open-angle glaucoma (POAG)**—This is the most common form of glaucoma. POAG affects both eyes, is usually asymptomatic, and is caused by a decrease in the outflow of aqueous humor. The intraocular pressure in those with primary open-angle glaucoma averages between 22mm Hg and 32mm Hg. Symptoms of primary open angle glaucoma include
Tired eyes.

Diminished peripheral vision.

Seeing halos around lights.

Hardening of the eyeball.

Increased intraocular pressure.

**Acute glaucoma**—This is sometimes called narrow-angle glaucoma and is less common. This is caused by a sudden increase in the production of aqueous humor. The onset of severe eye pain is sudden and without warning. Emergency treatment is necessary because rising intraocular pressure can exceed 30mm Hg resulting in loss of vision. Symptoms of acute glaucoma include the following:

- Sudden, excruciating pain around the eyes
- Headache or aching in the eyebrow
- Nausea and vomiting
- Cloudy vision
- Pupil dilation

**Secondary glaucoma**—This is related to ocular conditions that narrow the Canal of Schlemm or that alter eye structures involved in the production and circulation of aqueous humor.

**NOTE**

Normal intraocular pressure is 10–21mm Hg.

**Management of a Client with Glaucoma**

Conservative management of the client with glaucoma is aimed at reducing intraocular pressure with medications. Miotic eye drops such as Isopto Carpine (pilocarpine HCl) are instilled to constrict the pupil and increase the flow of aqueous humor. Beta blockers such as Timoptic (timolol) and carbonic anhydrase inhibitors like Diamox (acetazolamide) decrease the production of aqueous humor, thereby lowering the intraocular pressure. Osmotics like Osmotrol (mannitol) can be administered via IV to clients with acute glaucoma to rapidly reduce intraocular pressure and prevent permanent damage to the optic nerve.

Surgical management is indicated when medications fail to control the symptoms associated with open-angle glaucoma as well as for the client with acute glaucoma. A laser is used to create a hole, allowing the aqueous humor to drain more freely. Standard surgical therapy that
creates a new drainage canal or destroys the structures responsible for the increase in intraocular pressure is reserved for the client whose condition does not respond to either medications or laser surgery.

Post-operatively the client is instructed to lie on the nonoperative side, to avoid taking aspirin, and to report severe eye or brow pain. Changes in vital signs, a decrease vision, and acute pain deep in the eye are symptoms of choroidal hemorrhage.

**CAUTION**

Clients with known or suspected glaucoma should avoid over-the-counter medications that can increase intraocular pressure. Medications such as Visine cause vasoconstriction, which is followed by rebound vasodilation. Rebound vasodilation can raise pressures within the eye.

**CAUTION**

Atropine is contraindicated in the client with glaucoma because it closes the Canal of Schlemm and raises intraocular pressure.

### Retinal Disorders

Retinal disorders involve disorders of the innermost layer of the eye. The most common retinal disorders are hypertensive retinopathy, diabetic retinopathy, and macular degeneration. The following sections cover these retinal disorders in greater detail.

#### Hypertensive Retinopathy

*Hypertensive retinopathy* occurs in the client with a long history of uncontrolled hypertension. Elevations in diastolic blood pressure create a copper wire appearance in the retinal arterioles. If the blood pressure remains elevated, arterioles become occluded by the formation of soft exudates known as cotton wool spots. Treatment focuses on control of systemic hypertension. Left untreated, hypertensive retinopathy can result in retinal detachment and loss of vision.

#### Diabetic Retinopathy

*Diabetic retinopathy* is the result of vascular changes associated with uncontrolled diabetes mellitus. Vascular changes are inherent in all diabetics; however, good control of blood sugar helps reduce the severity of the disease. The two types of diabetic retinopathy are

- **Background diabetic retinopathy**—This leads to the development of microaneurysms and intraretinal hemorrhages.
- **Proliferative diabetic retinopathy**—This leads to the development of new, fragile blood vessels that leak blood and protein into the surrounding tissue.
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Chapter 8: Caring for the Client with Sensorineural Disorders

The treatment of diabetic retinopathy depends on the type and the degree of tissue involvement. Laser surgery can be used to seal microaneurysms and prevent bleeding.

**Macular Degeneration**

*Macular degeneration* affects the portion of the eye involved with central vision. The two types of macular degeneration are:

- **Atrophic (dry)**—This form is characterized by sclerosing of retinal capillaries with loss of rod and cone receptors, decreased central vision, and complaints of mild blurred vision. The condition progresses faster in smokers than nonsmokers. The risk for macular degeneration can be reduced by eating a diet rich in antioxidants, lutein, and carotenoids.

- **Exudative (wet)**—This form is characterized by a sudden decrease in vision due to serous detachment of the pigmented epithelium of the macula. Blisters composed of fluid and blood form underneath the macula, resulting in scar formation and decreasing vision.

Treatment of macular degeneration is aimed at slowing the process. Laser therapy can be used to seal leaking blood vessels near the macula.

**Retinal Detachment**

Retinal detachment can result from a blow to the head, fluid accumulation in the subretinal space, or the aging process. Generally, the condition is pain-free; however, the client might complain of the following symptoms:

- Blurred vision
- Flashes of light
- Visual floaters
- Veil-like loss of vision

**Management of Clients with Detached Retinas**

Conservative management usually involves placing the client with the area of detachment in dependent position. The most common site for retinal detachment is the superior temporal area of the right eye. Sedatives and anxiolytics will make the client more comfortable. Spontaneous reattachment of the retina is rare, so surgical management is often required.

Surgical management includes the creation of a scar to seal the retina to the choroid or, by scleral buckling, to shorten the sclera and improve contact between the retina and choroid.
Post-op activity varies with the procedure used. If gas or oil has been instilled during the scleral buckling, the client is positioned on the abdomen with the head turned so that the operative eye is facing upward. This position is maintained for several days or until the gas or oil is absorbed. An alternative is to allow the client to sit on the bedside and place his head on an overbed table. Bathroom privileges are allowed, but the client must keep his head bowed. The following discharge instructions should be given to the client with a scleral buckling:

- Report any sudden increase in pain or pain accompanied by nausea.
- Avoid reading, writing, and close work for the first post-op week.
- Do not bend over so that the head is in a dependent position.
- Be careful not to bump the head.

**Refractive Errors**

Refractory errors refer to the capability of the eyes to focus images on the retina. Refractory errors are due to an abnormal length of the eyeball from front to back and the refractive power of the lens. Refractory errors include the following:

- **Myopia (nearsightedness)**—Images focus in front of rather than on the retina; this is corrected by a concave lens.
- **Hyperopia (farsightedness)**—Images focus behind rather than on the retina; this is corrected by a convex lens.
- **Presbyopia**—The crystalline lens loses elasticity and becomes unable to change shape to focus the eye for close work so that images fall behind the retina; this is age related.
- **Astigmatism**—An uneven curvature of the cornea causes light rays to be refracted unequally so that a focus point on the retina is not achieved.

Nonsurgical management of refractory errors includes the use of eyeglasses and contact lenses. Surgical management includes the following:

- **Radial keratotomy (RK)**—This treatment is used for mild to moderate myopia. Eight to sixteen cuts are made through 90% of the peripheral cornea. The incisions decrease the length of the eye by flattening the cornea. This allows the image to be focused nearer the retina.
- **Photorefractive keratotomy (PRK)**—This is used for the treatment of mild to moderate stable myopia and low astigmatism. An excimer laser is used to reshape the superficial cornea using powerful beams of ultraviolet light. One eye is treated at a time with a wait period of 3 months between surgeries. Complete healing can take up to 6 months.
Laser in-situ keratomileusis (LASIK)—This is used for the treatment of nearsightedness, farsightedness, and astigmatism. An excimer laser is used to reshape the deeper corneal layers. Both eyes are treated at the same time. Complete healing can take up to 4 weeks. LASIK is thought to be better than PRK because the outer layer of the cornea is not damaged, there is less pain, and the healing time is reduced.

Intacs corneal ring—This is the newest vision enhancement for nearsightedness. The shape of the cornea is changed by using a polymeric ring on the outer edges of the cornea. The surgery does not involve the use of a laser and is reversible. Healing to best vision is immediate, and replacement rings can be applied if the client’s vision changes with aging.

Traumatic Injuries

Traumatic injuries to the eyes can occur from any activity. Traumatic injuries and their treatments include

- **Hyphema**—Hemorrhage in the anterior chamber as the result of a blow to the eye. Treatment includes bedrest in semi-Fowler’s position, no sudden eye movement for 3–5 days, cycloplegic eyedrops, use of an eye patch and eye shield to protect the eye, and limited television viewing and reading.

- **Contusion**—Bruising of the eyeball and surrounding tissue. Treatment includes ice to the affected area and a thorough eye exam to rule out other eye injuries. Elevating the client’s head 30 to 45 degrees will help to minimize edema and swelling.

- **Foreign bodies**—Objects that irritate or abrade the surface of the conjunctiva or cornea. Treatment includes transporting the client to the ER with both eyes covered by a cupped object, a visual assessment by a physician before treatment, and instillation of fluorescein followed by irrigation with normal saline to remove foreign particles.

- **Lacerations and penetrating injuries**—Corneal lacerations are considered emergencies because ocular contents can prolapse through the laceration. Treatment can require the administration of IV antibiotics and surgery.

**CAUTION**

Objects protruding from the eye should never be removed by anyone except an ophthalmologist because greater damage can occur, including the displacement of ocular structures. Clients with penetrating eye injuries have the poorest prognosis for retaining vision.
Visual Tests for Review

Several tests are commonly used during a routine eye examination. These tests include the Snellen chart, which assesses visual acuity, and the Ishihara polychromatic chart, which assesses color vision. Some medications, such as antituberculars, can affect both visual acuity and color vision; therefore, the client should have a thorough eye exam every 6 months. The Ansler grid is used to detect changes caused by macular degeneration, whereas tonometry detects changes in intraocular pressure that are associated with glaucoma. These tests should be done at least once a year for clients over 40.

Pharmacology Categories for Review

A number of medications are used to treat eye disorders. Mydriatics and cycloplegics are used for the client with cataracts. Miotics, beta blockers, and carbonic anhydrase inhibitors are ordered for the client with glaucoma to constrict the pupil and reduce pressure within the eye. It is important for you to review the side effects and contraindications for these medications:

- Cycloplegics
- Miotics
- Mydriatics
- Beta blockers
- Carbonic anhydrase inhibitors

Ear Disorders

Most of what we know about our world is gained through vision; however, a well-functioning auditory system is also important. Disorders of the ears and hearing loss create problems with everyday living. Some conditions, such as Meniere’s disease, interfere with balance and coordination. Other conditions, such as otosclerosis and age-related presbycusis, affect our ability to receive and give information accurately. The client with a significant hearing loss often becomes confused, mistrustful, and socially isolated from family and friends. Disorders of the ears can be divided into the following conditions:

- Conditions affecting the external ear (otitis externa)
- Conditions affecting the middle ear (otitis media)
- Conditions affecting the inner ear (Meniere’s, otosclerosis)
Age-related hearing loss (presbycusis)

Ear trauma

Otitis Externa

Otitis externa is often referred to as swimmer’s ear because it occurs more often in hot, humid environments. The condition can result from an allergic response or inflammation. Allergic external otitis media is often the result of contact with hair spray, cosmetics, earrings, earphones, and hearing aids. It can occur from infectious organisms, including bacteria or fungi. Most infections are due to pseudomonas aeruginosa, streptococcus, staphylococcus, and aspergillae. In rare cases, a virulent form of otitis externa develops, spreading the infection into the adjacent structures of the brain and causing meningitis, brain abscess, and damage to cranial nerves.

The treatment of otitis externa is aimed at relieving pain, inflammation, and swelling. Topical antibiotics and steroids are used. Systemic antibiotics, either oral or intravenous, are used in severe cases.

Otitis Media

Otitis media is an infection of the middle ear that occurs more often in young children than adults because the eustachian tube of the child is shorter and wider than that of the adult. H. influenza is the most common cause of acute otitis media. Signs and symptoms of acute otitis media include pain, malaise, fever, vomiting, and anorexia.

Increased pressure can cause the tympanic membrane to rupture. Rupture of the tympanic membrane usually results in relief of pain and fever; however, repeated rupture can lead to scarring of the membrane with eventual loss of hearing.

Treatment of acute otitis media includes the use of systemic antibiotics, analgesics for pain, as well as antihistamines and decongestants to decrease fluid in the middle ear. Antibiotic therapy is continued for 7–10 days to ensure that the causative organism has been eliminated. If the tympanic membrane continues to bulge following antibiotic therapy, a small surgical incision is made in the tympanic membrane (myringotomy) and a PE (polyethylene tube) is inserted to allow continuous drainage of the middle ear.

Meniere’s Disease

Meniere’s is a disease of the inner ear characterized by a triad of symptoms: vertigo, tinnitus, and hearing loss of low tones. Symptoms can occur suddenly and can last from several hours to several days. The exact cause of Meniere’s disease is unknown, but it is associated with allergies, as well as vascular and inflammatory responses that alter fluid balance.
Conservative management includes the use of antihistamines, antiemetics, and diuretics to control edema of the labyrinth and vasodilators to decrease vasospasm. Salt and fluid restrictions are recommended to decrease the amount of endolymphatic fluid produced. Cessation of smoking can also improve symptoms by helping to reduce vasoconstriction. Nicotinic acid has proven beneficial by producing a vasodilating effect.

Surgical management can involve an endolymphatic subarachnoid shunt or a labryinthectomy. Surgical management involving a labryinthectomy is controversial because hearing in the affected ear can be lost. Following surgery, the client will experience vertigo, nausea, and vomiting for several days.

**Otosclerosis**

*Otosclerosis* refers to the progressive hardening of the bony configuration known as the *stapes*, leaving them incapable of movement. Otosclerosis is the most common cause of conductive hearing loss. Symptoms of otosclerosis include tinnitus and conduction deafness.

Management of otosclerosis involves a stapedectomy. The diseased stapes is removed; then the oval window is sealed and rejoined to the incus using a metal or plastic prosthesis. Key points included in the care of the client who has had a stapedectomy are as follows:

- Tell the client that hearing might decrease after surgery due to swelling and accumulation of fluid but should improve as blood and fluid are absorbed.
- Instruct the client to avoid activities that increase pressure within the ear (such as blowing the nose, extreme head movement, and air travel). Avoiding crowds will lessen the chance of getting upper respiratory infections with symptoms such as coughing and sneezing. If the client must cough or sneeze, she should do it with an open mouth.
- Tell the client to report pain and changes in taste or facial sensation.
- Instruct the client to avoid getting water in the ears for at least 6 weeks. Tubs are better than showers.
- Instruct the client to take medications (antibiotics and antiemetics) as prescribed.

**Presbycusis**

Presbycusis associated with aging is a common cause of sensorineural hearing loss. This type of hearing loss is the result of damage to the ganglion cells of the cochlea and decreased blood supply to the inner ear. Deficiencies in vitamins B9 and B12 also have been found to play a role in the development of presbycusis. Sensorineural hearing loss is also related to the use of ototoxic drugs as well as exposure to loud noises.
Ear Trauma

Injury to the tympanic membrane can result in pain, infection, and hearing loss. Most ear trauma is the result of jabbing injuries that damage the eardrum and inner ear or blows to the ear that result in extreme changes in pressure. Children frequently use the ears (and the nose) as hiding places for foreign bodies that become lodged, interfering with hearing and creating a source of infection. Foreign bodies in the ear or nose should receive the attention of the physician who will remove them and provide appropriate follow-up treatment.

Assisting Clients with Hearing Loss

Devices to assist the client with a hearing loss include hearing aids and cochlear implants. If you are working with a client who is hearing impaired and he is not wearing a hearing aid, the following hints might prove helpful:

- Stand in front of the client when talking to him. Many hearing-impaired persons rely on lip reading and facial expression.
- Talk in a normal tone of voice. Raising your voice distorts the sound and can convey the wrong message.
- Keep the background noise to a minimum.
- Don’t forget other means of communicating, such as writing, using pictures, and so on.
- Try to speak in lower tones. People hard of hearing can usually hear lower voices easier than a higher pitch. For example, they usually can hear a male easier than a female.

Diagnostic Tests for Review

Several diagnostic tests provide useful information in caring for the client with disorders of the ears. The CBC lets you know whether infection is present, and CAT scans and MRIs tell you of structural alterations. The Weber and Rinne tests are used to assess air and bone conduction.
Pharmacology Categories for Review

Several drug categories are used in the care of the client with disorders of the ears. These drug categories include anti-infectives for those with ear infections and decongestants and antihistamines for those with otitis media:

- Anti-infectives
- Antihistamines
- Decongestants
- Steroids
Exam Prep Questions

1. A client with retinal detachment of the right eye has a scleral buckling with instillation of silicone oil. Post-operatively the client should be positioned:
   - A. In semi-Fowler's position with the head in neutral position
   - B. Supine with the head turned to the right side
   - C. In low Trendelenburg position with the head in neutral position
   - D. Prone with the head turned to the left side

2. A client wearing corrective lenses has a visual acuity of 20/200. The nurse recognizes that the client:
   - A. Has proper correction for astigmatism
   - B. Is legally blind
   - C. Experiences age-related presbyopia
   - D. Has low night vision related to loss of rods

3. The physician has scheduled a client with hyperopia for LASIK surgery. Which statement describes the procedure?
   - A. Diagonal incisions are made in the cornea, but the central cornea is not incised.
   - B. The cornea is reshaped using pulsation of ultraviolet light on the central superficial tissues.
   - C. Superficial layers of the cornea are lifted while laser pulsation reshapes the deeper layers of tissue.
   - D. Vertical incisions are made in the central cornea followed by reshaping of the lens with pulsation of ultraviolet light.

4. A client admitted with glaucoma is being treated with miotic (pilocarpine) eye drops. Following administration of the medication, the nurse will note:
   - A. Dilation of the pupils
   - B. Diminished redness of the sclera
   - C. Decreased edema of the cornea
   - D. Constriction of the pupils
5. Following a stroke, an elderly client develops ptosis. When assessing the client, the nurse will note:
   ✗ A. Drooping of the eyelid on the affected side
   ✗ B. Inverted eyelid margins
   ✗ C. Eversion of eyelid margins
   ✗ D. Granulomatous inflammation of the eyelids

6. The physician has ordered an irrigation of the client’s left ear for the removal of cerumen. To prevent vestibular stimulation, the fluid should be ___ degrees Fahrenheit:
   ✗ A. 68
   ✗ B. 76
   ✗ C. 98
   ✗ D. 120

7. The most suitable diet for the client with Meniere’s disease is:
   ✗ A. High in animal protein
   ✗ B. Restricted in sodium
   ✗ C. High in fat-soluble vitamins
   ✗ D. Restricted in complex carbohydrates

8. A client with a diagnosis of acoustic neuroma asks the nurse to explain what is wrong with his hearing. The nurse’s response is based on the knowledge that an acoustic neuroma is:
   ✗ A. A malignant tumor of the inner ear with rapid metastasis
   ✗ B. A malignant tumor of the fifth cranial nerve that affects hearing and chewing
   ✗ C. A benign tumor of the auditory nerve that may cause destruction to the cerebellum
   ✗ D. A highly vascular benign lesion of the middle ear that arises from the jugular vein

9. A pediatric client has been receiving Amoxicillin for acute otitis media. It is important the child receive all the medication. Which secondary disorder is associated with improper management of acute otitis media?
   ✗ A. Cholesteatoma
   ✗ B. Mastoiditis
   ✗ C. Acoustic neuroma
   ✗ D. Presbycusis
10. Following a tympanoplasty, the nurse should maintain the client in which position?

- A. Semi-Fowler’s with the operative ear facing down
- B. Low Trendelenburg with the head in neutral position
- C. Flat with the head turned to the side with the operative ear facing up
- D. Supine with a small neck roll to allow for drainage

**Answer Rationales**

1. Answer D is correct. Following a scleral buckling with instillation of silicone oil or gas, the client should be positioned prone with the head turned so that the operative eye is facing upward. Answers A, B, and C would displace the oil and prevent it from enhancing a seal between the retina and choroid.

2. Answer B is correct. The client whose vision is corrected to 20/200 is by definition legally blind because he is able to see at 20 feet what the healthy eye can see at 200 feet. Answer A refers to a refractive error, which is corrected by eyeglasses or one of the laser procedures. Answer C is an inability to focus on near objects due to a loss of elasticity of the lens and is corrected by the use of bifocal eye glasses. Answer D does not apply because the client would experience difficulty with vision at night or in dim lighting. Answers A, C, and D are incorrect because they do not explain what is meant by a visual acuity of 20/200.

3. Answer C is correct. The LASIK procedure uses an excimer laser to correct nearsightedness, farsightedness, and astigmatism. The superficial layers of the cornea are lifted, and laser impulses reshape the deeper corneal layers. Answer A refers to radial keratotomy, and answer B refers to photorefractive keratotomy, so they are incorrect. Answer D is an incorrect statement. Answers A, B, and D are incorrect because they do not describe LASIK surgery.

4. Answer D is correct. Miotics, such as pilocarpine, are administered to the client with glaucoma to cause pupillary constriction, thereby lowering intraocular pressure. Answer A is incorrect because miotics constrict the pupil. Answer B is incorrect because miotics do not diminish redness. Answer C is incorrect because miotics do not decrease edema of the cornea.

5. Answer A is correct. Ptosis or drooping of the eyelid can occur as the result of a stroke or Bell’s palsy. Answer B refers to entropion, and answer C refers to ectropion, so they are incorrect. Answer D refers to chalazion, so it’s incorrect. Answers B, C, and D are incorrect because they do not relate to ptosis.

6. Answer C is correct. Cerumen is removed using a mixture of water and hydrogen peroxide at body temperature. Answers A and B are incorrect because they are too cold. Answer D is incorrect because it is too hot.

7. Answer B is correct. A low sodium diet and nicotinic acid have been shown to be effective in reducing the symptoms of Meniere’s disease. Answers A, C, and D are incorrect because they do not relieve the symptoms of Meniere’s disease.
8. Answer C is correct. An acoustic neuroma is a benign tumor of the eighth cranial nerve. Because of its location it frequently involves the cerebellum. Damage to hearing, facial movement, and sensation are common. Answers A, B, and D are inaccurate statements therefore they are incorrect.

9. Answer B is correct. Mastoiditis is a secondary disorder that can result from untreated or inadequately treated acute or chronic otitis media. Answer A refers to a benign overgrowth of squamous cell epithelium, so it is incorrect. Answer C refers to a benign tumor, making it incorrect. Answer D is incorrect because it refers to sensorineural hearing loss associated with aging.

10. Answer C is correct. Following a tympanoplasty the client should be maintained flat with the head turned to the nonoperative side for at least 12 hours. Answers A, B, and D are incorrect positions following ear surgery.

Suggested Reading and Resources

- “Adjustment to Blindness and Visual Impairment”: www.whitsacre.info/vip
- emedicine from WebMD: www.emedicine.com
- Disabled Online—Serving Special People with Special Needs: www.disabledonline.com/hearingimpairment.php
CHAPTER NINE

Caring for the Client with Cancer

Terms you'll need to understand:

✓ Anovulation
✓ Dysphagia
✓ Dyspnea
✓ Emaciated
✓ Graft versus host disease
✓ Hyperthermia
✓ Nulliparity
✓ Postcoital
✓ Proliferation
✓ Pruritis
✓ Sepsis
✓ Spleenectomy

Nursing skills you'll need to master:

✓ Safely working with radioactive materials
✓ Caring for the body after death
Cancer

Cancer occurs when an overproliferation of abnormal cells harms the host by growing into a body system or by robbing the body of nutrients.

Metastasis refers to the spread of cancer from a primary site to a secondary site.

NOTE

Common sites of metastasis are breast cancer (metastatic to the bone and brain) and lung cancer (to the liver and brain).

American Cancer Society’s Seven Warning Signs of Cancer

Malignant, or cancer, cells are initiated by alterations in cell growth patterns. The warnings are offered by the American Cancer Society alert the public of occurrences that could indicate a problem. The following are the seven warnings you should know:

- Changes in a wart or mole
- A sore that does not heal
- Changes in bowel or bladder habits
- A new lump or the thickening of an existing lump
- A persistent cough
- Indigestion or difficulty in swallowing
- Unusual bleeding or discharge

The Four Major Categories of Cancer

The different types of cancers are classified according to the tissue from which they originate. The following list identifies the major cancer groups:

- **Carcinoma**—Cancer arising from epithelial tissue (for example, basal cell carcinoma)
- **Sarcoma**—Cancer arising from connective tissue, muscle, or bone (for example, osteosarcoma)
- **Lymphoma**—Cancer arising from lymphoid tissue (for example, Burkitt’s lymphoma)
- **Leukemia**—Cancer of the blood-forming cells in the bone marrow (for example, acute lymphocytic leukemia)
Risk Factors for Specific Cancers

Some environmental and intrinsic factors are associated with an increased incidence of certain cancers. Included here are risk factors associated with specific cancers:

- **Bladder**—Risk factors include smoking and environmental carcinogens such as dyes, paint, rubber, ink, and leather.

- **Breast**—Risk factors include a family history of first-degree relatives, the birth of the first child after age 30, menarche before age 12 and menopause after age 55, obesity, the use of birth control pills and hormonal replacement, alcohol intake, and a diet high in fat.

- **Cervical**—Risk factors include early sexual activity, early childbearing, multiple partners, human papillomavirus (HPV), human immunodeficiency (HIV) infection, smoking, the use of DES by the mother during pregnancy, and chronic cervical infections.

**NOTE**

The Gardasil vaccine is a medication that can be given for prevention of HPV.

- **Colon**—Risk factors include family history, polyps, chronic inflammatory bowel disease, and a diet high in fat and protein and low in fiber.

**NOTE**

Cancer of the colon is the second most common form of cancer in the United States.

- **Esophagus**—Risk factors include use of tobacco, use of alcohol, and chronic irritation.

- **Larynx**—Risk factors include use of tobacco, nutritional deficiencies (riboflavin), chronic laryngitis, use of alcohol, and exposure to carcinogens.

- **Liver**—Risk factors include cirrhosis, hepatitis B, exposure to certain toxins, smoking, and alcohol use.

- **Lung**—Risk factors include smoking and secondhand smoke, air pollution, occupational exposure to radon, vitamin A deficiency, and heredity.

- **Ovarian**—Risk factors include a diet high in fat; alcohol use; a history of cancer of the breast, endometrium, or colon or a family history of ovarian or breast cancer; anovulation; nulliparity; and infertility.
Chapter 9: Caring for the Client with Cancer

- **Pancreas**—Risk factors include a diet high in fat, smoking, exposure to industrial chemicals, diabetes mellitus, and chronic pancreatitis.

- **Prostate**—Risk factors include race (African Americans) and age (55 and older).

**CAUTION**

Prostate specific antigen (PSA) is a laboratory test used to monitor response to treatment and to detect recurrence and progression of prostate cancer.

- **Renal**—Risk factors include tobacco use, exposure to industrial chemicals, obesity, and dialysis.

- **Skin**—Risk factors include exposure to sun, exposure to various chemicals (arsenic and coal tar), scarring or chronic irritation of the skin, and ancestry (highest incidence in those of Celtic ancestry with red or blond hair, fair skin, and blue eyes).

**NOTE**

Skin cancer is the most common form of cancer in the United States.

**CAUTION**

Remember the alphabet A B C D when assessing skin lesions. If the answer is yes to any of the questions listed here, it could indicate a possible malignant lesion.

- **A**—Is the lesion asymmetrical in shape?
- **B**—Are the borders of the lesion irregular?
- **C**—Are there different colors within the lesion?
- **D**—Is the diameter of the lesion more than 5mm?

- **Stomach**—Risk factors include a diet high in smoked foods and lacking in fruits and vegetables, gastric ulcers, Helicobacter pylori bacteria, heredity, pernicious anemia, and chronic gastritis.

- **Testes**—Risk factors include infections, genetic or endocrine factors, and cryptorchidism.
Cancer Prevention

An early diagnosis can mean a better cure rate for a patient with cancer. Certain cancers can even be prevented by interventions. The nurse can make a substantial impact by the use of education in preventive teaching and early detection techniques. One way the incidence of cancer can be decreased is by a change in eating habits. For example, with colon cancer the risk is decreased by the avoidance of fatty, fried foods and increasing the intake of fruits, vegetables, and whole grains. Another way to decrease incidence is by staying away from carcinogens such as smoking, alcohol, and toxins. It is important for the nurse candidate to know the importance of patient education when studying for the NCLEX exam.

Patient Teaching

A part of the early detection process relies on the patient to perform regular exams to find any growths or abnormalities. The following gives information about the best time to perform these exams and the current recommendations by the American Cancer Society:

- Females should be instructed to perform breast self-exams monthly after menses.
- A baseline mammogram should be done at age 40 and yearly after age 40.
  
  Clients should avoid the use of deodorant or body powder prior to the mammogram because these can produce areas that appear as calcifications.

Management of the Client with Cancer

Treatments for cancer patients are focused on curing the cancer, prolonging survival time, or improving the quality of the patient’s life. Clients with cancer usually die within weeks without treatment. The therapies included here can involve one treatment or a combination of all three:

- **Surgery**—This procedure is done to remove the tumor or the diseased tissue for a cure. Surgery can also be used to diagnose, as a preventive measure, as a palliative treatment, or for reconstruction. The care of the patient with surgery would be as any patient post-operatively with a focus on the body part involved or removed.

- **Radiation**—This is performed to shrink the tumor.

- **Chemotherapy**—This is undertaken to destroy cancer cells by interfering with mitosis or by destroying the cell wall.
Radiation

Radiation therapy is used to destroy cancer cells without destruction of the normal cells. The candidate for the NCLEX exam should review all aspects of nursing care dealing with radiation. This section focuses on the client with cervical cancer and the use of a sealed radiation source implanted inside the patient. In this case, the radiation is to the patient’s cervix inserted through the vagina.

**CAUTION**

While the implant is in place, the client emits radiation but the client’s body fluids are not radioactive.

Care of the client with radiation therapy implants requires that the nurse pay attention to time, distance, and shielding when caring for these clients. The nurse should

- Limit the amount of time spent in contact with the client.
- Maximize the distance by standing to the side of the bed and refraining from close contact.
- Shield herself by using a lead-lined apron during patient contact.

This type of radiation therapy is temporary. While the implant is in place, the nursing interventions focus on prevention of dislodgement. Accomplishment of this outcome is helped by instituting nursing measures, to include

- Bed rest
- Low residue diet (to decrease bowel contents)
- Foley catheter (to prevent collection of urine in the bladder)

**CAUTION**

In the event the radium implant is dislodged, the nurse should retrieve it with forceps, place it in a lead-lined container, and return it to x-ray.

Clients receiving radiation x-ray treatments can have skin problems that result in drying, rashes, pruritis, and hyperpigmentation of the skin. Clients should be instructed to prevent drying by avoiding

- Soaps
- Alcohol skin preparations
- Hot baths
Chemotherapy

Chemotherapy has detrimental effects on the development of both normal and malignant cells. Chemotherapeutic agents include alkylating agents (which interfere with cell metabolism and growth), plant alkaloids (which react with acids to form salts), antitumor antibiotics (which interfere with the cell wall), cytoprotectants and colony-stimulating factors (which prevent problems associated with cancer treatments), topoisomerase inhibitors (break DNA and kills the cells), biological response modifiers (which charges the immune system), and hormones (which suppress hormonal-dependent tumors; an example is progesterone for ovarian cancer and estrogen for prostate or testicular cancer).

There are commonalities in the side effects of chemotherapeutic agents. You should become familiar with these side effects in preparation for the exam. Table 9.1 highlights the common side effects and some measures that are done to relieve them.

<table>
<thead>
<tr>
<th>Side Effect</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anorexia, nausea, and vomiting</td>
<td>Antiemetics; small, frequent meals that are palatable and nourishing; avoidance of foods that are too hot or too spicy; a diet of soft bland foods.</td>
</tr>
<tr>
<td>Alopecia</td>
<td>Teach the client that hair loss will be immediate but not permanent; help the client select a wig before treatment begins. Note that the regrowth of hair is usually different from the hair that was lost.</td>
</tr>
<tr>
<td>Bone marrow and platelet depression</td>
<td>Observe for petechiae and ecchymosis; use small-gauge needles; apply pressure over injection and venipuncture sites.</td>
</tr>
<tr>
<td>Mucosal membrane ulcerations</td>
<td>Glyoxide (glycerin and peroxide); xylocaine viscous (place on a cotton-tip applicator and apply to lesions); oral hygiene with a soft toothbrush.</td>
</tr>
<tr>
<td>Sterility</td>
<td>Sperm bank or egg deposits prior to chemotherapy administration.</td>
</tr>
</tbody>
</table>

Total Parenteral Nutrition

Clients with cancer often have inadequate nutrition due to the side effects of nausea, vomiting, and anorexia. These clients frequently require supplemental nutrition by the use of total parenteral nutrition (TPN).

CAUTION

Do not remove the markings placed on the skin by the radiologist.

NOTE

A central line is required for TPN administration.
Problems Associated with TPN

With TPN, the fluid is delivered directly into the venous system. This fluid has a high level of osmolarity, which can cause a fluid shift as well as electrolyte imbalances. The high dextrose content puts the client at risk for hyperglycemia and infection.

Dressing Changes for TPN

Because of the danger of infection, these clients are at a higher risk of developing sepsis. The following list gives the recommendations for the dressing change on the central line of a client receiving TPN:

- Sterile technique is utilized.
- Recommended dressing is a gauze dressing taped on all four sides or a transparent dressing.

Nursing Implementations

General nursing care for a client with TPN includes the following measures:

- Blood should not be drawn from the TPN port, but it can be drawn from the venous port.
- Avoid air entrance into the central line.
- TPN must be tapered to be discontinued.
- Monitor blood glucose levels.

Bone Marrow Transplantation

Bone marrow transplantation involves the destruction of the client’s bone marrow (this is accomplished by high-dose chemotherapy administration and whole body irradiation). The client then receives a stem cell or bone marrow transplant infusion.

Transplantation of bone marrow can be used to treat

- Aplastic anemia
- Thalassemia
- Sickle cell anemia
- Immunodeficiency disorders
- Certain cancers, such as acute leukemia, chronic myelogenous leukemia, Hodgkin’s lymphoma, non-Hodgkin’s lymphoma, and testicular cancer
Types of Transplants

The types of bone marrow transplants are based on the source of the donor cells. The three types of transplants available are

- **Autologous transplant**—Involves the harvesting, cryopreservation, and reinfusion of the client’s own marrow to correct bone marrow hypoplasia resulting from chemotherapeutic drugs.

- **Allogenic transplant**—Involves the transplantation of bone marrow from a compatible donor. It has the following requirements:
  - The prospective donor must be tissue and blood typed.
  - The donor should be of the same racial and genetic type to be successful.

- **Syngeneic transplant**—Involves the transplantation of bone marrow from an identical twin; this type is rare.

Nursing Care After Transplantation

Until the new bone marrow takes, or *engrafts*, the client has no immunity or normal bone marrow function. This predisposes the client to infection and decreased thrombocytes. The candidate for the NCLEX exam must recognize the major risk of bleeding and infection in these clients. Interventions after a transplant focus on the assessment and prevention of complications of the transplant, including failure to engraft, graft versus host disease, and venocclusive disease. The nurse also institutes measures to reduce the risk of bleeding and infection, as well as treating these disorders if they occur. The nurse should

- Use sterile technique when performing care.

- Assess for signs of complications or rejection of transplant, including jaundice, pain in right upper quadrant, weight gain, and hepatomegaly.

- Monitor for bleeding.

- Administer ordered blood transfusion.

- Administer ordered platelets.

- Institute bleeding precautions, including
  - Avoid IM injections.
  - Avoid venipunctures.
  - Avoid flossing of teeth (please refer to depression of platelets for other bleeding precautions).

- Monitor for infection.
Pharmacological interventions include

- Steroids.
- Immunosuppressants.

**Hodgkin’s Lymphoma**

Hodgkin’s lymphoma is a malignancy involving the lymph nodes. It is more prevalent in men and tends to peak in the early 20s and after age 50.

Clinical manifestations associated with Hodgkin's lymphoma include

- Coughing
- Dysphagia
- Dyspnea
- Enlargement of the cervical lymph node
- Fatigue
- Generalized pruritis
- Night sweats
- Pain in cervical lymph nodes when drinking
- Unexplained fever
- Weight loss

**NOTE**

A lymphoma client might first note this enlargement while shaving.

**Diagnosis of Hodgkin’s Lymphoma**

Diagnosis of Hodgkin’s lymphoma is made by assessment of previously mentioned clinical manifestations and by node biopsy results. The staging of involvement listed here becomes important in determining how far the disease has progressed:
Diagnostic Tests for Review

- Biopsy confirms presence of Reed-Sternberg cells.

- Staging of the disease by degree of involvement:
  - 1—Single node or single site
  - 2—More than one node, localized to a single organ on the same side of the diaphragm
  - 3—Involvement of lymph nodes on both sides of the diaphragm
  - 4—Diffuse involvement with disease disseminated in organs and tissues

Prognosis of Hodgkin’s Lymphoma

Prognosis is dependent on the stage of the disease. If it’s detected in the early stages, the prognosis for survival is good.

Treatment of Hodgkin’s Lymphoma

Treatment of Hodgkin’s depends on the stage of involvement. If the client is in stage 1 or 2, radiation is used alone; with more extensive involvement, though, chemotherapy is used with the radiation. The client might also undergo surgery to remove the spleen to help prevent the pooling of blood in this organ.

Diagnostic Tests for Review

Cancer clients require extensive diagnostic exams to determine the primary site of the cancer or tumor, as well as whether metastasis has occurred. The tests are also important in determining the treatment options: radiation, chemotherapy, and/or surgery. Laboratory exams such as carcinoembryonic antigen (CEA) and prostate specific antigen (PSA) are important in determining the disease and its progression. Routine laboratory exams such as chest x-rays, urinalysis, and cell blood counts (CBCs) with differentials also need to be reviewed.

Particularly important when caring for the cancer client receiving chemotherapy is the CBC. This test monitors for the side effects and bone marrow depression that can result from antineoplastic drugs. These diagnostic tests include

- Biopsy
- Bone marrow aspiration
- Bronchoscopy
- CBC
CEA
- CT scan
- Magnetic resonance imagery (MRI)
- Mammogram
- Mediastinoscopy
- PSA
- Radioactive scan

MRIs use a powerful magnet. Clients with metal in their body cannot take the exam. No metal can be in the room of the client receiving an MRI; therefore, tubings for equipment must be lengthened to accommodate the client on oxygen or other life support equipment. The candidate for the exam must consider the factors in the following list to determine whether an MRI would be contraindicated or whether special accommodations would need to be made for a client who is scheduled for an MRI:

- Pregnancy of client
- Client weight greater than 260 pounds (open MRI would be required due to client size)
- Clients with pacemakers or electronic implants
- Clients who have metal fragments, metal clamps, or aneurysm clips
- The ability of the client to communicate clearly
- Use of life support equipment
- Ability of the client to lie still in a supine position for 30 minutes
- Use of oxygen by the client
- Clients receiving an IV infusion

Pharmacology for Review

The nurse candidate writing for the NCLEX exam needs to be familiar with agents’ side effects and adverse effects. Although most nurses who administer chemotherapeutic drugs have extensive training, these drugs can be tested on the NCLEX exam, and the candidate is expected to have knowledge of the drugs. The nurse must be aware of the impact of these
drugs on the client’s quality of life and recognize that some of these drugs have life-threatening, adverse effects. Nurses who administer chemotherapy must also keep in mind the importance of self-protection from the drug agents by wearing appropriate equipment when coming in contact with the agents. The following list contains the various kinds of chemotherapeutic agents:

- Alkylating agents
- Antiestrogens
- Antimetabolites
- Antineoplastics
- Antitumor antibiotics
- Biologic response modifiers
- Hormones
- Monoclonal antibodies
- Plant alkaloids
- Topoisomerase inhibitors

Drugs that treat the adverse effects of chemotherapeutic agents include

- Antianxiety
- Antibiotics
- Antiemetics
- Colony stimulating factors
- Erythropoietin
- Immunosuppressants
- Steroids
Exam Prep Questions

1. A client on the oncology unit is to receive heparin sodium 5 units per kilogram of body weight by subcutaneous route every 4 hours. The client weighs 105.6 lbs. How many units should the client receive in a 24-hour period?
   - A. 800
   - B. 1080
   - C. 1440
   - D. 1960

2. A client diagnosed with metastatic cancer of the bone is exhibiting mental confusion and a BP of 160/100. Which laboratory value would correlate with the client's symptoms reflecting a common complication with this diagnosis?
   - A. Potassium 5.2 mEq/l
   - B. Calcium 13 mg/dl
   - C. Inorganic phosphorus 1.7 mEq/l
   - D. Sodium 138 mEq/l

3. A client with cancer has been placed on TPN. The nurse notes air entering the client via the central line. Which initial action is most appropriate?
   - A. Notify the physician.
   - B. Elevate the head of the bed.
   - C. Place the client in the left lateral decubitus position.
   - D. Stop the TPN and hang D51/2 NS.

4. The nurse is preparing a client for cervical uterine radiation implant insertion. Which will be included in the teaching plan?
   - A. TV or telephone use will not be allowed while the implant is in place.
   - B. A Foley catheter is usually inserted.
   - C. A high fiber diet is recommended.
   - D. Excretions will be considered radioactive.
5. The nurse is caring for a client with leukemia who is receiving the drug doxorubicin (Adriamycin). Which, if occurred, would be reported to the physician immediately due to the toxic effects of this drug?
   - A. Rales and distended neck veins
   - B. Red discoloration of the urine and an output of 75 ml the previous hour
   - C. Nausea and vomiting
   - D. Elevated BUN and dry, flaky skin

6. A client with cancer received platelet infusions 24 hours ago. Which of the following assessment findings would indicate the most therapeutic effect from the transfusions?
   - A. A Hgb level decrease from 8.9 to 8.7
   - B. A temperature reading of 99.4
   - C. A white blood cell count of 11,000
   - D. A decrease in oozing of blood from the IV site

7. The nurse is caring for a client receiving chemotherapy who is experiencing neutropenia. Which intervention would be most appropriate to include in the client’s plan of care?
   - A. Assess the client’s temperature every 4 hours due to risk of hypothermia.
   - B. Instruct the client to avoid large crowds and people who are sick.
   - C. Instruct the client in the use of a soft toothbrush.
   - D. Assess the client for hematuria.

8. A client who has a strong family history of breast cancer tells the nurse that she is taking a drug to prevent breast cancer. The nurse expects the drug that she is receiving is:
   - A. Tamoxifen (Nolvadex)
   - B. Cyclophosphamide (Cytoxan)
   - C. Estrogen (Premarin)
   - D. Doxorubicin (Adriamycin)
9. The nurse is caring for a client with possible cervical cancer. What clinical data would the nurse most expect to find in the client's history?
   - A. Postcoital vaginal bleeding
   - B. Nausea and vomiting
   - C. Foul-smelling vaginal discharge
   - D. Hyperthermia

10. A client is scheduled to undergo a bone marrow aspiration. Which position would the nurse assist the client into for this procedure?
   - A. Dorsal recumbent
   - B. Supine
   - C. High Fowler's
   - D. Lithotomy

Answer Rationales

1. Answer C is correct. The client weighs 48 Kg and should receive 5 units/Kg, or 240 units every 4 hours. This would be 1440 units in 24 hours. The answers in A, B, and D are incorrect calculation.

2. Answer B is correct. Hypercalcemia is a common occurrence with cancer of the bone. The potassium level is elevated but does not relate to the diagnosis, so answer A is incorrect. Answers C and D are both normal levels, so they are incorrect.

3. Answer C is correct. The client is at risk for an air embolus. Placing the client in this position displaces air away from the right ventricle. Answers B and D would not help, so they are incorrect, and answer A would not be done first, so it's incorrect.

4. Answer B is correct. A catheter allows urine elimination without possible disruption of the implant. There is usually no restriction on TV or phone use, so answer A is incorrect. The client is placed on a low residue diet, so answer C is incorrect. The client's radiation is not internal; therefore, there are no special precautions with excretions, making answer D incorrect.

5. Answer A is correct. This drug can cause cardiotoxicity exhibited by changes in the ECG and congestive heart failure. Rales and distended neck veins are clinical manifestations of congestive heart failure, so answer A is correct. A reddish discoloration to the urine is a harmless side effect, so answer B is incorrect. An elevated BUN and dry, flaky skin are not specific to this drug, so answers C and D are incorrect.

6. Answer D is correct. Platelets deal with the clotting of blood. Lack of platelets can cause bleeding. Answers A, B, and C do not directly relate to platelets, so they are incorrect.
7. Answer B is correct. With neutropenia, the client is at risk for infection; therefore, he would need to avoid crowds and people who are ill. Answer A would not be appropriate. Answers C and D would correlate with a risk for bleeding, so they are incorrect.

8. Answer A is correct. Tamoxifen is indicated for prevention of breast cancer in high risk patients. It can also be given to delay recurrence of breast cancer and for palliative treatment. The drugs in answers B, C, and D are not indicated for prevention of breast cancer, so they are incorrect.

9. Answer A is correct. Vaginal bleeding or spotting is a common symptom of cervical cancer. Nausea and vomiting and foul-smelling discharge are not specific or common to cervical cancer, so B and C are incorrect. Hyperthermia does not relate to the diagnosis, so answer D is incorrect.

10. Answer C is correct. This procedure is usually done by the physician with specimens obtained from the sternum or the iliac crest. The high Fowler's position would be the best position of the ones listed to obtain a specimen from the client's sternum. Answers A, B, and D would be inappropriate positions for getting a biopsy from the sites indicated.

Suggested Reading and Resources

CHAPTER TEN

Caring for the Client with Disorders of the Gastrointestinal System

Terms you’ll need to understand:

✓ Ascites
✓ Gastrinoma
✓ Hepatomegaly
✓ Malaise
✓ Melena
✓ Spleenomegaly
✓ String sign (see “Diagnosis of Crohn’s”)
✓ Tetany

Nursing skills you’ll need to master:

✓ Performing ostomy care
✓ Assisting with a paracentesis
Ulcers

Ulcers are erosions that occur in the mucosal lining of the esophagus, stomach, or duodenum. Ulcers occur more frequently in men, post-menopausal women, those with a family history for ulcers, and those with type O blood.

Factors contributing to the development of ulcers include

- Irritants that increase the secretion of hydrochloric acid; nonsteroidal, anti-inflammatory drugs (NSAIDs) such as ibuprofen and Toradol; and steroids.
- Stress
- *H. Pylori* bacteria, which is treated with antibiotic therapy with doxycycline (tetracycline) or amoxicillin and metronidazole (Flagyl) and a bismuth salt.
- Gastrinomas

**Types of Ulcers**

An ulcer is referred to as *duodenal, gastric, or esophageal* depending on its location in the gastrointestinal system. The two most common locations for ulcers are the duodenum and gastric area. The clinical manifestations for these ulcers follow, with differentiating characteristics that you will need to know for the exam.

**Duodenal**

Duodenal ulcers are erosions that occur on the mucosa of the duodenum. These ulcers occur more frequently in people 30–60 years of age and occur more frequently than any other type of ulcer. The basic pathophysiology is a hypersecretion of stomach acid.

Unlike gastric ulcers, with duodenal ulcers, vomiting is uncommon. Clinical manifestations include

- Epigastric pain 2–3 hours after meals
- Pain that is relieved by food intake
- Melena
**Gastric**

When an erosion occurs in the gastric mucosa, the ulcer is classified as *gastric*. This type of ulcer usually occurs in people over 50 and accounts for about 15% of ulcers. The pathophysiology of gastric ulcers involves a normal or hyposecretion of stomach acid.

Clinical manifestations include

- Midepigastric pain occurring from 1/2 to 1 hour after meals
- Discomfort that is increased by food consumption
- Vomiting (this is common and provides some relief of pain)

**Diagnostic Tools for Ulcers**

Ulcers are diagnosed by the patient history and a diagnostic test. The preferred diagnostic tool is the endoscopy exam because it allows direct visualization and biopsies of the area. The following are the major exams used to diagnose an ulcer:

- Upper gastrointestinal (GI) studies
- Barium swallow
- Endoscopy exam
- Gastric analysis
- Biopsy

**Treatment of Ulcers**

The treatment of ulcers includes two potential paths. One path is the *conservative* path that includes treatment through dietary modifications and medications. Dietary modifications include avoiding highly seasoned or spicy foods, high fiber foods, caffeine, alcohol, smoking, and stress. The following highlights some medications used to treat ulcers:

- Antacids
- Antibiotics
- Histamine (H2 receptor) blockers
- Anticholinergics
- Antispasmodics
- Proton pump inhibitors
- Barrier drugs (for example, sucralfate [Carafate])
The second method of ulcer treatment involves surgery. The surgical procedure is a gastrectomy. Caring for a client who has had a gastrectomy includes assessment for

- Bleeding
- Shock
- Abdominal distention

**CAUTION**

In the first 12–24 hours, the nasogastric drainage should be small in amount but may be bright red in appearance. After 24 hours, the drainage should turn darker in color and decrease further in amount.

Do not irrigate or move the NG tube after gastric surgery without a specific physician's order.

**Dumping Syndrome**

Post-gastrectomy problems can include the *dumping syndrome*. This syndrome is caused due to rapid emptying of food from the stomach into the jejunum. Symptoms of dumping syndrome include

- Dizziness
- Pallor
- Nausea
- Vomiting
- Palpitations

Treatment for clients with dumping syndrome include the following:

- Decreased fluids with meals
- Decreased carbohydrate intake
- Small, frequent meals
- Resting in recumbent position after meals
- Medications, including sedatives and antispasmodics, such as bentyl and pro-banthine

**Inflammatory Bowel Disorders**

There are two major inflammatory bowel diseases: Crohn's disease and ulcerative colitis. People 10–30 years of age have the greatest risk of developing these disorders. The causes are
unknown, but these disorders can be triggered by agents such as pesticides, food additives, and radiation. A connection might also exist between a client’s allergies or immune system.

**Crohn’s Disease (Regional Enteritis)**

Crohn’s disease is an inflammation of segments of the bowel, which leads to swelling, thickening, and abscess formation. The following lists symptoms associated with Crohn’s disease:

- Abdominal pain
- Diarrhea
- Cramping
- Weight loss
- Anemia
- Ulcer formation

**NOTE**
The client will usually try to control some of the symptoms by not eating.

**Diagnosis of Crohn’s**

In diagnosing Crohn’s, you will see that barium studies reveal the presence of a string sign. A *string sign* is a narrowing of the lumen of the intestine that shows as such on the barium x-ray.

**Treatment of Crohn’s**

Treating clients with Crohn’s can involve several methods. Diet control, vitamins, medications, and surgery are possible treatments. The following highlights the treatment paths for Crohn’s you should understand for the exam:

- Low-residue diet
- Vitamin and iron supplements
- Medications, including the following:
  - Sedatives
  - Antidiarrheals
  - Steroids
  - Antirheumatics
  - Immunosuppressives
- Surgery for severe cases
Ulcerative Colitis

Ulcerative colitis is an inflammation of the colon and rectum. This disorder usually begins at the rectum and proceeds upward. This disease can result in systemic complications and a high mortality rate. The following highlights symptoms associated with ulcerative colitis that you should be aware of for the exam:

- Abdominal cramping
- Urgent defecation
- Vomiting
- Weight loss
- Fever
- Hypocalcemia
- Bloody diarrhea
- Decreased iron absorption

Diagnosis of Ulcerative Colitis

Ulcerative colitis is diagnosed by exams that visualize the distal portion of the intestines. The two diagnostic tools that follow are valuable in distinguishing this disease from other conditions that have similar symptoms:

- Barium enema
- Sigmoidoscopy

Treatment of Ulcerative Colitis

People with ulcerative colitis are treated with options similar to those that were discussed with Crohn's. Medications included in the following list emphasize additional drugs that the candidate needs to know for the exam:

- Anti-inflammatories
- Antibiotics
Diverticulitis

Diverticula are sac-like outpouchings in the wall of the large intestine. The inflammation results from the trapping of food and bacteria in the diverticula. This inflammation increases the risk of abscess formation and perforation.

Diverticulitis is more prevalent in elderly females who eat a diet containing seeds, nuts, and grains. The following list highlights symptoms of diverticulitis:

- Bowel irregularity
- Intervals of diarrhea
- Cramping pain in the left lower quadrant of the abdomen
- A low-grade fever

Diagnosis of Diverticulitis

Tools used to diagnose diverticulitis include a CBC that can reveal an elevation in white blood cells due to infection and sedimentation rate elevations that indicate inflammation. A CT scan can be a valuable tool if an abscess has occurred due to the diverticulitis. The following list highlights other exams that can demonstrate muscle thickness, narrowing of the colon, and direct visualization of the inflamed diverticulum:

- Barium studies
- Endoscopy exam

CAUTION

A barium enema would be contraindicated in clients with acute diverticulitis due to the possibility of perforation of the diverticulum.

Treatment of Diverticulitis

The paths used to treat diverticulitis depend on the severity of the problem. Conservative treatment includes diet and medications. If the client's symptoms do not improve or the client becomes acutely ill, surgery might be required. The following highlights the treatment options you need to be familiar with for the exam:

- Increased dietary intake of soft fiber foods
- Increase in fluid intake (2–3 liters per day) within cardiac limits
Medications, including
- Antispasmodics
- Fiber laxatives
- Surgery (approximately 20% of clients with diverticulitis require surgical intervention due to hemorrhage, perforation, abscess formation, or bowel obstruction)

Diseases Associated with the Liver

The liver is a large internal organ. Liver function is complex and any dysfunction of this organ affects all body systems. Liver disorders are common and can result from substances that destroy the liver, such as alcohol (which causes pancreatitis and cirrhosis). These disorders can also result from a virus, such as hepatitis.

Hepatitis

Hepatitis is a viral infection of the liver. The five major types of hepatitis are known as hepatitis A, B, C, D, and E. Hepatitis A and E are similar in transmission: They have a fecal-oral route but are not chronic. Hepatitis B, C, and D have similar characteristics in that they are all transmitted by the same route: parenteral, perinatal, or sexual.

The following list gives you some important general management techniques for clients with forms of hepatitis:
- Bed rest for those with prodromal or icteric symptoms
- Small and frequent increased calorie meals
- Increased fluid intake (3000 ml/day)
- Avoidance of drugs detoxified by the liver
- Cool baths and soothing lotions to treat pruritis
- Medications used for treating forms of hepatitis, including steroids and immunosuppressives
- Anti-inflammatory medications, such as Motrin and Advil

Hepatitis A

Hepatitis A is transmitted by the fecal-oral route. It can lead to an acute infection, but without the chronicity seen in other forms of the disease.
The symptoms of hepatitis A appear after an incubation period of 2–6 weeks. Hepatitis A is usually limited to 1–3 weeks of duration. The following list gives you the symptoms of hepatitis A:

- Malaise
- Fever
- Jaundice
- Nausea
- Vomiting

**Diagnosis of Hepatitis A**

Diagnosing hepatitis A requires a stool specimen. This specimen can reveal the hepatitis A antigen for 7–10 days before the illness and 2–3 weeks after symptoms appear. HAV antibodies are found in the serum after symptoms appear.

**Treatment of Hepatitis A**

Treatment of hepatitis A includes many parameters. First, prevention of the transmission of hepatitis A is a key element. Obtaining the two-dose hepatitis vaccine (Havrix) is recommended for adults 18 years or older and is highly recommended for the following groups: homosexuals; people traveling to unsanitary, poor-hygiene countries or locations; and healthcare workers.

The second dose of the vaccine should be given 6–12 months after the first dose. Protection begins a few weeks after the first dose and can last for up to 20 years. Administration of the immune globulin should be administered within 2 weeks of exposure to boost antibody protection and provide 6–8 weeks of passive immunity. The following two medications are important treatment options to remember for the exam:

- Hepatitis vaccine (Havrix)
- Serum immune globulin for exposure to the disease

**CAUTION**

Remember that hepatitis A has no long-term effects and is not chronic.

**Hepatitis B**

Hepatitis B is transmitted through parenteral, perinatal, or sexual routes. People at the greatest risk of hepatitis B include
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- IV drug users
- Homosexual men
- Infants born to hepatitis B virus-infected mothers
- Healthcare workers

Hepatitis B symptoms closely resemble hepatitis A’s symptoms, but there is a much longer incubation period of 1–6 months. The following list gives you symptoms of hepatitis B that you will need to know for the exam:

- Malaise
- Fever
- Rash
- Jaundice
- Arthritis
- Abdominal pain
- Nausea

**Diagnosis of Hepatitis B**

In diagnosing hepatitis B, HBsAG can appear in the blood of infected clients for 1–10 weeks after exposure to the hepatitis B virus and for 2–8 weeks before the onset of symptoms. Clients who have HBsAg persist in serum for 6 or more months after an acute infection are considered to be carriers.

**Treatment of Hepatitis B**

When it comes to treating this problem, there are a lot of unknowns for hepatitis B—and for all other forms of hepatitis as well. However, treatments are available for hepatitis B, and the following lists the treatments you should be familiar with:

- **Prevention by administration of the hepatitis B vaccine (Heptavax or Recombivax)**—The hepatitis B vaccine is administered IM in three doses. The second and third doses are given 1 month and 6 months, respectively, after the first dose. Doses are given in the deltoid muscle in adults.

- **Alpha interferon injections for chronic hepatitis B**—This medication can cause a flu-like reaction 3–6 hours after administration. The drug is given as a regimen of 5 million units daily or 10 million units three times weekly for 4–6 months.
Diseases Associated with the Liver

- **Hepatitis B immune globulin (HBIG)**—This gives passive immunity to hepatitis B for people who have been exposed to the hepatitis B virus but have never received the hepatitis vaccine.

**Hepatitis C**

Hepatitis C is transmitted through the same routes as hepatitis B (parenteral, perinatal, or sexual). Cases of viral hepatitis not classified as A, B, or D are given the classification of hepatitis C. The age group with the highest incidence of hepatitis C is 40–59 years of age. Hepatitis B and C are similar, but a chronic carrier state exists more often with hepatitis C. More people with hepatitis C progress to chronic liver disease, including cirrhosis and liver cancer, than any other type of hepatitis.

**NOTE**

It is estimated that approximately 150,000 persons are infected with hepatitis C yearly, with most of that number being healthcare workers.

Symptoms of hepatitis C are similar to those of hepatitis B. Some say the symptoms are mild and variable. The reason there are so many people predicted to have hepatitis C is because of the lack of symptoms and vagueness. Consequently, those infected often do not seek assistance. A great deal of people with hepatitis C are carriers of the disease but do not know they have it.

**Diagnosis of Hepatitis C**

Diagnosis of hepatitis C is confirmed by the presence of HCV (hepatitis C virus) in serum.

**Treatment of Hepatitis C**

The combination therapy used to treat hepatitis C (interferon and ribavirin) has been shown to produce positive results. Some clients experience complete remission from the drug regimen. These drugs are also used for relapses in the client's condition. The following are important to keep in mind for the exam:

- No vaccine is available for hepatitis C.
- Medications for treating hepatitis C include a combination of alpha interferon and ribavirin.

**Hepatitis D**

Hepatitis D is a delta hepatitis that requires the HBV surface antigen for replication. Only people with hepatitis B are at risk for hepatitis D. The virus is common among IV drug users, hemodialysis clients, and clients who have received multiple blood transfusions. Symptoms are
similar to hepatitis B, except the incubation period is 3–20 weeks. These clients are also more likely to develop chronic active hepatitis and cirrhosis.

**Diagnosis of Hepatitis D**
Hepatitis D is diagnosed by a laboratory test. The presence of anti-delta antibodies in the presence of HBAg will be revealed in the test results.

**Treatment of Hepatitis D**
Treatment of hepatitis D includes alpha interferon.

**Hepatitis E**
Hepatitis E (HEV) is transmitted by the fecal-oral route. Like hepatitis A, it is not a chronic condition and has been found to develop mostly in persons living in underdeveloped countries. Many outbreaks have occurred in areas where flooding and heavy rains have occurred.
Symptoms are similar to hepatitis A, and the incubation period for this hepatitis is 15–64 days.

**Diagnosis of Hepatitis E**
Diagnosis is made by the presence of anti-HEV in serum.

**Treatment of Hepatitis E**
There is currently no known treatment for hepatitis E. Prevention is accomplished by practicing good hygiene and hand-washing techniques. Treatment with immune globulin after exposure has not been shown to be effective.

**Prodromal Stage and Icteric Stage**
Regardless of the type of hepatitis, clients experience symptoms associated with two stages: the *prodromal stage* and *icteric stage*. The prodromal stage of the hepatitis episode is the period of time when the client is exhibiting vague symptoms. This is the period when the patient’s bile is not being excreted as it should (signified by dark urine and clay-colored stools) and is collecting in the bloodstream. When the bile has accumulated in the client’s blood, the icteric stage begins and the client starts to exhibit symptoms such as jaundice, pruritis, and elevated liver enzymes.

Prodromal stage symptoms last from a few days to 2 weeks and include

- Fatigue
- Malaise
- Anorexia
- Nausea
Diseases Associated with the Liver

- Vomiting
- Fever
- Dark urine
- Clay-colored stools

Icteric stage symptoms occur 5–10 days after the prodromal stage begins and include
- Jaundice
- Pruritis
- Tenderness in the right upper quadrant of the abdomen
- Hepatomegaly
- Elevated liver enzymes

Cirrhosis

Cirrhosis is the scarring or fibrosis of the liver, which results in the distortion of the liver structure and vessels. The three types of cirrhosis are

- Laennec’s portal cirrhosis—This is the most common type, and it’s due to chronic alcoholism that produces scar tissue around the portal areas.
- Post-necrotic cirrhosis—This form of cirrhosis results from previous acute viral hepatitis and produces broad bands of scar tissue.
- Biliary cirrhosis—This results from chronic biliary obstruction and infection and produces scar tissue around the bile ducts.

The following lists symptoms of cirrhosis you should know for the exam:
- Jaundice
- Spleenomegaly and hepatomegaly
- Chronic indigestion
- Constipation or diarrhea
- Weight loss
- Ascites
- Edema
Vitamin deficiencies of A, D, E, and K
Changes in behavior, cognition, and speech
Elevations in liver enzymes, BUN, and ammonia levels

Diagnosis of Cirrhosis
Liver functions are complex, requiring many diagnostic tests. These tests determine the extent of the cirrhosis, and the type of treatment depends on the condition of the liver. The candidate will need to know the following list of tests or exams important in diagnosing cirrhosis:

- Laboratory tests (liver enzymes, prothrombin time, and ammonia levels)
- Upper gastrointestinal x-ray
- CT scan
- Esophagogastroduodenoscopy (EGD)
- Liver biopsy

Treatment of Cirrhosis
The treatment regimen for clients with cirrhosis is based on the symptoms the client is exhibiting. For example, if the client is retaining fluids, diuretics are prescribed. Diet interventions include a diet to promote healing of liver tissue. The client would need increased calories, increased proteins, and low sodium food sources.

If the client is in end-stage failure, protein sources are restricted.

Medications prescribed for clients with cirrhosis include antacids for gastric distress that could lead to bleeding, diuretics for fluid and ascites, and cathartics and enemas to correct the pH in the bowel and rid the body of ammonia. Other treatments the candidate should know for the exam include:

- Teach the client to avoid alcohol and medications detoxified by the liver
- Heme-test all stools and vomitus
- Record weight
- Intake and output
- Measure abdominal girth daily
- Use small needles for injections and maintain pressure for 5 minutes after injections due to bleeding tendencies

**Pancreatitis**

Pancreatitis is an acute inflammation of the pancreas associated with auto digestion. Enzymes secreted by the pancreas (lipase, amylase, trypsin, and so on) destroy the tissue of the pancreas. Consistent alcohol intake for 5–10 years is the common causative factor in middle-aged men with pancreatitis. The following list highlights some of the causes of pancreatitis:

- Biliary disease
- Alcoholism
- Bacterial or viral infections
- Blunt abdominal trauma
- Peptic ulcer disease
- Ischemic vascular disease
- Surgery on or near the pancreas
- Long-term use of steroids, thiazide diuretics, or oral contraceptives

The symptoms of pancreatitis a client might exhibit include

- Epigastric pain radiating to the back
- Nausea and vomiting
- Abdominal distention
- Elevated blood and urine glucose levels
- Elevated serum lipase and amylase levels
- Decreased serum calcium levels
- Elevated white blood cells
- Steatorrhea
Diagnosis of Pancreatitis
The nursing candidate should know that a diagnosis of acute pancreatitis is made by the clinical picture of the client and diagnostic tests. The major laboratory tests to diagnose this disorder are serum amylase and lipase. These tests will show an elevation with pancreatitis. More laboratory tests—for example, white blood cell counts and calcium, magnesium, and glucose levels—might also be done to determine a diagnosis. Other exams, x-rays, and endoscopic procedures that the candidate should know are included in the following list:

- 24-hour urine test
- MRI
- Endoscopic retrograde cholangiopancreatography (ERCP)

Treatment of Pancreatitis
The treatment modalities for the client with pancreatitis focus on relieving the client’s symptoms and preventing or treating complications. The client is kept NPO, in the acute episode, with administration of IV fluids to inhibit stimulation and secretion of pancreatic enzymes. A nasogastric tube is usually inserted to decrease abdominal distention, prevent vomiting, and prevent hydrochloric acid from entering the duodenum. Other forms of therapy utilized to treat these clients include

- Observe for signs of bleeding. To prevent excessive bleeding, use small-gauge needles for IM, IV, or subcutaneous injections and maintain pressure for 5 minutes after any injections have been given.
- Medications, including the following:
  - Meperidine (Demerol)
  - Cimetadine (Tagamet)
  - Calcium gluconate
  - Viokase
  - Vitamins A, D, E, and K
  - Antibiotics
  - Insulin
- After oral feedings begin, the diet should be low fat and low protein and the client should avoid caffeine and alcohol.
- ABGs to detect early complications.
Cholecystitis/Cholelithiasis

Cholecystitis is inflammation of the gallbladder. Cholelithiasis occurs when gallstones are formed due to bile that is usually stored in the gallbladder hardening into stonelike material. Precipitates of cholesterol, bilirubin, and calcium produce gallstones.

Causes of gallbladder disease include a familial tendency for the development of this disease, but it can also be due to dietary habits. It is also associated with certain drugs, such as cholesterol-lowering agents. People with diabetes, hemolytic blood disorders, and Crohn's disease have a higher risk of development.

CAUTION

An easy way to remember who usually develops gallstones is to remember these four Fs of gallbladder disease:

- Female (sex)
- Forty (usual age)
- Fat (usually obese)
- Fertile (usually have children)

Symptoms of Cholecystitis

The symptoms that occur with cholecystitis are usually associated with pain. The client might also exhibit jaundice of the skin, sclerae, and upper palate. Clinical manifestations also include

- Abdominal pain in RUQ, especially after a fatty meal
- Abdominal distention

Symptoms of Cholelithiasis

The client with gallbladder disease from gallstones can experience symptoms due to the disease of the gallbladder or from the stones blocking the flow of the bile from the gallbladder. The client might exhibit fullness and abdominal distention. Other symptoms the nurse might observe are as follows:

- Severe pain in the RUQ of abdomen (pain can radiate to the back and right shoulder)
- Nausea and vomiting
- Palpable mass in the abdomen
Treatment of Cholecystitis

Intervention for gallbladder inflammation and stones is supportive. The management might be for clients who might or might not have surgery after the acute episode.

Clients with cholecystitis might be treated conservatively or surgically. Conservative treatment is directed toward the relief of inflammation of the gallbladder and the elimination of pain. This goal is accomplished by placing the client NPO with IV fluids and NG suction. Pain relief is accomplished by administration of meperidine (Demerol).

**NOTE**

Morphine is not given for pain because it can cause spasms of the Sphincter of Oddi.

Antibiotics are administered intravenously, especially if the client’s WBC count is elevated. When the client has improved, diet intake is reinstituted with a gradual introduction of low-fat liquids and a high-protein, high-carbohydrate diet. Foods allowed and foods to avoid for clients recovering from a gallbladder attack are included here:

- **Foods allowed**—Skim milk, cooked fruits, rice, tapioca, lean meats, mashed potatoes, nongas-forming vegetables, bread, coffee, and tea
- **Foods to avoid**—Eggs, cream, pork, fried foods, cheese, rich dressings, gas-forming vegetables, and alcohol

Diagnosis of Cholecystitis/Cholethiasis

The following items are used to diagnose cholecystitis and cholethiasis:

- Abdominal x-ray
- Gallbladder ultrasound
- Choecystography using contrast media (telepague, cholografin, or oragrafin):
  - The client is held NPO for 10–12 hours before x-ray.
  - A laxative or cleansing enema is ordered the evening prior to x-ray.

Treatment of Cholethiasis

General treatments of cholethiasis include PO medication, lithotripsy procedures, and surgery. Small stones and radiolucent cholesterol stones can be treated with ursodeoxycholic acid
(UDCA) or chenodeoxycholic acid (CDCA). These drugs are bile acids that can be used to dissolve the gallstones. It can take up to 2 years for the medication to work and is usually reserved for older clients who are not good surgical candidates. Approximately one half of people who take these drugs have a recurrence of the stones after the medication is stopped.

Another form of treatment that can be used for clients with gallstones is lithotripsy. In this procedure, the client is placed in certain positions as repeated shock waves are directed at gallstones to cause them to fragment. After the stones are broken into small pieces, they can then pass through the common bile duct easily, be retrieved by endoscopy, or be dissolved by the bile acid drugs mentioned previously. This procedure is done on an outpatient basis, and the client resumes a regular routine within 48 hours. The positioning of the client depends on the location of the stones. These positions are listed here:

- Stones in gallbladder = prone position
- Stones in common bile duct = supine position

The final type of treatment for gallstones is surgery. The surgeries that can be performed are laparoscopic and abdominal cholecystectomy. Laparoscopic surgery accounts for more than half of all cholecystectomies.

When this surgical procedure is used, a small incision or puncture wound is made through the abdominal wall. Other puncture wounds allow for the introduction of surgical instruments to remove the gallbladder and stones.

Laparoscopic surgery is usually performed as same-day surgery. Its advantages are less postoperative pain, decreased likelihood of paralytic ileus, and quicker resumption of preoperative activity.

The second type of procedure is the abdominal cholecystectomy. This procedure is reserved for those with large stones or with extensive involvement of the duct system. The surgical procedure involves ligation of the cystic duct and artery and removal of the gallbladder. Insertion of a penrose drain allows the drainage of serosanguinous fluid and bile into an absorbent dressing. If the common bile duct was manipulated, a T-tube is usually inserted in the duct to keep it open until swelling diminishes.

**Food-Borne Illnesses**

Food-borne illnesses commonly cause gastrointestinal problems in clients in the United States. These illnesses result when a person receives an infectious organism with the intake of food. The NCLEX candidate needs to be prepared to answer questions relating directly to these diagnoses. Table 10.1 discusses the most common types of illnesses and accentuates the major points of these disorders.
TABLE 10.1 Food-Borne Illnesses

<table>
<thead>
<tr>
<th>Illness</th>
<th>Source of Infection</th>
<th>Symptoms</th>
<th>Treatment</th>
<th>Preventive Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botulism</td>
<td>Improperly canned fruits and vegetables; it’s less common in meats and fish</td>
<td>Nausea, vomiting, diarrhea, weakness, dysphagia, dysarthria, paralysis, respiratory failure</td>
<td>NPO, IV fluid replacement, trivalent botulism antitoxin, and respiratory support</td>
<td>Home canning containers should be boiled for at least 20 minutes.</td>
</tr>
<tr>
<td>E. coli</td>
<td>Undercooked beef and shellfish; food contaminated with fecal material</td>
<td>Vomiting, diarrhea, abdominal cramping, fever; some cases have proven fatal due to rapid fluid loss and organ failure</td>
<td>IV fluid replacement and antibiotic administration</td>
<td>Thoroughly cook meat.</td>
</tr>
<tr>
<td>Salmonella</td>
<td>Contaminated food and drinks, raw eggs</td>
<td>Fever, nausea, vomiting, cramping, abdominal pain, diarrhea</td>
<td>NPO, IV fluid replacement</td>
<td>Good hand washing.</td>
</tr>
<tr>
<td>Staphylococcal</td>
<td>Meat, dairy products, human carriers</td>
<td>Abrupt vomiting, abdominal cramping, diarrhea, weakness</td>
<td>Replacement of lost fluid volume and electrolytes</td>
<td>Properly prepare and store food.</td>
</tr>
</tbody>
</table>

Diagnostic Tests for Review

Most of the diagnostic exams for the gastrointestinal system are directly related to the anatomical area needing visualization. Along with the usual routine exams—for example, CBC, urinalysis, and chest x-ray—the NCLEX candidate should be knowledgeable of the preparation and care of clients receiving endoscopic exams. An example of special considerations for these exams is the need to assess the gag reflex before allowing oral intake after a gastroscopy procedure. The nurse candidate must also be aware of the risk of bleeding after a liver biopsy, as well as the possible breathing problems that can occur due to the sedation usually given for endoscopic exams. While reviewing these diagnostic exams, the candidate should be alert for information that would be an important part of nursing care:

- Barium enema
- Barium swallow
- Colonoscopy and sigmoidoscopy
- Endoscopic exams
Pharmacology for Review

An integral part of care to clients with gastrointestinal (GI) disorders is pharmacological intervention. These medications provide an improvement or cure of the clients’ GI problems. The NCLEX candidate needs to focus on the classification of drugs in the following list. Most of these drugs are commonly given, which makes them more likely to be a part of the NCLEX exam. When reviewing these drug classifications, the candidate should think about the common side and adverse effects associated with the classification, such as the GI upset and bleeding associated with NSAIDs:

- Antacids
- Antispasmodics
- Antivirals
- Cathartics
- Corticosteroids
- Cytoprotective
- Fiber laxatives
- Hepatitis vaccines
- Histamine receptor blockers
- Immunosuppressives
- Interferons
- Nonsteroidal anti-inflammatory drugs
- Proton pump inhibitors
Exam Prep Questions

1. The physician is assessing renal function in a client with severe pancreatitis. Which laboratory finding would be the best indicator of a problem in this area?
   ○ A. Alkaline phosphatase 20U/L
   ○ B. Hemoglobin 14.6 g/dl
   ○ C. BUN 28 mg/dl
   ○ D. Creatinine 2.3 mg/dl

2. An 85-year-old client with diverticulitis has been vomiting and febrile for 12 hours. Where is the best location to assess skin turgor on this client?
   ○ A. Dorsal hand
   ○ B. Feet
   ○ C. Back of the arm
   ○ D. Sternum

3. The nurse is caring for a client with pancreatitis experiencing the process of lipolysis of the pancreas. Which assessment would be a priority because of the pathophysiology of lipolysis?
   ○ A. Checking for tetany-like movements
   ○ B. Assessing breath sounds
   ○ C. Obtaining vital signs
   ○ D. Palpating pedal pulses

4. A client scheduled for a Nissen repair for a hiatal hernia is being instructed preoperatively to use the incentive spirometer. The nurse determines that the client has understood the teaching when the client states:
   ○ A. “These exercises will help to decrease my pain.”
   ○ B. “I should use this device once a day.”
   ○ C. “If I use this device, it will help in preventing pneumonia.”
   ○ D. “I should do these breathing techniques while lying down flat in bed.”
5. A nurse receives a report on a client 3 days postoperative abdominal surgery that includes four saturated dressing changes in 8 hours. On assessment of this client, dehiscence and evisceration of the wound are noted. After applying a sterile, moistened 4-x-4, what is the nurse’s next action?
   - A. Place the client in the dorsal recumbent position.
   - B. Notify the physician.
   - C. Wrap an Ace bandage around the abdomen.
   - D. Use a wheelchair to transport the client to the treatment room.

6. The nurse is caring for a client with a nasogastric tube in place. Assessment of the aspirate reveals a pH of 2.0. Which is the appropriate action?
   - A. Document the finding.
   - B. Notify the physician.
   - C. Remove the NG tube and replace it.
   - D. Turn the client side lying and reassess the aspirate.

7. A client diagnosed with an ulcer has been placed on tetracycline due to a positive helicobacter pyloric test result. Which food choice, when taken with the drug, could decrease its effectiveness?
   - A. Cabbage
   - B. Yogurt
   - C. Bran cereal
   - D. Bananas

8. A client with hepatitis C is scheduled for a liver biopsy. Which data, noted in the client’s record, would receive priority?
   - A. Prothrombin time of 56 seconds
   - B. BUN of 22 mg/dl
   - C. Hematocrit 42%
   - D. Potassium 4.0 mEq/L
9. A client is being admitted with a diagnosis of possible pancreatitis. Which of the following is the best support for this diagnosis?

- A. Pain is in the left upper quadrant of the abdomen
- B. Client reports steatorrhea for the last 3 days
- C. A serum amylase level of 366 U/L
- D. Assessed diminished bowel sounds

10. A client with diverticulitis has received nutritional discharge instructions for a high-fiber diet. Which menu selection by the client would reinforce that the teaching was effective?

- A. Spaghetti with meatballs and toast
- B. Baked chicken and macaroni with cheese
- C. Broccoli chicken stir fry and brown rice
- D. Broiled liver and dinner roll

**Answer Rationales**

1. Answer D is correct. Creatinine is the most specific laboratory test for renal functioning; normal is 0.5–1.5mg/dl. Answers A and B do not relate to the kidney, so they are incorrect. Answer C can be abnormal with kidney function but is not as specific as the creatinine, so it's incorrect.

2. Answer D is correct. This is the best area to check in the elderly due to loss of skin elasticity that occurs with aging. Answers A, B, and C are all influenced by loss of elasticity more than the sternum, so they are incorrect.

3. Answer A is correct. Hypocalcemia is a specific manifestation of clients with pancreatitis and lipolysis, and tetany is a major characteristic of low calcium levels. Answers B, C, and D are all pertinent assessments but are not priorities with the pathophysiology of lipolysis, so they are incorrect.

4. Answer C is correct. Incentive spirometry’s purpose is to prevent or treat atelectasis, which can lead to pneumonia. Answer A is a false statement, so it is incorrect. Answer B is incorrect because the timing is not as often as it should be. Answer D is wrong because it is best done sitting upright.

5. Answer B is correct. After the saline dressing is applied, the doctor should be notified for probable repair. Answer A is wrong because low Fowler’s position should be used. Answer C will not help, so it’s incorrect. Answer D is inappropriate at this time, so it’s incorrect.

6. Answer A is correct. This finding is within normal range for gastric aspirate of 0–4. Answers B, C, and D would not be appropriate or necessary due to the normal reading, so they’re incorrect.

7. Answer B is correct. Milk and dairy products can reduce the effectiveness of the drug when taken at the same time. Answers A, C, and D would not affect the drug, so they’re incorrect.
8. Answer A is correct. An abnormal prothrombin time would receive priority due to the risk of hemorrhage with a liver biopsy. Answers B, C, and D are all normal values and don’t relate to the procedure’s risks, so they’re incorrect.

9. Answer C is correct. The client’s amylase level is elevated above the normal level of 200 U/L. This measurement is the most accurate indicator of pancreatitis and the most objective and specific. The answers in A, B, and D are also clinical manifestations of pancreatitis, but are not as specific as the laboratory value, so they are incorrect choices.

10. Answer C is correct. This diet has the highest amount of fiber. Answers A, B, and D have low amounts of fiber, so they’re incorrect.

Suggested Reading and Resources

CHAPTER ELEVEN

Caring for the Client with Disorders of the Musculoskeletal System

Terms you'll need to understand:
✓ Bone density
✓ Clostridium
✓ Crepitation
✓ Demineralize
✓ Dowager's hump
✓ Fasciotomy
✓ Isometric exercises
✓ Paresis
✓ Pathological fractures
✓ Purine
✓ TENS unit

Nursing skills you'll need to master:
✓ Stump wrapping
✓ Caring for a client in traction
✓ Caring for a client with a cast
✓ Measuring and teaching crutch walking
✓ Measuring and teaching the use of canes
✓ Measuring and teaching the use of walkers
Fractures

A fracture is defined as simply a break in the continuity of the bone. Four major categories of bone fractures are classified according to the amount of tissue damage: simple or closed, compound, comminuted, and green stick. The first category is a simple or closed fracture. The second type is a compound fracture. With a compound fracture, the skin surface is broken.

CAUTION
There is more danger of infection and osteomyelitis with compound fractures.

The third type of fracture is the comminuted, which causes damage to soft tissue nerves and blood vessels. The last major category is the green stick. This category occurs more often in children.

A fifth type of fracture is the pathological fracture. These fractures occur without major injury or trauma. The bones on these clients have been weakened by diseases such as osteoporosis, osteogenesis imperfecta, or metastatic cancer.

The nurse candidate must be aware of the need for early intervention in the care of clients with fractures. Symptoms indicating a fracture include

- Coolness and blanching distal to the break
- Crepitation
- Disalignment
- Shortness of the affected limb
- Swelling

Treating Fractures

Treatment of fractures focuses on measures to limit movement, control pain, decrease edema, prevent complications, and promote healing. The following highlights the care you must know about for taking the exam. Treatment of a fracture includes

- Splinting the affected area
- Elevating the affected extremity
- Removing any jewelry from the extremity
Administering medication, such as
- Antibiotics for open fractures that are susceptible to gas-growing clostridium
- Antithrombotics
- Heparin
- Lovenox
- Narcotics and muscle relaxers for pain
- Using traction

**Traction**

It is important to explore a little more on the traction treatment. Traction utilizes a pulling force to maintain proper alignment of the bone so that healing can occur. It can also reduce the fracture and decrease muscle spasms, which decreases pain. The following information outlines the types of traction and your role in the care of traction necessary for effectively taking the exam:

- **Manual traction**—Maintained by the caregiver’s hand
- **Skin traction**—Maintained by using straps or wraps applied to the skin (for example, Buck’s traction, which is shown in Figure 11.1)

![FIGURE 11.1 Example of Buck’s traction.](image)

- **Skeletal traction**—Maintained by using pins or wires inserted into the bone (examples are 90-90, balance suspension, and Crutchfield tong traction, shown in Figures 11.2, 11.3, and 11.4)

Here are some points to remember in maintaining traction:

- Weights must hang free.
- Linens should not lie on ropes.
- Ropes should remain within the pulley.
Chapter 11: Caring for the Client with Disorders of the Musculoskeletal System

- Assess circulation, pulses, and movement of extremity.
- Maintain proper body alignment.

**FIGURE 11.2** Example of 90-90 traction.

**FIGURE 11.3** Example of balance suspension with Thomas ring splint and Pearson attachment.

**FIGURE 11.4** Example of the Crutchfield tong traction.
Fractures

Casts
Related to traction is the use of casts for fracture healing. *Casts* are rigid devices used to keep a specific body part immobile. This allows the bone fragments to stay in place and heal. The following accentuates what you need to know about the management of the client with a cast:

- Allow the cast to dry from the inside out.
- Handle a wet cast with the palms of your hands.
- Place the extremity on a plastic-lined pillow.
- Note any drainage on the cast by circling it and noting the time of observation.
- Petal rough edges of the cast.
- Instruct the client not to scratch or place objects beneath the cast, such as hangers or toys.
- Assess circulation, pulses, and movement of extremity.

Compartment Syndrome
A complication that can occur after a fracture is *compartment syndrome*. This is a serious condition resulting from pressure within different compartments (these separate the blood vessels, muscles, and nerves) that cause decreased circulation to the area—usually the leg and forearm. This disorder can lead to irreversible motor weakness, infection, and amputation of the limb.

A major element in compartment syndrome is prevention. The nurse candidate must be able to recognize the clinical manifestations of compartment syndrome, which include the following:

- Cyanosis
- Numbness
- Pain (especially pain that is unrelieved by medication)
- Pallor
- Paresis/paralysis
- Swelling
- Tingling
Treating Compartment Syndrome

Treatment of compartment syndrome requires a means to relieve the pressure. Two types of treatments can be used to accomplish this goal: bivalve treatment and fasciotomy. Bivalve treatment means cutting the cast on each side and is done if the cast is too tight, causing pressure and restricting blood flow. If symptoms persist, the client might require the second type of treatment—a surgical procedure called a **fasciotomy**. This is done by the surgeon making an incision through the skin and subcutaneous tissue into the fascia to relieve the pressure and improve circulation.

Osteomyelitis

Another complication that can occur with fractures is **osteomyelitis**. Osteomyelitis occurs when an infection has invaded the bone area. Clients at risk for osteomyelitis include the malnourished, the elderly, the overweight, and people who have a chronic illness (such as cardiovascular disease). The symptoms that can occur with osteomyelitis are

- Fever
- Malaise
- Swelling in the infected area
- Tenderness in the infected area
- Purulent drainage in the infected area
- Pain in the infected area

Treating Osteomyelitis

The treatment of osteomyelitis can involve several modalities. One course of treatment includes medications, which can include the use of antibiotics (the specific antibiotics used depend on the wound and blood culture results) and pain medication. Surgical debridement of
the wound might also speed the elimination of infection in the bone. The following contains nursing interventions you need to know for the exam:

- Immobilize the body part.
- Administer pain medication.
- Perform neurovascular assessment.
- Perform sterile dressing changes.
- Teach the client how to use IV access devices for at-home antibiotic administration.
- Provide a diet high in protein and vitamin C.

Osteoporosis

Osteoporosis is a disease whereby bone demineralizes, resulting in bone density reduction. The wrist, hip, and vertebral column are most often affected. The density of bones decreases rapidly in postmenopausal women due to decreases in estrogen. It has been determined that almost one-half of women over age 65 have osteoporosis. The following highlights the risk factors associated with osteoporosis:

- Age (there’s a greater incidence over age 60)
- Low body weight
- Race (it occurs more in Asian and Caucasian women)
- Sedentary lifestyle
- Low dietary calcium intake
- Smoking
- Alcohol consumption
- Decreased estrogen levels

Clinical manifestations of osteoporosis include

- Back pain
- Constipation
- Decrease in height
- Dowager’s hump
- Fractures
Chapter 11: Caring for the Client with Disorders of the Musculoskeletal System

Treatment of Osteoporosis

Treatment of osteoporosis involves direct involvement of the client. Exercises to increase the muscles are recommended, including walking, swimming, and water aerobics. The client should also be taught to eat foods high in calcium, vitamin D, fiber, and protein. Foods high in calcium include molasses, apricots, breads, cereal, milk, dairy products (especially yogurt), beans, carrots, asparagus, and collard greens. They should also be taught to avoid alcohol and caffeine.

**CAUTION**

Excess caffeine can cause calcium to be excreted in the urine.

Another important aspect to teach clients with osteoporosis involves safety measures—for example, avoiding the use of throw rugs and teaching the clients to avoid falls.

Medications have been developed that are efficient in combating and preventing the disease, and some general medications are given for pain relief:

- Biphosphonates (examples are Fosamax and Didronel)
- Calcitonin
- Calcium supplements
- Estrogen for post-menopausal women
- Muscle relaxers
- NSAIDs
- Selective estrogen receptor modules, or SERMs (for example, Evista)

Gout

*Gout* is the formation of uric acid deposits in the joints, particularly the joint of the big toe. It is an arthritic condition resulting from the body's inability to metabolize purine foods. The buildup of uric acid, the end product of purines, causes inflammation in the joints involved. Symptoms of gout include painful joints and tophi (growths of urate crystals) that occur most often on the outer ear of the client with gout.
Treatment of the Client with Gout

The treatment regimen used for clients with gout follows two distinct paths: diet and drugs. Diet is the path directed toward decreasing purine in the diet. The following indicates foods that are low in purine and should be increased in the diet:

- Cheese
- Eggs
- Fats
- Gelatin
- Milk
- Most vegetables
- Nuts
- Sugar
- Cherries

The client should avoid high-purine foods such as these:

- Dried beans
- Fish
- Liver
- Lobster
- Oatmeal
- Oysters
- Peas
- Poultry
- Spinach
- Mussels

The second path of treatment for clients with gout is drugs, which are the primary element in the care of this client. Colchicine is prescribed for the acute episode of gout. Allopurinol (Zyloprim) is used in chronic gout to both reduce the production of uric acid and promote the excretion of it.
Rheumatoid Arthritis

Rheumatoid arthritis is a connective tissue disorder believed to be due to a C reactive protein immune response. It is destructive to the joints and can cause deformities. The usual onset of the disease is between 35 and 45 years of age, and it affects women three times more often than men. The person with RA exhibits many symptoms. The following highlights the most common symptoms you need to be familiar with for the exam:

- Subcutaneous nodules (usually on the ulnar surface of the arm)
- Warmth, tenderness, and swelling in the affected joints

Diagnosis is made by the history of the clinical course of the disease, as well as elevations in the following laboratory tests:

- Protein
- Rheumatoid factor
- Sedimentation rate
- Antinuclear antibody (ANA)

Treatment of Rheumatoid Arthritis

The treatment plan for RA involves the use of a combination of drugs, exercise, and pain relief measures such as heat and ice. If the interventions are not effective in providing mobility and pain relief, surgery might be required to replace the joint. The following highlights medications, comfort measures, and joint mobility interventions you need to know when testing on the topic of rheumatoid arthritis:

- Medications, including
  - Antiarthritics (for example, etanercept [Enbrel] and infliximab [Remicade])
  - Antibiotic therapy (for example, Minocycline)
  - Cytotoxic agents (for example, Methotrexate)
  - Disease-modifying antirheumatic medications, or DMARDs (for example, hydroxychlorquine [Plaquenil])
  - Gold salts
  - NSAIDs
  - Salicylates
Musculoskeletal Surgical Procedures

A client who has a dysfunction of the musculoskeletal system might have to undergo a surgical procedure. Surgery might be performed to relieve pain, provide stability, and improve function of the joint. The discussion that follows focuses on the care necessary for clients who have had a break in a hip, have had a joint disability or damage, or require an amputation because of disease or trauma.

Fractured Hip and Hip Replacement

Fracture of the hip is most common in white, elderly females. A fractured hip can contribute to death in the elderly due to it predisposing them to infection and respiratory complications. The most definitive symptoms associated with a fractured hip are disalignment and shortening of the affected leg. The client also cannot move the leg without pain and complains of pain in the hip and groin on the affected side. Diagnosis is made by a hip x-ray that confirms the break.

Treatment of a Fractured Hip

The treatment option for a hip fracture is to repair it by the use of internal fixation devices or prosthetic joint placement. The preoperative care of a hip fracture includes the use of Buck’s traction to immobilize the hip, resulting in a reduction of muscle spasms and pain. Medications are also administered to relieve pain, relax the muscle, and prevent complications.

After the surgery, the nurse candidate needs to become familiar with assessments and specific nursing measures. The following highlights the care required after hip surgery:

- Assess for bleeding and shock.
- Ambulate early, with no weight bearing on the affected leg.
- Joint replacement clients should sit in a recliner and not in straight chairs. The affected leg should be bent no more than 45°.
- When in bed, the client should be turned to the unaffected side.
Legs must be kept abducted and no more than 90-degree hip flexion allowed on clients with prosthetic joint placement.

- Monitor output from any existing drains.
- Collaborate with physical therapy on mobility treatments and exercises.

**Total Knee Replacement**

Total knee replacements are performed for clients who have severe joint pain that makes them immobile. It is also considered when people have arthritic destruction of the articular cartilages or deformity of the knee, and in clients who are not able to walk or have limited motion due to knee instability. The goal of the surgery is twofold:

- Restore full flexion and extension
- Provide adequate strength and stability of the knee for most functional activities

Post-operative efforts for the client after total knee replacement are directed toward preventing complications and restoring mobility. The candidate should consider the nursing care requirements for this client when studying for the exam. Along with the usual medication administration (pain medication, antithrombotics, and antibiotics), these clients need specific limb care and physical therapy. The following includes the specific care of the post-operative knee replacement, use of the CPM machine, and physical therapy regimen that are important to know for the exam:

- Keep the knee in extension to prevent contractures.
- Maintain the patella in alignment with the toes.
- Use two persons for transfer until the client regains muscle strength.
- Support the affected leg during a transfer.
- Follow a set protocol for movement, ambulation, and weight bearing.

Clients are usually placed on a device called a *continuous passive motion (CPM) machine* in the recovery room. This device is applied early to increase circulation and range of motion of the knee joint. Flexion of the knee is an important aspect of care because, if it is not achieved, another surgery might be required. You need to know the usual guidelines for the use of the machine. The major information for use of the machine follows:

**NOTE**

CPM control machines are usually placed at the foot of the bed, beyond the reach of the client.
On day 1, the client should be on the CPM with a setting of 0°–45°.  

The CPM machine should be on for 2 hours and off for 1 hour. Following 2 hours on the CPM machine, the leg should remain in extension for 1 hour; then resume use of the CPM machine.

**Physical Therapy for Total Knee Replacement**  
Physical therapy is invaluable in supervising the exercises for strength and range of motion. The nurse needs to be aware of the usual regimen followed. The client exercise program to be followed after a total knee replacement is

- Begins therapy with prescribed exercises on the second day post-op.  
- Ankle pumps are used to promote circulation and decrease edema.  
- Quad sets, glut sets, and straight leg raises are performed to improve neuromuscular control.

Clients with total knee replacements are usually discharged within 3–4 days with a plan for continued exercises. An initial appointment is needed with the physical therapy department within 48–72 hours of discharge.

**Amputations**

Amputations occur when a part of the body is removed, usually an extremity. Causes of amputations include trauma, infection and possible sepsis, peripheral vascular disease, and accidents. Amputations are done to relieve pain or improve the quality of life. They can also be required to save the patient's life.

**Interventions Post Amputation Surgery**

The candidate needs to be aware of the nursing care required for amputation clients. Specific problems that might occur with the client after an amputation include pain, hemorrhage, and infection. You need to be aware of the therapeutic measures to use with phantom limb pain that commonly occurs in amputation. One way to deal with phantom limb pain is to treat it as any other pain. If the pain is real, it is nontherapeutic to remind the client of the missing limb. A TENS unit might be used to relieve the pain.

Assessments are another important nursing measure. Monitoring for hemorrhage and infection are critical because they are major potential complications. Restoring mobility is very important; mobility can be fostered by collaboration with physical therapy and encouraging the use of a prosthetic limb. Additional nursing measures that focus on exercise and prevention of complications are as follows:
Exercises (a trapeze bar is used to move in bed).
A firm mattress is needed to make movement easier.

Prevent contractures by using the following nursing interventions:
- Placing the client in a prone position every 3–4 hours
- Using a sandbag to the knee
- Ensuring that the residual limb stays flat on the bed

**NOTE**
The residual limb might be elevated for the first 24 hours after surgery to reduce swelling and pain.

The nurse candidate must also be aware of the psychological aspects of the loss of a limb. A disturbance in body image occurs with an amputation. The client might therefore go through the grief process.

**Assistive Devices for Ambulation**

Clients with musculoskeletal disorders often need devices to assist them with mobility. The following discusses how to measure and fit for three of these devices: crutches, canes, and walkers. This information will assist you in answering questions on the exam that refer to these topics.

**Crutches**

Crutches are prescribed for clients who need partial weight bearing or non-weight bearing assistance. A person who is to use crutches needs to have good balance, good upper body strength, and an adequate cardiovascular system. The procedure used to fit the client for crutches follows: With the crutch tip extended 6 inches diagonally in front of the foot, 2–3 finger widths should be allowed between the axilla and the top of the crutch to prevent nerve damage.

Five types of crutch-walking gaits exist, with the use depending on the amount of weight bearing allowed:
- **Two-point gait**—This permits limited weight bearing bilaterally. The right leg and left crutch move simultaneously; the left leg and right crutch move simultaneously.
Three-point gait—Non-weight bearing or partial weight bearing is allowed on the affected leg. Both crutches and the affected leg move in unison. Body weight is supported on the unaffected leg.

Four-point gait—This permits weight bearing on both legs. The crutches and feet move alternately. The left crutch and right foot move, and then the right crutch and left foot.

Swing through—No weight bearing is permitted on the affected legs. Both crutches move forward and both legs swing through between the crutches. The weight is borne by the crutches.

Stairs—This is for climbing stairs. The client leads with the unaffected leg, and the crutches and affected leg move together. For descending stairs, the client leads with the crutches and affected leg.

TIP
Go up the stairs with the good leg first, and go down the stairs with the bad leg first.

Canes
Canes are the least stable of ambulation devices and should not be used for weight bearing or partial weight bearing activities. The cane does give a client greater balance and support and is recommended when this is needed. There are basically three types of canes: the four-foot adjustable (quad or hemi), the adjustable, and the offset adjustable. Here’s how you adjust the cane for proper fit:

To determine the proper length of the cane, the client should be standing or lying supine.

The client’s arm should lie straight along the side with the cane handgrip level with the greater trochanter.

The cane should be placed parallel to the femur and tibia with the tip of the cane on the floor or at the bottom of the shoe heel.

Walkers
Indications for walker use include the need for balance, stability, and decreased weight bearing. Walkers provide anterior and lateral stability with a wide base of support. Proper walker adjustment allows for 20°–30° elbow flexion. The three types of walkers are the standard, the
folding, and the rolling walker. The following highlights the instructions that the exam taker should be aware of for the use of a walker.

The instructions for using walkers for partial or non-weight bearing are as follows:

1. Advance the walker an arm’s length.
2. Place all four legs on the floor.
3. Advance the affected leg.
4. Push the body weight through the arms.
5. Advance the unaffected leg.

The instructions for using walkers for balance and stability are as follows:

1. Advance the walker an arm’s length.
2. Set all four legs on the floor.
3. Take two complete steps into the walker.

**CAUTION**

For safety reasons, a gait belt is necessary when initiating cane and walker use.

## Diagnostic Tests for Review

The diagnostic exams that are used for the musculoskeletal system are associated with the body part involved. Fractures are easily diagnosed by an x-ray of the area. As with all diseases or disorders, the usual exams are the CBC, urinalysis, and chest x-ray. Direct visualization is obtained by the use of scopic devices—for example, arthroscopes are typically used with knees. For clients with bone weaknesses, density testing is done to measure the degree of the problem. While reviewing the diagnostic exams that follow, you should be alert for the abnormalities that correlate with specific musculoskeletal diseases, such as the elevation levels of rheumatoid factor in rheumatoid arthritis:

- Arthrography
- Arthroscopy
- Bone biopsy
- Bone density testing
- Bone scan
- CT scan
Electromyography
Laboratory tests, including rheumatoid factor, antinuclear antibody titer, and erythrocyte sedimentation rate (ESR)
MRI
Muscle biopsy

Pharmacology for Review

Medications are invaluable as a method of treatment for musculoskeletal disorders. These medications are important in preventing some of the common complications that can occur with immobility. Commonly used medications include antithrombotics and antimicrobials. The uric acid inhibitors function well in curing the disease of gouty arthritis, and the newer DMARD classification has helped with osteoporosis. You need to focus on the drug classifications in this list and think about which drug would be used in which musculoskeletal disease:

- Analgesics
- Antiarthritics
- Anticoagulants
- Antimicrobial agents
- Antithrombotics
- Biphosphonates
- Cytotoxics
- DMARDs
- Muscle relaxants
- NSAIDs
- Salicylates
- SERMs
- Steroids
- Uric acid inhibitors
- Vitamins
Exam Prep Questions

1. The nurse is caring for a client after a motor vehicle accident. The client has a fractured tibia, and bone is noted protruding through the skin. Which action is of priority?
   - A. Provide manual traction above and below the leg.
   - B. Cover the bone area with a sterile dressing.
   - C. Apply an Ace bandage around the entire lower limb.
   - D. Change the client to the prone position.

2. The nurse has performed nutritional teaching on a client with gout who is placed on a low-purine diet. Which selection by the client would indicate a need for further teaching?
   - A. Broccoli
   - B. An orange
   - C. Chocolate cake
   - D. Fish

3. The nurse at an orthopedic joint clinic is preparing pre-operative teaching for clients scheduled for total hip replacement surgery. Which would be included in the teaching plan?
   - A. Avoid sitting in a recliner
   - B. Make sure that commode seats are at low levels
   - C. Avoid crossing the legs when sitting
   - D. Physical therapy will assist with adduction leg exercises

4. Which client would be at greatest risk for a fat emboli following a fracture?
   - A. A 50-year-old with a fractured fibula
   - B. A 20-year-old female with a wrist fracture
   - C. A 21-year-old male with a fractured femur
   - D. An 8-year-old with a fractured arm
5. An elderly female is admitted with a fractured right femoral neck. Which assessment finding is expected?
   - A. Free movement of the right leg
   - B. Abduction of the right leg
   - C. Internal rotation of the right hip
   - D. Shortening of the right leg

6. The nurse is caring for a client with osteoporosis who is being discharged on alendronate (Fosamax). Which statement would indicate effective teaching?
   - A. “I should take the medication immediately before bedtime.”
   - B. “I should remain in an upright position for 30 minutes after taking the medication.”
   - C. “The medication is more effective if I take it with milk or dairy products.”
   - D. “If I skip a dose, I can take two tablets the next time.”

7. The nurse has a client with knee surgery who is receiving patient-controlled analgesia (PCA) of meperidine (Demerol). Which assessment finding would be a priority due to the use of this device and medication?
   - A. Pulse rate 108
   - B. 100 cc of green emesis
   - C. Respiratory rate of 10
   - D. Lack of pain relief

8. A client with a below-the-knee amputation is experiencing phantom limb pain. Which action by the nurse would be most effective in relieving the pain?
   - A. Acknowledging the presence of the pain
   - B. Elevating the stump on a pillow
   - C. Applying a transcutaneous nerve stimulator unit (TENS)
   - D. Rewrapping the stump
9. A client is being evaluated for carpal tunnel syndrome. The nurse is observed asking the client to place the backs of her hands together and flex them at the same time. Which assessment is the nurse performing?
   - A. Phalen’s maneuver
   - B. Tinel’s sign
   - C. Kernig’s
   - D. Brudzinski’s

10. The nurse is caring for a client recovering from a fracture. Which diet selection would be best for this client?
   - A. Fried chicken, a loaded baked potato, and tea
   - B. Dressed cheeseburger, French fries, and soda
   - C. Tuna fish salad on sourdough bread, potato chips, and skim milk
   - D. Broiled chicken, Mandarin orange salad, and milk

**Answer Rationales**

1. Answer B is correct. The client has an open fracture. The priority would be to cover the wound and prevent further contamination. Manual traction should not be attempted, so answer A is incorrect. Swelling usually occurs with a fracture, making answer C an incorrect option. Changing the client to the prone position would cause excessive movement and is inappropriate.

2. Answer D is correct. Fish should be avoided on a low-purine diet. Other foods to avoid include poultry, liver, lobster, oysters, peas, spinach, and oatmeal. Answers A, B, and C are all foods included on a low-purine diet, which makes them incorrect.

3. Answer C is correct. The client with joint hip replacement should avoid adduction of the legs and flexion of the hips greater than 90 degrees to ensure continued placement of the prosthetic joint. It is recommended for these clients to use recliners for seating instead of straight chairs, therefore A is incorrect. Commode seats will have to be raised and abduction of the legs is required, making B and D incorrect choices.

4. Answer C is correct. Fat emboli occur more frequently with long bone or pelvic fractures and usually in young adults age 20–30. Answers A, B, and D are not high-risk incidents and do not fall in the greater risk category, so they are incorrect.

5. Answer D is correct. The symptoms of this fracture include shortened, adducted, and external rotation. Answer A is incorrect because the patient usually is unable to move the leg due to pain. Answer B is incorrect because the symptom is adduction, not abduction. Answer C is wrong because it's external rotation, not internal rotation.
6. Answer B is correct. This is required to prevent esophageal problems. The medication should be taken in the morning before food or other medications with water, making answers A and C incorrect choices. It should also be taken as ordered, which makes answer D incorrect.

7. Answer C is correct. The patient is in danger of respiratory depression due to narcotic administration; therefore, this would be a priority assessment. Answer A does not relate to the PCA, so it is incorrect. Answer B is not a priority, making it wrong. Pain relief in answer D is important, but not as important as airway, so it is incorrect.

8. Answer C is correct. The TENS unit is applied for pain relief. This is the only option that actually does anything about the pain the client is experiencing. Answers A, B, and D might help the pain, but answer C would help more, so those answers are wrong.

9. Answer A is correct. This test is used to check for paresthesia in the median nerve. An abnormal result would be paresthesia within 60 seconds of performing the test. Answer B is incorrect because it is another test used in which the nurse taps over the median nerve in the wrist or uses a BP cuff inflated to the patient's systolic pressure, resulting in pain and tingling. Answers C and D are both incorrect because these are methods of assessment for meningeal irritation and have nothing to do with carpal tunnel.

10. Answer D is correct. This diet selection is the most balanced and the best to promote healing. Answers A, B, and C are not as inclusive as answer D, so they are incorrect.

Suggested Reading and Resources

Chapter 11: Caring for the Client with Disorders of the Musculoskeletal System


CHAPTER TWELVE

Caring for the Client with Disorders of the Endocrine System

Terms you'll need to understand:

✓ Acromegaly
✓ Chvostek's sign
✓ Corticosteroids
✓ Cretinism
✓ Cushing's syndrome
✓ Dwarfism
✓ Endocrine
✓ Exophthalmoses
✓ Glucocorticoids
✓ Goiter
✓ Graves' disease
✓ Hashimoto's disease
✓ Hormones
✓ Myxedema
✓ Syndrome of inappropriate antidiuretic hormone (SIADH)
✓ Thyroid-stimulating hormone (TSH)
✓ Thyroid storm
✓ Transphenoidal hypophysectomy
✓ Trouseau's sign
Pituitary Disorders

The pituitary gland is responsible for secreting a number of hormones that regulate many bodily processes, including growth, reproduction, and metabolic activity.

Hormones secreted by the anterior lobe are

- **Growth hormone**—Regulates cell division and protein synthesis
- **Adrenocorticotropic hormone**—Regulates functions of the adrenal cortex
- **Thyrotrophic hormone**—Regulates functional activity of the thyroid
- **Gonadotrophic hormone**—Stimulates development of ovarian follicles in females and spermatogenesis in males

Tumors of the Pituitary

Tumors of the pituitary tend to be benign, but due to their location they can be fatal. Depending on the area of the tumor, several problems can arise. Elevations in prolactin inhibit the secretion of gonadal steroids and gonadotropins in men and women, resulting in galactorrhea, amenorrhea, and infertility. Overproduction of growth hormone results in gigantism or acromegaly. If the disorder is noted prior to puberty, a diagnosis of **gigantism** is made. If the disorder occurs in the adult, it is known as **acromegaly**. Because growth hormone is an insulin antagonist, hyperglycemia can also occur.

Symptoms associated with pituitary tumors include

- Diminished vision due to pressure on the optic chiasm
- Headache and a feeling of “fullness” in the head
- Amenorrhea
- Sterility
- Increased growth plates
- Skeletal thickness
- Hypertrophy of the skin
- Enlargement of the visceral organs, such as the heart and liver

Management of the client with a pituitary tumor involves

- Surgery using a transphenoidal approach
- Radiation
Thyroid Disorders

The thyroid is located below the larynx and anterior to the trachea. The thyroid gland produces two iodine-dependent hormones (thyroxin and thyroid-stimulating hormone) that regulate the metabolic processes controlling the rate of growth, oxygen consumption, contractility of the heart, and calcium absorption.

Hypothyroidism

Hypothyroidism is caused by a deficiency of thyroid hormone. In the adult this is called myxedema, and in the infant it is called cretinism.

Signs and symptoms of hypothyroidism in the adult are as follows:

- Fatigue and lethargy
- Decreased body temperature
- Decreased pulse rate
- Decreased blood pressure
- Weight gain
- Edema of hands and feet
- Hair loss
- Thickening of the skin
Signs and Symptoms of Hypothyroidism in the Infant
As mentioned previously, hypothyroidism in an infant is called cretinism. The following list gives you the signs and symptoms of cretinism:

- Decreased respirations
- Changes in skin color (jaundice or cyanosis)
- Poor feeding
- Hoarse cry
- Mental retardation in those not detected or improperly treated

Diagnostic studies for cretinism include evaluation of T3 and T4 levels using test doses of thyroid-stimulating hormone.

Managing Hypothyroidism
Management of the client with hypothyroidism includes the replacement of thyroid hormone, usually in the form of synthetic thyroid hormone (Synthroid). The client’s history should include other drugs the client is taking. Prior to administering thyroid medications, the pulse rate should be evaluated. If the pulse rate is above 100 in the adult or above 120 in the infant, the physician should be notified. Clients with hypothyroidism are more comfortable in a warm environment. Because constipation is often a problem, a high fiber diet is suggested.

Hyperthyroidism
Hyperthyroidism, or Graves’ disease, results from an increased production of thyroid hormone. The most common cause of hyperthyroidism is hyperplasia of the thyroid, commonly referred to as a goiter. Signs and symptoms of hyperthyroidism include

- Increased heart rate and pulse pressure
- Tremors, or nervousness
- Moist skin and sweating
- Increased activity
- Insomnia
- Atrial fibrillation
- Increased appetite and weight loss
- Exophthalmos
Diagnosis of hyperthyroidism involves the evaluation of T3 and T4 levels and a thyroid scan with or without contrast media. These thyroid function studies tell the physician if the client has an adequate amount of circulating thyroid hormone. A thyroid scan can clarify the presence of or an enlargement of a tumor of the thyroid gland.

Management of the client with hyperthyroidism includes

- The use of antithyroid drugs (prophythiouracil or tapazole)
- Radioactive iodine, which can be used to test and to destroy portions of the gland
- Surgical removal of a portion of the gland

Prior to thyroid surgery, the client is given Lugol’s solution—an iodine preparation—to decrease the vascularity of the gland. Post-operatively the client should be carefully assessed for the following:

- Edema and swelling of the airway (the surgical incision is located at the base of the neck anterior to the trachea)
- Bleeding (check for bleeding behind the neck)
- Tetany, nervousness, and irritability (complications resulting from damage to the parathyroid)

Because the thyroid is located anterior to the trachea, any surgery in this area may result in swelling of the trachea. For this reason it is imperative that the nurses be prepared for laryngeal swelling and occlusion of the airway. The nurse should keep a tracheostomy set at the bedside and call the doctor if the client has changes in his voice or signs of laryngeal stridor. The nurse should instruct the client to keep the head and neck as straight as possible and to support the neck when getting out of bed.
Parathyroid Disorders

The parathyroid glands are four small glands located on the thyroid gland. The primary function of the parathyroid glands is the regulation of calcium and phosphorus. Diagnosis of parathyroid disorders is based on an evaluation of serum calcium and serum phosphorus levels and 24-hour urine levels of calcium and phosphorus. Radioimmunoassay exams are used to check serum parathormone. Potential disorders of these glands include hypoparathyroidism and hyperparathyroidism.

Hypoparathyroidism

Hypoparathyroidism is an inadequate production of parathormone. This hormone is responsible for the regulation of calcium and phosphorus levels in the blood. Calcium and phosphorus levels must be maintained within normal limits to have adequate nerve function. Bone density is also maintained by the parathormone. Signs and symptoms of hypoparathyroidism include the following:

- Decreased blood calcium
- Increased blood phosphorus
- Neuromuscular hyperexcitability
- Carpopedal spasms
- Urinary frequency
- Mood changes (depression)
- Dry, scaly skin and thin hair
- Cataracts
- Changes in teeth (cavities)
- Seizures
- Changes in EKG (prolonged QT intervals and inverted T waves)
- Checking Trousseau’s sign, which is carpopedal spasms (noted when the blood pressure cuff is inflated on the arm) or checking the Chvostek’s sign (noted when the facial nerve [C7] and trigeminal nerve [C5] is tapped with the nurse’s index finger and grimacing of the facial muscles is observed)
Management of the client with hypoparathyroidism involves the administration of IV calcium gluconate and long-term use of calcium salts. Vitamin D supplements can be given to increase the absorption of calcium preparations as well as calcium in the diet. Parathyroid hormone in the form of Forteo (PTH) can also be given on a long term basis. To prevent the need for lifelong treatment with calcium, the client may have a parathyroid transplant (implantation of one or more parathyroid glands to another part of the body).

**Hyperparathyroidism**

*Hyperparathyroidism* is the direct opposite of hypoparathyroidism. In this disorder, you find an overproduction of parathormone. Signs and symptoms of hyperparathyroidism include

- Decreased blood phosphorus.
- Increased blood calcium.
- Muscle weakness.
- Osteoporosis.
- Bone pain and pathological fractures.
- Increased urinary output and calcium renal calculi.
- Nausea and vomiting.
- Changes in ECG (shortened QT interval and signs of heart block). Heart block involves an alteration in the conduction system of the heart. In third and fourth degree heart block there is an alteration in the heart’s ability to transmit electrical impulses from the sinus node located in the right atria to the ventricle. This interference in the conduction system may cause a prolonged p-r interval and possibly deletion of atrial contractions.

Managing a client with hyperparathyroidism is accomplished by the removal of the parathyroid. Pre-operative management involves the reduction of calcium levels. Post-operative management includes

- Assessment of the client for respiratory distress
- Maintaining suction, oxygen, and a tracheostomy set at bedside
Checking for bleeding (1–5 cc’s is normal)
- Checking the serum calcium level and serum phosphorus

Adrenal Gland Disorders

Adrenal gland disorders result from insufficient production of cortisol or overproduction of cortisol. Two adrenal gland disorders include adrenocortical insufficiency (Addison’s disease) and adrenocortical hypersecretion (Cushing’s disease).

Adrenocortical Insufficiency (Addison’s Disease)

Addison’s disease can occur as a result of long-term use of steroids or the rapid cessation of corticosteroids. It may also be caused by sepsis, surgical stress, or hemorrhage of the adrenal glands (Waterhouse-Friderichsen syndrome).

Signs and symptoms associated with Addison’s disease include
- Weakness
- Bronze-like pigmentation of the skin
- Decreased glucose levels
- Decreased blood pressure
- Anorexia
- Sparse axillary hair
- Urinary frequency
- Depression
- Addisonian crisis

CAUTION

The symptoms of Addisonian crisis are severe hypotension, cyanosis, and shock. This constitutes an emergency situation. The nurse should call the doctor immediately to obtain orders for medications to treat shock.

Diagnosis of Addison’s disease involves an evaluation of serum sodium and chloride levels. Evaluation of ketosteroid and 17-hydroxycorticoids is also done. Adrenal function is evaluated by administering adrenocorticoid stimulating hormone (ACTH) and checking for changes in cortisol levels.
Management of the client with Addison’s disease includes the use of intravenous cortisone and plasma expanders to achieve and maintain the blood pressure. Once stable, the client can be given intramuscular cortisol in the form of dexamethasone (Decadron) or orally in the form of prednisolone (Prednisone). The client with Addison’s disease requires lifelong maintenance with cortisone. The client should be instructed to take the medication exactly as prescribed and to avoid sudden cessation of the drug.

**Adrenocortical Hypersecretion (Cushing’s Syndrome)**

Cushing’s syndrome can result from prolonged administration of cortisone or due to hypersecretion of the adrenal cortex. Signs and symptoms associated with Cushing’s syndrome include

- Pendulous abdomen
- Buffalo hump
- Moon facies
- Hirsutism (facial hair)
- Ruddy complexion (dark red)
- Increased BP
- Hyperglycemia
- Osteoporosis
- Decreased serum potassium and decreased serum chloride
- Increased 17-hydroxycorticoids
- Decreased eosinophils and decreased lymphocytes

Management of the client with Cushing’s syndrome is accomplished by removing part of the adrenal gland or reducing the amount of cortisone that the client is receiving. Administration of a drug such as spironalactone (Alldactone), a potassium-sparing diuretic, has also been used to reduce the amount of circulating antidiurectic hormone. The treatment for Cushing’s syndrome is accomplished by decreasing the amount of cortisone that the client is receiving.

**Diabetes Mellitus**

Diabetes mellitus is a chronic disorder of carbohydrate metabolism, marked by hyperglycemia and glycosuria resulting in the inadequate production or use of insulin. Diabetes mellitus is
believed to be multifactoral in nature (genetic, autoimmune, or insulin resistance). Signs and symptoms associated with it include

- **Weight loss**—Insulin is required for carbohydrates to be converted into useable glucose; a lack of insulin results in a lack of glucose with cellular starvation.
- **Ketonuria**—The breakdown of fats leads to the production of ketones that causes characteristic fruity breath.
- **Polyphagia**—Cellular starvation causes the diabetic to increase food consumption.
- **Polyuria**—The kidneys attempt to regulate pH by increasing urinary output of ketones and glucose.
- **Polydipsia**—The loss of large amounts of fluid leads to metabolic acidosis and dehydration. To compensate for the fluid loss, the client drinks large amounts of water.
- **Delayed wound healing**—Increased blood sugar contributes to poor wound healing.
- **Elevated blood glucose**—Related to decreasing function of the isles of Langerhan or insulin resistance. Normal is 70–110 mg/dl.

**CAUTION**

Uncorrected or improperly managed diabetes mellitus leads to coma and death.

Diagnosis of diabetes mellitus is made by checking blood glucose levels. There are several diagnostic tests that can be performed to determine the presence and extent of diabetes. The following are diagnostic tests done for determining if the client has diabetes and if the client has been compliant to treatment:

- Glucose tolerance test.
- Fasting blood glucose levels.
- Two-hour post-prandial.
- Dextrostix.
- Hemoglobin A-1C or glycosylated hemoglobin (the normal range is 4%–6%). This test indicates compliance with the client’s diet and medication regimen for the past 90–120 days.
- Urine checks for glucose (ketouria occurs if blood glucose levels exceed 240 mg/dl).
Management of the client with diabetes mellitus includes the following:

- **Diet**—The diet should contain a proper balance of carbohydrates, fats, and proteins.

- **Exercise**—The client should follow a regular exercise program. He should not exercise if his blood glucose is above 240 mg/dl. He should wait until his blood glucose level returns to normal.

- **Medications**—Oral antidiabetic agents or insulin.

**CAUTION**

Because regular insulin peaks in 90–120 minutes and NPH insulin peaks in 8–12 hours, the nurse should instruct the client to draw up the regular insulin (clear) and then draw up the NPH insulin. This prevents contaminating the regular insulin with the NPH insulin.

**CAUTION**

Because Lantus and Levimir are insulins that are released slowly over an extended time, they should not be mixed in the same syringe with any other insulin. This would cause a client to experience a hypoglycemic reaction.

It is very important that the nurse be aware of the signs of hyperglycemia to teach the client and family. Signs and symptoms of hyperglycemia are

- Headache
- Nausea/vomiting
- Coma
- Flushed, dry skin
- Glucose and acetone in urine

**TIP**

The following statements are a couple of helpful hints for dealing with diabetes mellitus clients:

- **Hot and dry; blood sugar high**—This means that if the diabetic’s skin is hot and he is dehydrated, his blood glucose level is likely high.

- **Cold and clammy; need some candy**—This means that if the diabetic’s skin is cold and clammy, his blood glucose level is low and he needs a glucose source.
Signs and symptoms of hypoglycemia are:

- Headache
- Irritability
- Disorientation
- Nausea/vomiting
- Diaphoresis
- Pallor
- Weakness
- Convulsions
- Coma
- Death

**CAUTION**

If the client fails to eat her regular bedtime snack, she might experience Somogyi’s effect. This abrupt drop in the client’s blood glucose level during the night is followed by a false elevation. The treatment of Somogyi’s effect is to teach the client to eat a bedtime snack consisting of a protein source, such as peanut butter and a glass of milk.

Management of hypoglycemia includes giving glucose. Glucagon is an injectable form of glucose given in emergency. Cake icing, orange juice, or a similar carbohydrate can be administered. The best bedtime snack is milk and a protein source, such as peanut butter and crackers.

**Diagnostic Tests for Review**

The following are diagnostic test you should review. These test require the collection of a blood sample to determine the glucose level:

- **Glucose tolerance test**—The glucose tolerance test is the most diagnostic test for determining whether the client has diabetes. A high-carbohydrate diet is eaten prior to the exam. The client is told to remain NPO after midnight the day of the test and to come to the clinic for a blood sample to be collected. After a fasting blood sample is obtained, the client is told to drink a liquid containing 75 gm of glucose. A sample of blood is then collected 1 hour after the glucose is administered. Some physicians also obtain blood samples at 2 hours or more.
Pharmacology Categories for Review

- **Fasting blood glucose**—A fasting blood glucose is an excellent method of determining an accurate estimate of the glucose level. It is obtained by asking the client to refrain from eating after midnight and coming to the clinic for a blood sample.

- **Dextrostix**—A glucose test that requires a sample of blood be collected, usually prior to meals.

- **Hgb A-1C or glycosylated hemoglobin**—A blood test done to determine the client’s compliance to his diet and medication regimen. It is obtained by a collection of a blood sample.

Pharmacology Categories for Review

Several drug categories are used in the care of the client with disorders of the endocrine system. The following list highlights the drug categories you should be familiar with:

- Antidiabetics
- Calcium supplements
- Glucocorticoids
- Insulins
- Mineralcorticoids
- Plasma expanders
- Synthetic thyroid hormone
- Antithyroid medications
Exam Prep Questions

1. A client is admitted for removal of a goiter. Which nursing intervention should receive priority during the post-operative period?
   - A. Maintaining fluid and electrolyte balance
   - B. Assessing the client’s airway
   - C. Providing needed nutrition and fluids
   - D. Providing pain relief with narcotic analgesics

2. A client is admitted for treatment of hypoparathyroidism. Based on the client’s diagnosis, the nurse would anticipate an order for:
   - A. Potassium
   - B. Magnesium
   - C. Calcium
   - D. Iron

3. A client with Addison’s disease will most likely exhibit which symptom?
   - A. Hypertension
   - B. Bronze pigmentation
   - C. Hirsutism
   - D. Purple striae

4. A client with Cushing’s syndrome should be instructed to:
   - A. Avoid alcoholic beverages
   - B. Limit the sodium in her diet
   - C. Increase servings of dark green vegetables
   - D. Limit the amount of protein in her diet

5. The client with a suspected pituitary tumor will most likely exhibit symptoms of:
   - A. Alteration in visual acuity
   - B. Frequent diarrhea
   - C. Alterations in blood glucose
   - D. Urticaria
6. A diabetic client has been maintained on Glucophage (metformin) for regulation of his blood glucose levels. Which teaching should be included in the plan of care?

- A. Report changes in urinary pattern
- B. Allow six weeks for optimal effects
- C. Increase the amount of carbohydrates in your diet
- D. Use lotions to treat itching

7. A client with diabetes experiences Somogyi’s effect. To prevent this complication, the nurse should instruct the client to:

- A. Take his insulin each day at 1400 hours
- B. Engage in physical activity daily
- C. Increase the amount of regular insulin
- D. Eat a protein and carbohydrate snack at bedtime

8. Which item should be kept at the bedside of a client who has just returned from having a thyroidectomy?

- A. A padded tongue
- B. An endotracheal tube
- C. An airway
- D. A tracheostomy set

9. Which vitamin is directly involved in the metabolism of the hormones secreted by the parathyroid?

- A. Vitamin C
- B. Vitamin D
- C. Vitamin K
- D. Vitamin B9

10. A client with acromegaly will most likely experience which symptom?

- A. Bone pain
- B. Frequent infections
- C. Fatigue
- D. Weight loss
11. A diabetic client is taking Lantus insulin for regulation of his blood glucose levels. The nurse should know that this insulin will most likely be administered:
   ○ A. Prior to each meal
   ○ B. At night
   ○ C. Midday
   ○ D. Prior to the evening meal

12. A client with polyuria, polydipsia, and polyphagia is diagnosed with diabetes mellitus. The nurse would expect that these symptoms are related to
   ○ A. Hypoglycemia
   ○ B. Hyperglycemia
   ○ C. Hyperparathyroidism
   ○ D. Hyperthyroidism

13. Which laboratory test conducted on the client with diabetes mellitus indicates compliance?
   ○ A. Fasting blood glucose
   ○ B. Two-hour post-prandial
   ○ C. Hgb A-1C
   ○ D. Dextrostix

Answer Rationales

1. Answer B is correct. A goiter is hyperplasia of the thyroid gland. Removal of a goiter can result in laryngeal spasms and airway occlusion. The other answers are lesser in priority.

2. Answer C is correct. The parathyroid is responsible for calcium and phosphorus absorption. Clients with hypoparathyroidism have hypocalcemia. Answers A, B, and D are not associated with hypoparathyroidism therefore they are incorrect.

3. Answer B is correct. Answer B is correct because a bronze pigmentation is a sign of Addison’s disease. Answers A, C, and D are symptoms of Cushing’s syndrome, making them incorrect.

4. Answer B is correct. A client with Cushing’s syndrome has adrenocortical hypersecretion, so she retains sodium and water. The client may drink alcohol in moderation, so answer A is incorrect, and there is no need to eat more green vegetables or limit protein, so answers C and D are incorrect.
5. Answer A is correct. The pituitary is located in the middle of the skull adjacent to the optic nerve and brain. Pressure on the optic nerve can cause an increase in intracranial pressure. Clients frequently complain of headache, nausea, vomiting, and decreasing visual acuity as the intracranial pressure increases. B, C, and D are incorrect because they are not associated with a pituitary tumor.

6. Answer A is correct. Glucophage (metformin) can cause renal complications. The client should be monitored for changes in renal function. In answer B, the medication begins working immediately, so it is incorrect. In answer C, the amount of carbohydrates should be regulated with a diabetic diet, so it is incorrect. The use of lotions in answer D is unnecessary, so it is incorrect.

7. Answer D is correct. Somogyi’s is characterized by a drop in glucose levels at approximately 2 a.m. or 3 a.m. followed by a false elevation. Eating a protein and carbohydrate snack before retiring prevents the hypoglycemia and rebound elevation. Answers A, B, and C are incorrect because they do not prevent Somogyi’s effect.

8. Answer D is correct. Laryngeal swelling is not uncommon in clients following a thyroidectomy. A tracheostomy tray should be kept available. The ventilator is not necessary, so answer A is incorrect. The endotracheal tube is very difficult, if not impossible, to intubate if swelling has already occurred, so answer B is incorrect. The airway will do no good because the swelling is in the trachea, so answer C is incorrect.

9. Answer B is correct. Vitamin D is related to absorption of calcium and phosphorus. A, C, and D are incorrect because they are not related to the absorption of calcium and phosphorus.

10. Answer A is correct. Acromegaly is an increase in secretion of growth hormone. The growth hormones cause expansion and elongation of the bones. Answers B, C, and D are not directly associated with acromegaly, so they are incorrect.

11. Answer B is correct. This insulin, unlike others, is most frequently administered at night. It’s duration is 24–36 hours. A, C, and D are incorrect times to administer Lantus insulin.

12. Answer B is correct. The client with hyperglycemia will exhibit polyuria, polydipsia or increased thirst and polyphagia, or increased hunger. A, C, and D are incorrect because they are not signs of hypoglycemia.

13. Answer C is correct. The Hgb A-1C indicates that the client has been compliant for approximately three months. Answers A, B, and D tell the nurse the client’s blood glucose at the time of the test, so they are incorrect.

Suggested Reading and Resources

American Diabetes Association (http://www.diabetes.org)
CHAPTER THIRTEEN

Caring for the Client with Disorders of the Cardiovascular System

Terms you'll need to understand:

✓ Aneurysms
✓ Angina pectoris
✓ Angioplasty
✓ Arterosclerosis
✓ Blood pressure
✓ Buerger's disease
✓ Cardiac catheterization
✓ Cardiac tamponade
✓ Cardiopulmonary resuscitation
✓ Cholesterol
✓ Conduction system of the heart
✓ Congestive heart failure
✓ Coronary artery bypass graft
✓ Defibulation
✓ Diastole
✓ Electrocardiogram
✓ Heart block
✓ Hypertension
✓ Implantable cardioverter
✓ Myocardial infarction
✓ Pacemaker
✓ Raynaud's
✓ Systole
✓ Thrombophlebitis
✓ Varicose veins
✓ Ventricular fibrillation
✓ Ventricular tachycardia

Nursing skills you'll need to master:

✓ Performing cardiopulmonary resuscitation (CPR)
✓ Monitoring central venous pressure
✓ Monitoring blood pressure
✓ Interpreting electrocardiography (ECG)
The cardiovascular system is comprised of the heart and blood vessels and is responsible for the transport of oxygen and nutrients to organ systems of the body. The heart is a cone-shaped organ made up of four chambers. The right side of the heart receives deoxygenated venous blood from the periphery by way of the superior and inferior venae cavae. The left side of the heart receives blood from the lungs and pumps the oxygenated blood to the body. The blood vessels are divided into arteries and veins. Arteries transport oxygenated blood and veins transport deoxygenated blood. In this chapter, you will discover diseases that affect the cardiovascular system, the treatment of these diseases, and the effects on the client’s general health status.

**Hypertension**

Blood pressure is the force of blood exerted on the vessel walls. *Systolic pressure* is the pressure during the contraction phase of the heart and is evaluated as the top number of the blood pressure reading. *Diastolic pressure* is the pressure during the relaxation phase of the heart and is evaluated as the lower number of the blood pressure reading. A diagnosis of hypertension is made by a blood pressure value greater than 140/90 obtained on two separate occasions with the client sitting, standing, and lying. In clients with diabetes, a reading of 130/85 or higher is considered to be hypertension.

Accuracy of the BP reading depends on the correct selection of cuff size. The bladder of the blood pressure cuff size should be sufficient to encircle the arm or thigh. According to the American Heart Association, the bladder width should be approximately 40% of the circumference or 20% wider than the diameter of the midpoint of the extremity. A blood pressure cuff that’s too small yields a false high reading, whereas a blood pressure cuff that’s too large yields a false low reading.

Hypertension is classified as either primary or secondary. Primary hypertension, or essential hypertension, develops without apparent cause; secondary hypertension develops as a result of another illness or condition. Symptoms associated with secondary hypertension are improved by appropriate treatment of the contributing illness. Blood pressure fluctuates with exercise, stress, changes in position, and changes in blood volume. Medications such as oral contraceptives and bronchodilators can also cause elevations in blood pressure. Often the client with hypertension will have no symptoms at all or might complain of an early morning headache and fatigue. This silent killer, if left untreated, can lead to coronary disease, renal disease, strokes, and other life-threatening illnesses.

Management of hypertension includes a program of diet and exercise. If the client’s cholesterol level is elevated, a low-fat, low-cholesterol diet is ordered. The total serum cholesterol levels should be less than 200 mg/dl.
Medications Used to Treat Hypertension

Should diet and exercise prove unsuccessful in lowering the blood pressure, the doctor might decide to prescribe medications such as diuretics or antihypertensives. Table 13.1 includes drugs used to treat hypertension.

TABLE 13.1 Hypertension Drugs

<table>
<thead>
<tr>
<th>Drug Category</th>
<th>Drug Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diuretics</td>
<td>Thiazide: Chlorothiazide (Diuril), hydrochlorothiazide (Esidrix, HydroDiuril)</td>
</tr>
<tr>
<td></td>
<td>Loop diuretics: Furosemide (Lasix), ethacrynic acid (Edecrin)</td>
</tr>
<tr>
<td></td>
<td>Potassium-sparing diuretics: Spironolactone (Aldactone), triamterene (Dyrenium)</td>
</tr>
<tr>
<td>Beta blockers</td>
<td>Propanolol (Inderal), atenolol (Tenormin), nadolol (Corgard)</td>
</tr>
<tr>
<td>Calcium channel blockers</td>
<td>Nifedipine (Procardia), verapamil (Calan), diltiazem hydrochloride (Cardizem)</td>
</tr>
<tr>
<td>Angiotensin converting inhibitors</td>
<td>Captopril (Capoten), enalapril (Vasotec), lisinopril (Zestril, Prinivil)</td>
</tr>
<tr>
<td>Angiotensin receptor blockers</td>
<td>Candesartan (Altactand), losartan (Cozaar), telmisartan (Micardis)</td>
</tr>
</tbody>
</table>

These drugs can be used alone or in conjunction with one another. Diuretics and vasodilators are often given in combination to lower blood pressure through diuresis and vasodilation. Hypertensive crisis exists when the diastolic blood pressure reaches 140. Malignant hypertension is managed with administration of IV Nitropress, nitroglycerine, Nipride, Lasix, and other potent vasodilators such as Procardia.

Heart Block

The normal conduction system of the heart is comprised of the sinoatrial (SA) node located at the junction of the right atrium and the superior vena cava. This area contains the pacing cells that initiate the contraction of the heart. The SA node is considered to be the main pacer of the heart rate. The atrioventricular (AV) node is located in the interventricular septum and receives the impulse and transmits it on to the Bundle of His, which extends down through the ventricular septum and merges with the Purkinje fibers in the lower portion of the ventricles. Figure 13.1 shows an anatomical drawing of the human heart.

Heart block is a condition in which the conduction system of the heart fails to conduct impulses normally. Heart block can occur as a result of structural changes in the conduction system, such as tumors, myocardial infarctions, coronary artery disease, infections of the heart, or toxic effects of drugs such as digoxin. First-degree AV block occurs when the SA node continues to
function normally, but transmission of the impulse fails. Because of the conduction dysfunction and ventricular depolarization, the heart beats irregularly. These clients are usually asymptomatic and all impulses eventually reach the ventricles. Second-degree heart block is a block in which impulses reach the ventricles, but others do not. In third-degree heart block or complete heart block, none of the sinus impulses reach the ventricle. This results in erratic heart rates where the sinus node and the atrioventricular nodes are beating independently. The result of this type of heart block can be hypotension, seizures, cerebral ischemia, or cardiac arrest. Detection of a heart block is made by assessing the electrocardiogram. See Figure 13.2 for a graph depicting a normal electrocardiogram.

![Anatomical drawing of the heart.](FIGURE_13.1)

**FIGURE 13.1** Anatomical drawing of the heart.

![A normal electrocardiogram.](FIGURE_13.2)

**FIGURE 13.2** A normal electrocardiogram.
The P wave as shown in the graph is the SA node firing, the QRS complex is the contraction phase of the heart, and the T wave is the repolarization of the heart.

**Toxicity to Medications**

Toxicity to medications, such as Digoxin, can be associated with heart block. Clients taking Digitalis should be taught to check their pulse rate and to return to the physician for regular evaluation of their Digitalis level. The therapeutic level for Digoxin is 0.5–2.0 ng/ml. If the client’s blood level of Digoxin exceeds 2.0 ng/ml, the client is considered to be toxic. Clients with Digoxin toxicity often complain of nausea, vomiting, and seeing halos around lights. The nurse should teach the client to check his heart rate prior to taking Digoxin. A resting pulse rate of less than 60 bpm in the adult client should alert the nurse to the possibility of toxicity. Treatment for Digoxin toxicity includes checking the potassium level because hypokalemia can contribute to Digoxin toxicity. The physician often will order potassium be given IV or orally and that the Digoxin be held until serum levels return to normal. Other medications, such as Isuprel or Atropine, and Digibind, are frequently ordered to increase the heart rate.

**Malfunction of the Conduction System**

Because a malfunction of the conduction system of the heart is the most common cause for heart block, a pacing mechanism is frequently implanted to facilitate conduction. Pacemakers can be permanent or temporary and categorized as demand or set. A demand pacemaker initiates an impulse if the client’s heart rate fails below the prescribed beats per minute. A set pacemaker overrides the heart’s own conduction system and delivers an impulse at the rate set by the physician. Frequently, pacemakers are also combined with an internal defibrillation device.

**Permanent Pacemakers/Internal Defibrillators: What the Client Should Know**

Clients with internal defibrillators or pacemakers should be taught to avoid direct contact with electrical equipment. Clients should be instructed to

- Wear a medic alert stating that a pacemaker/internal defibrillator is implanted. Identification will alert the healthcare worker so that alterations in care can be made.
- Take the pulse for 1 full minute and report the rate to the physician.
- Avoid applying pressure over the pacemaker/internal defibrillator. Pressure on the defibrillator or pacemaker can interfere with the electrical leads.
- Inform the dentist of the presence of a pacemaker/internal defibrillator because electrical devices are often used in dentistry.
- Avoid having a magnetic resonance imaging (MRI). Magnetic resonance interferes with the electrical impulse of the implant.
Avoid close contact with electrical appliances, electrical or gasoline engines, transmitter
towers, antitheft devices, metal detectors, and welding equipment because they can
interfere with the electrical conduction of the device.

Be careful when using microwaves. Microwaves are generally safe for use, but the client
should be taught to stand approximately 5 feet away from the device while cooking.

Report fever, redness, swelling, or soreness at the implantation site.

If a vibration or beeping tone is noted coming from the internal defibrillator, immedi-
ately move away from any electromagnetic source. Stand clear from other people
because shock can affect anyone touching the client during defibrillation.

Report dizziness, fainting, weakness, blackouts, or a rapid pulse rate. The client will
most likely be told not to drive a car for several months after the internal defibrillator
is inserted to evaluate any dysrhythmias.

Report persistent hiccupping because this can indicate misfiring of the
pacemaker/internal defibrillator.

Myocardial Infarction

When there is a blockage in one or more of the coronary arteries, the client is considered to
have had a myocardial infarction. Factors contributing to diminished blood flow to the heart
include arteriosclerosis, emboli, thrombus, shock, and hemorrhage. If circulation is not quick-
ly restored to the heart, the muscle becomes necrotic. Hypoxia from ischemia can lead to
vasodilation of blood vessels. Acidosis associated with electrolyte imbalances often occurs, and
the client can slip into cardiogenic shock. The most common site for a myocardial infarction
is the left ventricle. Classic signs of a myocardial infarction include substernal pain or a feel-
ing of heaviness in the chest. However it should be noted that women, elderly clients, and
clients with diabetes may fail to report classic symptoms. Women might tell the nurse that the
pain is beneath the shoulder or in the back, anxiety, or a feeling of apprehension and nausea.

The most commonly reported signs and symptoms associated with myocardial infarction
include

- Substernal pain or pain over the precordium of a duration greater than 15 minutes
- Pain that is described as heavy, vise-like, and radiating down the left arm
- Pain that begins spontaneously and is not relieved by nitroglycerin or rest
- Pain that radiates to the jaw and neck
Pain that is accompanied by shortness of breath, pallor, diaphoresis, dizziness, nausea, and vomiting

Increased heart rate, decreased blood pressure, increased temperature, and increased respiratory rate

**CAUTION**

Angina pectoris occurs when there are vasospasms. This pain is relieved by nitroglycerine. The client should be taught to take one nitroglycerine tablet sublingually every 5 minutes. If the first tablet does not relieve the pain, a second can be taken, and if the pain is still not relieved, a third can be taken. If, however, the pain is not relieved after taking three tablets, one every 5 minutes, the client should come directly to the hospital or call an ambulance. The client should be taught to replenish his supply every 6 months and protect the pills from light by leaving them in the brown bottle. The cotton should be removed from the bottle because it will decrease the tablets’ effectiveness. Most physicians recommend that the client take one 365 mg aspirin at the first sign of chest pain. Aspirin has an anticoagulant effect and decreases the clotting associated with heart attacks.

**CAUTION**

The nurse must always wear gloves when applying nitroglycerine cream or patches to the client. Clip hair with scissors or shave, but do not abrade area.

**Diagnosis of Myocardial Infarction**

The diagnosis of a myocardial infarction is made by looking at both the electrocardiogram and the cardiac enzymes. The following are the most commonly used diagnostic tools for determining the type and severity of the attack:

- Electrocardiogram (ECG), which frequently shows dysrhythmias
- Serum enzymes and isoenzymes

Other tests that are useful in providing a complete picture of the client’s condition are white blood cell count (WBC), sedimentation rate, and blood urea nitrogen (BUN).

The best serum enzyme diagnostic is the creatine kinase (CK-MB) diagnostic. This enzyme is released when there is damage to the myocardium. The Troponin T and 1 are specific to striated muscle and are often used to determine the severity of the attack. C-reactive protein (CRP) levels are used with the CK-MB to determine whether the client has had an acute MI and the severity of the attack. Lactic acid dehydrogenase (LDH) is a nonspecific enzyme that is elevated with any muscle trauma.
Management of Myocardial Infarction Clients

Management of myocardial infarction clients includes monitoring of blood pressure, oxygen levels, and pulmonary artery wedge pressures. Because the blood pressure can fall rapidly, medications such as dopamine are prescribed. Other medications are ordered to relieve pain and to vasodilate the coronary vessels—for example, morphine sulfate IV is ordered for pain. Thrombolytics, such as streptokinase, will most likely be ordered. Early diagnosis and treatment significantly improve the client’s prognosis.

Clients suffering a myocardial infarction can present with dysrhythmias. Ventricular dysrhythmias such as ventricular tachycardia or fibrillation lead to standstill and death if not treated quickly.

Ventricular Tachycardia

Ventricular tachycardia is a rapid rhythm absence of a p-wave. Usually the rate exceeds 140–180 bpm. A lethal arrhythmia that leads to ventricular fibrillation and standstill, ventricular tachycardia is often associated with valvular heart disease, heart failure, hypomagnesium, hypotension, and ventricular aneurysms. Figure 13.3 shows a diagram demonstrating ventricular tachycardia.

![Evidence of ventricular tachycardia.](image)

Ventricular tachycardia is treated with oxygen and medication. Amiodarone (Cordarone), procainamide (Pronestyl), or magnesium sulfate is given to slow the rate and stabilize the rhythm. Lidocaine has long been established for the treatment of ventricular tachycardia; however, it should not be used in an acute MI client. Heparin is also ordered to prevent further thrombus formation but is not generally ordered with clients taking streptokinase.

Ventricular Fibrillation

Ventricular fibrillation (V-fib) is the primary mechanism associated with sudden cardiac arrest. This disorganized chaotic rhythm results in a lack of pumping activity of the heart. Without effective pumping, no blood is sent to the brain and other vital organs. If this condition is not corrected quickly, the client’s heart stops beating and asystole is seen on the ECG. The client quickly becomes faint, loses consciousness, and becomes pulseless. Hypotension or a lack of blood pressure and heart sounds are present. Figure 13.4 shows a diagram of the chaotic rhythms typical with V-fib.
Treatment of ventricular fibrillation is to defibrillate the client starting with 200 Joules. Three quick, successive shocks are delivered with the third at 360 Joules. If a defibrillator is not readily available, a precordial thump can be delivered. Oxygen is administered and antidysrhythmic medications such as epinephrine, amiodarone, procainamide, lidocaine, or magnesium sulfate are ordered. If cardiac arrest occurs, the nurse should initiate cardiopulmonary resuscitation and be ready to administer first-line drugs such as epinephrine.

Cardiac catheterization is used to detect blockages associated with myocardial infarctions and dysrthymias. Cardiac catheterization, as with any other dye procedure, requires a permit. This procedure can also accompany percutaneous transluminal coronary angioplasty. Prior to and following this procedure, the nurse should

- Assess for allergy to iodine or shellfish.
- Maintain the client on bed rest with the leg straight.
- Maintain pressure on the access site for at least 5 minutes or until no signs of bleeding are noted. Many cardiologists use a device called Angio Seals to prevent bleeding at the insertion site. The device creates a mechanical seal anchoring a collagen sponge to the site. The sponge absorbs in 60–90 days.
- Use pressure dressing and/or ice packs to control bleeding.
- Check distal pulses because diminished pulses can indicate a hematoma and should be reported immediately.
- Force fluids to clear dye from the body.

If the client is not a candidate for angioplasty, a coronary artery bypass graft might be performed. The family should be instructed that the client will return to the intensive care unit with several tubes and monitors. The client will have chest tubes and a mediastinal tube to drain fluid and to reinflate the lungs. If the client is bleeding and blood is not drained from the mediastinal area, fluid accumulates around the heart. This is known as cardiac tamponade. If this occurs, the myocardium becomes compressed and the accumulated fluid prevents the filling of the ventricles and decreases cardiac output.
A Swan-Ganz catheter for monitoring central venous pressure, pulmonary artery wedge pressure monitor, and radial arterial blood pressure monitor are inserted to measure vital changes in the client’s condition. An ECG monitor and oxygen saturation monitor are also used. Other tubes include a nasogastric tube to decompress the stomach, an endotracheal tube to assist in ventilation, and a Foley catheter to measure hourly output.

Following a myocardial infarction, the client should be given small, frequent meals. The diet should be low in sodium, fat, and cholesterol. Adequate amounts of fluid and fiber are encouraged to prevent constipation, and stool softeners are also ordered. Post-MI teaching should stress the importance of a regular program of exercise, stress reduction, and cessation of smoking. Because caffeine causes vasoconstriction, caffeine intake should be limited. The client can resume sexual activity in 6 weeks or when he is able to climb a flight of stairs without experiencing chest pain. Medications such as Viagra are discouraged and should not be taken within 24 hours of taking a nitrate because taking these medications in combination can result in hypotension. Clients should be taught not to perform the Valsalva maneuver or bend at the waist to retrieve items from the floor. The client will probably be discharged on an anticoagulant such as enoxaparin (Lovenox) or sodium warfarin (Coumadin).

### CAUTION
Anticoagulants such as heparin are used. The nurse should check the partial thromoplastin time (PTT). PTT levels vary. The normal control level is approximately 30–60 seconds. The therapeutic bleeding time should be from one and a half to two times the control. The medication should be injected in the abdomen 2" from the umbilicus using a tuberculin syringe. Do not aspirate or massage. The antidote for heparin derivatives is protamine sulfate.

### CAUTION
If Coumadin (sodium warfarin) is ordered, the nurse should check the PT or protime. The control level for a protime is 10–12 seconds. The therapeutic level for Coumadin should be from one and a half to two times the control. The antidote for Coumadin is vitamin K. The international normalizing ratio (INR) is done for oral anticoagulants. The therapeutic range is 2–3. If the level exceeds 7, watch for spontaneous bleeding.

### Buerger’s Disease
Buerger’s disease (thromboangilitis obliterans) results when spasms of the arteries and veins occur primarily in the lower extremities. These spasms result in blood clot formation and eventually destruction of the vessels. Symptoms associated with Buerger’s include pallor of the extremities progressing to cyanosis, pain, and paresthesia. As time progresses, tophic changes occur in the extremities. Management of the client with Buerger’s involves the use of Buerger-Allen exercises, vasodilators, and oxygenation. The client should be encouraged to stop smoking because smoking makes the condition worse.
Thrombophlebitis

Thrombophlebitis occurs when there is an inflammation of a vein with formation of a clot occurs. Most thrombophlebitis occurs in the lower extremities, with the saphenous vein being the most common vein affected. Homan’s sign is an assessment tool used for many years by healthcare workers to detect deep vein thrombi. It is considered positive if the client complains of pain on dorsiflexion of the foot. Homan’s sign should not be performed routinely because it can cause a clot to be dislodged and lead to pulmonary emboli. If a diagnosis of thrombophlebitis is made, the client should be placed on bed rest with warm, moist compresses to the leg. An anticoagulant is ordered, and the client is monitored for complications such as cellulitis. If cellulitis is present, antibiotics are ordered.

Antithrombotic stockings or sequential compression devices are ordered to prevent venous stasis. When antithrombotic stockings are applied, the client should be in bed for a minimum of 30 minutes prior to applying the stockings. The circumference and length of the extremity should be measured to prevent rolling down of the stocking and a tourniquet effect.

Raynaud’s Syndrome

Raynaud’s syndrome occurs when there are vascular spasms brought on by exposure to cold. The most commonly effected areas are the hands, nose, and ears. Management includes preventing exposure, stopping smoking, and using vasodilators. The client should be encouraged to wear mittens when outside in cold weather.

Aneurysms

An aneurysm is a ballooning of an artery. The greatest risk for these clients is rupture and hemorrhage. Aneurysms can occur in any artery in the body and can be due to congenital malformations or arteriosclerosis or be secondary to hypertension. The following are several types of aneurysms:

- **Fusiform**—This aneurysm affects the entire circumference of the artery.
- **Saccular**—This aneurysm is an outpouching affecting only one portion of the artery.
- **Dissecting**—This aneurysm results in bleeding into the wall of the vessel.

Frequently, the client with an abdominal aortic aneurysm complains of feeling her heart beating in her abdomen or lower back pain. Any such complaint should be further evaluated. On auscultation of the abdomen, a bruit can be heard. Diagnosis can be made by ultrasound, arteriogram, or abdominal x-rays.
If the aneurysm is found to be 6 centimeters or more, surgery should be scheduled. During surgery the aorta is clamped above and below and a donor vessel is anastamosed in place. When the client returns from surgery, pulses distal to the site should be assessed and urinary output should be checked. Clients who are not candidates for surgery might elect to have stent placement to reinforce the weakened artery. These stents are threaded through an incision in the femoral artery, hold the artery open, and provide support for the weakened vessel. See Figure 13.5 for a diagram of an abdominal aortic aneurysm.

**FIGURE 13.5 Abdominal aortic aneurysm.**

### Congestive Heart Failure

When fluid accumulation occurs and the heart is no longer able to pump in an efficient manner, blood can back up. Most heart failure occurs when the left ventricle fails. When this occurs, the fluid backs up into the lungs, causing pulmonary edema. The signs of pulmonary edema are frothy, pink-tinged sputum; shortness of breath; and orthopnea. Distended jugular veins might also be present. When right-sided congestive heart failure occurs, the blood backs up into the periphery. The nurse might also note signs of pitting edema. Pitting can be evaluated by pressing on the extremities and noting the degree of pitting, how far up the extremity the pitting occurs, and how long it takes to return to the surface. Treatment for congestive
heart failure includes use of diuretics, inotropic drugs such as milrinone (Primacor), and cardiotonics such as nesiritide (Natrecor). Morphine might also be ordered.

**Diagnostic Tests for Review**

The following diagnostic test should be reviewed prior to taking the NCLEX exam:

- **CBC**—A complete blood count tells the nurse the level of oxygenation of the blood, particularly the hemoglobin and hematocrit.
- **Chest x-ray**—Chest x-rays and other x-rays tell the nurse whether the heart is enlarged or aneurysms are present.
- **Arteriogram**—Arteriography reveals the presence of blockages and abnormalities in the vascular system.
- **Cardiac catheterization**—A cardiac catheterization reveals blockages, turbulent flow, and arteriosclerotic heart disease.
- **ECG interpretation**—Indicates abnormalities in the rate and rhythm of the conduction system of the heart.
- **Central venous pressure monitoring**—CVP indicates fluid volume status.
- **B-type natriuretic peptide (BNP)**—Used to diagnose heart failure in clients with acute dyspnea. It is used to differentiate dyspnea found in those with lung disorders from those with congestive heart failure.
- **Thallium stress**—A test used to determine ischemia. A radionuclide is injected at the peak of exercise.

**Pharmacology Categories for Review**

The following pharmacology categories should be reviewed prior to taking the NCLEX exam:

- Diuretics
- Cardiotonics
- Antihypertensives
- Anticoagulants
- Thrombolytics
- Inotropic
- Analgesics
Exam Prep Questions

1. The client presents to the clinic with a serum cholesterol of 275 mg/dl and is placed on rosuvastatin (Crestor). Which instruction should be given to the client?
   - A. Report muscle weakness to the physician.
   - B. Allow 6 months for the drug to take effect.
   - C. Take the medication with fruit juice.
   - D. Ask the doctor to perform a complete blood count prior to starting the medication.

2. The client is admitted to the hospital with a hypertensive crisis. Diazoxide (Hyperstat) is ordered. During administration the nurse should:
   - A. Utilize an infusion pump.
   - B. Check the blood glucose level.
   - C. Place the client in Trendelenburg position.
   - D. Cover the solution with foil.

3. A 6-month-old client with a ventricular septal defect is receiving Lanoxin elixir for regulation of his heart rate. Which finding should be reported to the doctor?
   - A. A blood pressure of 126/80
   - B. A blood glucose of 110 mg/dl
   - C. A heart rate of 60 bpm
   - D. A respiratory rate of 30 per minute

4. The client admitted with angina is given a prescription for nitroglycerine. The client should be instructed to:
   - A. Replenish her supply every 3 months.
   - B. Take one every 15 minutes if pain occurs.
   - C. Leave the medication in the brown bottle.
   - D. Crush the medication and take it with water.
5. A 54-year-old male is admitted to the cardiac unit with chest pain radiating to the jaw and left arm. Which enzyme would be most specific in the diagnosis of a myocardial infarction?

- A. Aspartate aminotransferase
- B. Lactic acid dehydrogenase
- C. Hydroxybutyric dehydrogenase
- D. Creatine phosphokinase

6. The client is instructed regarding foods that are low in fat and cholesterol. Which diet selection is lowest in saturated fats?

- A. Macaroni and cheese
- B. Shrimp with rice
- C. Turkey breast
- D. Spaghetti and meatballs

7. The client is admitted with left-sided congestive heart failure. In assessing the client for edema, the nurse should check the:

- A. Feet
- B. Neck
- C. Hands
- D. Sacrum

8. The nurse is checking the client's central venous pressure. The nurse should place the zero of the manometer at the:

- A. Phlebostatic axis
- B. Point of maximum impulse (PMI)
- C. Erb's point
- D. Tail of Spence

9. The physician orders lisinopril (Zestril) and furosemide (Lasix) to be administered concomitantly to the client with hypertension. The nurse should:

- A. Question the order.
- B. Administer the medications.
- C. Administer them separately.
- D. Contact the pharmacy.
10. The best method of evaluating the amount of peripheral edema is:

❖ A. Weighing the client daily
❖ B. Measuring the extremity
❖ C. Measuring the intake and output
❖ D. Checking for pitting

Answer Rationales

1. Answer A is correct. The client taking antilipidemics should be encouraged to report muscle weakness because this is a sign of rhabdomyositis. The medication takes effect within 1 month of beginning therapy, so answer B is incorrect. The medication should be taken with water. Fruit juice, particularly grapefruit juice, can decrease the drug's effectiveness, so answer C is incorrect. Liver function studies, not a CBC, should be checked prior to beginning the medication, so answer D is incorrect.

2. Answer B is correct. Hyperstat is given IV push for hypertensive crisis. It often causes hyperglycemia. The glucose level will drop rapidly after the medication is administered. Answer A is incorrect because this medication is given IV push. The client should be placed in dorsal recumbent position, not Trendelenburg, so answer C is incorrect. Answer D is incorrect because the medication is ordered IV push.

3. Answer C is correct. A heart rate of 60 in the 6-month-old receiving Lanoxin elixir (digoxin) should be reported immediately because bradycardia is associated with digoxin toxicity. The blood glucose, blood pressure, and respirations are not associated with administration of Lanoxin, so answers A, B, and D are incorrect.

4. Answer C is correct. The client should leave the medication in the brown bottle because light deteriorates the medication. The supply should be replenished every 6 months, so answer A is incorrect. One tablet should be taken every 5 minutes times three, so answer B is incorrect. If the pain does not subside, the client should report to the emergency room. The medication should be taken sublingually and should not be crushed, so answer D is incorrect.

5. Answer D is correct. CK-MB (creatine phosphokinase muscle bond isoenzyme) is the most specific for a myocardial infarction. Troponin is also extremely reliable. Answers A, B, and C are nonspecific to myocardial infarctions, so they are incorrect.

6. Answer C is correct. Turkey contains the least amount of fat and cholesterol. Cheese, shrimp, and beef should be avoided by the client on a low cholesterol, low fat diet; therefore, answers A, B, and D are incorrect.

7. Answer B is correct. The neck veins should be assessed for distension in the client with congestive heart failure. Edema of the feet and hands do not indicate central circulatory overload, so answers A and C are incorrect. Edema of the sacrum is an indication of right-sided congestive heart failure, so answer D is incorrect.
8. Answer A is correct. The nurse should place the zero of the manometer at the phlebostatic axis (located at the fifth intercostal space mid-axillary line) when checking the central venous pressure. Answers B, C, and D are incorrect methods for determining the central venous pressure.

9. Answer B is correct. Zestril is an ACE inhibitor and is frequently given with a diuretic such as Lasix. There is no need to question the order, give the drugs separately, or contact the pharmacy, so answers A, C, and D are incorrect.

10. Answer B is correct. The best method for evaluating the amount of peripheral edema is measuring the extremity. A paper tape measure should be used rather than plastic or cloth, and the area should be marked with a pen. This provides the most objective assessment. Answers A, C, and D are not the best methods for evaluating the amount of peripheral edema, therefore they are incorrect.

Suggested Reading and Resources

Caring for the Client with Disorders of the Neurological System

Terms you'll need to understand:

✓ Areflexia
✓ Aura
✓ Automaticism
✓ Burr holes
✓ Cheyne Stokes respirations
✓ Clonic movements
✓ Craniotomy
✓ Decerebrate posture
✓ Decorticate posture
✓ Doll's eye phenomena
✓ Hypocapnia
✓ Piloerection
✓ Post-ictal
✓ Pulse pressure
✓ Rinne test
✓ Tonic movements
✓ Webber test

Nursing skills you'll need to master:

✓ Performing neurological assessments
✓ Performing log roll turning technique
✓ Bowel and bladder training
Seizures

Seizures are episodes of abnormal motor, sensory, or autonomic activity that result from the excessive discharge of electrical impulses from cerebral neurons. All seizures affect the level of consciousness; however, the degree is dependent on the type of seizure. Most seizures occur without a cause. Any abnormality in the central nervous system (CNS) can cause seizure activity. The significant causes of a seizure you need to know for the NCLEX exam are

- Abrupt withdrawal of barbiturates
- Brain tumors
- Central nervous system infections
- Head injuries
- High fevers
- Hypertension
- Hypoglycemia

Types of Seizures

There are two main categories for classifying seizures: the generalized seizure and the partial, or focal, seizure. The following sections describe these two seizure categories more fully.

Generalized Seizures

With this type of seizure, the whole brain is involved in the seizure activity. Within this category, two types of seizures are identified. The first type is the tonic-clonic, or grand mal, seizure; the second is the absence, or petit mal, seizure.

Tonic-Clonic Seizures

Tonic-clonic seizures can last for up to 5 minutes. The following highlights the signs and symptoms of tonic-clonic seizures you need to know:

- Aura prior to seizure activity
- Brief episodes of apnea
- Chewing of the tongue
- Incontinence
- Loss of consciousness
Seizures

- Loss of motor function
- Tonic (muscle tension) and clonic (alternating muscle contraction and relaxation) movements

**NOTE**

Aura can be any type of sensory sensation, such as a smell or flashing lights, that signals to the client that the seizure is about to occur. Children usually do not have an aura.

There is a risk for injury for any client involved in this type of seizure activity. You must become familiar with nursing care required for the general safety and physiological care of the client before and after the seizure. You also need to know how to accurately document the seizure because this will assist the physician with the diagnosis. You should gain knowledge of the following aspects of care and expect to see them on your exam:

- Assess the client’s behavior and surroundings prior to the seizure.
- Loosen his clothing.
- Maintain a patent airway (oxygen, suction).
- Note any loss of consciousness, aura, or incontinence.
- Provide client safety (place padding under the client’s head and move objects out of reach of the client to prevent self-injury).
- Time and document the seizure activity.
- Turn the client on his side.

Don’t

- Put anything in the client’s mouth after a seizure has begun.
- Restrain the client.

Nursing care after a tonic/clonic seizure includes

- Allow the client to sleep.
- Keep the client side-lying.
- Orient the client to the environment.
- Be prepared for the client to be confused and disoriented because he’s in the post-ictal phase after the seizure.
Absence Seizures
The second type of generalized seizure is absence, or petit mal, seizure. This type is more common in children and might improve by adolescence. There is no loss of consciousness, and it can be mistaken for daydreaming. Other clinical manifestations you need to know are

> Blank stare
> Smacking of the lips
> Twitching of the mouth

Partial Seizures
The second category of seizures is called partial, or focal, seizures. These seizure types affect one cerebral hemisphere. Mostly found in adults, these seizures respond unfavorably to medical regimens. Focal seizures are further divided into two classifications. The first type is the simple partial seizure, and the second is known as the complex partial seizure.

Simple Partial
With simple partial seizure, the client’s finger or hand might shake or she might have unusual sensations. The client often has an aura but does not lose consciousness.

Complex Partial
The second type of focal seizure is the complex partial. One of the major differentiating factors is that these clients do lose consciousness, whereas in simple partial they do not. The seizure can last for up to 3 minutes. Some characteristics you need to know for the exam include

> Automaticisms (behaviors that the person is not aware of, such as hand movements and picking at clothes) might occur.
> These seizures are common in adults.
> The client has amnesia of the episode.
> The client is in a trancelike state.

Treatment of Seizure Clients
The treatment of clients with seizures concentrates on stopping the seizure activity. This goal is most often accomplished by the use of anticonvulsant medications. Another method of treatment involves the insertion of a vagal nerve stimulator. In this procedure, an electrode is placed on the vagal nerve and gives intermittent stimulation to the nerve, preventing seizures. Clients who continue to have seizures with treatment might require surgical removal of the section of the brain causing the seizure; however, this is a last resort.
Status Epilepticus

A person in status epilepticus has a continuation of grand mal seizures without a normal recovery period. The client does not regain consciousness between attacks, despite medical intervention. Any one seizure that lasts longer than 10 minutes or repeated seizures longer than 30 minutes are classified as status epilepticus. This disorder is life-threatening if not corrected. Possible causes of status epilepticus include sudden noncompliance of anticonvulsant medications, head trauma, and alcohol withdrawal.

Clients experiencing status epilepticus are treated as a neurological emergency. Interventions important for the nurse candidate to know are administration of oxygen, initiation of IV access, and establishment and maintenance of a patent airway (intubation by an anesthetist or a physician might be required). Medications need to be given to stop the seizure, as well as drugs to prevent another seizure. If the seizure activity continues despite efforts, general anesthesia might be required. The following highlights the drugs you need to know for this disorder: IV diazepam (Valium) or lorazepam (Ativan) to stop the seizure activity, followed by phenobarbital and diphenylantion (Dilantin) or fosphenytoin (Cerebyx).

Brain Injuries

Brain injuries occur when a force is applied to the brain, causing damage. The age group most affected is 18–34. An injury of this type can cause extreme emotional adjustments and disability.

Several types of brain injuries can occur. They are classified according to the area in the brain that’s affected. The information that follows discusses the three hematomas that can develop from an injury.

Epidural Hematomas

The first type of hematoma is the epidural. It usually develops from an arterial bleed, which makes it more acute. An epidural hematoma occurs when there is a collection of blood between the skull and dura. The symptoms indicating an epidural hematoma involve a pattern of consciousness, a lucid interval, followed by the client being critical and then comatose.

Subdural Hematoma

The second type of hematoma is a subdural hematoma. It is usually venous in origin and occurs when a collection of blood is between the dura and above the arachnoid space. Subdural hematomas are subdivided into three classifications that are identified by their time of development after the injury. The following highlights these terms and how they are identified:
Acute—Occurs within the first 2 days of injury
Subacute—Occurs 2–14 days after the injury
Chronic—Occurs from 14 days to several months after the injury

Treatment of Epidural and Subdural Hematomas
Clients with hematomas are treated depending on the amount of space occupied by the hematoma. If the client has increased intracranial pressure (ICP), measures included in the following section on increased ICP are used. Surgical interventions include insertion of burr holes and a craniotomy to evacuate the hematoma.

Increased Intracranial Pressure
Increased intracranial pressure can result from any alteration that increases tissue or fluid volume within the cranium. The skull is rigid with no flexibility; therefore, there is no room for any additional fluid or blood, or a space-occupying lesion. The causes of increased ICP are as follows:

- Accumulation of cerebral spinal fluid in the ventricles
- Brain tumors
- Central nervous system infections
- Cerebral edema
- Intracranial bleeding

The client with increased ICP exhibits specific signs and symptoms that you need to be able to recognize and report to the physician for early intervention. These clinical manifestations include

- Blurred vision
- Changes in cognition
- Changes in the level of consciousness
- Cheyne Stokes respirations
- Coma
- Decerebrate posture (see Figure 14.1)
Increased Intracranial Pressure

Decorticate posture (see Figure 14.2)

![Decorticate posture](image)

**NOTE**
Decorticate posture indicates brain stem dysfunction.

- Decreased motor responsiveness
- Diplopia
- Doll’s eye phenomena
- Headache
- Nausea and vomiting (usually projectile)
- Pupil changes
- Personality and behavior changes
- Seizures
- Vital signs changes (also called Cushing’s triad):
  - Increased BP with a widening pulse pressure
  - Decreased pulse rate
  - Decreased respirations
It is important for the nurse candidate to be aware of the differences of symptoms that can occur in infants. The following focuses on the clinical manifestations of increased ICP you need to know for the infant:

- Bulging fontanels
- High-pitched crying
- Irritability
- Restlessness

**Treatment of ICP**

Treatment of increased ICP is directed toward paths that will both prevent further increases in intracranial pressure and help in the recognition of it so that early intervention is possible. The following interventions are important for you to know for the exam:

- Frequent neurological assessment.
- Strict intake and output to prevent overhydration.
- Prevent seizures by administering anticonvulsants when due for blood level maintenance.
- Treat nausea and vomiting.
- Maintain the client in a barbiturate coma to decrease metabolic demands.
- Maintain hypocapnia to constrict cerebral blood vessels and decrease ICP.
- Pharmacological interventions, including
  - Decadron.
  - Mannitol (observe for signs of congestive heart failure due to a possible alteration of cardiac enzymes).
  - Anticonvulsants.
  - Avoid aspirin, narcotics, or medications that depress respirations.
Neurological Assessment

The client assessment is a major component of nursing care. Early recognition of a deficit in neurological status can mean a more favorable outcome in the client’s condition. The following information offers insight into three forms of assessment techniques: cranial nerve assessment, Glasgow coma scale, and intracranial pressure monitors that can be used to identify deficits in a client.

Cranial Nerve Assessment

Table 14.1 highlights the 12 cranial nerves, their names, functions, and the assessment methods.

<table>
<thead>
<tr>
<th>Cranial Nerve</th>
<th>Function</th>
<th>Assessment Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Olfactory</td>
<td>Smell.</td>
<td>Identify common odors.</td>
</tr>
<tr>
<td>II Optic</td>
<td>Visual acuity.</td>
<td>Snellen chart (central vision) and peripheral vision check.</td>
</tr>
<tr>
<td>III Oculomotor; IV Trochlear; VI Abducens</td>
<td>Cranial nerves III, IV, and VI regulate eye movement, accommodation, and the elevation of the eyelids. IV is responsible for inferior and medial eye movement. VI is responsible for lateral eye movement.</td>
<td>Check for pupil constriction; check for accommodation and convergence as the object is brought near the eyes; check for strength of lid closure.</td>
</tr>
<tr>
<td>V Trigeminal</td>
<td>Facial sensation; corneal reflex; mastication.</td>
<td>Identify the location of the stimulus; check jaw strength.</td>
</tr>
<tr>
<td>VII Facial</td>
<td>Movement of facial muscles; facial expression; tear formation; salivation; taste sensation in anterior tongue.</td>
<td>Check for symmetry of facial expressions; muscle strength.</td>
</tr>
<tr>
<td>IX Glossopharyngeal</td>
<td>Taste sensation in post third of the tongue.</td>
<td>Identify sweet, sour, and salty tastes.</td>
</tr>
</tbody>
</table>

(continues)
TABLE 14.1  Continued

<table>
<thead>
<tr>
<th>Cranial Nerve</th>
<th>Function</th>
<th>Assessment Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>X Vagus</td>
<td>Pharyngeal contraction; symmetrical movement of vocal cords and soft palate; movement and secretion of thoracic and abdominal viscera.</td>
<td>Ask client to say “Ah”; uvula should rise midline; check ability to swallow.</td>
</tr>
<tr>
<td>XI Spinal Accessory</td>
<td>Movement of trapezius and sternocleidomastoid muscles.</td>
<td>Have client shrug shoulders against resistance.</td>
</tr>
<tr>
<td>XII Hypoglossal</td>
<td>Tongue movement.</td>
<td>Have client stick out tongue; observe for deviations or tremors; check strength of tongue movement as it presses against tongue blade.</td>
</tr>
</tbody>
</table>

Glasgow Coma Scale

The Glasgow coma scale assesses neurologic status based on the client’s motor, verbal, and eye-opening responses. Lower responses indicate central nervous system impairment, whereas higher responses indicate central nervous system functioning. The scale is a universal tool, which makes it a popular screening tool. The candidate should be aware of the following information for the nursing exam:

Eye Opening:
- Spontaneous opening = 4
- To speech = 3
- To pain = 2
- No response = 1

Best Motor Response:
- Obeys = 6
- Localizes pain = 5
- Withdraws = 4
- Abnormal flexion = 3
- Extends = 2
- No response = 1
Verbal Response:

Oriented = 5
Confused conversation = 4
Inappropriate words = 3
Incomprehensible words = 2
No response = 1

Total Points = 3–15

Intracranial Pressure Monitors

The third assessment tool is the most invasive and accurate of the ones mentioned. An intracranial pressure monitor is inserted by the physician.

This is a sensing device inside the skull that is attached to a transducer. This device gives an electronic recording of intracranial pressure. The normal ICP reading is less than 15 mm Hg. The monitoring device can also be used to drain cerebrospinal fluid.

The cerebral perfusion pressure (CPP) can also be used to evaluate the client. Cerebral perfusion pressure is calculated by subtracting the ICP reading from the mean arterial pressure (MAP). A CPP above 70 is needed to have adequate brain viability. It is important for you to have the knowledge required for clients with ICP monitors in place:

- Assess for complications or problems with the ICP monitor.
- Interpret and report results to the physician.
- Utilize sterile technique when handling the equipment.

Care of the Client with Intracranial Surgery (Craniotomy)

Neuro assessments might indicate to the physician that surgery is required. If a client has a craniotomy, post-operative care is of particular importance. The following post-operative craniotomy interventions are important for you to know:

- Monitor vital signs and neurological assessments.
- Monitor cardiac rhythm.
Perform passive range of motion exercises on the client.
- Assist the client to turn, cough, and deep breathe every 2–3 hours.

**CAUTION**
Be careful with coughing exercises because they can increase intracranial pressure.

- Use cold application for periorbital edema and bruising.
- Prevent deep vein thrombosis by compression stocking application.
- Use the following positioning:
  - **Supratentorial surgery**—Elevate the head of the bed 30°
  - **Infratentorial surgery**—Flat on either side
- Assess head dressing and drainage from wound suction devices.
- Monitor ABGs.
- Assess urinary output (note: excessive urinary output could indicate the complication of diabetes insipidus).
- Use the following pharmacological interventions:
  - Anticonvulsants
  - Steroids
  - Histamine blockers
  - Prophylactic antibiotics

**Spinal Cord Injury**

Spinal cord injuries (SCIs) occur most often in young men between the ages of 15 and 30. Most cord injuries occur at the 5th, 6th, or 7th cervical, or at the 12th thoracic or the 1st lumbar. These areas are weaker due to the range of mobility needed.

A spinal cord injury is classified as *complete* (no function below the level of injury) or *incomplete* (partial function remains). These injuries can occur from diseases—for example, tumors causing compression and damage—but the most frequent causes are trauma and falls. These clients display the following characteristics:
Spinal Cord Injury

- Acute respiratory failure
- Compromised respiratory function
- Loss of bowel and bladder tone
- Loss of sweating and vasomotor tone
- Marked reduction in BP due to loss of peripheral vascular resistance
- Sensory and motor paralysis below the level of injury

**NOTE**
Acute respiratory failure is the primary cause of death in high-level cord injuries.

**Treatment of Spinal Cord Injuries**

Treatment of spinal cord injuries follows the paths of stabilization, monitoring and assessing, and preventing further damage. The following measures are important aspects of care:

- Stabilize respiratory and cardiovascular systems.
- Transport the client on a spinal board to prevent further damage.
- Medication administration of high-dose steroids within 8 hours of injury is the frontline treatment.
- Perform surgical reduction and alignment. The client might be placed in traction after reduction with the use of skeletal tongs. Three types of tongs are
  - Crutchfield
  - Gardner-Wells
  - Vinke

**CAUTION**
Proper spinal cord alignment is essential. A physician's order is required for turning the client.

A halo vest is another type of alignment immobilization device that provides immobilization of the bone with ambulation allowed. These clients, as well as clients with tongs, require pin care per protocol with \( \text{H}_2\text{O}_2 \) or normal saline and an antibiotic cream.
Potential Complications with SCI Clients

Because of the damage to the spinal cord and autonomic nervous system, clients with SCIs can develop two main complications. The first complication is spinal shock, which occurs because of the sudden failure in the communication of the upper and lower neurons. Spinal shock can last for 3–6 weeks. Clients exhibit the following symptoms:

- Decreased heart rate
- Flaccid paralysis
- Low blood pressure

Another complication from this syndrome is autonomic hyperreflexia, or dysreflexia. Most often seen in injuries higher than T6, this disorder usually occurs after the spinal shock has resolved. You need to be familiar with clinical manifestations, which include:

- Bradycardia
- Headache
- Hypertension
- Nasal congestion
- Piloerection
- Profuse sweating

The treatment plan for autonomic dysreflexia focuses on removing the trigger or cause and lowering the blood pressure. The immediate interventions you will need to know are:

- Remove the triggering stimuli.
- Elevate the head.
- Empty the bladder.
- Administer antihypertensive medications.
- Check for impaction after the episode has resolved.

Guillain-Barré

Guillain-Barré is a rapidly ascending progressive paralysis or weakness. It can also be descending but is uncommon by this progression, and it is an acute inflammatory process. Respiratory complications are the usual cause of death, although the exact cause is unknown. It has been
shown to be related to a para-infection or post-infection immune response. It frequently develops 1–3 weeks following an upper respiratory or gastrointestinal infection. It has also been linked to clients with a history of a recent immunization or allergy. A client with Guillain-Barré displays the following symptoms:

- Diminished or absent tendon reflexes
- Low-grade fever
- Muscle weakness that gradually moves up the arms, trunk, and face
- Numbness, pain, and tingling in the lower extremities

### Treating Clients with Guillain-Barré

The treatment phase for Guillain-Barré is directed toward performing in-depth assessments, paying particular attention to the need for assisted ventilation. Emotional support and adequate nutrition are also used. You also need to be aware of other treatment modalities, including medications such as steroids to decrease the immune response and IV immunoglobulin and plasmapheresis. Plasmapheresis is used to remove circulating antibodies and speed the healing process.

### Degenerative Neurological Disorders

Several neuro disorders have similar pathophysiological features: There is a deficit in a neurotransmitter or an impairment of nerve conduction. Table 14.2 discusses these disorders, giving you an overview of each condition. As you study this table, keep in mind that the medications for treatment in several of the disorders are used to replace the deficiencies listed in the pathophysiology section. You should study and learn this table and expect some of this information to be on the exam.

#### TABLE 14.2 Degenerative Neurological Disorders

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Parkinson's</th>
<th>Multiple Sclerosis</th>
<th>Myasthenia Gravis</th>
<th>Alzheimer's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset</td>
<td>50–60 years</td>
<td>20–40 years</td>
<td>20–50 years</td>
<td>50–60 years</td>
</tr>
<tr>
<td>Gender</td>
<td>Most prevalent in males</td>
<td>Most prevalent in females</td>
<td>Most prevalent in females</td>
<td>Most prevalent in females</td>
</tr>
<tr>
<td>Cause</td>
<td>Unknown</td>
<td>Unknown, but it’s autoimmune or viral</td>
<td>Unknown, but it’s autoimmune</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

(continues)
Diagnostic Tests for Review

A part of the neurological assessment includes diagnostic exams. Routine laboratory work, such as the CBC, chest x-ray, and urinalysis will also be done. Blood cultures are also required to identify the causative agent in CNS infections. Clients with head injuries and spinal cord injuries need skull x-rays, CT scans, and MRIs to identify defects. When reviewing the diagnostic exams that follow, remember which tests are commonly done for a specific disorder. For example, the electroencephalogram is used for epilepsy and seizure activity:

- Cerebral arteriogram
- CT scan
- Electroencephalogram

**TABLE 14.2  Continued**

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Parkinson’s Area affected</th>
<th>Multiple Sclerosis White matter of brain and spinal cord</th>
<th>Myasthenia Gravis Myoneural junction of voluntary muscles</th>
<th>Alzheimer’s Cerebral cortex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathophysiology</td>
<td>Deficiency in dopamine, which impairs coordination and autonomic function</td>
<td>Impairs nerve impulse conduction, which is related to the loss of myelin sheath</td>
<td>Impairs transmission of impulses due to lack of acetylcholine</td>
<td>Loss of brain cells from the cerebral cortex and creation of neurofibrillary tangles</td>
</tr>
<tr>
<td>Clinical manifestations</td>
<td>Muscle stiffness, non-intentional tremor, and autonomic dysfunction</td>
<td>Loss of bowel and bladder control, blurry vision, paralysis, intentional tremor, and labile emotions</td>
<td>Profound muscle weakness, fatigue, and respiratory failure</td>
<td>Memory loss, overactivity, emotional distress, agitation, and a feeling of disaster</td>
</tr>
<tr>
<td>Treatment</td>
<td>Supportive care and medications such as L-dopa, Artane, and Cogentin</td>
<td>Supportive care and medications such as steroids, Immuran, interferons, glatiramer acetate (Copaxone), Rebif, Baclofen, and Novantrone</td>
<td>Supportive care and medications such as Mestinon, Prostigmin, and steroids</td>
<td>Supportive care and medications such as tacrine hydrochloride (Cognex), folic acid, Aricept, and Exelon</td>
</tr>
</tbody>
</table>

**Chapter 14: Caring for the Client with Disorders of the Neurological System**

**TABLE 14.2  Continued**

**Diagnostic Tests for Review**

A part of the neurological assessment includes diagnostic exams. Routine laboratory work, such as the CBC, chest x-ray, and urinalysis will also be done. Blood cultures are also required to identify the causative agent in CNS infections. Clients with head injuries and spinal cord injuries need skull x-rays, CT scans, and MRIs to identify defects. When reviewing the diagnostic exams that follow, remember which tests are commonly done for a specific disorder. For example, the electroencephalogram is used for epilepsy and seizure activity:

- Cerebral arteriogram
- CT scan
- Electroencephalogram
Pharmacology for Review

Pharmacological interventions are used in most types of neurological problems. Some drug classifications are used in several disorders. For example, steroids are used in clients with multiple sclerosis, but also in head injuries and spinal cord injuries. While reviewing the drug classifications, you should recognize the most common ones, such as anticonvulsants, and realize that these drugs have a higher probability of being tested. Continue to look for the commonality in side effects of the drugs you are reviewing and focus on nursing considerations and adverse drug effects:

- Antianxiety
- Anticonvulsants
- Antimyasthenics
- Anti-Parkinson's
- Cholinesterase inhibitor
- Corticosteroids
- Diuretics
- Gamma globulins
- Immunosuppressives
- Interferons
- Muscle relaxers
- Osmotic diuretics
Exam Prep Questions

1. A client is admitted with a head injury. Which vital sign assessment is most indicative of increased intracranial pressure?
   - A. BP 120/80, pulse 120, respirations 20
   - B. BP 180/98, pulse 50, temperature 102° F
   - C. BP 98/60, pulse 132, temperature 97.6° F
   - D. BP 170/90, pulse 80, respirations 24

2. The nurse is caring for a client with a head injury who has an intracranial pressure monitor in place. Assessment reveals an ICP reading of 66. What is the nurse's best action?
   - A. Notify the physician.
   - B. Record the reading as the only action.
   - C. Turn the client and recheck the reading.
   - D. Place the client supine.

3. A client has developed diabetes insipidus after removal of a pituitary tumor. Which finding would the nurse expect?
   - A. Polyuria
   - B. Hypertension
   - C. Polyphagia
   - D. Hyperkalemia

4. The nurse is caring for a client with a head injury who has increased ICP. The physician plans to reduce the cerebral edema by reversing dilation of cerebral blood vessels. Which physician prescription would the nurse expect to accomplish this?
   - A. Hyperventilation per mechanical ventilation
   - B. Insertion of a ventricular shunt
   - C. Furosemide (Lasix)
   - D. Solu medrol
5. A client is admitted with Parkinson's disease. The client has been taking Carbidopa/levodopa (Sinemet) for 1 year. Which clinical manifestation would be the most important to report?

- A. Dry mouth
- B. Spasmodic eye winking
- C. Dark urine
- D. Dizziness

6. The nurse caring for a client with myasthenia gravis recognizes which of the following as the priority nursing diagnosis?

- A. Risk for injury
- B. Acute pain
- C. Ineffective airway clearance
- D. Impaired mobility

7. A client with a T6 injury 6 months ago develops facial flushing and a BP of 210/106. After elevating the head of the bed, which is the most appropriate nursing action?

- A. Notify the physician.
- B. Assess the client for a distended bladder.
- C. Apply oxygen at 3 L/min.
- D. Increase the IV fluids.

8. The nurse is performing an admission history for a client recovering from a stroke. Medication history reveals the drug clopidogrel (Plavix). Which clinical manifestation alerts the nurse to an adverse effect of this drug?

- A. Epistaxis
- B. Abdominal distention
- C. Nausea
- D. Hyperactivity
9. Which assessment finding is most indicative of increased ICP in a client admitted with a basilar skull fracture?
   - A. Nausea and vomiting
   - B. Headache
   - C. Dizziness
   - D. Papilledema

10. A client with angina is experiencing migraine headaches. The physician has prescribed sumatriptan succinate (Imitrex). Which nursing action is most appropriate?
   - A. Call the physician to question the prescription order.
   - B. Try to obtain samples for the client to take home.
   - C. Perform discharge teaching regarding this drug.
   - D. Consult social services for financial assistance with obtaining the drug.

Answer Rationales

1. Answer B is correct. Vital signs correlating with increased intracranial pressure are an elevated BP with a widening pulse pressure, a slow pulse rate, and an elevated temperature with involvement of the hypothalamus. Answer C relates to hypovolemia, so it is incorrect. Answers A and D do not relate to increased intracranial pressure and are therefore incorrect.

2. Answer A is correct. Normal ICP is less than 15. 66 is a high reading, and the physician should be notified. Answer B would be the action if the reading was normal, so it is incorrect. Answers C and D would not be appropriate actions, so they are wrong.

3. Answer A is correct. Clients with diabetes insipidus have excessive urinary output due to a lack of antidiuretic hormone. Answers B, C, and D are not exhibited with diabetes insipidus, so they are incorrect.

4. Answer A is correct. Hyperventilation is utilized to decrease the PCO₂ to 27–30, producing cerebral blood vessel constriction. Answers B, C, and D can decrease cerebral edema, but not by constriction of cerebral blood vessels; therefore, they are wrong.

5. Answer B is correct. Spasmodic eye winking could indicate a toxicity or overdose and should be reported to the physician. Other signs of toxicity include involuntary twitching of muscles, facial grimaces, and severe tongue protrusion. Answers A, C, and D are incorrect because they are side effects of the drug.

6. Answer C is correct. Clients with myasthenia gravis have problems with the muscular activity of breathing. Answers A, B, and D are not the priority, so they are wrong.
7. Answer B is correct. The client is experiencing autonomic hyperreflexia, which can be caused by a full bowel or bladder. Answer A is not the appropriate action before the assessment of the bladder, so it is incorrect. There is no evidence in the stem to support the need for oxygen, so answer C is incorrect. Answer D is not appropriate at this time and might serve to further increase the BP, making it wrong.

8. Answer A is correct. Plavix is an antiplatelet. Bleeding could indicate a severe effect. Answers B, C, and D are not associated with Plavix’s undesired effects, so they are incorrect.

9. Answer D is correct. Papilledema is a hallmark symptom of increased intracranial pressure. Answers A, B, and C are not as conclusive as papilledema, so they are wrong.

10. Answer A is correct. Imitrex results in cranial vasoconstriction to reduce pain, but it can also cause vasoconstrictive effects systemically. This drug is contraindicated in clients with angina, and the physician should be notified. Answers B and D are incorrect because they are inappropriate actions from the information given. Answer C is appropriate, but answer A is most appropriate.

**Suggested Reading and Resources**

Caring for the Client with Psychiatric Disorders

Terms you'll need to understand:

✓ Anorexia nervosa  ✓ Hallucination
✓ Attention deficit hyperactive disorder ✓ Hypertensive crisis
✓ Bipolar disorder ✓ Hypochondriasis
✓ Bulimia nervosa ✓ Neuroleptic malignant syndrome
✓ Conduct disorder ✓ Neurosis
✓ Conversion ✓ Neurotransmitter
✓ Delusion ✓ Pain disorder
✓ DSM-IV-TR ✓ Personality disorder
✓ Dysthymic disorder ✓ Psychosis
✓ Electroconvulsive therapy ✓ Schizophrenia
✓ Extrapyramidal side effect ✓ Somatization disorder

Nursing skills you'll need to master:

✓ Administering medication ✓ Assessing for side effects of psychotropic drugs
✓ Performing mental status assessment ✓ Assisting with alternative therapies
✓ Maintaining a therapeutic milieu ✓ Obtaining vital signs
The past decade has been an exciting time for psychiatric nursing. Technological advances have given us the ability to study not only the physical structure of the brain, but also how chemical messengers (known as neurotransmitters) affect our mood and behavior. The depiction of the hopelessness of mental illness has been partly done away with by the release of movies like *A Beautiful Mind*. Finally, the discovery of newer and more effective drugs has made it possible for many of those with mental illness to lead more normal lives.

Although it is not possible to cover all the psychiatric disorders described in the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)*, we will review the most commonly diagnosed disorders: anxiety-related disorders, personality disorders, psychotic disorders of schizophrenia and bipolar disorder, substance abuse, and disorders of childhood and adolescence. Alzheimer's disease and other degenerative neurological disorders are discussed in Chapter 14, “Caring for the Client with Disorders of the Neurological System.”

### Anxiety-Related Disorders

These types of disorders were formerly referred to as *neurotic disorders* and include the following categories:

- Dissociative identity disorder
- Generalized anxiety disorder
- Obsessive-compulsive disorder
- Panic disorder
- Phobic disorder
- Post-traumatic disorder
- Somatoform disorder

*Anxiety disorders* are characterized by feelings of fear and apprehension accompanied by a sense of powerlessness. Anxiety-related disorders are listed on Axis I of the *DSM-IV-TR*.

### Generalized Anxiety Disorder

Generalized anxiety disorder (GAD) is the most common form of anxiety disorder and frequently is accompanied by depression and somatization or the development of phobias.

The client with GAD worries excessively over everything, and the stress this creates eventually affects every aspect of life. The client with GAD might try to gain a sense of control by retreating from anxiety-producing situations or by self-medication with drugs or alcohol.
Genetics and alterations in neurotransmitters seem to be the primary causes for GAD. Studies show a higher occurrence in those with an affected twin. Neurophysiology research suggests that alterations in serotonin, norepinephrine, and gamma-aminobutyric acid can account for some cases of generalized anxiety disorder.

**Post-traumatic Stress Disorder**

Post-traumatic stress disorder (PTSD) develops after exposure to a clearly identifiable threat. The nature of the threat is so extreme that it overwhelms the individual's usual means of coping. PTSD is characterized according to the onset as either acute or delayed. Acute PTSD occurs within 6 months of the event, whereas delayed PTSD occurs 6 months or more after the event. Symptoms of PTSD include

- Blunted emotions
- Feelings of detachment
- Flashbacks
- Moral guilt
- Numbing of responsiveness
- Survivor guilt

Additional symptoms include increased arousal, anxiety, restlessness, irritability, sleep disturbances, and problems with memory and concentration. Individuals with PTSD frequently have problems with depression and impulsive self-destructive behaviors, including suicide attempts and substance abuse. Post-traumatic stress disorder is common in survivors of combat, natural disasters, sexual assault, or catastrophic events.

**CAUTION**

Clients with PTSD who use cocaine or amphetamines are more vulnerable to paranoia and psychosis than those who do not use stimulants.

**Dissociative Identity Disorder**

Dissociative identity disorder (DID), formerly referred to as multiple personality disorder, is characterized by the existence of two or more identities or alter personalities that control the individual's behavior.
The traditional view of DID is that dissociation acts as a defense against an overwhelming sense of anxiety that is both painful and emotionally traumatic. The alter personality contains feelings associated with the trauma, which is often related to physical, emotional, or sexual abuse.

Each alter personality is different from the other, having its own name, ways of behaving, memories, emotional characteristics, and social relationships. Overwhelming psychological stress can cause the onset of a dissociative fugue. The major feature of a dissociative fugue is unexpected travel from home with the appearance of one of the alter personalities. The travel and behavior might seem normal to the casual observer who is unfamiliar with the client’s history.

NOTE

The following films offer good depictions of dissociative identity disorder: The Three Faces of Eve, Sybil, and Identity. These films are older, so you might have to check with a movie store that specializes in older films.

Somatoform Disorder

Somatoform disorder is characterized by the appearance of physical symptoms for which there is no apparent organic or physiological cause. The client with a somatoform disorder continuously seeks medical treatment for a physical complaint even though he has been told there is no evidence of physical illness. Somatoform disorders include

- Conversion disorder
- Hypochondriasis
- Pain disorder
- Somatization disorder

Panic Disorder

Panic disorder is characterized by sudden attacks of intense fear or discomfort that peaks within 10–15 minutes. Clients with panic disorder might complain of not being able to breathe, of feeling they are having a heart attack, or that they are “going crazy.” Panic attacks can occur during sleep or in anticipation of some event. In some instances, clients with panic disorder develop agoraphobia, or fear of having a panic attack in a place where they cannot escape. As a result, they restrict activities outside the safety of their home.
Genetic and environmental factors appear to be involved in the development of panic disorder. Other findings suggest that there are alterations in the benzodiazepine receptor sites.

**Phobic Disorders**

Phobic disorders are expressed as intense, irrational fears of some object, situation, or activity. A person with a phobic disorder experiences anxiety when he comes in contact with the situation or feared object. Although the client recognizes that the fear is irrational, the phobia persists. According to the DSM-IV-TR the three major categories of phobic disorders are

- Agoraphobia
- Social phobia
- Specific phobia

There are no clearly identifiable factors in the development of phobic disorders.

**Obsessive-Compulsive Disorder**

Obsessive-compulsive disorder (OCD) is characterized by the presence of recurrent persistent thoughts, ideas, or impulses and the repetitive rituals that are carried out in response to the obsession. Persons with OCD know that their actions are ridiculous; still they must carry them out to avoid overwhelming anxiety. Unfortunately, this continual preoccupation interferes with normal relationships. The client with OCD is viewed by others as rigid, controlling, and lacking spontaneity.

**NOTE**

The main character in the movie *As Good As It Gets* is an excellent example of the client with OCD. Remember what happened when his schedule was upset?

There is some evidence that OCD, like other anxiety disorders, is related to genetic transmissions or alterations in serotonin regulation.

Treatment of anxiety disorders depends on the diagnosis and severity of symptoms. Some disorders, such as panic disorder and obsessive-compulsive disorder, respond to treatment with antidepressant medication. Others, such as post-traumatic stress disorder and phobic disorder, benefit from cognitive behavioral therapy and desensitization.

Nursing interventions in caring for the client with an anxiety disorder include administering antidepressant medication, helping the client become aware of situations that increase anxiety,
helping the client recognize the overuse of certain defense mechanisms, and teaching cognitive behavioral methods for reducing anxiety.

### CAUTION

You should review your psychiatric nursing textbook for a discussion of the most commonly used defense mechanisms as well as cognitive behavioral methods used to reduce anxiety.

## Personality Disorders

The second major category of reality-based disorders focuses on the client with faulty personality development.

Unlike clients with an anxiety disorder, who believe that everything is wrong with them, clients with personality disorders seldom seek treatment. They see nothing wrong with their behavior and therefore see no need to change. Personality disorders are listed on Axis II of the *DSM-IV-TR*.

Personality disorders refer to pervasive maladaptive patterns of behavior that are evident in the perceptions, communication, and thinking of an individual. The *DSM-IV-TR* divides personality disorders into three clusters according to the predominant behaviors:

- **Cluster A**—Includes odd, eccentric behavior
- **Cluster B**—Includes dramatic, erratic, emotional behavior
- **Cluster C**—Includes anxious, fearful behavior

Of these three clusters, those with dramatic, erratic behavior pose the greatest threat to others.

Each cluster contains from three to four identifiable personality disorders. The clusters and identified personality disorders of each are outlined in the following sections.

### Cluster A

Cluster A disorders include paranoid, schizoid, and schizotypal personality disorders. Although these represent different personalities, they all involve behavior that is odd or eccentric in nature.

**Paranoid Personality Disorder**

Paranoid personality disorder is characterized by rigid, suspicious, and hypersensitive behavior. Persons with paranoid personality disorder spend a great deal of time and energy validating
their suspicions. Unlike those with paranoid schizophrenia, the client with paranoid personality does not have fixed delusions or hallucinations. However, transient psychotic features can appear when the client experiences extreme stress, and the client might be hospitalized because of uncontrollable anger toward others.

**Schizoid Personality Disorder**
This disorder is characterized by shy, aloof, and withdrawn behavior. The client with schizoid personality disorder prefers solitary activities and is often described by others as a hermit. This client might be quite successful in situations where little interaction with others is required. Although the client with schizoid personality disorder is reality oriented, she often fantasizes or daydreams.

**Schizotypal Personality Disorder**
Like schizoid personality disorder, this disorder is found more often in relatives of those with schizophrenia. Their behaviors are similar to those of the client with schizoid personality—that is, they are shy, aloof, and withdrawn. However, clients with schizotypal personality disorder display a more bizarre way of thinking. They often appear similar to clients with schizophrenia but with less frequent and less severe psychotic symptoms. Because they are sensitive to the reactions of and possible rejection by others, clients with schizotypal and schizoid behavior avoid social situations.

**Cluster B**
This disorder set includes the histrionic, narcissistic, antisocial, and borderline personality disorders. Persons with these identified disorders tend to be overly dramatic, attention seeking, and manipulative with little regard for others.

**Histrionic Personality Disorder**
This disorder is diagnosed most often in females. Sometimes referred to as *southern belle syndrome*, the picture of the histrionic female is one who is overly seductive, excitable, immature, and theatrical in her emotions. These behaviors are not genuine but are used to manipulate others. The client with histrionic personality disorder tends to form many shallow relationships that are always short lived.

**Narcissistic Personality Disorder**
This disorder is summarized by the expression “It’s all about me.” Characterized by self-absorption, persons with narcissistic personality have grandiose ideas about their wealth, power, and intelligence. They believe that they are superior to others and that, because they are superior, they are entitled to certain privileges and special treatment. Although they appear nonchalant or indifferent to the criticism of others, it is only a cover-up for deep feelings of
resentment and rage. Clients with narcissistic personality tend to rationalize or blame others for their self-centered behavior.

**Antisocial Personality Disorder**

This disorder is characterized by a pattern of disregard for the rights of others and a failure to learn from past mistakes. These clients frequently have a history of law violations, which usually begin before age 15. Common behaviors in early childhood include cruelty to animals and people, starting fires, running away from home, truancy, breaking and entering, and early substance abuse. Persons with antisocial personality disorder are often described as charming, smooth talking, and extremely intelligent—characteristics that allow them to take advantage of others and escape prosecution when caught.

Persons with antisocial personality disorder do not feel remorse for wrongs committed and respond to confrontation by using the defense mechanisms of denial and rationalization.

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**NOTE**

You might want to check out a number of older movies that depict the features of those with antisocial personality disorder. *Primal Fear* and *Monster* are good examples.

**Borderline Personality Disorder**

Borderline personality disorder, the most commonly treated personality disorder, is seen most often in females who have been victims of sexual abuse. These clients have many of the same traits as those with histrionic, narcissistic, and antisocial personality disorder; thus, they have a difficult time identifying their feelings. Like many victims of sexual abuse, this client relies on dissociation as a means of coping with stress. This dissociation results in splitting. Splitting is a very primitive defense mechanism that creates an inability to see self and others as having both good and bad qualities. Clients with borderline personality disorder tend to see themselves and others as all good or all bad. Feelings of abandonment and depression can escalate to the point of self-mutilation and suicidal behavior. These clients usually require hospitalization and treatment with antidepressant medication as well as counseling for post-traumatic stress disorder.

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**NOTE**

*Fatal Attraction* is an excellent movie for reviewing the characteristics of borderline personality disorder.

**Cluster C**

Cluster C disorders include the avoidant, dependent, and obsessive-compulsive personality disorders, which are characterized by anxious, fearful behavior.
Avoidant Personality Disorder
Avoidant personality disorder is used to describe clients who are timid, withdrawn, and hypersensitive to criticism. Although they desire relationships and challenges, clients with this disorder feel socially inadequate, so they avoid situations in which they might be rejected. They tend to lack the self-confidence needed to speak up for what they want and so are seen as helpless.

Dependent Personality Disorder
Dependent personality disorder is characterized by an extreme need to be taken care of by someone else. This dependency on others leads to clinging behavior and fear of separation from the perceived caretaker. Clients with dependent personality disorder see themselves as inferior and incompetent, and they frequently become involved in abusive relationships. These abusive relationships are usually maintained because of a fear of being left alone.

Obsessive-Compulsive Personality Disorder
This disorder describes the individual who is a perfectionist, overly inhibited, and inflexible. Clients with obsessive-compulsive personality disorder are preoccupied with rules, trivial details, and procedures. They are cold and rigid with no expression of tenderness or warmth. They often set standards too high for themselves or others to make and, because they are fearful of making mistakes, tend to procrastinate. Clients with obsessive-compulsive personality disorder put off making decisions until all the facts are in; thus, they might do good work but not be very productive.

NOTE
Although they share some common traits, obsessive-compulsive anxiety disorder and obsessive-compulsive personality disorder are two different diagnoses.

Managing Clients with Personality Disorders
The management of the client with a personality disorder depends on the diagnosis. Pharmacological interventions are generally not appropriate for these clients. However, if there is a coexisting diagnosis such as depression or anxiety, medication will be ordered. The nurse caring for the client with a personality disorder should set limits on the client’s behavior while at the same time conveying a sense of acceptance of the individual. Many clients with personality disorders have disturbed personal boundaries; therefore, it is important to maintain a professional rather than friendly relationship.
Psychotic Disorders

Psychotic disorders involve alterations in perceptions in reality. Common symptoms include hallucinations, delusions, and difficulty organizing thoughts. Psychotic symptoms are present in clients with schizophrenia, bipolar disorder, dementia, and drug intoxication or withdrawal. This section reviews two of the most common psychotic disorders: schizophrenia and bipolar disorder. Psychosis associated with drug use and withdrawal is covered later in the chapter.

Schizophrenia

This disorder is most often diagnosed in late adolescence or early adulthood, although symptoms might have been present at a much earlier age. The disorder equally affects both males and females; however, males seem to have an earlier onset of symptoms. Theories offered regarding the cause of schizophrenia include genetics, environmental factors, and biological alterations in the neurotransmitters serotonin and dopamine.

Clients with schizophrenia are best known for their odd appearance and behavior, which are sometimes summarized by the 4 A’s. The 4 A’s include:

- **Affect**—Described as flat, blunted, or inappropriate
- **Autism**—Preoccupation with self and a retreat into fantasy
- **Association**—Loosely joined unrelated topics
- **Ambivalence**—Having simultaneous opposing feelings

The *DSM-IV-TR* classifies schizophrenia into subtypes based on the client’s history and presenting symptoms:

- Catatonic
- Disorganized
- Paranoid
- Residual
- Undifferentiated

In addition to the subtypes, schizophrenia is classified as having either positive or negative symptoms. *Positive* symptoms of schizophrenia are those such as delusions and hallucinations; *negative* symptoms are those such as social withdrawal and failure to communicate with others. One of the main differences in the newer antipsychotic medications is that they work on both the negative as well as the positive symptoms of schizophrenia. The older medications worked primarily on clearing the hallucinations and delusions.
Psychotic Disorders

Nursing interventions in the care of the client with schizophrenia include:

- Providing a quiet, supportive environment
- Establishing a trusting relationship
- Administering antipsychotic medication
- Observing for side effects of antipsychotic medication
- Assisting with the activities of daily living
- Attending to the client’s physical needs, including nutrition and hydration

Instead of allowing the client to retreat to his room, the nurse should provide simple recreational activities such as painting.

**NOTE**

You might want to refer to your nursing textbook for a more complete description of the subtypes and symptoms associated with positive and negative schizophrenia. Although there are overlapping symptoms, some have unique features. For instance, the client with catatonic schizophrenia exhibits waxy flexibility or stupor.

The nurse shouldn’t argue or try to change the client’s delusional thinking; instead, redirecting the client to a reality-based subject will be more effective and less upsetting. In instances where the client is having hallucinations, the nurse should respond to the client’s feelings and at the same time reinforce what is real. For example, the nurse should acknowledge the client’s fear at hearing voices when no one is there but then point out that the voices are not real and that the medication will soon help eliminate the voices.

The discovery of newer, more effective medications in the past decade has enabled many persons with schizophrenia to remain in their homes and communities for longer periods of time than the older medications. These medications are often referred to as atypical or novel antipsychotics. Atypical antipsychotics, such as risperidone, can be given in smaller doses, produce fewer side effects, and help manage the negative symptoms of schizophrenia more effectively than the older antipsychotics (such as chlorpromazine).
Schizophrenia is a chronic illness and, although the medications improve the client’s quality of life, they do not cure the disease. The prognosis for the client with schizophrenia is based on the subtype, severity of symptoms, and compliance with treatment.

**Bipolar Disorders**

This refers to a group of psychotic disorders that are evident in extreme changes in mood or affect. These disorders, like schizophrenia, are believed to be caused by alterations in serotonin, dopamine, and norepinephrine. Most clients with bipolar disorder have the type known as *bipolar I*, in which the client experiences periods of acute mania and major depression.

**Acute Mania**

Manic episodes are essential to a diagnosis of bipolar I disorder. During a manic episode, the client experiences profound changes in mood. These mood changes are described as elevated, expansive, or irritable. Additional symptoms associated with acute mania include

- Delusions of grandeur
- Flight of ideas
- Increased motor activity
- Increased risk taking and promiscuity

Schizophrenia is a chronic illness and, although the medications improve the client’s quality of life, they do not cure the disease. The prognosis for the client with schizophrenia is based on the subtype, severity of symptoms, and compliance with treatment.

**NOTE**

The mainstay in the management of the client with schizophrenia is medication. Refer to the chapter on psychopharmacology in your psychiatric nursing textbook for more information on the typical and atypical antipsychotics.

**CAUTION**

Antipsychotic medication carries the risk of neuroleptic malignant syndrome, a potentially fatal adverse reaction. Symptoms of neuroleptic malignant syndrome include malignant hyperthermia or extreme temperature elevation, in some instance as high as 107° F. The medication should be immediately discontinued and an antiparkinsonian medication given.

**CAUTION**

Older antipsychotic medications have many side effects and adverse reactions associated with their use, including extrapyramidal effects. Some of these are severe enough to warrant discontinuing the drug and administering medication to reverse their effects.
Psychotic Disorders

- Use of profanity
- Uncontrolled spending
- Failing to sleep or eat for long periods of time

When limitations are placed on the client’s behavior, he typically reacts with sarcasm and belligerence.

Nursing interventions for clients with acute mania include providing a quiet, nonstimulating environment and protecting them from physical exhaustion. Most will have weight loss due to their excessive activity; therefore, nutritional needs can best be met by providing high-calorie, high-protein finger foods and snacks that can be eaten while moving about. Nursing interventions also include the administration of medications to stabilize the mood. Medications commonly used as mood stabilizers include lithium, valproic acid, and carbamezepine. Olanzapine, an atypical antipsychotic, has also been shown to be effective in treating clients with acute mania.

**CAUTION**

Lithium is not a drug, but a mineral that stabilizes the mood of the client with acute mania. During the initiation of lithium therapy, lithium levels should be drawn twice weekly and then every 2–3 months during long-term therapy.

The therapeutic range for lithium is 0.5–1.5 meq/liter.* Lithium levels greater than 1.5 meq/liter can produce signs of toxicity that can be fatal. Symptoms of lithium toxicity include muscle weakness, confusion, ataxia, seizures, cardio-respiratory changes, and multiple organ failure. A standard treatment for lithium toxicity is the administration of intravenous normal saline.

*The therapeutic range for lithium may vary slightly according to laboratory methods used.

**Major Depression**

Major depression, the other side of bipolar I disorder, is characterized by a depressed mood lasting at least two weeks. Symptoms of major depression include feelings of worthlessness, diminished ability to concentrate, anorexia, sleep disturbances, and recurrent thoughts of death or suicide. A diagnosis of mental disorder or substance abuse is among the most significant risk factors for suicide.

**CAUTION**

The depressed client should be assessed for the presence of suicidal ideation and suicidal plan. Harmful objects should be removed from the client’s environment, and the client should be placed on basic suicide precautions with constant observation by the nursing staff. The nurse must remember that the greatest risk for suicide exists when the client seems to be improving.
Nursing interventions for the client with major depression include providing a safe environment, meeting the client's physiological needs, reinforcing the client's sense of worth, assisting with electroconvulsive therapy, and administering antidepressant medications. Currently, the most frequently prescribed antidepressants are selective serotonin reuptake inhibitors (SSRIs). Less frequently prescribed medications include monoamine oxidase inhibitors (MAOIs) and tricyclic antidepressants (TCAs).

**CAUTION**

The use of SSRIs with MAOIs, selective MAOIs, tryptophan, and St. John's wort is contraindicated. Serotonin syndrome, a potentially fatal condition, can occur as a result of drug interaction. Symptoms of serotonin syndrome include confusion, hypomania, agitation, hyperthermia, hyperreflexia, tremors, rigidity, and gastrointestinal upset. The medication should be discontinued immediately. The physician will order medication to block the serotonin receptors, and artificial ventilation might be required. Most clients show improvement within 24 hours of discontinuing the SSRI.

### Substance Abuse

Substance abuse is defined as the excessive use of a drug that is different from societal norms. These drugs can be illegal, as in the case of heroin, or legal, as in the case of alcohol or prescription drugs. Symptoms of substance abuse include

- Absenteeism
- Decline in school or work performance
- Frequent accidents
- Increased isolation
- Slurred speech
- Tremors

The primary substance abuse problem in the United States is alcohol addiction.

### Alcoholism

Alcoholism is responsible for more than 100,000 deaths each year in the United States. Many of these deaths are the result of accidents. Premature death from cirrhosis, cardiovascular disease, esophageal varices, and cancer has also been linked to heavy alcohol consumption. It is
important for the nurse to recognize the stages of alcohol withdrawal to keep the client safe. Symptoms of withdrawal usually begin about 6–8 hours after the client’s last drink, or when the amount consumed is less than usual. Four stages of alcohol withdrawal are generally recognized. The stages of withdrawal and the symptoms associated with each stage are as follows:

- **Stage 1 (6–8 hours after last use)**—Symptoms include anxiety, anorexia, tremors, nausea and vomiting, depression, headache, increased blood pressure, tachycardia, and profuse sweating.

- **Stage 2 (8–12 hours after last use)**—Symptoms include confusion, disorientation, hallucinations, hyperactivity, and gross tremors.

- **Stage 3 (12–48 hours after last use)**—Symptoms include severe anxiety, increased blood pressure, profuse sweating, severe hallucinations, and grand mal seizures.

- **Stage 4 (3–5 days after last use)**—Symptoms of delirium tremens include confusion, insomnia, agitation, hallucinations, and uncontrolled tachycardia. In spite of treatment, the client might die from cardiac complications.

**NOTE**

Although each stage has an expected timeframe and behaviors during the withdrawal, you should keep in mind that withdrawal is highly individual.

**TIP**

The Addiction Research Foundation Chemical Institute Withdrawal Assessment-Alcohol (CIWA-Ar) is a useful instrument for quickly assessing the client’s withdrawal status (see Figure 15.1).

Nursing interventions for the client with alcohol withdrawal include maintaining a safe environment, providing nutritional supplements, providing additional fluids to prevent dehydration, and administering pharmacological agents to prevent delirium tremens.

**CAUTION**

The nurse should teach the client taking Antabuse (disulfiram) to avoid alcohol or substances containing alcohol. Contact with alcohol while taking Antabuse (disulfiram) can produce headache, nausea and vomiting, tachycardia, chest pain, convulsions, cardio-respiratory collapse, and death.
Assessment of Alcohol Withdrawal

**Patient: _______________________________**

**Date: _______________________________**

**Time: _______________________________**

**Blood pressure: _______________________________**

**Pulse or heart rate, taken for one minute: _______________________________**

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**Nausea and vomiting.** Ask “Do you feel sick to your stomach? Have you vomited?”

**Observation:**
- 0—No nausea and no vomiting
- 1—Mild nausea with no vomiting
- 2—
- 3—
- 4—Intermittent nausea with dry heaves
- 5—
- 6—
- 7—Constant nausea, frequent dry heaves, and vomiting

**Tremor.** Ask patient to extend arms and spread fingers apart.

**Observation:**
- 0—No tremor
- 1—Tremor not visible but can be felt, fingertip to fingertip
- 2—
- 3—
- 4—Moderate tremor with arms extended
- 5—
- 6—
- 7—Severe tremor, even with arms not extended

**Paroxysmal sweats.**

**Observation:**
- 0—No sweat visible
- 1—Barely perceptible sweating; palms moist
- 2—
- 3—
- 4—Beads of sweat obvious on forehead
- 5—
- 6—
- 7—Drenching sweats

**Anxiety.** Ask “Do you feel nervous?”

**Observation:**
- 0—No anxiety (at ease)
- 1—Mildly anxious
- 2—
- 3—
- 4—Moderately anxious or guarded, so anxiety is inferred
- 5—
- 6—
- 7—Equivalent to acute panic states as occur in severe delirium or acute schizophrenic reactions

**Agitation.**

**Observation:**
- 0—Normal activity
- 1—Somewhat more than normal activity
- 2—
- 3—
- 4—Moderately fidgety and restless
- 5—
- 6—
- 7—Paces back and forth during most of the interview or constantly thrashes about

---

**Tactile disturbances.** Ask “Do you have any itching, pins-and-needles sensations, burning, or numbness, or do you feel like bugs are crawling on or under skin?”

**Observation:**
- 0—None
- 1—Very mild itching, pins-and-needles sensation, burning, or numbness
- 2—Mild itching, pins-and-needles sensation, burning, or numbness
- 3—Moderate itching, pins-and-needles sensation, burning or numbness
- 4—Moderately severe hallucinations
- 5—Severe hallucinations
- 6—Extremely severe hallucinations
- 7—Continuous hallucinations

**Auditory disturbances.** Ask “Are you more aware of sounds around you? Are they harsh? Do they frighten you? Are you hearing anything that is disturbing to you? Are you hearing things you know are not there?”

**Observation:**
- 0—Not present
- 1—Very mild harshness or ability to frighten
- 2—Mild harshness or ability to frighten
- 3—Moderate harshness or ability to frighten
- 4—Moderately severe hallucinations
- 5—Severe hallucinations
- 6—Extremely severe hallucinations
- 7—Continuous hallucinations

**Visual disturbances.** Ask “Does the light appear to be too bright? Is its color different? Does it hurt your eyes? Are you seeing anything that is disturbing to you? Are you seeing things you know are not there?”

**Observation:**
- 0—Not present
- 1—Very mild sensitivity
- 2—Mild sensitivity
- 3—Moderate sensitivity
- 4—Moderately severe hallucinations
- 5—Severe hallucinations
- 6—Extremely severe hallucinations
- 7—Continuous hallucinations

**Headache, fullness in head.** Ask “Does your head feel different? Does it feel like there is a band around your head?”

Do not rate for dizziness or lightheadedness; otherwise, rate severity.

- 0—Not present
- 1—Very mild
- 2—Mild
- 3—Moderate
- 4—Moderately severe
- 5—Severe
- 6—Very severe
- 7—Extremely severe

**Orientation and clouding of sensorium.** Ask “What day is this? Where are you? Who am I?”

**Observation:**
- 0—Oriented and can do serial additions
- 1—Cannot do serial additions or is uncertain about date
- 2—Date disorientation by no more than two calendar days
- 3—Date disorientation by more than two calendar days
- 4—Disoriented for place and/or person

Total score: _______ (maximum = 67); _______ Rater’s initials _______

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**FIGURE 15.1** Clinical Institute Withdrawal Assessment for Alcohol (CIWA-Ar) scale.
Other Commonly Abused Substances

Other commonly abused substances include sedative-hypnotics, opiates, stimulants, hallucinogens, and cannabis. Tables 15.1–15.5 list the signs of use, signs of withdrawal, signs of overdose, and treatments for several of these substances.

Sedative-Hypnotics

Sedative-hypnotics are potent central nervous system depressants. This group, which includes barbiturates and benzodiazepines, is capable of producing both physiological and psychological dependence. Drugs in this category are regulated by the Controlled Substances Act. Table 15.1 highlights important signs and treatments related to clients abusing sedative-hypnotic drugs.

**TABLE 15.1 Signs and Treatments Related to Sedative-Hypnotic Abuse**

<table>
<thead>
<tr>
<th>Signs of use</th>
<th>Slurred speech, unsteady gait, drowsiness, decreased blood pressure, irritability, inability to concentrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signs of withdrawal</td>
<td>Nausea and vomiting, tachycardia, diaphoresis, tremors, and seizures</td>
</tr>
<tr>
<td>Signs of overdose</td>
<td>Cardiovascular and respiratory depression, seizures, shock, coma, death</td>
</tr>
<tr>
<td>Treatment of overdose</td>
<td>Activated charcoal and gastric lavage, mechanical ventilation and dialysis as needed</td>
</tr>
</tbody>
</table>

**CAUTION**

Withdrawal from barbiturates should be done by slow taper to avoid fatal seizures.

Opiates

This refers to a group of drugs used for their analgesic effects. These drugs include the natural opiates morphine and codeine as well as synthetic opiates such as meperidine and methadone. Opiates produce both physiological and psychological addiction. One of the most abused opiates, heroin, has no legal medical use. Others are regulated by the Controlled Substances Act. Table 15.2 highlights signs and treatments related to clients abusing opiates.

**TABLE 15.2 Signs and Treatments Related to Opiate Abuse**

<table>
<thead>
<tr>
<th>Signs of use</th>
<th>Constricted pupils, decreased respirations, decreased blood pressure, euphoria, impaired attention span, impaired judgment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signs of withdrawal</td>
<td>Anorexia, irritability, runny nose, nausea, bone pain, chills</td>
</tr>
<tr>
<td>Signs of overdose</td>
<td>Dilated pupils, respiratory depression, seizures, coma, death</td>
</tr>
<tr>
<td>Treatment of overdose</td>
<td>Narcan (a narcotic antagonist that reverses the central nervous system depression)</td>
</tr>
</tbody>
</table>
Stimulants
Stimulants excite various areas of the central nervous system. Some stimulants, such as the amphetamine and nonamphetamine groups, are used to treat attention deficit hyperactivity disorder and weight loss. Cocaine is used to control local bleeding and is an ingredient in some eye medications. Others, such as caffeine and alcohol, are widely accepted for social use. Stimulants are physiologically addicting; therefore, the more potent ones are regulated by the Controlled Substances Act. Table 15.3 highlights signs and treatments related to clients abusing stimulants.

<table>
<thead>
<tr>
<th>Table 15.3</th>
<th>Signs and Treatments Related to Stimulant Abuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signs of use</td>
<td>Euphoria, grandiosity, dilated pupils, tachycardia, elevated blood pressure, nausea and vomiting, paranoia, hallucinations, violent outbursts</td>
</tr>
<tr>
<td>Signs of withdrawal</td>
<td>Agitation, disorientation, insomnia, depression, suicidal ideation</td>
</tr>
<tr>
<td>Signs of overdose</td>
<td>Ataxia, hyperpyrexia, respiratory distress, seizures, cardiovascular collapse, coma, death</td>
</tr>
<tr>
<td>Treatment of overdose</td>
<td>Provide respiratory and cardiac support, treatment of hyperpyrexia and seizures</td>
</tr>
</tbody>
</table>

Hallucinogens
Hallucinogens are capable of distorting perceptions of reality. Hallucinogens include those that occur naturally, such as mescaline and psilocybin, as well as those that are synthetically produced, such as LSD. There is no evidence of physiological dependence with hallucinogens; however, they can produce tolerance and psychological dependence. Table 15.4 highlights signs and treatments related to clients abusing hallucinogens.

<table>
<thead>
<tr>
<th>Table 15.4</th>
<th>Signs and Treatments Related to Hallucinogens Abuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signs of use</td>
<td>Dilated pupils, tachycardia, diaphoresis, irregular eye movement, grandiosity, hallucinations</td>
</tr>
<tr>
<td>Signs of withdrawal</td>
<td>None known</td>
</tr>
<tr>
<td>Signs of overdose</td>
<td>Psychosis, possible hypertensive crisis, hyperthermia, seizures</td>
</tr>
<tr>
<td>Treatment of overdose</td>
<td>Provide a quiet environment and sedation for anxiety</td>
</tr>
</tbody>
</table>

Cannabis
Cannabis ranks second among the drugs abused in the United States. Marijuana, which is composed of the dried leaves, stems, and flowers, is the most prevalent cannabis preparation. Hashish is derived from the flowering tops of the plant. Medical uses for marijuana include the management of glaucoma, treatment of the nausea that accompanies cancer therapy, and an appetite stimulant for clients with AIDS-related anorexia. Physical dependence and tolerance have been found in chronic users. Table 15.5 highlights signs and treatments related to clients abusing cannabis.
TABLE 15.5 Signs and Treatments Related to Cannabis Abuse

<table>
<thead>
<tr>
<th>Signs of use</th>
<th>Signs of withdrawal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tachycardia, increased appetite, euphoria, slowed perception of time</td>
<td>Irritability, restlessness, insomnia, tremors, sweating, gastrointestinal upset</td>
</tr>
<tr>
<td>Signs of overdose</td>
<td>Fatigue, paranoia, psychosis</td>
</tr>
<tr>
<td>Treatment of overdose</td>
<td>Treatment of presenting symptoms</td>
</tr>
</tbody>
</table>

Disorders of Childhood and Adolescence

These disorders refer to the emotional and behavioral alterations that become evident in the early years of life. In this section, we review four of these disorders:

- Conduct disorder
- Oppositional defiant disorder
- Attention deficit hyperactive disorder
- Eating disorders

Other emotional disorders, such as major depression and schizophrenia, were covered in previous sections of this chapter.

Conduct Disorder

Conduct disorder is characterized by persistent patterns of behavior in which the rights of others are violated. Early in life, some say by the age of 3, the child with conduct disorder is observed to be cruel and physically aggressive with people and animals. The child later develops antisocial behavior that includes destruction of property, truancy, and substance abuse. When confronted with their behavior, children with conduct disorder show a lack of guilt or remorse and frequently blame others for their acts. Conduct disorder gives way to an adult diagnosis of antisocial personality disorder.

Oppositional Defiant Disorder

Oppositional defiant disorder is characterized by persistent patterns of negativistic, hostile, and defiant behavior. Unlike the child with conduct disorder, the child with oppositional defiant disorder does not violate the rights of others. The behaviors of the child diagnosed with oppositional defiance are more likely to be argumentative, uncooperative, annoying, and spiteful.
Attention Deficit Hyperactive Disorder

Attention deficit hyperactive disorder (ADHD) is characterized by persistent patterns of hyperactivity, impulsivity, and inattention. The disorder, which is more common in boys, often goes unrecognized until the child enters school. The child with ADHD typically has problems following directions and lacks the attention necessary to complete assigned tasks. Theories as to the cause of ADHD include genetics, exposure to environmental lead, dietary influences, and alterations in dopamine and norepinephrine levels. Impairments in social, academic, and occupational functioning are common in those with ADHD.

The approach to the treatment of ADHD is threefold. Children with ADHD need counseling to help them develop positive self-esteem and gain the social skills necessary for making and keeping friends. These children also need educational interventions to help them succeed in school. Finally, children with ADHD can benefit from medication that helps control the symptoms of the disorder.

Eating Disorders

Eating disorders refer to the separate disorders of anorexia nervosa and bulimia nervosa. Both disorders, which are more common in females, have increased in incidence in the past three decades.

Anorexia Nervosa

Anorexia nervosa is defined as a morbid fear of obesity characterized by a preoccupation with food while refusing to eat. The client with anorexia nervosa sustains significant weight loss through strict dieting, excessive exercising, self-induced vomiting, and the abuse of laxatives and diuretics.

Bulimia Nervosa

Bulimia nervosa is characterized by the uncontrolled compulsive ingestion of enormous amounts of food in a short period of time. High-calorie, high-carbohydrate snacks that can be ingested quickly are preferred. The binging episode, which occurs in secret, is followed by feelings of guilt that are relieved only by a period of purging.

Nursing interventions for the client with an eating disorder include stabilizing the client's physical condition. Complications from fluid and electrolyte imbalance and muscle wasting are often life-threatening. When the client's physical condition is stable, treatment modalities using behavior modification, individual therapy, and family therapy are begun. Although there are no specific medications to treat eating disorders, selective serotonin reuptake inhibitors have been effective in treating bulimia nervosa.
Diagnostic Tests for Review

The diagnostic tests for a client admitted with a psychiatric diagnosis include many of the tests used for clients with any hospital admission. Other tests are necessary for monitoring the client's response to certain medications. For example, the client with lithium will continue to show signs of mania until a therapeutic level is reached. Some of the diagnostics requested for the client on a behavioral health unit include

- CBC
- Complete metabolic panel
- Lithium level
- Urinalysis

Pharmacology Categories for Review

The client with a psychiatric diagnosis usually receives one or more of the psychotropic medications. Some conditions, such as ADHD, are treated with central nervous system stimulants or antidepressants. The categories of psychotropic medications commonly prescribed are

- Anticonvulsants
- Antidepressants
- Antipsychotics
- Mood stabilizers
- Selective norepinephrine reuptake inhibitors (ADHD)
- Stimulants (ADHD)
Exam Prep Questions

1. A client with paranoid personality disorder monopolizes group activities with complaints that the staff is out to get him. The nurse should:
   - A. Point out that his suspicions are unfounded.
   - B. Ask the client to return to his room for awhile.
   - C. Tell the client that he is upsetting others.
   - D. Talk with the client in a nonchallenging manner.

2. The nurse is caring for a preschool-aged child admitted with a diagnosis of suspected child abuse. During painful procedures, the child remains quiet and watchful. When planning the care of a victim of child abuse, the nurse should give priority to:
   - A. Arranging playtime with same-age children.
   - B. Scheduling the same caregiver each day.
   - C. Asking how the injury occurred.
   - D. Praising the child for grown-up behavior.

3. An adolescent hospitalized with conduct disorder has been seen taking items from the nurse’s station. The most therapeutic response by the nurse would be to:
   - A. Confront the client with his behavior and maintain limit setting.
   - B. Request stimulant medication to control his behavior.
   - C. Recognize that the client is not responsible for his actions.
   - D. Tell the client he will be punished for stealing.

4. The nurse is preparing to discharge a client who is receiving Nardil. The nurse should tell the client to:
   - A. Wear protective clothing and sunglasses outside.
   - B. Avoid medications containing pseudoephedrine.
   - C. Drink six to eight glasses of water a day.
   - D. Avoid foods that are high in purine.
5. The nurse caring for a client with mania understands that the client's behavior is a way of avoiding feelings of despair. The expression of behaviors opposite to those being experienced is an example of which defense mechanism?  
   ○ A. Conversion  
   ○ B. Splitting  
   ○ C. Sublimation  
   ○ D. Reaction formation

6. The morning staff of an inpatient psychiatric unit has just completed the change of shift report. The nurse should give priority to assessing the client:  
   ○ A. With schizophrenia having auditory hallucinations  
   ○ B. Scheduled for electroconvulsive therapy  
   ○ C. With a lithium level of 1.8 meq/L  
   ○ D. Receiving chlorpromazine with a WBC of 7,500

7. A client taking Zoloft tells the nurse that she has also been taking St. John's wort. The nurse should report this information to the doctor because:  
   ○ A. The two substances have opposing effects.  
   ○ B. The amount of medication may be reduced.  
   ○ C. Herbals only provide a placebo effect.  
   ○ D. It will be necessary to increase the dosage.

8. The nurse is observing the movements of a client receiving Thorazine. The client continually paces and rocks back and forth when sitting. The nurse recognizes that the client is experiencing:  
   ○ A. Oculogyric crisis  
   ○ B. Akathisia  
   ○ C. Dystonia  
   ○ D. Bradykinesia
9. Which nursing diagnosis is least likely to apply to the client admitted with a diagnosis of borderline personality disorder?

- A. Risk for self-injury
- B. Identity disturbance
- C. Self-esteem disturbance
- D. Sensory-perceptual alteration

10. A client addicted to morphine is being treated for withdrawal symptoms. The drug commonly administered for opiate withdrawal is:

- A. Tranxene
- B. Methadone
- C. Narcan
- D. Antabuse

**Answer Rationales**

1. Answer D is correct. One of the most therapeutic actions the nurse can take with the paranoid client is to spend time with him but not challenge his delusions. Answer A would challenge his delusions and make him more convinced that he is right, so it is incorrect. Answers B and C would isolate the client and increase his paranoid thinking, so they’re incorrect.

2. Answer B is correct. Assigning a consistent caregiver will best meet the child’s need for safety and security. Playtime will be therapeutic for the child, but it does not have to be with same-age children, so answer A is incorrect. Answer C is too threatening to the child who has been abused, so it is incorrect. Answer D does not allow the child the chance to respond in an expected way, so it is incorrect.

3. Answer A is correct. Management of the client with conduct disorder includes explaining the rules of the unit and maintaining limits on behavior. There is a loss of privileges if the client continues to violate unit rules. Answer B is incorrect because stimulants do not control antisocial behavior. The client with conduct disorder is responsible for his actions; therefore, answer C is incorrect. Answer D is threatening, so it is incorrect.

4. Answer B is correct. Drug interactions between an MAOI and pseudoephedrine can result in hypertensive crisis. Answer A refers to the client receiving antipsychotic medications such as Thorazine, so it is incorrect. Answers C and D do not apply to MAOIs, so they are incorrect.

5. Answer D is correct. Reaction formation is the outward expression of feelings that are opposite to those experienced. Answer A refers to the development of physical symptoms in response to inner conflict, so it is incorrect. Answer B refers to the defense mechanism used by those with borderline personality disorder, so it is incorrect. Answer C is incorrect because it’s the channeling of unacceptable thoughts and behaviors into socially acceptable behaviors.
6. Answer C is correct. The client's lithium level is in the toxic range. Answers A and B should be seen next therefore they are incorrect. Answer D has a normal WBC and can be seen last, so it is incorrect.

7. Answer B is correct. St. John's wort has an antidepressant effect so it might be necessary to reduce the current medication dosage. Answers A, C, and D are incorrect statements, so they're incorrect.

8. Answer B is correct. The client's movements are an example of akathesia. Answers A, C, and D are also extrapyramidal side effects of Thorazine, but they involve different movements, so they're incorrect.

9. Answer D is correct. The client with borderline personality is least likely to have sensory-perceptual alteration. Answers A, B, and C do apply to the client with borderline personality disorder, so they're incorrect.

10. Answer B is correct. Methadone is given for the treatment of opiate withdrawal. Answer A is given for the treatment of alcohol withdrawal, so it's incorrect. Answer C is given for opiate and narcotic overdose, so it is incorrect. Answer D is aversive therapy for the treatment of alcoholism, so it's incorrect.

Suggested Reading and Resources

Caring for the Maternal/Infant Client

Terms you'll need to understand:

✓ Abortion
✓ Alpha-fetoprotein
✓ Amenorrhea
✓ Braxton Hicks contractions
✓ Caput succedaneum
✓ Cervix
✓ Cesarean section
✓ Chadwick's sign
✓ Colostrum
✓ Condylomata acuminata
✓ Contraception
✓ Decelerations
✓ Disseminated intravascular coagulation
✓ Dystocia
✓ Ectopic pregnancy
✓ Epidural anesthesia
✓ Estriol
✓ Fetal monitoring
✓ Fundus
✓ Goodell's sign
✓ Gravida
✓ Hegar's sign
✓ HELLP
✓ Herpes
✓ Human papillomavirus (HPV)
✓ Hydatidiform mole
✓ Hyperbilirubinemia
✓ Hyperemesis gravidarum
✓ Isoimmunization
✓ Leopold's maneuvers
✓ Linea nigra
✓ McDonald's sign
✓ Multigravida
✓ Nagel's rule
✓ Nullipara
✓ Oligohydramnios
✓ Oxytocin
✓ Papanicolaou smear
✓ Para
✓ Pica
✓ Polyhydramnios
✓ Preeclampsia
✓ Premature rupture of membranes
✓ Preterm labor
✓ Prostaglandin
✓ Pulmonary surfactant
✓ Rubella
✓ Sexually transmitted infections
✓ TORCH
✓ Toxic Shock Syndrome
✓ Toxoplasmosis
✓ Ultrasonography
✓ Wharton's jelly

Nursing skills you'll need to master:

✓ Performing pediatric heelstick
✓ Checking for cervical dilation
✓ Performing fetal monitoring
This chapter focuses on the health needs of the obstetric client and newborn. Methods of birth control, prenatal care, and diseases affecting women are also discussed. After reviewing this chapter, the nurse should be able to answer commonly asked questions and provide teaching for the client and family.

**Signs of Pregnancy**

Signs of pregnancy include presumptive signs, probable signs, and positive signs. *Presumptive* signs are subjective and can be associated with some other gynecological alteration. *Probable* signs can be documented and are more conclusive; however, these signs can also be associated with conditions other than pregnancy. *Positive* signs establish the diagnosis of pregnancy.

**Presumptive Signs**

Presumptive signs of pregnancy are those signs and symptoms that lead the client to believe she is pregnant but that are not conclusive. Symptoms that make the client suspect pregnancy include

- Amenorrhea
- Breast sensitivity
- Chadwick’s sign
- Fatigue
- Fingernail changes
- Urinary frequency
- Weight gain

**Probable Signs**

Probable signs of pregnancy are more conclusive than presumptive signs, but are still not definitive. Even though the client believes she is pregnant, more tests should be done to determine if pregnancy exists. The probable signs of pregnancy are

- Ballottement
- Chadwick’s sign
- Goodell’s sign
- Hegar’s sign
Positive Signs

There are only three definite signs of pregnancy. These signs are:
- Fetal heart tones
- Leopold’s maneuver
- Ultrasound of the fetal outline

Prenatal Care

Early prenatal care provides the nurse the opportunity to teach the client and family members. Systematic physical exam and health history provide information needed to treat and prevent fetal anomalies. Screening tests are performed during the prenatal visit to detect diseases that affect the mother and fetus. It has been found that the earlier the pregnant client begins to visit the doctor, the better the outcome for the mother and newborn. In this section, you will discover prenatal topics and information that might be tested on the NCLEX exam.

Prenatal Diet and Weight Maintenance

During the prenatal period, the nurse should encourage the client to eat foods high in vitamins and minerals. A weight gain of approximately 36 pounds is allowable, and weight reduction during pregnancy is generally discouraged. Prior to pregnancy, the client should be encouraged to increase the intake of foods high in vitamins such as B9 (folic acid). The ingestion of folic acid has been credited to a reduction of neural tube defects. Prenatal diagnostic studies can be performed to detect neural tube defects and other conditions.

Alpha-Fetoprotein Screening

Alpha-fetoprotein levels can be done on mother’s blood between 16 and 20 weeks gestation. Alpha-fetoprotein levels are considered a screening tool and are not diagnostic. This level can be tested by obtaining a blood sample from the mother. Alpha-fetoprotein is a glucoprotein produced by the fetal yolk sac, gastrointestinal tract, and liver. This protein passes through the placenta to the maternal circulation and is excreted through fetal circulation and into the mother’s circulation. Normal ranges for each week of pregnancy are measured.
If abnormal levels are detected, an amniocentesis should be performed. An amniocentesis can be performed as early as 16 weeks gestation. An ultrasound exam of the uterus is performed prior to the amniocentesis to locate the placenta and the pockets of amniotic fluid. The client having an abdominal ultrasound is instructed to drink large amounts of fluids to fill the bladder and not to void until after the ultrasound exam. When the fetus is visualized and pockets of amniotic fluid are found, the client is instructed to void. When an amniocentesis is performed a sample of amniotic fluid is then removed using a large bore needle. The client is instructed to remain in the clinic for approximately 2 hours and to report any bleeding or cramping.

**NOTE**

The client having an amniocentesis prior to 20 weeks gestation should be instructed not to void until after the amniocentesis. A full bladder helps to push the uterus up in the abdominal cavity, thereby providing access to pockets of amniotic fluid. After 20 weeks, the client should be asked to void prior to the amniocentesis because there is an increased risk of damaging the bladder with the amniocentesis needle.

Note that clients having a vaginal ultrasound should be instructed to void prior to the exam. Please note that this is different than the preparation for a client having an abdominal ultrasound.

**Other Prenatal Diagnostic Tests**

Many other diagnostic studies can also be done from examination of amniotic fluid. Although amniocentesis is an invasive procedure with risk, the benefits of early diagnosis are many. Following the amniocentesis, the client should be told to report any cramping or bleeding and avoid lifting objects heavier than 5 pounds for several days. Some of the tests that can be performed on the amniotic fluid are lecithin/sphingomyelin (L/S) ratios, which detect lung maturity; estriol levels, which indicate fetal distress; and creatinine levels, which indicate renal function. Teratogenic effects of drugs and disease can also be detected by checking the amniotic fluid. Some examples of teratogenic agents are

- Accutane
- Alcohol
- Cytomegalovirus
- Herpes
- LSD
- Rubella virus
- Syphilis
- Tetracycline
- Toxoplasmosis
Signs of Complications of Pregnancy

Assessing Fetal Heart Tones

The fetal heart tone should be checked frequently to measure the viability and status of circulating blood to the fetus. This noninvasive technique can be obtained by use of a fetoscope or tocomonitor.

Fetal heart tones can be heard with a fetoscope at approximately 18–20 weeks and with a Doppler ultrasound at approximately 12 weeks.

Ultrasonography

Ultrasonography is done to determine fetal age and can be a useful tool in determining fetal abnormalities. If a vaginal ultrasound is performed, the client is instructed to void prior to the test. If an abdominal ultrasound is performed, the client is instructed not to void until after the test.

Signs of Complications of Pregnancy

There are many complications of pregnancy. The nurse should instruct the client to report to a doctor if she has any of the following symptoms:

- **Persistent vomiting**—Hyperemesis gravidarum (nausea and vomiting after the first trimester) can lead to fluid and electrolyte imbalances.

- **Vaginal bleeding**—Can be an indication of placenta previa (placenta over cervix, which produces painless bleeding), abruptio placenta (separation of the placenta before the third stage of labor, which produces painful bleeding), or a threatened abortion.

- **Abdominal pain**—Can indicate a threatened abortion, an ectopic pregnancy (pregnancy outside the body of the uterus; if it ruptures, peritonitis results), or abruptio placenta.

- **Incompetent cervix**—Causes a spontaneous abortion. This problem is corrected by performing a McDonalds’, cerclage, or Shirodkar procedure to close the cervix.

- **Vertigo, headache, or edema of the hands and face**—Can indicate preeclampsia.

- **Premature rupture of membranes**—Can indicate premature labor and lead to infections.

- **Chills and fever**—Can be an indication of a urinary tract infection or sepsis.

- **Excessively rapid uterine enlargement**—Can indicate a hydatidiform mole.

NOTE

TORCHS is a syndrome that includes toxoplasmosis, rubella, cytomegalovirus, herpes, and syphilis.
Types of Abortions

An abortion is the loss of the fetus prior to the time when it can live outside the uterus. Several types of abortions can be experienced by the client:

- **Elective abortion**—Evacuation of the fetus. There are several types of elective abortions, but all of them require early diagnosis of the pregnancy.

- **Threatened**—Produces spotting. The treatment is bed rest. If bleeding or cramping continues, the client should contact the physician immediately because the doctor might order tocolytic medications such as magnesium sulfate, bethrine, or yutopar.

- **Inevitable**—If there are no fetal heart tones and parts of the fetus are passed, the client is said to be experiencing an inevitable abortion. This type of abortion produces bleeding and passage of fetal parts. The treatment is a dilation and curettage (D & C).

- **Incomplete**—In an incomplete abortion, fetal demise exists but part of the conception is not passed. The treatment is a dilation and evacuation (D & E).

- **Complete**—In a complete abortion, all parts of the conception are passed. There is no treatment.

- **Septic**—A septic abortion includes the presence of infection. The treatment is administering antibiotics.

- **Missed**—In a missed abortion, there is fetal demise but there is no expulsion of the fetus. The treatment is an induction of labor or a surgical removal of the fetus.

Complications of all types of abortion include bleeding and infection. The client should be taught to report to the doctor any bleeding, lethargy, or elevated temperature.

Complications Affecting Pregnancy

Several conditions can affect the outcome of pregnancy. This section covers diabetes in pregnancy, problems with elevated blood pressure, bleeding disorders, cord prolapse, abruptio placentae, sexually transmitted infections, and preterm labor.
Diabetes in Pregnancy

Screening tests are done on all clients when they are seen in the prenatal clinic. The best diagnostic test for diabetes is the glucose tolerance test. See Chapter 12, “Caring for the Client with Disorders of the Endocrine System,” for a description of the glucose tolerance test. Clients with diabetes, and their newborns, are at risk for complications during pregnancy. Newborns of diabetic mothers tend to be large for gestational age. Because glucose crosses the placenta, whereas insulin does not, these newborns tend to gain weight. At birth they appear pudgy, ruddy, and lethargic. The high glucose environment impedes lung development and, although they are large for gestational age, they are often premature. Complications of maternal diabetes on the newborn include

- Congenital heart defects such as patent ductus arteriosus
- Polyhydramnios
- Premature delivery
- Respiratory distress syndrome
- Hypoglycemia

Fluctuations in maternal blood sugar can result in fetal brain damage or sudden fetal death due to ketosis. The pregnant clients with diabetes should be taught to check her blood glucose levels frequently during the day. Levels over 120 mg/dl should be reported to the doctor.

Newborns of diabetic mothers might be delivered by Cesarean section due to their large sizes. They should be assessed immediately after delivery for hypoglycemia by performing a dextrostix. The blood is usually obtained by performing a heel stick. The newborn should be stuck on the lateral aspect of the heel. Blood tests should be performed to detect hypocalcemia, hypokalemia, and acidosis.

Preeclampsia

Preeclampsia is an abnormality found only in pregnancy. The diagnostic criteria are an elevated blood pressure, facial edema, and proteinuria. Clients with preeclampsia tend to have infants that are low birth weight for gestational age. These newborns can also suffer from respiratory distress syndrome and congenital heart defects such as patent ductus arteriosus. Clients with mild preeclampsia are treated with bed rest and a low sodium diet. A diagnosis of severe preeclampsia is made if

- The blood pressure is equal to or greater than 160/110 on two occasions at least 6 hours apart with the woman at bed rest.
- Proteinuria is found to be greater than or equal to 5 grams in a 24-hour urine specimen.
Oliguria equal to or less than 400ml in a 24-hour period is present.
- Cerebral or visual disturbances are reported.
- Epigastric pain is present.
- Pulmonary edema or cyanosis is reported.
- HELLP syndrome is diagnosed.

**NOTE**

HELLP syndrome means hemolysis, elevated liver enzymes, and low platelets. This syndrome results in an enlarged liver and associated bleeding. If it's not treated, the client can die as a result of bleeding. The treatment for this problem is early delivery of the fetus.

Management of severe preeclampsia include
- Complete bed rest
- Low-sodium diet
- Magnesium sulfate

Magnesium sulfate, or magnesium gluconate, is the treatment of choice. A therapeutic level of 4.8–9.6 mg/dl is achieved by controlled infusion of intravenous magnesium sulfate. Magnesium sulfate is a vasodilator that rapidly lowers the blood pressure.

Complications associated with the use of MgSO₄ include maternal hypotension, oliguria, and apnea. Hourly intake and output should be done to access for oliguria.

Common side effects of MgSO₄ infusion are drowsiness and hot flashes. Every effort should be made to prevent seizures. A quiet, dark environment must be maintained and visitors should be restricted. The client should be assessed for signs of toxicity, which include hyporeflexia, oliguria, and decreased respirations. Magnesium levels should be checked approximately every 6 hours and the results reported to the doctor.

The treatment for magnesium sulfate toxicity is the administration of calcium gluconate. Calcium gluconate should be kept at the bedside along with an airway and tracheotomy set.

**Disseminated Intravascular Coagulation**

Disseminated intravascular coagulation (DIC) can occur in many disorders; however, pregnancy is a high risk time for the development of DIC. This bleeding disorder is caused when clotting factor is consumed, causing widespread external and internal bleeding. Bleeding can
be evident from the gastrointestinal trait, kidneys, and vagina. The diagnostic tool for DIC is the presence of fibrin split compound. Treatment includes heparin administration to treat clotting, Amicar to stabilize bleeding, electrolyte replacement, blood transfusions, and administration of oxygen. Hourly intake and output should also be monitored carefully. Early diagnosis is imperative if the prognosis is to be improved.

**Cord Prolapse**

Umbilical cord prolapse occurs when the umbilical cord is expelled with rupture of the membranes. If pressure is exerted on the cord by the presenting fetal part, fetal hypoxia results. Treatments include placing the client in Trendelenberg position or knee-chest position, rapid IV infusion of normal saline or lactated Ringer's solution, and oxygen administration. Vital signs and fetal heart tones are evaluated, and the client is readied for a Cesarean section. If the cord remains outside the uterus, drying will occur, causing loss of oxygen-carrying capacity. Treatment with sterile saline soaks is recommended until a Cesarean section can be performed.

**Abruptio Placenta**

Abruptio placenta is the separation of the placenta from the uterine wall prior to the third stage of labor. This premature separation results in bleeding. A board-like abdomen and abdominal pain are often noted. Vital signs often reveal hypotension. The treatment for abruption is delivery of the fetus.

**Placenta Previa**

Placenta previa is the result of implantation of the placenta over the cervix. When cervical dilation occurs, the placenta is delivered first. The symptom of placenta previa is painless bleed. The treatment of placenta previa is delivery of the fetus by cesarean section.

**Maternal Infections**

Infections during pregnancy are responsible for significant mortality and morbidity. Vaginal cultures to check for *beta streptococcus* infection are done to prevent contact of the newborn with the infection during birth. If the bacteria is found to be present, the mother is given antibiotics during labor. Sexually transmitted infections are detrimental to the mother and fetus and should be treated promptly. Table 16.1 highlights some infections you should be aware of.
### TABLE 16.1 Sexually Transmitted Infections

<table>
<thead>
<tr>
<th>Disease</th>
<th>Symptoms</th>
<th>Diagnosis</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syphilis (caused by the spirochete treponema pallidum)</td>
<td>Primary stage: Chancre regional lymph node enlargement that disappears within 6 weeks. Secondary stage: Malaise, low-grade fever, sore throat, headache, muscle aches, generalized rash, and pustules that disappear in 4–12 weeks. Tertiary stage: Benign lesions of skin and mucosa and heart and central nervous system involvement.</td>
<td>VDRL, RPR, FTA-ABS (fluorescent treponemal antibody absorption test; it's most sensitive to all stages)</td>
<td>Penicillin or other antibiotics.</td>
</tr>
<tr>
<td>Gonorrhea (caused by gram negative bacteria Neisseria gonorrhea; onset occurs 3–10 days after exposure)</td>
<td>Males: Dysuria and yellowish-green discharge. Females: Dysuria, vaginal discharge, no symptoms in many, late in course of the illness, pelvic inflammatory disease can occur.</td>
<td>Culture of discharge</td>
<td>Penicillin, tetracycline, Rocephin 125mg IM in a single dose with Vibramycin 100mg twice daily for one week.</td>
</tr>
<tr>
<td>Chlamydia trachomatis (caused by a bacteria; onset occurs in 1–3 weeks)</td>
<td>Males: Urethritis, dysuria, frequent urination, discharge. Females: Frequent urination and mucopurulent cervicitis.</td>
<td>Gram stain of the discharge</td>
<td>Vibramycin 100mg twice daily. Azithromycin one gram and treat the client and partner.</td>
</tr>
</tbody>
</table>
Genital herpes (HSV2) (caused by a virus; incubation period is 2–4 weeks)  
Local symptoms are caused by blisters, which erupt and leave shallow ulcers that disappear after 2–6 weeks.  
Systemic symptoms include fever, malaise, anorexia, painful inguinal lymph nodes, and dysuria. HSV harbors in one or more of the nerve ganglia.  
Physical and emotional stress trigger recurrent episodes.  
(If there is an active lesion during labor, a Cesarean section is performed because direct contact can lead to transmission of the virus to the infant.)

Condylomata acuminata (caused by human papilloma virus HPV that is transmitted by skin-to-skin contact; the presence of HPV has been linked to vaginal and cervical cancers)  
A dry wart located on vulva, cervix, rectum, or vagina  
Visualization, biopsy, and Pap smear  
Antiviral medications, including Podophylin 20% in tincture of benzoin (Podophylin is not recommended for pregnant clients).  
Antineoplastics such as 5-FU have also been used successfully.

(continues)
### Table 16.1 Continued

<table>
<thead>
<tr>
<th>Disease</th>
<th>Symptoms</th>
<th>Diagnosis</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (acquired primarily through blood and other body fluids)</td>
<td>Seroconversion to HIV occurs in approximately 10 weeks. Many opportunistic illness can affect the client, including parasitic infections (enterocolitis), bacterial (tuberculosis), viral infections (cytomegalovirus), fungal infections (candidiasis), and malignancies (Kaposi's sarcoma).</td>
<td>ELISA; western blot; viral T-cell count. A T-cell count of less than 200 indicates that the client is at risk for opportunistic diseases. Load/burden; a viral load of less than 400 copies/ml indicates the client is relatively free of circulating virus. A white blood cell count less than 3200 requires evaluation. Presence of infections.</td>
<td>Antiviral medications: Nucleoside analog transcriptase inhibitors (AZT-Zidovudine) is given to the pregnant client and the infant after delivery. Non-nucleoside reverse transcriptase inhibitors. Protease inhibitors. Highly active antiretro-viral therapy (HAART), previously known as an AIDS cocktail, is a combination of these medications given in conjunction with other medications used to treat anemia and infections. Bactrim is used to treat pneumocystis carinii pneumonia (PCP). Blood and body fluids should be cleaned up with a hypochlorite solution (1 part bleach and 10 parts water).</td>
</tr>
</tbody>
</table>
Preterm Labor

Premature labor can be managed with hypnotics or sedatives. Several medications stop contractions, including

- **Yutopar (ritodrine)**—Contraindicated in client with maternal cardiovascular disease because a side effect of this drug is tachycardia.

- **Brethine (terbutaline sulfate)**—A commonly used bronchodilator that is contraindicated in clients with cardiovascular disease because it causes tachycardia and in clients with diabetes because it elevates the blood glucose levels.

- **Magnesium sulfate**—A drug used to treat preeclampsia. It can also help to decrease uterine contractions. If this drug is given to treat premature contractions, the client should be monitored for magnesium toxicity.

**NOTE**

Clients receiving magnesium sulfate should have a Foley catheter inserted to monitor the output hourly. The client should be assessed for hypotension and respiratory distress.

*Preterm* is defined as a delivery that occurs prior to 37 weeks gestation. These infants exhibit several characteristics, including low birth weight (less than 1500 gms), lack of lanugo, absence of sucking pads, and in males undescended testes. Premature infants are prone to rapid heat loss through conduction, convection, radiation, and evaporation. Additional complications include respiratory distress syndrome, pneumothorax, necrotizing enterocolitis, bronchopulmonary dysplasia, and bleeding disorders. Careful management of the infant during bathing and drying should be taken because intracranial bleeding is a potential danger. Premature infants are best managed in neonatal intensive care units where respiratory status is supported through mechanical ventilation and treatment with applied surfactant.

Intrapartal Care

*Labor* is defined as the process by which the fetus is expelled from the uterus and the time period immediately after. Five factors influence the labor process:

- **Passageway**—The birth canal, which consists of the uterus, bony pelvis, and vagina.

- **Passenger**—The baby. This consideration during the intrapartal period involves evaluation and management of distress.

- **Powers**—The mother’s body’s power to expel the fetus; it consists of the uterine contractions.
Position—The position the mother assumes during labor; it can make a difference in the decent of the fetus and the mother’s comfort.

Psychological response—The psychological response of the mother makes a difference in the labor experience. If the mother is prepared and in control, it is much more likely that the labor process will proceed smoothly.

The intrapartal period is divided into stages and phases of labor, as covered in the following sections.

**Stages of Labor**

The stages of labor describe the process of dilation and decent of the baby. The four stages of labor are

- **Stage 1**—Closed cervix to 10 centimeters dilation of the cervix
- **Stage 2**—From complete cervical dilation to delivery of the baby
- **Stage 3**—From delivery of the baby to delivery of the placenta
- **Stage 4**—From delivery of the placenta until completion of the recovery period

**Phases of Labor**

The first stage of labor is divided into three phases of labor:

- **Phase 1**—Early labor or prodromal (0–3 cm dilation)
- **Phase 2**—Active labor (4–7 cm dilation)
- **Phase 3**—Transition (8–10 cm dilation)

**Important Terms You Should Know**

Several terms associated with labor and delivery are listed here. You should know these for the exam:

- **Presentation**—The part of the fetus that engages and presents first at delivery (cephalic presentation, or head presentation, is the most common type of presentation).
- **Position**—The relationship of the presenting part to the mother’s pelvis. For example, left occiput anterior (LOA) means that the back of the baby’s head is anterior to the pelvis and tilted to the left side. Right occiput anterior (ROA) means that the back of
the baby’s head is anterior and tilted to the right side; occiput anterior (OA) means that the back of the baby’s head is directly to the front of the mother’s pelvis. See Figure 16.1 for a diagram of the fetal positions.

- **Fetal lie**—The relationship of the fetus to the long axis of the mother. This can be determined by performing Leopold’s maneuvers. Leopold’s maneuver is a technique performed by the healthcare provider by palpating the maternal abdomen to determine where the fetal back, legs, head, and so on are located. This technique is a noninvasive way of estimating the fetal lie and whether the baby is engaged or in the true pelvis.
- **Dystocia**—This term is associated with a difficult or extremely painful labor and delivery.
- **Effacement**—This is the thinning of the cervix.
- **Dilation**—This is the opening of the cervix.
- **Precipitate delivery**—This term is associated with a rapid labor and delivery. The client with precipitate delivery is at risk for uterine rupture, vaginal lacerations, amniotic emboli, and postpartal hemorrhage. Fetal complications include hypoxia and intracranial hemorrhage.
- **Station**—This refers to the relationship of the presenting part to the maternal ischial spines (0 station is at the ischial spines).
Prelabor Testing

Several tests can be performed to predict possible complications to the fetus and mother:

- **Non-stress test**—This test is used to determine fetal response to cyclical periods of rest and activity. A fetal monitor is applied for approximately 90 minutes. During this time, the client is instructed to press the response button each time the baby moves. Normal fetal response is an increase in fetal heart rate of 15 beats per minute. A reassuring or positive reading indicates a positive fetal outcome.

- **Oxytocin challenge test (contraction stress test)**—This test is used to determine fetal response to contractions. The length of time for an OCT is generally 90–120 minutes. Contractions are stimulated by beginning an infusion of Pitocin. Ten units of pitocin are diluted in 1000 ml of IV fluid, begun at 3 milliunits per minute, and increased every 15 minutes until three contractions in 10 minutes are observed. If fetal bradycardia (FHT is less than 110 bpm) or tachycardia (FHT is greater than 160 bpm) is observed or if the blood pressure of the mother rises above normal, the test is considered positive or abnormal. A positive reading can indicate that labor might not be advisable. After the exam, the pitocin is discontinued.

**NOTE**

If the physician decides to induce labor, the pitocin can be continued and prostaglandin gel can be used to ripen or soften the cervix.

**CAUTION**

Pitocin should always be infused using a pump or controller.

Fetal Monitoring

Fetal monitoring can be done continuously by using an external tocodynamometer monitor. External monitoring is a noninvasive procedure that allows the nurse to observe the fetal heart tones and uterine contractions. Internal fetal monitoring is recommended if fetal heart tones and contractions cannot be evaluated externally. The duration of a contraction is evaluated by measuring from the beginning of a contraction to the end of the same contraction. The frequency of a contraction is evaluated by measuring from the beginning of one contraction to the beginning of the next contraction or from the peak of one contraction to the peak of the next contraction.
Bradycardia is a deceleration of fetal heart tones. Decelerations are associated with fetal hypoxia. The three types of decelerations are

- **Early decelerations**—Transitory drops in the fetal heart rate caused by head compression. If the client is complete and pushing and the baby is in a cephalic presentation, this finding is relatively benign. An early deceleration mirrors in depth and length the contraction. If there is a rapid return to the baseline fetal heart rate and the fetal heart rate is within normal range, no treatment is necessary. Figure 16.2 shows graphs of early decelerations.

![Figure 16.2 Early decelerations.](image)

Note there is a drop in the fetal heart rate prior to the peak of the contraction. If there is average variability and rapid return to the baseline fetal heart rate, no treatment is necessary.

- **Variable decelerations**—V-shaped transitory decreases in the fetal heart rate that occur anytime during the contraction. Variable decelerations can also occur when no contractions are present. Variable decelerations are caused by cord compression. Two possible causes of variable decelerations are a prolapsed cord and a cord that is entangled or wrapped around the fetal neck (nuchal cord). Because hypoxia can result from the cord being compressed, intervention is required. Treatment of variable decelerations includes placing the mother in Trendelenburg position, oxygen administration, IV fluids, and notification of the physician. If fetal distress continues, the client should be prepared for a C-section. Figure 16.3 shows graphs of variable decelerations.
Note the drop in the fetal heart tones that are V-shaped and do not correlate to the contractions. These decelerations are caused by cord compression. The treatment is to turn the client to the side, turn off pitocin, and apply oxygen. Contact the doctor if these continue after treatment.

- **Late decelerations**—Drops in the fetal heart rate late in the contraction are caused by utero-placental insufficiency. These decelerations are U-shaped and mirror the contractions. Late decelerations are ominous because they result in fetal hypoxia. Treatment of late decelerations includes discontinuation of pitocin, applying oxygen, and changing the mother’s position. The recommended position is left side-lying. If late decelerations continue despite interventions, the physician should be notified to expedite delivery. Figure 16.4 shows graphs of late decelerations.

Note the drop in the fetal heart rate after the peak of the contraction caused by utero-placental insufficiency. The treatment is to turn off pitocin if infusing, administer oxygen, and turn the client on her side or change position. Left side-lying is best. If this pattern continues, contact the doctor.
Pharmacologic Management of Labor

Several methods are used to relieve the pain of labor, including

> **Sedatives**—Examples: Stadol (butorphanol) and Nubain (nalbuphine) are two agonist medications commonly used in labor. These drugs provide pain relief with little suppression of fetal heart tones. To decrease the amount of medication crossing the placental barrier, the medication should slowly be administered via IV push during a contraction. Phenergan (promethezine) can also be used to treat nausea associated with labor.

> **Nerve blocks**—Several types of nerve blocks are useful in labor. The following six items are examples of nerve blocks:

  > **Local infiltration**—This uses xylocaine for an episiotomy.
  
  > **Pudendal block**—Useful for the second stage of labor, episiotomy, and birth, this blocks nerve impulses to the perineum, cervix, and vagina.
  
  > **Subarachnoid (spinal) anesthesia**—This is injected through the third, fourth, or fifth lumbar interspace into the subarachnoid space. It is useful in relieving uterine pain. Because complete anesthesia is achieved, the client should be observed for hypotension and bradycardia. She will probably be unable to assist with pushing during the third stage of labor.

**NOTE**

Leakage of spinal fluid can result in a headache. The client should be maintained supine following delivery for 8 hours, and fluids should be encouraged. If a spinal headache occurs following spinal anesthesia, the doctor might perform a blood patch. A blood patch is done by injecting maternal blood into the space where spinal fluid is being lost. This allows for quicker replenishing of spinal fluid and restoration of equilibrium.

> **Epidural block**—This is useful for uterine labor pain. This type of anesthesia is commonly used in laboring clients because it does not suppress the fetal heart rate and does not result in complete anesthesia. The client is able to assist with pushing but is relatively free of pain. Maternal hypotension is a complication. Two thousand milliliters of IV fluid should be given immediately prior to an epidural or spinal anesthesia to prevent hypotension. This increase in the amount of circulating volume helps prevent the associated hypotension. If hypotension occurs, the nurse should increase the IV infusion, apply oxygen, and reposition the client on her left side. Platelet counts should be monitored. Obstetric clients having epidural anesthesia often complain of shivering; explain to the client that this is expected and provide extra blankets.
Spinal/epidural narcotics—Narcotics can be administered into the spinal or epidural space. Fentanyl or morphine is commonly used. Side effects include nausea, itching, urinary retention, and respiratory distress.

General anesthesia—This is rarely used for the laboring client and if used is reserved for Cesarean section deliveries.

Postpartum Care
To reduce bleeding and improve uterine tone, the nurse should massage the fundus often. Lochia rubra, or bright red bleeding, occurs after delivery and lasts approximately 3 days. Lochia serosa, or blood and serous fluid, is usually noted on the third or fourth postpartum day. Lochia alba, or the white or clear discharge, can last several weeks following delivery. Allowing breast feeding immediately after delivery is encouraged because it stimulates oxytocin release and uterine contractions. Another advantage of early breast feeding is the production of colostrum. Colostrum, the first liquid secreted from the breast, contains antibodies and nutrients that are needed by the infant.

Urinary retention often increases postpartal bleeding and is a problem during the early postpartal period, especially in clients who have epidural or spinal anesthesia for relief of labor pain. If the nurse notes that the fundus is deviated to the side, the bladder is probably distended. Encourage the client to void, or insert a French or Foley catheter to empty the bladder and enhance uterine contractions.

Terms Associated with the Normal Newborn
The following terms are associated with normal newborns. You should be familiar with these terms for the exam:

- Acrocyanosis—This is a bluish discoloration of the hands and feet of the newborn.
- APGAR scoring—This permits a rapid assessment of the need for resuscitation based on five signs. This survey is done at 1 and 5 minutes. Table 16.2 demonstrates the measures for APGAR scoring.
- Caput succedaneum—This is an edema that crosses the suture line on the baby’s scalp.
- Cephalohematoma—This is blood that does not cross the suture line on the baby’s scalp.
Hyperbilirubinemia—An elevation in the infant's bilirubin level caused by an immature liver. The bilirubin level is checked by obtaining a blood sample via heel stick or by use of a bilirubinometer. This device uses a handheld battery-powered instrument to detect jaundice. Levels of 12mg/dl may require phototherapy. Preparation of the infant for phototherapy include covering the eyes and genitals. Increasing fluids and feedings is encouraged to facilitate the excretion of bilirubin through the gastrointestinal tract and urinary system.

Milia—These are tiny, white bumps that occur across the newborn's nose.

Mongolian spots—These are darkened discolorations that occur on the sacral area of dark-skinned infants.

TABLE 16.2 APGAR Scoring

<table>
<thead>
<tr>
<th>Heart Rate</th>
<th>Respirations</th>
<th>Reflexes</th>
<th>Cry-Reflex</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = Absent</td>
<td>0 = Absent</td>
<td>0 = Absent, flaccid</td>
<td>0 = Absent</td>
<td>0 = Blue</td>
</tr>
<tr>
<td>1 = Slow &lt;100</td>
<td>1 = Slow, weak cry</td>
<td>1 = Some flexion of extremities</td>
<td>1 = Grimace</td>
<td>1 = Pink body, blue extremities</td>
</tr>
<tr>
<td>2 = Over 100</td>
<td>2 = Good cry</td>
<td>2 = Good reflexes, active movement</td>
<td>2 = Cry</td>
<td>2 = Pink</td>
</tr>
</tbody>
</table>

Rh Incompatibility

Problems with hemolysis occur if the mother is Rh negative and the fetus is Rh positive. Maternal and fetal blood do not mix in utero until the third stage of labor when the placenta separates from the wall of the uterus. At that time, a fetal-maternal transfusion can occur. This mixing of incompatible blood types causes isoimmunization and a transfusion reaction.

Usually no problems are seen in the first pregnancy. If, however, the mother becomes pregnant with another Rh positive fetus, her body will react as if the fetus were a foreign object and destroy the baby's red blood cells. This destruction is known as erythroblastosis fetalis.

To prevent isoimmunization, the mother should be given Rhogam during pregnancy as early as 20 weeks or postpartally within the first 48–72 hours. Kernicterus is the condition that results when unconjugated bilirubin crosses the blood-brain barrier. This often results in conditions such as cerebral palsy. Infants with pathologic jaundice should be assessed for alertness, presence of a high-pitched cry, a decreased sucking reflex, hydrops fetalis, and seizure activity.
Treatment for pathological jaundice involves exchange transfusion either in utero or immediately after delivery.

Physiologic jaundice is a benign condition resulting from an immature liver. As the amount of conjugated bilirubin builds in the baby’s blood, the infant becomes jaundice. This jaundice does not become evident until 48–72 hours and, although it does cause the infant to be irritable, it does not cause brain damage. Treatment of physiological jaundice includes placing the baby under a bili-light. Clothing should be removed and the eyes and genitals covered to prevent damage to fragile tissue. Feedings and fluids should be increased to promote defecation and urination. The infant should be turned often and vital signs should be monitored frequently.

**Contraception**

Contraception is the voluntary prevention of pregnancy. This can be accomplished using several methods (see Table 16.3).

<table>
<thead>
<tr>
<th>Method Name</th>
<th>Description</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coitus interruptus</td>
<td>Withdrawal of the penis from the vagina before ejaculation.</td>
<td>Not very effective and should be discouraged. It does not prevent STIs.</td>
</tr>
<tr>
<td>Abstinence</td>
<td>Voluntarily refraining from sexual intercourse.</td>
<td>Very reliable if the client has adequate knowledge of ovulation. Ovulation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>usually occurs 12–18 days after the first day of the menstrual cycle. The</td>
</tr>
<tr>
<td></td>
<td></td>
<td>client’s temperature decreases and then sharply rises at the time of ovulation.</td>
</tr>
<tr>
<td>Cervical mucus method</td>
<td>The cervical mucus method is also called the Billings</td>
<td>Adequate amounts of thin cervical mucus is required for the sperm to have</td>
</tr>
<tr>
<td></td>
<td>method and the Creighton Model. This method helps the client determine whether ovulation has occurred. If the mucus is slippery, the client should abstain from sexual intercourse until ovulation is past.</td>
<td>motility. This method of birth control is less effective than many others because it requires the client to make a judgment of the consistency of the mucus.</td>
</tr>
</tbody>
</table>
TABLE 16.3  Continued

<table>
<thead>
<tr>
<th>Method Name</th>
<th>Description</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Barrier methods</strong></td>
<td>Condom/diaphragm: One concern with the use of a diaphragm is the occurrence of Toxic Shock Syndrome, a potentially life-threatening problem caused by bacterial invasion of the uterus. To prevent the occurrence of this problem, the woman should be taught to clean the diaphragm after each use and remove it after 8 hours. She should not use the diaphragm during menses. Signs of TSS include hypotension, fever, dizziness, and a rash. Treatment includes antibiotics. Condoms are the only method of birth control that are also helpful in preventing sexually transmitted infections. Latex condoms are recommended.</td>
<td>Very reliable. Latex condoms also help decrease the incidence of STIs. The condom should be removed from the vagina while the penis is still erect. Diaphragms should be resized if the client gains or loses 10 pounds, has abdominal surgery, or has a baby. The diaphragm is used in conjunction with spermicidal gel or cream and should be left in for 6–8 hours after sexual intercourse. The client should not douche after intercourse.</td>
</tr>
<tr>
<td><strong>Hormonal methods</strong></td>
<td>Birth control pills, such as depoprovera and Norplant.</td>
<td>Very reliable if taken consistently. If the client misses a pill, she should be instructed to take it as soon as she remembers. If she misses more than two, another method of contraception such as a condom should be used until the end of the cycle. If antibiotics are taken, oral contraceptives might be ineffective.</td>
</tr>
<tr>
<td><strong>Intrauterine device (IUD)</strong></td>
<td>Several types exist. These prevent implantation and fertilization.</td>
<td>Very reliable. They should not be used in clients with a history of pelvic inflammatory disease (PID), diabetes, or bleeding disorders.</td>
</tr>
<tr>
<td><strong>Sterilization (tubal ligation and vasectomy)</strong></td>
<td>Tubal fulguration in females is the destruction of a portion of the fallopian tube by an electric current. A vasectomy is cutting the vasa deferentia to prevent the passage of sperm.</td>
<td>Very reliable.</td>
</tr>
</tbody>
</table>
Diagnostic Tests for Review

The following are diagnostic tests you should review before taking the NCLEX exam. These tests are performed to determine potential problems in the obstetric client and the fetus:

- 24-hour urine to determine renal disease
- Alpha feto-protein to determine neural tube defects
- CBC to indicate anemia or infections
- Estriol levels to determine fetal well-being
- Ferning test/nitrozine testing to confirm amniotic fluid
- Glucose tolerance test to determine whether an elevated blood glucose exists, and possibly diabetes
- L/S ratio to determine lung maturity
- Pap smear to detect cervical cancer
- Ultrasound/amniocentesis to determine fetal anomalies
- Urinalysis to detect kidney infections

Pharmacology Categories for Review

Several pharmacological agents are used to treat the pregnant client. You will need to review these prior to taking the NCLEX exam:

- Analgesics
- Anesthetics
- Antibiotics
- Antihypertensives
- Antivirals
- Hormonal preparations
- Insulin
- Narcotics
- Surfactants
- Tocolytics
- Vasodilators
Exam Prep Questions

1. A client is admitted to the labor and delivery unit in active labor. During examination, the nurse notes a papular lesion on the perineum. Which initial action is most appropriate?
   - A. Document the finding.
   - B. Report the finding to the doctor.
   - C. Prepare the client for a C-section.
   - D. Continue primary care as prescribed.

2. A client with a diagnosis of HPV is at risk for which of the following?
   - A. Hodgkin's lymphoma
   - B. Cervical cancer
   - C. Multiple myeloma
   - D. Ovarian cancer

3. During the initial interview, the client reports that she has a lesion on the perineum. Further investigation reveals a small blister on the vulva that is painful to touch. The nurse is aware that the most likely source of the lesion is:
   - A. Syphilis
   - B. Herpes
   - C. Gonorrhea
   - D. Condylomata

4. A client visiting a family planning clinic is suspected of having an STD. The most diagnostic test for all stages of treponema pallidum (syphilis) is the:
   - A. Venereal Disease Research Lab (VDRL)
   - B. Rapid plasma reagin (RPR)
   - C. Floresent treponemal antibody (FTA-Abs)
   - D. Thayer-Martin culture (TMC)
5. A 15-year-old primigravida is admitted with a tentative diagnosis of HELLP syndrome. Which laboratory finding is associated with HELLP syndrome?
   - A. Elevated blood glucose
   - B. Elevated platelet count
   - C. Elevated creatinine clearance
   - D. Elevated hepatic enzymes

6. The nurse is assessing the deep tendon reflexes of a client with preeclampsia. Which method is used to elicit the biceps reflex?
   - A. The nurse places her thumb on the muscle inset in the antecubital space and taps the thumb briskly with the reflex hammer.
   - B. The nurse loosely suspends the client’s arm in an open hand while tapping the back of the client’s elbow.
   - C. The nurse instructs the client to dangle her legs as the nurse strikes the area below the patella with the blunt side of the reflex hammer.
   - D. The nurse instructs the client to place her arms loosely at her side as the nurse strikes the muscle insert just above the wrist.

7. A primigravida with diabetes is admitted to the labor and delivery unit at 34 weeks gestation. Which doctor’s order should the nurse question?
   - A. Magnesium sulfate 4 gm (25%) IV
   - B. Brethine 10 mcg IV
   - C. Stadol 1 mg IV push every 4 hours PRN for pain
   - D. Ancef 2 gm IVPB every 6 hours

8. A diabetic multigravida is scheduled for an amniocentesis at 32 weeks gestation to determine the L/S ratio and phosphatidyl glycerol level. The L/S ratio is 1:1 and the presence of phosphatidylglycerol is noted. The nurse’s assessment of this data is:
   - A. The infant is at low risk for congenital anomalies.
   - B. The infant is at high risk for intrauterine growth retardation.
   - C. The infant is at high risk for respiratory distress syndrome.
   - D. The infant is at high risk for birth trauma.
9. Which observation in the newborn of a diabetic mother would require immediate nursing intervention?

- A. Crying
- B. Wakefulness
- C. Jitteriness
- D. Yawning

10. The nurse caring for a client receiving intravenous magnesium sulfate must closely observe for side effects associated with drug therapy. An expected side effect of magnesium sulfate is:

- A. Decreased urinary output
- B. Hypersomnolence
- C. Absence of knee jerk reflex
- D. Decreased respiratory rate

11. The client has elected to have epidural anesthesia to relieve labor pain. If the client experiences hypotension, the nurse's first action should be:

- A. Place her in Trendelenburg position.
- B. Slow the IV infusion.
- C. Administer oxygen per nasal cannula.
- D. Speed the IV infusion of normal saline.

**Answer Rationales**

1. Answer B is correct. Any lesion should be reported to the doctor. This can indicate a herpes lesion. Clients with open lesions related to herpes are delivered by Cesarean section because there is a possibility of transmission of the infection to the fetus with direct contact to lesions. It is not enough to document the finding, so answer A is incorrect. The physician must make the decision to perform a C-section, making answer C incorrect. It is not enough to continue primary care, so answer D is incorrect.

2. Answer B is correct. The client with HPV is at higher risk for cervical and vaginal cancer related to this STI. She is not at higher risk for the cancers mentioned in answers A, C, and D, so those are incorrect.

3. Answer B is correct. A lesion that is painful is most likely a herpetic lesion. A chancre lesion associated with syphilis is not painful, so answer A is incorrect. Gonorrhea does not present as a lesion but is exhibited by a yellow discharge, so answer C is incorrect. Condylomata lesions are painless warts, so answer D is incorrect.
4. Answer C is correct. The FTA-Abs is the most sensitive to all stages to all stages of syphilis. VDRL and RPR are screening tests done for syphilis, so answers A and B are incorrect. The Thayer-Martin culture is done for gonorrhea, so answer D is incorrect.

5. Answer D is correct. The criteria for HELLP is hemolysis, elevated liver enzymes, and low platelet count. An elevated blood glucose level is not associated with HELLP, so answer A is incorrect. Platelets are decreased in HELLP syndrome, not elevated, so answer B is incorrect. The creatinine levels are elevated in renal disease and are not associated with HELLP syndrome, so answer C is incorrect.

6. Answer A is correct. Answer B elicit the tricep reflex, so it’s incorrect. Answer C elicits the patella reflex, making it incorrect. Answer D elicits the radial nerve reflex, so it’s incorrect.

7. Answer B is correct. Brethine is used cautiously because it raises the blood glucose levels. Answers A, C, and D are all medications that are commonly used in the diabetic client, so they are incorrect.

8. Answer C is correct. When the L/S ratio reaches 2:1, the lungs are considered to be mature. The L/S ratio does not indicate congenital anomalies, so answer A is incorrect. The infant is not at risk for intrauterine growth retardation, so answer B is incorrect. The infant will most likely be small for gestational age and will not be at risk for birth trauma, so answer D is incorrect.

9. Answer C is correct. Jitteriness is a sign of seizure in the neonate. Crying, wakefulness, and yawning are expected in the newborn, so answers A, B, and D are incorrect.

10. Answer B is correct. The client is expected to become sleepy, have hot flashes, and lethargy. A decreasing urinary output, absence of the knee jerk reflex, and decreased respirations indicate toxicity, so answers A, C, and D are incorrect.

11. Answer D is correct. If the client experiences hypotension after an injection of epidural anesthetic, the nurse should turn her to the left side, apply oxygen by mask, and speed the IV infusion. If the blood pressure does not return to normal, the physician should be contacted. Epinephrine should be kept for emergency administration. Placing the client in Trendelenberg position allows the anesthesia to move up above the respiratory center, thereby decreasing the diaphragm’s ability to move up and down and ventilate the client, so answer A is incorrect. The IV rate should be increased, not decreased, making answer B incorrect. The oxygen should be applied by mask, not cannula, so answer C is incorrect.

Resource List

CHAPTER SEVENTEEN

Caring for the Pediatric Client

Terms you’ll need to understand:
✓ Aganglionic
✓ Atresia
✓ Autosomal recessive disorder
✓ Congenital anomaly
✓ Craniofacial
✓ Dysplasia
✓ Enteropathy
✓ Extravasation
✓ Fistula
✓ Hyperpnea
✓ Hyperpyrexia
✓ Lordosis
✓ Meconium ileus
✓ Neural tube defect
✓ Palliative
✓ Polycythemia
✓ Respiratory syncytial virus
✓ Sex-linked disorder
✓ Steatorrhea
✓ Stenosis
✓ Stridor

Nursing skills you’ll need to master:
✓ Performing sterile dressing changes
✓ Calculating pediatric medication dosage
✓ Administering medications to infants and children
✓ Using intravenous pumps and burette
✓ Applying pediatric urine collector
✓ Instilling eye drops and ear drops
✓ Determining intake and output
✓ Applying mummy and clove hitch restraints
✓ Providing care for the client with traction and casts
There are few areas in nursing more challenging or more rewarding than working with children and their families. Most nurses who work with pediatric clients will jokingly tell you that one of the first things that attracted them to the specialty was the brightly painted walls with the likes of Charlie Brown, Linus, and Snoopy or the fact that they get to wear cartoon-imprinted uniforms. But taking care of a sick child involves more than reading a bedtime story or making a balloon from a surgical glove. The pediatric nurse combines the knowledge of disease process with an understanding of how illness and injury affect normal growth and development and uses the best of her communication skills to help parents cope. This chapter reviews normal growth and development and the most common alterations in child health. As you review normal growth and development, you should consider ways in which nurses help children stay healthy through accident prevention and immunizations. Your pediatric textbook lists guidelines for accident prevention as well as the recommended schedule for childhood immunizations. The recommended schedule for childhood immunizations is also included in Appendix A, “Things You Forgot,” which you can find on the CD.

Growth and Development

Growth and development refers to the numerous changes that take place over a lifetime. For the nurse, growth and development represents a guide for assessing and providing care to children from birth through adolescence. Key elements include physical growth, development of gross motor and fine motor skills, and socialization through play. Although there are individual differences in growth and development, Tables 17.1–17.4 provide useful information regarding overall developmental changes.

Infant (28 Days to 1 Year)

The infancy stage is marked by rapid changes in growth and development. In fact, there is no other time in life when changes occur so quickly and dramatically. Body weight triples and length increases by 50% in the first year of life (aren’t we glad that doesn’t continue!). Infant reflexes are replaced with fine motor and gross motor skills. These skills occur in an orderly fashion in a head-to-toe and center-to-peripheral sequence, which is referred to as cephalocaudal—proximodistal development. Table 17.1 summarizes infant development elements that are important for you to know for the exam.
TABLE 17.1  Key Elements in the Development of Infants

Physical growth and development

Weight: The birth weight (average is 7–9 pounds) doubles by approximately 6 months of age and triples by 1 year of age.
Length: The length at birth (average is 19–21 inches) increases by 1 inch per month during the first 6 months of life. By 1 year of age, the birth length has increased by 50%.
Head circumference: The head circumference at birth (13–14 inches) increases to an average of 17 inches by 6 months and 18 inches at 1 year of age. The posterior fontanel closes by approximately 2 months of age; the anterior fontanel closes by approximately 18 months of age. As the brain matures, the infant’s reflexes (Moro, tonic neck, Babinski, stepping, and rooting) are replaced by purposeful movements that influence motor development.
Chest circumference: The lateral diameter becomes greater than the anteroposterior diameter. By 1 year of age, the circumferences of the head and the chest are approximately the same.

Development of gross motor and fine motor skills

1–3 months: The infant can lift the head, grasp and hold objects for a brief period of time, and roll from side to back. The eyes become more coordinated, and the infant can focus on objects. By 3 months, the infant gains head control, rolls from abdomen to back, sits with support, and can move her hand to her mouth. The lower central incisors erupt and, by 6 months of age, new foods are added to the infant’s diet, including crackers, melba toast, rice cereal, vegetables, fruits, meat, and egg yolk.
9 months: The infant can sit without support, transfer objects from hand to hand, bang cubes together, play patty-cake, creep on hands and knees, and pull herself to a standing position. Upper lateral incisors begin to appear. By 12 months, the infant can walk with one hand being held, begins to take her first steps alone, can sit down from a standing position unassisted, can turn pages in a book, and recognizes familiar pictures like animals (likes to make animal sounds). The use of a pincer grasp allows placement and retrieval of small objects. The 1-year-old has from six to eight deciduous teeth.

Socialization

1–3 months: The infant smiles, recognizes the primary caregiver, and vocalizes by cooing. By 3–6 months, the infant now socializes by imitating sounds and laughing aloud.
9 months: The infant now reaches for familiar people, can say “mama” and “dada,” and responds to simple verbal requests.
12 months: The infant shows affection (blows kisses on request), explores away from parents, and seeks a security blanket or favorite toy when upset. The infant plays alone (solitary play) and enjoys mobiles, busy boxes, soft cuddle toys, and soft picture books.
Toddler (1–3 Years)

By the end of the first year of life, the infant has acquired the skills necessary for mobility. Sitting up and pulling to a standing position give rise to the more advanced gross motor skills of walking, running, and climbing. These skills, along with advancing fine motor development, allow the child to explore his environment as he tries to find out how things work. In the midst of toddlerrdom is the stage known as the terrible twos, in which the most often-heard word from both parent and child is no. Everyday is a new adventure for the toddler and getting into things is a way of life. Parenting the toddler involves allowing exploration while setting limits, overcoming the struggles of toilet training, and (in some cases) managing sibling rivalry. Table 17.2 highlights important developmental elements for toddlers.

**TABLE 17.2 Key Elements in the Development of Toddlers**

| Physical growth and development | Weight: On average the birth weight quadruples by the time the toddler is age 2 1/2 years. Weight gain slows to an average of 4–6 pounds per year.  
Height: The toddler is approximately one half his adult height by the age of 2 1/2 years.  
Head circumference: The head circumference is about 19 inches by 15 months of age and about 20 inches by 2 years of age. Brain growth increases to 90% of the adult size.  
Chest circumference: The chest circumference is greater than the head circumference, giving the toddler a more adult appearance.  

| Development of gross motor and fine motor skills | 12–18 months: The toddler can kick a ball forward, walk up steps, build a tower of two or four cubes, use a spoon, drink from a cup, push and pull toys, remove clothes, and scribble with crayons or pencils.  
19–24 months: The toddler can jump in place, throw a ball overhand, kick a ball forward without falling, walk up and down steps with two feet on each step, build a tower of four or six cubes, copy a vertical line, wash and dry his hands, and help dress himself.  
2–3 years: The toddler can balance on one foot, jump with both feet, take a few steps on tiptoe, ride a tricycle, build a tower of eight cubes, and copy vertical and horizontal lines. The toddler at this age can give his first and last name and name a friend and one color.  

| Socialization | 12–18 months: At this age the toddler imitates housework, points to at least one named body part (nose, eyes, and so on), and can say three to six words other than mama or dada.  
19–24 months: At this age the toddler has understandable speech, can combine three or four words, and can name pictures.  
2–3 years: The toddler plays beside another child with little or no interaction in a fashion known as parallel play. Toddlers enjoy nesting toys, picture books, push-pull toys, riding toys, pounding boards, sand, soap bubbles, talking toys, balls, dolls, and dress-up clothes. |
Preschooler (3–5 Years)

If toddlers are best known for the terrible twos, the preschooler should be known as a delightful paradox. He loves secrets and yet he will share all the family secrets with a total stranger. He can recite the sweetest of prayers and yet swear like a sailor. He can be brutally honest and yet invent the tallest of tales. He explores his world; imitates the adults in it; and yet lives in the fantasy world of adventure figures, becoming them from time to time. No one has more fun than the preschooler, who will run with total abandonment through the largest, muddiest puddle of water. Many of his baby features have given way to those of the older child. The potbelly of the toddler disappears and is replaced by a thinner, more athletic preschooler’s body. Unfortunately, the potbelly will reappear when you least want it—and you can count on the preschooler to point it out to you in case you didn’t notice. Although physical growth slows a bit, cognitive and language development continue at a rapid rate, preparing the child for a major life event: entering school. Table 17.3 summarizes important elements that are key to the development of preschoolers.

TABLE 17.3 Key Elements in the Development of Preschoolers

| Physical growth and development | Weight: The average weight gain is about 5 pounds per year so that the 3-year-old weighs about 37 pounds, the 4-year-old about 42 pounds, and the 5-year-old about 47 pounds. Height: The average increase in height is about 2–3 inches per year, which is mostly due to an elongation of the legs rather than the trunk. The average 3-year-old is 37 inches tall, the average 4-year-old is 40 inches tall, and the average 5-year-old is 43 inches tall. | Head and chest circumference: Unlike the squat, potbellied appearance of the toddler, the physical proportions of the preschooler are more like that of the adult. The preschooler is usually slender and agile and takes great pride in showing off for others. |
| Development of gross motor and fine motor skills | 3 years: The 3-year-old can pedal a tricycle, jump in place, broad jump, balance on one foot, walk up and down steps using alternating feet, build a tower of 9 or 10 cubes, copy a circle, put facial features on a circle, and feed and dress himself. 4 years: The 4-year-old can balance on one foot for 5 seconds, walk heel to toe, catch a ball, throw a ball overhand, skip and hop on one foot, use scissors, lace shoes, copy a square, and add three parts to a stick figure. 5 years: The 5-year-old can skip and hop on alternate feet, throw and catch a ball, jump rope, jump from a height of 12 inches, balance on alternate feet with eyes closed, tie shoelaces, use scissors, begin to print a few letters or numbers, copy a diamond and triangle, and draw a stick figure with from seven to nine parts. | (continues) |
Socialization 3 years: The 3-year-old has a vocabulary of about 900 words and can use complete sentences of 3–4 words, asks many questions, and begins to sing songs.

4 years: The 4-year-old prizes independence, takes pride in her accomplishments, enjoys entertaining others, shares family secrets with outsiders, and commonly has an imaginary friend.

5 years: The 5-year-old has a vocabulary of approximately 2,100 words and can use sentences with 6–8 words. At this age, the child can name the days of the week and the months of the year. The preschooler enjoys associative play, group play with similar or identical activities but without organization or rules. Preschoolers enjoy wading pools, tricycles, wagons, dolls, books with pictures, musical toys, finger paints, and toys that imitate objects used by adults.

School Age (6–12 Years)

School age begins with the child’s entrance into the school environment, which has a profound effect on the child’s development and relationship to the outside world. The freedom of expression enjoyed by the preschooler is less tolerated in the classroom, and the child learns to conform to social expectations. Associative play gives way to cooperative play in which following the rules is a must with little or no tolerance for those who do not. It is a time of leaders and followers as well as the emergence of in crowds and out crowds. Children with special learning needs, the overweight, those with physical limitations, and the poor often find themselves in the out crowd, making the school years a time of loneliness and frustration. In a few instances, this has later given way to school violence with tragic results. Parents and teachers can help by making children more sensitive to the needs of others and by providing opportunities for all children to achieve their potential. Table 17.4 highlights development milestones for the school-aged child.

TABLE 17.4 Key Elements in the Development of School-Age Children

<table>
<thead>
<tr>
<th>Physical growth and development</th>
<th>Weight: During the period known as school age, the child gains an average of 6–8 pounds a year, reaching an average of 85–90 pounds by age 12 years. Height: Between the ages of 6 and 12, children grow an average of 2 inches per year. By age 12, the child should be approximately 5 feet tall. Head and waist circumference: Head and waist circumference decrease in relation to standing height. Leg length increases, and the child takes on a more mature appearance.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of gross motor and fine motor skills</td>
<td>6–8 years: The child has boundless energy, which is channeled into activities such as swimming, skating, biking, dancing, and sports. Fine motor skills become more developed as dexterity becomes more refined. Among the skills acquired during the early school years the ability to read, tell time, and use simple math are important. 9–12 years: The child uses tools and equipment well, follows direction, is enthusiastic at work and at play, and looks for ways to earn money.</td>
</tr>
</tbody>
</table>
Adolescence (12–18 Years)

Adolescence is a time of rapid growth with the peak growth spurt spanning 24–36 months. Secondary sex characteristics appear, with physical and sexual maturity occurring in late adolescence.

Growth in height generally ceases by age 17 in girls and age 18–20 in boys. Boys generally gain more in height and weight than girls. In early adolescence (12–15 years), the teen is usually uncoordinated with awkward movements due to the increasing length of the legs and the size of the feet. In later adolescence (16–18 years), the teen has increased coordination with more graceful movement. This no doubt accounts for the perfecting of athletic ability in high school and college.

The teen years represent a time of developmental crisis for the adolescent as well as the parents. The adolescent is usually on an emotional roller coaster, with highs and lows and periods of sociability and isolation. The desire for increased independence and changing roles within the family often leads to parent-child conflicts. Peer relationships are all-important and friendships can replace the influence parents have had during the childhood years. Adolescents enjoy music, sports, video games, and activities where there are others of the same age.

You should review nursing textbooks for Erikson’s Theory of Psychosocial Development, Kohlberg’s Theory of Moral Development, and Piaget’s Theory of Cognitive Development as they relate to normal growth and development.

Congenital Anomalies

Congenital anomalies are also known as birth defects, and they refer to deviations in normal development that are evident at the time of birth or shortly thereafter. Congenital anomalies can be caused by genetic or environmental factors and include gastrointestinal, musculoskeletal, neurological, and cardiovascular defects. Some congenital defects are not physical malformations but are evident as inborn errors in metabolism and mental retardation. This section
includes a review of the most common congenital anomalies, their management, and the reaction of parents to the birth of an infant with defects in physical development.

**Anomalies of the Gastrointestinal System**

These disorders can involve any portion of the gastrointestinal tract from the mouth to the anus. Incomplete development during embryonic development can result in atresia, malrotation, malposition, or failure of embryonic structures to close. The most common disorders of the gastrointestinal tract are

- Cleft lip and cleft palate
- Esophageal atresia/tracheoesophageal atresia
- Imperforate anus
- Hirschsprung disease
- Biliary atresia

**Cleft Lip and Cleft Palate**

Cleft lip and cleft palate are craniofacial deformities that involve the lip, hard palate, or soft palate. These can occur as separate malformations or occur together. Surgical repair of a cleft lip is generally performed between 1 and 3 months of age, whereas cleft palate repairs are performed between 6 months and 2 years of age depending on whether the defect involves the hard palate or soft palate.

**CAUTION**

Lip repair is performed earlier than palate repair to facilitate feeding and promote parental-infant bonding. The nurse should assess the amount and quality of parental interaction with the infant because the bonding process can be negatively affected by the infant’s appearance.

Preoperatively the nurse should teach the parents to feed the infant using a Breck feeder or flanged nipple. The infant should be fed slowly to prevent aspiration and should be burped more frequently to prevent gastric distention. The infant’s weight should be closely monitored.

**CAUTION**

Postoperatively the nurse should give priority to assessing the respiratory status of the infant. Surgical correction of the soft tissue of the mouth and palate can result in airway obstruction.
Additional postoperative care includes feeding the infant using a Breck feeder to prevent stress on the suture line caused by sucking. The mouth and suture line are cleansed of formula residue using sterile water. The suture line of the lip is cleaned using half-strength hydrogen peroxide. The suture line is reinforced with a Logan bar, which lessens stress on the suture line caused by crying. Elbow restraints prevent the infant placing his hands near his face or mouth.

**NOTE**

A multidisciplinary team is involved in the care of the infant with cleft lip/cleft palate. This team can include the physician, nurse, orthodontist, speech therapist, otolaryngologist, and social worker.

**Esophageal Atresia or Tracheoesophageal Fistula**

Esophageal atresia (EA) is a failure of the esophagus to develop a continuous passage, and tracheoesophageal fistula (TEF) is an abnormal opening between the trachea and esophagus. These can occur alone or in combination. Symptoms of EA and TEF include:

- The presence of maternal polyhydramnios (excessive amniotic fluid)
- Excessive mucus and drooling in the newborn
- Coughing, choking, and cyanosis with the first feeding
- An x-ray of the esophagus that confirms the presence of a blind pouch at each end, widely separated with no connection (EA) or the presence of an abnormal connection between the trachea and esophagus (TEF)

Prior to surgical correction, intravenous fluids are started and the infant is positioned to facilitate drainage of secretions. Frequent suctioning of secretions from the mouth and pharynx decreases the likelihood of aspiration. A double lumen catheter placed in the esophageal pouch is attached to intermittent low suction. Keeping the infant’s head in an upright position makes it easier to remove collected secretions.

**NOTE**

Aspiration pneumonia is so common that prophylactic antibiotics are usually started.

The surgical correction of esophageal atresia can be performed in one operation or staged in one or two operations. Surgical correction of TEF involves a thoracotomy, a division and ligation of the TEF, and an end-to-end anastomosis. If the repair is to be done in stages, a gastrostomy tube is inserted to permit tube feedings. Prior to feeding, the gastrostomy tube is elevated and secured above the level of the infant’s stomach. This allows gastric contents to
pass into the duodenum and lessens the likelihood of aspiration. Gastrostomy feedings are continued until the esophageal anastomosis is healed. Oral feedings are begun about one week postoperatively and are started with sterile water followed by small, frequent feedings of formula.

Esophageal atresia and tracheoesophageal fistula are associated with several other anomalies, including congenital heart disease, anorectal malformations, and genitourinary anomalies. The prognosis depends on the preoperative weight, associated congenital anomalies, and prompt diagnosis. Premature and low birth weight infants as well as those with severe respiratory complications have poorer prognoses.

**Imperforate Anus**

This deformity includes a number of malformations in which there is no obvious anal opening or where an abnormal opening exists between the anus and the perineum or genitourinary system. A routine part of neonatal assessment includes checking for patency of the anus and rectum and noting the passage of meconium.

*CAUTION*

Passage of meconium does not always indicate anal patency—particularly in females—because a fistula might be present, allowing evacuation of the meconium. In males meconium might pass through a fistula in the midline. This can appear as ribbonlike meconium at the base of the scrotum or near the base of the penis.

Surgical repair depends on the extent of the malformation. The imperforate anal membrane is removed, followed by dilation. More extensive surgery is required for the infant with perineal defects. Postoperatively, the infant should be positioned to prevent pressure on the perineal sutures.

**Hirschsprung Disease (Congenital Aganglionic Megacolon)**

This anomaly refers to the absence of nerve stimulation to the bowel, which produces normal peristalsis. Although it accounts for about 25% of all cases of neonatal bowel obstruction, it might not be diagnosed until later in infancy or childhood. Hirschsprung disease is more common in males and is frequently associated with other congenital anomalies such as Down syndrome. The symptoms of Hirschsprung disease depend on the amount of bowel involved, the occurrence of complications, and the age at time of diagnosis.

Symptoms in the newborn include failure to pass meconium within the first 24–48 hours, refusal to feed, abdominal distention, and intestinal obstruction. During infancy, symptoms include the failure to gain weight, constipation, abdominal distention, and episodes of vomiting. In childhood the symptoms become chronic and include poor appetite; poor growth;
abdominal distention; infrequent passage of foul-smelling, ribbonlike stools; and palpable fecal masses.

**CAUTION**

The presence of fever, bloody diarrhea, and severe lethargy should alert the nurse to the possibility of enterocolitis, a potentially fatal condition.

The diagnosis of Hirschsprung disease is made using a barium enema, rectal biopsy, and anorectal manometry (a procedure that records the pressure response of the internal anal sphincter). In the case of Hirschsprung disease, the internal sphincter fails to relax.

In some cases the child with Hirschsprung disease can be managed with dietary modifications such as increasing fluid and fiber intake. Management also includes the administration of occasional enemas using isotonic or normal saline solutions. These solutions can be purchased without a prescription or can be prepared by adding 1 level measuring teaspoon of noniodized salt to 1 pint of tap water.

**CAUTION**

The use of tap water, concentrated salt solutions, soap solutions, or phosphate preparations is discouraged because frequent use of nonisotonic solution can lead to water intoxication and the dilution of serum electrolytes.

Most children with Hirschsprung disease require surgical correction. The child's fluid and electrolyte is stabilized, and a temporary colostomy is performed to relieve the obstruction and allow the bowel to return to normal. Following the initial surgery, a complete corrective surgery is performed. Several surgeries are used; however, one of the most common includes a pull-through procedure in which the end of the normal bowel is pulled through the muscular sleeve of the rectum. The temporary colostomy is closed at the same time. Postoperative nursing care includes assessing the client for abdominal distention and for the return of bowel sounds and the passage of stool. The abdominal wound is assessed and cared for the same as any abdominal wound.

**Biliary Atresia**

This problem causes fibrosis of the intrahepatic and extrahepatic bile ducts and gradually results in liver failure. Most affected infants are full term and appear healthy at birth. Jaundice, dark urine, clay-colored stools, and hepatomegaly occur early in the disease. Later symptoms are associated with the development of cirrhosis and splenomegaly.
Treatment of biliary atresia includes surgical procedures that allow drainage of the bile (hepatic portoenterostomy or Kasai procedure) and orthotopic liver transplantation, now considered to be the definitive therapy for biliary atresia.

**CAUTION**

Jaundice that exists longer than 2 weeks of age accompanied by elevations in direct (conjugated) bilirubin points to the possibility of biliary atresia.

### Anomalies of the Musculoskeletal System

These disorders affect the development and ossification of bones and joints. The most common skeletal disorders are developmental hip dysplasia (DHD) and congenital clubfoot.

Developmental hip dysplasia most commonly involves subluxation or incomplete dislocation of the hip. The disorder can affect one or both hips; if only one hip is involved, it is most often the left hip. Although the cause is unknown, certain factors such as gender, family history, intrauterine position, method of delivery, and postnatal positioning affect the risk of DHD. Females are affected more often than males, and there is an increased incidence if one of the parents or a sibling had the disorder. DHD is more common in the infant with frank breech presentation and delivery by Cesarean section.

**NOTE**

DHD is found more often in groups that use cradle boards or papoose boards for carrying the infant (such as Native Americans) than those groups that carry the infant on the back or on the hips (such as Asians).

Symptoms of DHD in the infant 2–3 months of age include laxity in the hip joint and the presence of the Ortolani click—the audible sound that is made when the affected hip is abducted. Other signs include shortening of the affected limb (Allis sign) and asymmetrical thigh and gluteal folds. Symptoms of DHD in the older child include delays in walking, the presence of extra gluteal folds, and a positive Trendelenburg sign when weight bearing. If both hips are affected, the child develops a waddling gait and lordosis.

Early diagnosis and correction of DHD are important because correction becomes more difficult as the child ages. Correction in the infant less than 6 months of age involves the use of a Pavlik harness. This device prevents hip extension or adduction and is worn continuously for about 3–6 months. Failure to diagnose the condition before the child begins to stand results in apparent contractures of the hip adductor and flexor muscles. Correction at this point involves traction, open or closed reduction, and the application of a hip spica cast.
Congenital Anomalies

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Congenital Clubfoot
Also known as talipes equinovarus, this problem is a structural deformity in which the foot is turned inward, causing the child to walk on the outer border of the foot. Congenital clubfoot can be classified as positional (due to intrauterine crowding), teratologic (associated with other congenital anomalies), or true clubfoot (due to a bony abnormality). The affected foot is usually smaller and shorter than the unaffected foot. If the defect is unilateral, the affected limb is smaller with atrophy of the calf muscle.

Treatment begins in the nursery or shortly after birth with the application of casts. The cast is changed and the affected limb is manipulated weekly for the first 6–12 weeks. Surgical correction involves pin fixation and the release of tight joints and tendons followed by casting for 2–3 months. After the cast is removed, a varus-prevention brace is worn.

Anomalies of the Central Nervous System
Central nervous system (CNS), or neural tube defects, make up the largest group of congenital anomalies. The incidence of neural tube defects has been drastically reduced by supplementing the mother’s diet with folic acid prior to conception. Avoiding extremes of temperature during early fetal development has likewise reduced the risk of neural tube defects.

Spina Bifida
This disorder is marked by a failure of the bony spine to close. It is the most common defect of the central nervous system. There are two types of spina bifida: spina bifida occulta and spina bifida cystica. Of these two types, spina bifida cystica, an external sac-like protrusion, causes the greatest CNS damage.

The major forms of spina bifida cystica are meningocele (the defect contains the meninges and spinal fluid) and myelomeningocele (the defect contains the meninges, nerve tissue, and spinal fluid). Unlike the child with a meningocele, who usually has no neurological deficit, the child with a myelomeningocele often has serious neurological deficit.
In most instances, myelomeningocele occurs in the lumbar or lumbosacral area. Regardless of where the defect is located, higher and larger defects result in more neurological damage. The defect, which is usually enclosed in a thin membrane, should be protected from trauma as well as contamination with urine and stool, which can cause infection. Any stool or urine near the sac is gently removed using sterile saline, and the sac is examined for signs of leakage.

**CAUTION**

During the preoperative period, the nurse should give priority to preventing injury to or drying of the sac. The sac should be covered with a sterile, nonadherent dressing moistened with sterile normal saline. Dressings are changed every 2–4 hours. The newborn should be placed prone with the hips slightly flexed and elevated (low Trendelenburg) to prevent stretching of involved nerves.

Surgical correction usually takes place within the first 24–72 hours of life to prevent local infection and trauma to the exposed tissues. Several neurosurgical and reconstructive procedures are used for skin closure. Complications of myelomeningocele include the development of hydrocephalus, urinary tract infection, meningitis, pressure sores, and contractures.

**CAUTION**

Symptoms of meningitis in the infant include temperature instability, poor feeding, high-pitched cry, and bulging fontanels. Symptoms of meningitis in the child include fever, projectile vomiting, headache, and visual disturbances.

**Anomalies of the Cardiovascular System**

Cardiovascular disorders are classified as congenital heart defects and acquired heart disorders. *Congenital* heart defects involve structural defects in the anatomy of the heart and blood vessels that are apparent at birth or shortly thereafter. These affect the function of the heart and are evident in the development of congestive heart failure and hypoxemia. *Acquired* heart disorders refers to disease processes that affect the structure and function of the heart. Acquired heart disease can be the result of bacterial infection, autoimmune response, environmental factors, or heredity. This section focuses on two congenital heart defects: coarctation of the aorta and Tetralogy of Fallot. A review of two acquired heart diseases—rheumatic fever and Kawasaki disease—follows later in the chapter.

**Congenital Heart Defects**

Heart defects are the major cause of death during the first year of life, with the exception of those infants who die from prematurity. In most cases, the cause of congenital heart defects (CHD) remains unknown. However, certain maternal risk factors have been identified:
Congenital Anomalies

- Alcoholism
- Maternal age over 40
- Rubella during pregnancy
- Type 1 diabetes

CHD is more likely to be diagnosed when the infant is several weeks old than at the time of birth.

**NOTE**
The rapid heart rate of the infant, the instability of the circulatory system, and the fact that many newborns have a benign murmur present for the first few days of life often delay diagnosis. It is more likely that a congenital heart defect will be diagnosed when the infant is several weeks old.

Symptoms of CHD in the infant and child depend on the type and severity of the defect but include
- Cyanosis with feeding
- Clubbing of the fingers and toes
- Dyspnea
- Failure to gain weight
- Fatigue
- Respiratory congestion

Complications of CHD include delayed growth and development, polycythemia, clot formation, and congestive heart failure.

**CAUTION**
Early signs of congestive heart failure include tachycardia while sleeping, profuse sweating (especially on the scalp), fatigue, irritability, respiratory distress, and weight gain.

Congenital heart disease is classified according to whether the defect is acyanotic (without cyanosis) or cyanotic (with cyanosis). Acyanotic defects include patent ductus arteriosus, atrial septal defect, ventricular septal defect, and coarctation of the aorta. Cyanotic defects include transposition of the major vessels, truncus arteriosus, and Tetralogy of Fallot.
As you probably realize, the content area of congenital heart disease is quite large, so we’ll focus on two defects (one acyanotic and one cyanotic) because of the uniqueness of the symptoms associated with these two conditions.

**Coarctation of the Aorta**
This refers to a narrowing within the aorta that alters blood flow to the extremities. Symptoms of coarctation of the aorta (COA) include elevated blood pressure and bounding pulses in the upper extremities and diminished blood pressure and weak or absent pulses in the lower extremities. Infants who develop congestive heart failure require hospitalization for stabilization of the blood pressure and treatment of acidosis. Older children with COA might complain of dizziness; headache; fainting; and nosebleed, which can indicate that the blood pressure is higher than usual.

Correction of COA involves resection of the coarcted portion with an end-to-end anastomosis of the aorta or by enlargement of the narrowed portion using either a prosthetic graft or a graft taken from the left subclavian artery. The defect is outside the heart and pericardium, so cardiopulmonary bypass is unnecessary.

Residual hypertension following surgery seems to be related to the age of the child at the time of repair, so elective surgery should be performed within the first 2 years of life. The prognosis is good, with less than 5% mortality in children with no other defects.

**Tetralogy of Fallot**
As the name implies, this disorder involves four separate defects. These defects include pulmonic stenosis, ventricular septal defect, overriding aorta, and right ventricular hypertrophy. Infants with Tetralogy of Fallot (TOF) might have a history of acute cyanosis and heart murmur at birth that worsens over the first year of life. Acute episodes of cyanosis and anoxia, referred to as *blue spells* or *tet attacks*, occur during crying or feeding because the infant’s oxygen demands are greater than the blood supply. Children with TOF have noticeable cyanosis, clubbing of the fingers, and growth retardation. When oxygenation is compromised, the child with TOF assumes a squatting position. Children with TOF are at risk for developing emboli, seizures, loss of consciousness, or sudden death following an anoxic episode.
Surgical treatment for TOF involves a palliative shunt (Blalock-Taussig procedure) to increase blood flow to the lungs thereby providing for better oxygenation. Complete elective repair, involving correction of each of the four defects, is usually performed in the first year of life. Surgical repair requires the child to be placed on cardiopulmonary bypass. The operative mortality is less than 5% for total correction of TOF.

CAUTION
Nursing care for the infant or child with a tet attack involves placing the child in knee chest position and providing supplemental oxygen.

NOTE
The movie Something the Lord Made gives an account of the first surgery performed on a child with Tetralogy of Fallot.

Inborn Errors of Metabolism
This refers to inherited diseases caused by the absence or deficiency of a substance, usually an enzyme that is essential to cellular metabolism. Most inborn errors in metabolism involve abnormal metabolism of protein, carbohydrate, or fat. Although many diseases are included in this category, we will focus on two of the most common: phenylketonuria and galactosemia.

Phenylketonuria
Phenylketonuria (PKU) is a genetic disorder in which the child is unable to metabolize phenylalanine into tyrosine. Tyrosine is essential to the formation of melanin (responsible for hair, skin, and eye color) and the hormones epinephrine and thyroxine. Accumulation of phenylalanine affects the normal development of the brain and central nervous system. Without early detection and treatment, the child with PKU develops irreversible brain damage.

Clinical manifestations of PKU include irritability, frequent vomiting, failure to thrive, and seizures. Older children with PKU have bizarre behaviors such as head banging, screaming, arm biting, and other psychotic behaviors.

The most commonly used screening test for PKU is the Guthrie blood test. All newborns are screened for PKU before discharge or within the first week of life because early detection and treatment are necessary to prevent mental retardation.
The treatment for PKU consists of instituting a low-phenylalanine diet begun as soon as possible after diagnosis and continued through adolescence. Specially prepared formulas include Lophenalac and ProPhree Total. Partial breast feeding can be allowed if phenylalanine levels are closely monitored. Solid foods such as cereal, fruits, and vegetables are added according to the recommended schedule. Most high-protein foods are either eliminated or restricted to small amounts. Artificial sweeteners containing aspartame should be avoided because they are converted to phenylalanine.

Galactosemia

Galactosemia is a genetic disorder in which one of the three enzymes necessary to covert galactose to glucose is missing. The infant with galactosemia appears normal at birth, but within a few days of ingesting a formula containing lactose, she begins to vomit and lose weight. Additional symptoms arise from accumulations of galactose, which target the major organs.

Damage done to the liver and spleen results in jaundice, cirrhosis, and portal hypertension. Cataracts—opacities in the lens of the eyes—are usually evident by 1–2 months of age. Lethargy and hypotonia associated with brain damage are evident soon afterward.

Newborn screening for galactosemia is required in most states. Diagnosis is based on history, physical exam, and increased levels of serum galactose. The treatment of galactosemia is aimed at eliminating all milk- and lactose-containing foods, including breast milk. Instead, the infant is fed a soy-protein formula.

Respiratory Disorders

These disorders include infections of the upper airway and lower airway and as well as infections of the ears. Three points should be made about respiratory disorders in children. First, respiratory disorders are more common, and often more serious, in infants and children than adults. Some infections, such as otitis media, occur with greater frequency because of anatomical differences. Second, although all children are at risk, certain children are more vulnerable...
to respiratory disorders. This includes premature and low-birth weight infants and children with AIDS. Finally, children with respiratory disorders are more likely than adults to develop gastrointestinal symptoms such as vomiting and diarrhea, which increase the risk of dehydration and acidosis. This section focuses on the care of children with the most common pediatric respiratory disorders.

**Acute Otitis Media**

Acute otitis media (AOM) is one of the most common respiratory diseases in childhood. The incidence is highest in children 6 months to 3 years of age. Otitis media is more prevalent in the young child because the eustachian tube is straighter, shorter, and wider than in older children or adults. Other factors that contribute to AOM are passive smoking, enlarged adenoids, attendance at day care, and supine positioning with bottle feeding. In AOM the child develops a high fever (103°–104° F), anorexia, vomiting, and pain. The infant or young child might be seen rubbing or pulling at the affected ear or rolling her head from side to side. Increasing pressure can rupture the eardrum. If rupture occurs, pain and fever subside.

The organism responsible for AOM is usually *H. influenza*, although other organisms (such as *S. pneumoniae* and *M. catarrhalis*) can also produce an acute infection. Treatment of AOM involves the use of antibiotics, including oral amoxicillin, sulfonamides, erythromycin, or cephalosporins. Antipyretics such as ibuprofen or acetaminophen can be given to reduce fever and pain.

**CAUTION**

Oral suspensions are usually administered for 7–10 days. It is important that parents comply by giving the medication for the full course of treatment. Single-dose injections of an appropriate antibiotic can be used if the child has poor absorption of the drug, the child refuses to take the medication, or the parents fail to comply with oral therapy.

Complications of AOM include mastoiditis, meningitis, and hearing loss. Hearing evaluation is recommended for a child who has bilateral OM for a total of 3 months. Children with AOM should be seen after antibiotic therapy to check for any residual infection and to identify potential complications.

**NOTE**

More information on otitis media, including myringotomy and insertion of PE tubes, is included in Chapter 8, “Caring for the Client with Sensorineural Disorders.”
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Tonsillitis

This problem often accompanies pharyngitis and is a major cause of illness in young children. The tissue referred to as tonsils is actually made up of several pairs of lymphoid tissue:

- Adenoids
- Lingual tonsils
- Palatine tonsils
- Pharyngeal tonsils

Symptoms of tonsillitis include

- Difficulty swallowing and breathing
- Enlargement of the tonsils
- Inability to smell and taste
- Mouth breathing
- Snoring

The condition can be viral or bacterial in origin.

Viral infections are usually self-limited, and management is aimed at relieving the symptoms of soreness and dryness of the throat.

Tonsillitis is usually caused by a virus; therefore, management focuses on the relief of symptoms. However, if the infection is caused by Group A beta hemolytic streptococcus, antibiotic therapy is ordered. A tonsillectomy—surgical removal of the palatine tonsils—is indicated if tonsillar enlargement interferes with eating or breathing, if there is a recurrent history of frequent streptococcal infection, or if there is a history of peritonsillar abscesses. An adenoidectomy—surgical removal of the adenoids—is recommended if enlarged adenoids block breathing. In most cases, the tonsils are not removed before 3 years of age because of the possible complications associated with blood loss in very young children and the possibility of the regrowth of lymphoid tissue.

Preoperative nursing care includes obtaining a detailed history (including a history of unusual bleeding), assessing for signs of upper respiratory infection, and noting whether any teeth are loose. Routine vital signs are obtained to serve as a baseline for postoperative comparison, and a bleeding and clotting time are requested.

Postoperatively the child should be closely observed for continual swallowing, which is an indication of bleeding. An ice collar can be applied to the throat to increase comfort, and analgesics can be given intravenously or rectally for the first 24 hours to decrease pain and promote
rest. When the child is awake and responsive, ice chips and cool, clear liquids are given. Citrus foods, hot foods, and foods with rough textures should be avoided as well as foods that are red, orange, or brown in color. Upon discharge, the parents should be instructed to keep the child out of crowds for 1–2 weeks and to report any signs of new bleeding, which is most likely 7–10 days after surgery. The doctor should be notified immediately if bleeding occurs after discharge.

### Laryngotracheobronchitis

This is the most common form of croup in hospitalized children and is a viral infection of the upper airway. It is most common in children between 3 months and 8 years of age. Unlike acute spasmodic croup, which appears suddenly at night, the onset of laryngotracheobronchitis (LTB) begins with an upper respiratory infection and low-grade fever. The child is restless and irritable, with noticeable hoarseness and a brassy cough.

The goal of care is to maintain the airway and ensure adequate oxygenation. The child with mild croup is often managed at home and treated symptomatically. The symptoms of hoarseness, cough, and inspiratory stridor can be relieved by providing high humidity with cool mist. The child should be frequently offered fluids to maintain adequate hydration.

**CAUTION**

Immediate medical attention should be sought if the child develops labored respirations, continuous stridor, or intercostal retractions or refuses to take oral fluids.

If the respiratory condition worsens, treatment includes withholding oral intake and administering IV fluids until the respiratory condition improves. Other measures include cool mist vaporizers, supplemental oxygen, and the administration of antibiotics to treat coexisting infections and steroids or epinephrine to reduce bronchial swelling.

### Acute Epiglottitis

This is an upper airway infection that primarily affects children 2–5 years of age, but it can also occur at any age from infancy to adulthood. The primary cause of acute epiglottitis is *H. influenza*.

**NOTE**

The American Academy of Pediatrics recommends that all children receive the *H. influenza* B conjugate vaccine beginning at 2 months of age as part of the routine childhood immunization series. This can account for the decline in the incidence of epiglottitis.
The child with epiglottitis is much sicker than symptoms suggest. Typically, the child goes to bed with no symptoms but awakens complaining of a sore throat and pain on swallowing. Additional symptoms include drooling, muffled phonation, inspiratory stridor, and sitting in a tripod position. Upon examination, the physician notes the appearance of a cherry red epiglottis.

**CAUTION**

Remember that only the physician should assess the child's throat because visualization can precipitate immediate airway obstruction. A tracheostomy set or endotracheal intubation set should be readily available because emergency intervention might be necessary to support respiratory efforts.

Endotracheal intubation or tracheostomy is usually performed if the child has *H. influenza* epiglottitis. These procedures, as well as initiation of intravenous fluids and antibiotics, are usually carried out in the operating room. Even if intubation and assisted ventilation are unnecessary, the child should be maintained in an intensive care area for continual observation for at least 24 hours. Dramatic improvement occurs in 24 hours with antibiotic therapy, and the epiglottis is almost normal within 2–3 days.

**Bronchiolitis**

This is a lower airway infection that occurs most often in infants and children under 2 years of age. The respiratory syncytial virus (RSV) accounts for most cases of bronchiolitis; however, the condition is also caused by adenoviruses, parainfluenza viruses, and *M. pneumoniae*. Outbreaks occur most commonly in the winter and spring months.

Symptoms of bronchiolitis include dyspnea, nonproductive cough, wheezing, nasal flaring, intercostal and sternal retractions, and emphysema.

Management of the client with bronchiolitis depends on the age and presenting symptoms. Older children with bronchiolitis can be treated at home, but infants are more likely to need hospitalization. Treatment is aimed at maintaining the respiratory status, decreasing the chance of aspiration, treating the infection, and maintaining acid/base balance. Nursing care includes careful assessment of the vital signs and respiratory status as well as attention to intake and output. Oral fluids might be withheld until respiratory function improves. Additional measures include the use of cool mist vaporizers with or without supplemental oxygen and respiratory therapy with Virazole (ribavirin).

**CAUTION**

To be effective, ribavirin should be administered within 3 days of the infection. Healthcare workers who are pregnant should avoid direct care of the client receiving aerosolized Virazole (ribavirin) because the medication can cause birth defects or death of the fetus. Surgical masks do not provide adequate filtration of the Virazole particles.
Cystic Fibrosis (Mucoviscidosis)

This is inherited as an autosomal recessive gene. The disease affects the exocrine system and produces abnormalities in the lungs, pancreas, and sweat glands. Although cystic fibrosis affects these systems, the prognosis depends on the degree of lung involvement. Lung function has been greatly improved with the use of Pulmozyme, an enzyme that improves respiratory function.

Symptoms of cystic fibrosis include meconium ileus, frequent upper respiratory infections, malabsorption, failure to gain weight, and heat prostration. Additional health problems include reoccurring nasal polyps and rectal prolapse.

The diagnosis of cystic fibrosis is made by the sweat test, which reveals elevated sodium and chloride levels. The absence of pancreatic enzymes results in malabsorption and steatorrhea or undigested fat in stools. Chest x-ray reveals emphysematous changes in lungs.

The treatment of cystic fibrosis includes the use of antibiotics to treat respiratory infections and pancreatic enzyme replacement to improve absorption and decrease weight loss. The client’s diet should be high in carbohydrate, high in protein, and moderate in fat. Extra salt is allowed, and the diet is supplemented with water-soluble preparations of vitamins A, D, E, and K.

Gastrointestinal Disorders

Gastrointestinal disorders include infections, malformations, and structural changes that affect the digestion and absorption of nutrients. When we think of the GI tract, and we seldom do unless there is a problem, we typically only think of its role in digestion and elimination. However, the GI tract plays a key role in maintaining fluid and electrolyte balance through its interaction with the kidneys and lungs. Gastrointestinal disorders are considered
to be more severe in the infant and young child because of the danger of dehydration and metabolic acidosis.

**Gastroenteritis**

Gastroenteritis, or acute diarrheal disease, can be caused by an infection with rotavirus, salmonella, or another organism, or it can accompany another illness such as an upper respiratory or urinary tract infection. Additional causes include ingestion of sorbitol or fructose in juices. Regardless of the cause, acute diarrhea is a more severe illness in infants and very young children because they develop dehydration more quickly than adults. Untreated, the condition can quickly progress to a life-threatening situation.

Treatment focuses on determining the cause of the illness, assessing for signs of fluid and electrolyte imbalance, ensuring adequate hydration, and reintroducing adequate diet. Stool and urine cultures are ordered in addition to the routine lab studies.

Oral rehydration solutions such as Pedialyte and Infalyte replace formula feedings in the child with mild dehydration. Intravenous fluids with electrolytes are started on children with severe dehydration and shock. When symptoms improve, the child can begin to have clear liquids with progression to the BRAT diet (bananas, rice, applesauce, and toast). Although the BRAT diet may still be used, its therapeutic effects have been questioned since it is nutritionally deficient and the increased sugar may encourage diarrhea. Infants can begin formula progression as follows: half-strength soy formula, full-strength soy formula, and (if tolerated) a return to regular formula.

**CAUTION**

Potassium replacement should be instituted only after assessing for the presence of urinary output.

**Pyloric Stenosis**

This problem involves a narrowing of the sphincter at the outlet of the stomach, and it occurs most often in firstborn males. The signs and symptoms of pyloric stenosis include projectile vomiting and a palpable olive-shaped mass in the right upper quadrant of the abdomen. X-ray confirms the presence of hypertrophy and an elongation of the pylorus. The disorder is corrected surgically by a procedure known as a pyloromyotomy or Fredet-Ramstedt procedure. The prognosis following surgery is excellent.

**Intussusception**

This problem involves an invagination or telescoping of one portion of the bowel into another. The most common site for intussusception is the ileocecal valve or the point where the
large and small intestines join. Symptoms associated with intussusception include colicky abdominal pain, the presence of a sausage-shaped mass in the abdomen, and the passage of “currant jelly” stools by an otherwise healthy child. The use of air pressure or water-soluble contrast can be used to diagnose and reduce the intussusception. If conservative measures fail, surgical intervention is required to restore normal bowel function.

**Celiac (Gluten-Induced Enteropathy, Celiac Sprue)**

This issue is a malabsorptive disorder of the proximal small intestine caused by an intolerance to gluten. Gluten is found in the grain of wheat, oats, barley, and rye. Digestive problems most often appear between the ages of 1 and 5 years when the child begins to ingest various foods containing gluten. Symptoms vary but generally include malabsorption, steatorrhrea, abdominal distention, and muscle wasting (particularly in the buttocks and extremities). Diagnosis is based on jejunal biopsy, which reveals changes in the intestinal mucosa. The treatment of celiac involves the replacement of gluten-containing grains with corn, rice, and millet as well as avoiding hidden sources of gluten. Hydrolyzed vegetable protein, a common ingredient in many commercially prepared foods, contains gluten and can cause an exacerbation of symptoms. Associated problems include deficiencies in iron, folic acid, and fat-soluble vitamins that are treated with vitamin and mineral supplements.

**Strict adherence to dietary restrictions can help minimize the development of small intestine lymphoma, one of the most serious complications of celiac.**

**Cardiovascular Disorders**

These are divided into two groups: *acquired heart disorders* and *congenital heart disorders*, which are sometimes referred to as *congenital heart disease*. Congenital heart disease, which exists at the time of birth, was discussed earlier in this chapter. Acquired heart disease refers to disease processes that occur after birth and can be found in those with a normal heart and cardiovascular system. Two examples of acquired heart disease are rheumatic fever and Kawasaki’s disease.

**Rheumatic Fever**

This is an autoimmune response to Group A beta hemolytic streptococcal infection. The disease, which is self-limiting, affects the skin, joints, brain, serous surfaces, and heart. The most serious complication of rheumatic fever is damage to the valves of the heart, and the valve most often affected is the mitral valve.
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The major clinical manifestations of rheumatic fever are the result of inflammation and the appearance of hemorrhagic lesions (Aschoff bodies) that are found in all the affected tissues. The symptoms associated with each of the major manifestations are:

- **Carditis (heart)**—Includes the presence of an apical systolic murmur, aortic regurgitation, tachycardia, cardiomegaly, complaints of chest pain, and development of mitral stenosis.

- **Polymigratory arthritis (joints)**—Includes the presence of red, swollen, painful joints, particularly the larger joints (knees, elbows, hips, shoulders, and wrists). The symptoms move from one joint to another and are most common during the acute phase of illness.

- **Erythema marginatum (skin)**—Includes the presence of a distinct red macule with a clear center found on the trunk and on proximal extremities.

- **Subcutaneous nodules (serous surfaces)**—Includes the presence of small, painless swellings located over the bony prominences of the feet, hands, elbows, vertebrae, scalp, and scapulae.

- **Syndeham’s chorea (brain)**—Includes the presence of aimless, jerking movements of the extremities; involuntary facial grimacing; speech disturbances; emotional lability; and muscle weakness.

In addition to the major manifestations, the client with rheumatic fever has minor manifestations that include fever, arthralgia, elevated erythrocyte sedimentation rate, and positive C-reactive protein. Supporting evidence of a preceding Group A beta hemolytic streptococcal infection includes a positive throat culture and a positive antistreptolysin-O (ASLO) titer.

The goals of treatment are eradicating the hemolytic streptococcal infection, preventing permanent cardiac damage, making the child more comfortable, and preventing recurrences of Group A beta hemolytic infection. Nursing interventions include administering prescribed medications (such as penicillin, salicylates, and steroids), promoting rest and proper nutrition, providing emotional support for the child and the family, and teaching regarding the need for periodic follow-up with the physician. In addition, the nurse plays a key role in emphasizing the need for good dental hygiene and regular dental visits.

**Kawasaki’s Disease (Mucocutaneous Lymph Node Syndrome)**

This is an acute systemic vasculitis. The exact cause remains unknown, although it appears to be a problem with the immune system. The disease mainly affects children under 5 years of age with the peak incidence occurring in toddlers. The disease is best known for the damage
done to the heart; however, it involves all the small- and medium-size blood vessels. The most common sequela of Kawasaki's disease (KD) is the dilation of coronary arteries, which results in aneurysm formation. Infants under 1 year of age and those over 5 years of age appear to be at the greatest risk for developing coronary problems. KD is one of the major causes of acquired heart disease in children in the United States.

The child with KD develops a high fever that lasts 5 or more days and fails to respond to antipyretics or antibiotics. Other symptoms include redness of the bulbar conjunctiva, inflammation of the pharynx and oral mucosa, red cracked lips, “strawberry tongue,” and swelling of the cervical lymph nodes. One of the most notable symptoms is desquamation that begins at the fingertips and toes and gradually spreads, leaving the soles and palms red and swollen. Swelling is also noted in the weight-bearing joints. Additional findings include increased platelet counts and increased coagulation.

NOTE
Most cases of KD are reported in the winter and early spring. There is also an increased incidence in children who are exposed to recently cleaned carpet, which suggests there is perhaps an immune response.

There is no specific test for KD. The diagnosis is based on the presence of symptoms and supporting lab work that reveals a decreased number of RBC, an increased number of immature WBC, and an increased erythrocyte sedimentation rate. Medical management includes the use of IV immunoglobulin and aspirin.

The nursing care of the child with KD focuses on relieving symptoms, providing emotional support, administering medications, and educating the family. The nurse should carefully monitor the vital signs and assess for signs of cardiac complications, which include congestive heart failure and myocardial infarction.

NOTE
Signs of myocardial infarction in the infant or young child include abdominal pain, vomiting, restlessness, inconsolable crying, pallor, and shock. Signs of congestive heart failure include respiratory distress, tachycardia, and decreased urinary output.

Nursing interventions during the acute phase focus on the relief of symptoms. Inflammation of the skin and mucous membranes accounts for much of the child's discomfort during the acute phase. The nurse can help minimize discomfort by applying soothing, unscented lotions to the skin. Mouth care with a soft-bristled toothbrush is followed by the application of lubricating ointment to the lips. Acetaminophen can be given for fever and to relieve joint pain. The child should be placed in a quiet environment to promote rest.
The administration of intravenous gamma globulin requires that the nurse carefully assess vital signs and observe for signs of an allergic reaction, which include chills, fever, dyspnea, and flank pain.

**CAUTION**
The nurse must ensure patency of the IV line before administering gamma globulin because extravasation can result in tissue damage.

The child with KD might be discharged on high doses of aspirin for an extended period of time. The nurse should teach parents the side effect signs and symptoms of aspirin toxicity, including tinnitus, dizziness, headache, and confusion. Low-dose aspirin can be continued indefinitely if the child has coronary abnormalities. The child with coronary abnormalities should avoid contact sports.

**CAUTION**
The nurse should instruct the parents to discontinue the aspirin and notify the physician if the child is exposed to influenza or chickenpox.

### Musculoskeletal Disorders

These disorders involve alterations in bones, joints, muscles, or cartilaginous tissues. Musculoskeletal disorders, like fractures, are the result of trauma (refer to Chapter 11, “Caring for the Client with Disorders of the Musculoskeletal System”). Disorders such as congenital hip dysplasia and clubfoot involve prenatal or genetic factors. Other musculoskeletal disorders include scoliosis, Legg-Calve Perthes disease, and muscular dystrophy.

### Scoliosis

*Scoliosis* refers to a lateral curvature of the spine with rotation of the vertebrae. It is the most common spinal deformity and is associated with physiological alterations in the spine, chest, and pelvis. Idiopathic scoliosis is more prevalent in adolescent females, and there is some evidence that it might be genetically transmitted as an autosomal dominant trait. Routine scoliosis screening is often a part of the adolescent physical exam.

**NOTE**
The Adams position is used to screen for scoliosis. With the examiner standing behind, the child is asked to bend from the waist while allowing the arms to hang freely. When viewed from behind, the child with scoliosis is noted to have a primary and compensatory curvature of the spine.
Conservative treatment includes the use of either the Milwaukee brace or Boston brace and exercise. Surgical correction consists of realignment and straightening the spine with internal fixation. Two surgical methods that can be used are Harrington rods and Luque wires. The Cotrel-Dubousset approach uses both Harrington rods and Luque wires.

Postoperative nursing care includes assessment of vital signs, medication administration for pain, assessment of operative site, and providing emotional support to the client and family. Logrolling technique should be used when turning the client with Harrington rods.

**Legg-Calve-Perthes Disease (Coxa Plana)**

This disease is a self-limiting disorder in which there is an aseptic necrosis of the head of the femur. Although the exact cause is unknown, it occurs most often in males 4–8 years of age. Symptoms include soreness, aching, stiffness, and the appearance of a limp on the affected side. Pain and joint dysfunction are most evident on arising or at the end of the day.

The goal of treatment is to keep the head of the femur within the acetabulum and to prevent microfractures of the epiphysis. Initial measures include bed rest and non-weight-bearing activity. An abduction brace, leg casts, or leather harness sling can be used to prevent weight bearing. Conservative therapy is continued for 2–4 years. Although the condition is self-limiting, the ultimate outcome depends on early recognition and effective treatment.

**Muscular Dystrophies**

_Muscular dystrophies_ refer to a group of inherited degenerative diseases that affect the cells of specific muscle groups resulting in muscle atrophy and weakness. The most common type, Duchenne muscular dystrophy, is inherited as a sex-linked disorder; therefore, it affects only males. Clinical manifestations of muscular dystrophy include delayed walking; wide-based waddling gait; lordosis; weak, hypertrophied leg muscles; and the use of Gower’s maneuver to stand erect. Children with Duchenne muscular dystrophy lose the ability to walk by 9–12 years of age.

_With Gower’s maneuver, the child places his hands on his knees and moves his hands up his legs until he’s standing erect._

The goal of treatment is aimed at maintaining mobility and independence for as long as possible. Nursing interventions include dietary teaching to prevent obesity and complications associated with limited mobility, coordinating healthcare services provided by physical therapy, and providing emotional support to the child and family.
Childhood Cancer

Childhood cancer is a leading cause of death in children under 15 years of age. Although survival has increased for most types of cancer, few diagnoses present a greater challenge for the nurse as she cares for the child and his family. Refer to Chapter 9, “Caring for the Client with Cancer,” for a detailed review of cancer, treatment modalities, and nursing care. This section briefly reviews the key points of the following childhood cancers: Wilms tumor, leukemia, and osteosarcoma.

Wilms Tumor (Nephroblastoma)

This is the most common type of renal cancer. Parents usually find the tumor while diapering or bathing the infant. The tumor, which is confined to one side, is characteristically firm and nontender. The tumor is also usually encapsulated, so it is responsive to chemotherapy. Survival rates for Wilms tumor are the highest of all childhood cancers.

CAUTION

The nurse should post a DO NOT PALPATE THE ABDOMEN sign on the bed of the child suspected of having Wilms tumor.

Leukemia

Leukemia, a cancer of the blood-forming elements of the bone marrow, is the most common form of childhood cancer. Pathological changes are related to the rapid proliferation of immature white blood cells, and symptoms include anemia; fatigue; lethargy; fever; joint and bone pain; pallor; petechiae; and enlargement of the spleen, liver, and kidneys. Acute lymphoid leukemia, the most common form, is more prevalent in males 1–5 years of age.

Treatment involves a combination of cytotoxic drugs and possible bone marrow transplantation. Nursing interventions include preparing the child and family for diagnostic procedures, administering chemotherapy, observing for signs of infection, and providing continuous emotional support.

Osteogenic Sarcoma (Osteosarcoma)

This cancer type is the most common bone cancer found in children. Most of those affected are males, ages of 10–25. The most common site is the epiphyseal plate of long bones, particularly the femur. Traditional management involves amputation of the affected extremity and intensive chemotherapy. Nursing interventions are the same as those for the child with other forms of cancer.
Ingestion of Hazardous Substances

Injuries and death related to accidental poisoning have declined over the past three decades. This is largely due to the Poison Prevention Packaging Act of 1970, which requires that potentially hazardous drugs and household products be sold in child-resistant containers. Still, poisoning remains a significant health concern for children under 6 years of age. Common sources of household poisoning are plants, cosmetics and perfumes, cleaning products, and petroleum distillates. Over-the-counter medications such as cough and cold remedies, laxatives, and dietary supplements are also frequently ingested by children.

CAUTION

Consultation with the physician or poison control center should be done before administering any antidote.

Salicylate Overdose

Salicylate, or aspirin overdose, results in an acid/base imbalance. Symptoms include nausea, vomiting, dehydration, tinnitus, hyperpnea, hyperpyrexia, bleeding, convulsions, and coma. Treatment is aimed at removal through emesis, lavage, or the use of activated charcoal. Additional measures are sodium bicarbonate transfusions to correct metabolic acidosis, vitamin K to control bleeding, and diazepam to control seizures. Hemodialysis might be needed in the most severe cases.

Acetaminophen (Tylenol) Overdose

This results in severe and sometimes fatal damage to the liver. Initial drug levels are drawn 4 hours after the drug is ingested, but treatment should begin before the lab results are obtained. Tylenol overdose is treated with IV acetylcysteine. Plasma levels of 300 mcg/ml occurring 4 hours after ingestion or 50 mcg/ml occurring 12 hours after ingestion are associated with hepatotoxicity. In spite of treatment, there can be continuing hepatic damage that makes liver transplantation a necessity.

Lead (Plumbism)

This poisoning results in irreversible damage to the brain. Sources of lead include lead-based paint, lead crystal, ceramic wares, dyes, playground equipment, stained glass, and collectible toys. Lead poisoning affects the hematopoietic, renal, and neurological systems. With low-dose exposure, the child might experience symptoms of impulsivity, hyperactivity, and distractibility. With higher-dose exposure, the child can experience mental retardation, paralysis, blindness, convulsions, and death.
Chelation therapy is used to remove lead from the circulating blood. Commonly used chelation agents include calcium disodium edetate (EDTA), calcium disodium versenate (Versenate), British anti-Lewisite (BAL/Dimercaprol), and Succimer (which can be given orally).

Nursing care includes the administration of medication, which is often painful. If renal function is adequate, Versenate can be given intravenously; otherwise, it is given by injection. The nurse should assess the client receiving Versenate for signs of cerebral edema. Cerebral edema is treated with intravenous mannitol or dexamethasone. The side effects of heavy metal antidotes include malaise, paresthesia, nausea, and vomiting.

**NOTE**

Houses constructed before 1950 are more likely to have leaded paint. Lead-based paints were officially banned for use in 1978.

**Iron Poisoning**

This poisoning is usually the result of ingesting vitamins or iron-containing medications intended for adults. Initial symptoms of iron poisoning include vomiting of blood and blood in the stools. If the condition is left untreated, the victim becomes restless, hypotensive, tachypneic, and cyanotic. Hepatic injury, coma, and death can occur within 48–96 hours after ingestion. The treatment of iron poisoning includes emesis or gastric lavage. In cases of severe intoxication, chelation therapy with deferoxamine is necessary.

**Diagnostic Tests for Review**

The following are routine tests done on most all hospital admissions. Specific tests are ordered to confirm or rule out a particular illness. For example, an erythrocyte sedimentation rate and antistreptolysin titer are ordered for the client with symptoms of rheumatic fever. Positive results on these tests indicate inflammation caused by a preceding infection with Group A beta hemolytic streptococcus. It is helpful if you have a text of laboratory and diagnostic tests with nursing implications as a reference while you review. The routine tests are as follows:

- CBC
- Urinalysis
- Chest x-ray
Pharmacology Categories for Review

The following drug classifications are most commonly ordered for the pediatric client. However, some situations require the nurse to know about drugs rarely given. It is helpful to have a pharmacology text with nursing implications available as you review. The following are the drug classifications most commonly ordered:

► Antibiotics
► Antipyretics
► Analgesics
► Vitamin supplements
Exam Prep Questions

1. Assessment findings the nurse could expect to find in the infant with biliary atresia are:
   - A. Excessive drooling that requires frequent suctioning
   - B. Pale, frothy stools and poor weight gain
   - C. Poor tissue turgor and weight loss
   - D. Clay-colored stools and abdominal distention

2. The mother of a child with cystic fibrosis asks the nurse for information about the disease. The nurse’s teaching is based on the knowledge that cystic fibrosis:
   - A. Produces multiple cysts in the lungs
   - B. Affects the exocrine glands
   - C. Is an autosomal dominant disorder
   - D. Affects the endocrine glands

3. A 3-year-old with coarctation of the aorta is scheduled for corrective surgery. Which preoperative lab result should be reported to the physician?
   - A. HCT 48%
   - B. WBC 14,000
   - C. Platelet count 200,000
   - D. RBC 5.3

4. Which play activity is most appropriate for a 15-month-old with a cyanotic heart defect?
   - A. Push-pull toy
   - B. Mobile
   - C. Shape sorter
   - D. Pounding board

5. A 9-year-old is admitted with suspected rheumatic fever. Which finding is suggestive of Sydenham’s chorea?
   - A. Irregular movements of the arms and legs and facial grimacing
   - B. Painless swellings over the surface of the joints
   - C. Faint areas of red demarcation over the back
   - D. Swelling and inflammation of the joints
6. The nurse observes that a child with muscular dystrophy has a positive Gower’s sign. The nurse documents that the child:
   - A. Has weak deep tendon reflexes
   - B. Must use his hands to rise from the floor
   - C. Has increased spinal reflexes
   - D. Rocks back and forth in rhythmic fashion

7. The nurse is caring for a child with celiac disease. The nurse’s discharge teaching plan should include:
   - A. Dietary instructions and a list of foods to be avoided
   - B. Hand-washing instructions to prevent disease transmission
   - C. Instructions to continue antibiotics for 1 week
   - D. Explaining that one attack confers immunity

8. Which play activity is most appropriate for a 3-year-old with a hip spica cast?
   - A. Barbie doll and accessories
   - B. Toy telephone
   - C. Coloring book and crayons
   - D. Puzzle

9. During morning rounds, the nurse notices blood spots on the pillowcase of child with acute lymphoid leukemia. The nurse should be most concerned about the client’s:
   - A. Red blood cell count
   - B. White blood cell count
   - C. Platelet count
   - D. Reticulocyte count

10. A 4-year-old has a right nephrectomy to remove a Wilms tumor. The nurse knows that it is essential to:
    - A. Request a low-salt diet
    - B. Restrict fluids
    - C. Educate the family regarding renal transplants
    - D. Prevent urinary tract infections
Answer Rationales

1. Answer D is correct. Symptoms of biliary atresia include jaundice, dark urine, clay-colored stools, and liver enlargement. Answer A describes symptoms of esophageal atresia, so it’s incorrect. Answer B describes symptoms of cystic fibrosis, so it’s incorrect. Answer C describes symptoms of dehydration, so it is incorrect.

2. Answer B is correct. Cystic fibrosis is a chronic disorder that affects the exocrine system or mucous-secreting glands of the body. It is inherited as an autosomal recessive disorder. Answers A, C, and D do not relate to cystic fibrosis, so they are incorrect.

3. Answer B is correct. The WBC is elevated, indicating possible infection. Answers A, C, and D are within normal range, so they are incorrect.

4. Answer C is correct. The shape sorter is most developmentally appropriate for the 15-month-old. Answers A and D require too much energy expenditure for the child with a cyanotic heart defect, so they are incorrect. Answer B is suitable for the infant but not for a 15-month-old, so it’s incorrect.

5. Answer A is correct. The child with Sydenham’s chorea has facial grimacing, jerking movements of the extremities, and rapidly changing mood. Answer B describes subcutaneous nodules, so it’s incorrect. Answer C describes erythema marginatum, so it’s incorrect. Answer D describes polymyogranular arthritis, so it is incorrect.

6. Answer B is correct. Muscular dystrophy results in hypertrophied weak muscles of the legs and pelvis, which causes the child to use his hands to rise to standing position. Answers A and C have nothing to do with Gower’s sign, so they are incorrect. Answer D refers to the movement of the child with autism, so it’s incorrect.

7. Answer A is correct. Celiac disease is related to the ingestion of gluten-containing grains. The client should avoid oats, wheat, barley, and rye as well as foods containing those grains. Answers B and C are incorrect. They do not apply to celiac disease because it is not bacterial or viral in origin. Answer D is incorrect because ingestion of substances containing gluten will produce symptoms again.

8. Answer B is correct. The toy telephone is large enough that it cannot be placed beneath the cast, and it promotes social and language development. Answers A, C, and D contain small pieces that can be placed beneath the cast, so they are incorrect.

9. Answer C is correct. Depressed platelet count indicates a potential for bleeding and hemorrhage. Although answers A, B, and D are important, they do not relate to the finding of blood spots on the pillowcase. Therefore, they are incorrect.

10. Answer D is correct. Because the child has only one remaining kidney, it is important to prevent urinary tract infections. Answers A, B, and C are not necessary, so they are incorrect.
Suggested Reading and Resources

- www.aaai.org—American Academy of Allergy, Asthma, and Immunology
- www.cdc.gov—Centers for Disease Control
- www.lungusa.org—The American Lung Association
- www.aafp.org—The American Academy of Family Practice
- www.pathguy.com—Dr. Ed Friedlander, pathologist
CHAPTER EIGHTEEN

Cultural Practices Influencing Nursing Care

Terms you’ll need to understand:
✓ Culture
✓ Ethnicity
✓ Heritage
✓ Religion
✓ Time orientation
✓ Tradition
✓ Value

Nursing skills you’ll need to master:
✓ Knowing differing cultural and religious beliefs and how these affect response to disease, treatment of diseases, childbearing, death, and dying
✓ Knowing and applying principles learned in nursing school to facilitate communication with those from other cultures
Cultural Diversity and Its Effect on Healthcare

Cultural practices and beliefs are passed down from generation to generation. The United States has always been a melting pot of varying cultural groups. Today more than ever, nurses must be aware of traditional medicine practices and cultural beliefs that influence healthcare. Migration trends indicate that one in three Americans is an ethnic minority. The NCLEX Exam has changed to reflect these differences in client populations. This chapter explores cultural differences including environmental, social, religious, communication, space, and time differences, among varying populations. We cover these differences as they affect healthcare practices and discuss how you as a nurse can utilize knowledge of these beliefs in nursing practice.

Cultural Assessment

The nurse must be able to assess the client for differences in beliefs and utilize the knowledge gained to plan care for the client. It is critical that you know about your client's beliefs to effectively treat him and not engage in acts that might be considered offensive to him.

Understanding Client Beliefs

As you assess the cultural background and beliefs of your client, you should remember that beliefs can be considered beneficial, neutral, or maladaptive. An example of a beneficial belief, or one that is helpful to the nurse, in planning care for the client would be a Hispanic client who believes in the use of garlic with his antihypertensive medication to lower blood pressure. Because garlic has been linked to lowering cholesterol and triglyceride levels, this is beneficial. If, however, he refuses his blood pressure medication and uses only the garlic, this would be considered a maladaptive consideration. A neutral consideration is one that is neither helpful nor harmful to the client.

Folk medicine is used by many groups. It involves the use of nonprofessional healthcare providers such as medicine men and midwives. These practitioners often use remedies that are not found in the local pharmacy. Herbs and potions are often used to treat fevers, pain, and upset stomach.
Working with Clients Who Speak Different Languages

The nurse might not be able to speak the language of the client being cared for. For this reason, it is useful to be able to use other techniques to communicate during teaching sessions.

The following are 10 tips to use if you do not speak the client’s language:

- Sit down next to the client. Regardless of language differences, the client will understand a calm, caring tone in your voice.
- Respect the client’s personal space and observe the client’s body language for cues that you are getting too close or touching her inappropriately.
- If a client is from a different culture from your own, don’t treat her differently from other clients because she does not speak English. Do not talk to her as if she were deaf. Speaking loudly will not help her understand you.
- Use an interpreter when one is available. Many hospitals have individuals employed in other areas of the hospital who can help with translation. Investigate these possibilities before the client arrives for the visit.
- Explain medical and nursing terms simply and clearly. Ask the client to demonstrate when possible. Remember that demonstration is the best indicator that the client understands your teaching.
- Involve the extended family when possible. In most cultures, family is an important part of the client’s healthcare.
- Be careful not to offend members of the family by asking them to perform duties that are not allowed or preferred in their culture. For example, in Hispanic culture, the father might not want to bathe his child. When you are unsure, always ask—and do not assume.
- Be careful if you do not have a thorough knowledge of the language. Many words have an entirely different meaning when pronounced incorrectly.
- Use the title Mr. or Mrs. unless you know the person well. Not using these titles is often seen as disrespectful.
- Do not assume that the client is angry if she speaks more loudly. Do not assume that the client is disinterested if she does not make eye contact.
Healthcare of Hispanics/Latinos

The fastest growing minority in the United States is the Hispanic/Latino population. Some Hispanic people believe that disease is caused by an imbalance in hot and cold. They also believe that health is maintained by preventing exposure to extreme temperatures. A “hot” disease is treated with a “cold” remedy. Some examples of “hot” conditions are diabetes, hypertension, pregnancy, and indigestion. These problems are treated with cold compresses and cold liquids. Some examples of “cold” conditions are menstrual cramps, colic, and pneumonia. These problems should be treated with hot liquids such as broths, hot tea, or hot coffee. Warm baths can also help relieve these conditions.

Hispanics/Latinos use herbals to treat most illnesses and maintain health. Examples of the use of herbals are garlic to treat hypertension and cough; chamomile to treat nausea and anxiety; and a laxative tea combined with stomach massage to cure anorexia, stomach pains, or diarrhea. Peppermint is also used to treat dyspepsia. Manzanilla is another herb used as a tea to treat stomach and intestinal pain, and anise (a star-shaped seed) is used to treat nausea and colic and to increase breast milk.

A healer is often used to provide herbal remedies or to deliver babies. The santero/santera are well-respected in the community and should be considered as part of the health team. Several differences exist between the modern American healthcare provider and the traditional healer that you should be aware of. Table 18.1 highlights some of these differences.

**TABLE 18.1 Comparison of Hispanic/Latino Traditional Healers to Modern Medicine**

<table>
<thead>
<tr>
<th>Traditional Healers</th>
<th>Modern Medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal and know the entire family.</td>
<td>It’s formal, and the visit is with the client and not the family unit.</td>
</tr>
<tr>
<td>Make house calls.</td>
<td>Doctor’s visits occur only in the clinic and often only by appointment.</td>
</tr>
<tr>
<td>The male is considered the head of the household. Always discuss any decisions with the husband or father.</td>
<td>Information is released to the client only. Healthcare providers comply with laws in regard to confidentiality.</td>
</tr>
<tr>
<td>Bartering is used as payment and the cost is very low.</td>
<td>It’s often very expensive.</td>
</tr>
<tr>
<td>Involves spirituality with healing.</td>
<td>Often the healthcare provider is a specialist who deals only with the system involved in the illness.</td>
</tr>
<tr>
<td>Most of the time, the healer is a part of the community where the client and family live.</td>
<td>The physician or nurse practitioner might be located many miles away.</td>
</tr>
</tbody>
</table>

The “evil eye” (*mal de ojo*) is thought to cause fever, crying, and vomiting in the infant. It is believed to be brought on by a person with a strong eye who looks at the baby in an admiring manner. The treatment for the evil eye is to sweep the body with eggs, lemons, and bay leaves.

*Susto*, or fright sickness, is brought on by an emotional trauma. Any traumatic event can bring on a susto. The result is fever, vomiting, or diarrhea. The treatment involves brushing the body with ruda, a rough object, for nine consecutive nights.

*Bilis* is a disease of the intestinal tract brought on by anger. If untreated, bilis can cause acute nervous tension and chronic illness.

*Empacho* is a disease that can affect children. It is caused by food particles being trapped in the intestine. To manage this illness, the client lies face down with his back bare. The healer pinches a piece of skin at the waist, listening for a snap as the skin is released. This is repeated several times to dislodge the material. Prayer should accompany these rituals. Many Puerto Rican parents believe that an amulet pinned to the baby’s shirt will protect her from evil. *Jabon de la mano milagrosa* is a soap used by a miracle man to clean and protect a person from evil spirits. Many also believe that candles should be burned to ward off evil spirits. The nurse should consider the strong religious beliefs of many in the Hispanic culture. Often a priest is the spiritual advisor and should be notified in the case of birth, illness, or death.

**Time Considerations**

The Hispanic population often views time differently from Americans. Time is viewed in generalities, so the nurse must be aware that the client might view time as present, past, or future. This difference can also affect the teaching plan. If the nurse tells the client to take the medication two times per day, the client might not understand the need to take the medication every 12 hours.

**Use of Nonverbal/Verbal Communication**

Most Hispanics speak Spanish or a dialect of Spanish as their primary language. They also might speak English. It is an untrue assumption that, if the client does not speak English, he is less intelligent. Many drug companies now provide written material in both Spanish and English. The nurse should use a translator when needed and should allow time for the client to respond to teaching. Eye contact is often avoided out of respect. The nurse should not assume that the client is disinterested or bored if he avoids eye contact. A handshake is often used to communicate agreement or understanding. Intimate zones are reserved for family and close friends. A distance of 1’–4’ should be reserved for personal distance, and a distance of 4’–12’ should be observed for social distance. The nurse should respect this spatial territory when providing healthcare.
Childbirth and Pain Response

It is very important for the nurse to be aware that the Hispanic client might not complain of pain. Watching the client’s nonverbal cues will help to prevent complications. During labor, the woman might remain stoic. She will often not ask for pain medication until late in the labor process, if at all. Female relatives are often present for the birth of the infant.

Hispanic women might go into a 40-day period of rest after the birth of the infant. During this time the woman is placed on a regimen of dietary and restricted activity. An abdominal binder might be used to prevent air from entering the uterus and to promote healing. Filipino and Pacific Islanders might also perform this practice. Many in the Hispanic culture practice baptism of the infant by sprinkling. These clients do not believe that colostrum is good for the infant, so the nurse should consult with the mother and father before placing the baby to the breast in the delivery room. Modesty must be maintained during breast feeding.

Native Americans and Alaskan Natives

Native Americans are considered those whose ancestors inhabited North America and Alaska. There are 170 North American tribes, and Inuits are also included in this group.

Native Americans believe in the need to be one with nature and hold in reverence animals such as the eagle, buffalo, and deer. This group, like the Hispanic population, uses medicine men. In the Native American culture this person is called a shaman. Native Americans believe that evil spirits and devils are responsible for illness, so masks are worn to hide from the devil. An amulet called a thunderbird is worn for good luck and protection. Navajo medicine men are often called on to use sand painting to diagnose ailments. Some Native Americans conduct sacred ceremonies that rely on having visions and using plants and objects that symbolize the individual or the illness that is being treated. Chanting, prayer, and dancing are also used to treat illness and drive off the evil spirits. Sweat lodges are used by some groups to help in the treatment of fever. Herbals, corn meal, and medicine bundles are used to treat most illness.

Although herbals are used, most Native Americans will take medications prescribed by the physician. Decisions regarding healthcare should be directed at the male members of the family.

Time Considerations

Most Native Americans and Alaskan Natives are relaxed in their view of time and view life in the present. An appointment time for a clinic visit might be ignored or the client might arrive late. The nurse should consider this factor when making clinic appointments.
Use of Nonverbal/Verbal Communication

Many Native American Indians and Native Alaskans speak English as their primary language. However, some still speak the native language of their forefathers, especially when communicating with one another. The nurse might have difficulty understanding the native language because several dialects exist. The nurse might have problems understanding the client because he will probably speak in a low tone. These clients expect the listener to be very attentive during the discussion. Eye contact often is considered disrespectful.

Childbirth and Pain Response

Native Americans tend to be very quiet. The nurse must be aware of nonverbal cues that indicate understanding of teaching. Some nonverbal clues are nodding positively or negatively or the client complying with the nurse’s request. The client might be in a great deal of pain before the nurse realizes that the client needs medication.

The family is extremely important to the well-being of the client during childbirth; the extended family typically attends the birth. Use of village women to assist with childbirth is also a part of their culture. Women might not complain of pain during the labor and birth. In the Navajo Indian culture, the umbilical cord is given to the family after the birth of the child to be buried near a tree so that the child will grow strong and wise.

Asian Americans

Asian Americans have come to the United States from more than 20 countries and speak more than 100 languages. Since 1965, their population in the United States has grown from 1 million to more than 10.9 million. The nurse dealing with this large minority must consider the variations in healthcare beliefs to promote the well-being of the client and family.

Asian medicine includes therapies such as acupuncture, acupressure, herbals, and dietary supplements. Clients might be reluctant to use herbals because they fear that Western doctors or nurses will disapprove of traditional remedies. Asian clients often believe in the yin (cold) and yang (hot) theory. They believe that illness is caused by a disruption in this environment. “Hot” foods include beef, chicken, eggs, fried foods, red foods, and foods served hot. “Cold” foods include pork, most vegetables, boiled foods, foods served cold, and white foods. Noodles and soft rice are considered neither cold nor hot. To maintain fluid balance, Chinese Americans prefer hot tea to ice water.

Some Chinese believe that illness is a result of moral retribution by the gods and rituals must be performed to satisfy the gods and restore balance. A poor combination of the stars with the birth order can also lead to disharmony.
Some Cambodians practice cupping, pinching, coining, or rubbing an ill person’s skin to treat illnesses. Usually the forehead or abdomen is used, depending on the type and location of the illness. With the practice of *cupping*, a hot cup is placed on the skin. As it cools, the cup contracts and the skin is pulled into the cup, leaving a circular mark or blister on the skin. It is believed that this practice draws the evil spirit into the cup. *Pinching* is the practice of pinching the skin between the thumb and index finger to the point of producing a contusion on the chest, on the neck, on the back, at the base of the nose, or between the eyes. *Coining* is the rubbing of the skin with the side of a coin, causing bruising. The nurse should be careful not to assume child abuse if she witnesses this practice. However, teaching regarding the dangers to the infant should be included in the plan of care.

If the client is Hindu, Sikh, or Buddhist he might have beliefs that affect medical treatment. Hinduism accepts modern medicine but believes that illness is caused by past sins. Because life and death are part of an unending cycle, efforts to prolong life are discouraged and CPR might be forbidden. Sikh clients might accept healthcare but refuse certain aspects of treatment. Female clients often refuse being examined by a male, and removing the undergarments might be very traumatic for the client.

Buddhist clients will probably refuse treatment on holy days. They believe that spirits invading the body cause illness and will ask for a priest in times of birth and death. They also believe body should pass into eternity whole, which forbids organ donation and performance of an autopsy. When death is imminent the priest is called. He will tie a thread around the neck or wrist to ensure that the person will pass into eternity in peace—the nurse should not remove this string. The priest will then pour water in the client’s mouth and place the dying client on the floor. After death, the family washes the body before cremation. Some Buddhists might refuse to move the body because they believe that it takes time for the spirit to leave. In the Shinto religion, the body is wrapped in a white kimono and straw shoes are applied. Because reincarnation is a primary belief of this group, insulin produced from beef or materials containing gelatin are forbidden.

**Time Considerations**

Asian Americans live in the present. Many of them believe in reincarnation and that, if they die, they go immediately to paradise. For this reason the nurse might encounter difficulty in teaching regarding preventive care.

**CAUTION**

Literature should be given to the client in his own language when available. Many hospitals and healthcare facilities provide interpreters when needed.
Use of Nonverbal/Verbal Communication

Direct eye contact is considered a sign of disrespect. The nurse should be aware of this difference in communication and should not consider a lack of eye contact as a sign of a lack of interest or difficulty hearing. The client might nod as a sign of compliance or understanding and respect. Shaking hands with a person of the opposite sex is considered forward and inappropriate.

Childbirth and Pain Response

Asian clients will probably be stoic and not complain of pain until it becomes unbearable. Childbirth is a time of celebration for the Asian-American family. The extended family is present and usually takes the infant after delivery, especially if the mother has had a Cesarean section. This allows the mother to rest and recover. This time is considered a “hot” time.

After the birth, the postpartum period is considered a “cold” time because the uterus is more open. The client might therefore refuse to shower or do peri-care in the traditional American manner; however, she might allow a heat lamp to be used to improve healing. The postpartal period is much longer in most Asian cultures: A length of 30–40 days is thought to provide time for healing. The family stays close during this time to provide emotional and physical support.

Some Asians prefer to give birth side-lying because this position is thought to be less traumatic to the infant. Many in the Hindu religion believe that placing honey in the mouth of the infant ensures a sweet life. However, this practice is discouraged by healthcare providers in the United States because honey can carry botulism. Many in the Chinese culture believe that Colostrum is not good for the baby. The mother is often given hot rice water to drink to restore the balance between the body and nature.

Arab Americans

The term Arab is associated with people from a region of the Middle East extending from Northern Africa to the Arabian Gulf. The large majority of Arabs are members of the Islamic (Muslim) religion. Their cultural and religious beliefs direct most of their beliefs regarding healthcare. Prayer and fasting are a major part of the Muslim client’s day. Nurses should be willing to accommodate the client’s desire to pray, and the bed should be positioned facing toward Mecca. So, if the client is in the United States, the bed should face southeast. A sick client who is unable to fully kneel and touch his head to the floor might be allowed by his religious leaders to sit up while praying. During Ramadan, Muslims must fast from sunrise to sunset. If the client has a life-threatening condition, accommodations can be made, but this fasting does pertain to IV therapy and most injections.
Cleanliness is very important to the Arab-American client. The left hand is used for toileting; therefore, the client will avoid using the left hand to eat or touch others. Food should be kept clean and free of odors. Because alcohol is forbidden, medications and liquids containing alcohol should be avoided.

Most Arab Americans prefer to be treated by a healthcare worker of the same sex. When prescribing medications, pills and injections are preferred—suppositories should be avoided if possible.

In some countries, secluding women from men and restricting movement outside the home is practiced. Covering of the women in public is practiced.

The dying client must confess his sins to be taken to paradise. The body is washed and wrapped in a white cloth and the head is turned to the right shoulder. The body of the client who has died should be positioned facing east. A prayer called a *Kalima* is said.

**Time Considerations**

Arab Americans live in the present, so many do not plan for retirement or save for future needs. Preventive medicine is a concept that is difficult for them to understand. This group, like many others, might be less aware of appointment times. Scheduling of office visits should allow for this cultural difference.

**Use of Nonverbal/Verbal Communication**

As with other cultures, nonverbal communication is used frequently in Arab cultures. Women are particularly prone to speaking softly and might not voice health concerns, especially to a male healthcare provider.

**Childbirth and Pain Response**

Response to pain differs with each individual. Some clients in this group will be stoic, but some might respond to pain by crying or moaning. It is generally believed that an injection of pain-killing medication works better than a pill. The nurse should assess changes in vital signs and other cues such as grimacing to be able to provide pain medication as needed. During childbirth, group prayer is used to strengthen the mother, and women assist the client during childbirth. At the time of birth, a prayer is said into the baby’s ear. The mother is then secluded from the group for a period of time to allow for cleansing. Because blood is considered a pollutant, a ritual bath is performed before the woman can resume relations with her husband. In some African cultures, such as in Ghana and Sierra Leone, some women will not resume sexual relations with their husbands until after the baby is weaned.
Nursing Plan Dietary Considerations Across Cultures

Dietary considerations play a part in the nursing plan of care for all cultural populations. See Table 18.2 for information regarding variations in dietary management.

**TABLE 18.2 Dietary Practices of Various Cultural Groups**

<table>
<thead>
<tr>
<th>Culture</th>
<th>Grains</th>
<th>Fruits</th>
<th>Vegetables</th>
<th>Meats</th>
<th>Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic</td>
<td>Prefer potatoes and corn.</td>
<td>Prefer most fruits.</td>
<td>Prefer spicy vegetables such as chilli peppers, tomatoes, onions, beets, and cabbage.</td>
<td>Prefer eggs, pinto beans, and most meats (all are allowed).</td>
<td>Cheese is preferred, and milk is seldom consumed.</td>
</tr>
<tr>
<td>Chinese</td>
<td>Consume starchy grains such as rice.</td>
<td>All fruits are eaten by this group.</td>
<td>Prefer Chinese vegetables such as water chestnuts, and bean sprouts. These are used in cooking.</td>
<td>All meat is consumed.</td>
<td>They eat ice cream, but few other milk products.</td>
</tr>
<tr>
<td>Chinese (to include Buddhist)</td>
<td>All grains are allowed.</td>
<td>All fruits are allowed.</td>
<td>All vegetables are allowed.</td>
<td>Devout Buddhists restrict meats and do not eat beef.</td>
<td>Cheese and milk products are allowed.</td>
</tr>
<tr>
<td>Japanese</td>
<td>Prefer rice.</td>
<td>They do not consume most fruits.</td>
<td>All vegetables are consumed.</td>
<td>All meats are consumed.</td>
<td>There is a high incidence of lactose intolerance, and little milk is consumed.</td>
</tr>
<tr>
<td>Europeans (to include persons of the Jewish faith)</td>
<td>Most grains are allowed but must be prepared using kosher standards. Leavened bread and cakes are forbidden during Passover.</td>
<td>All fruits are consumed.</td>
<td>All vegetables are consumed.</td>
<td>Pork is forbidden, as are fish without scales. All meats must be prepared according to Biblical ordinances, and blood is forbidden.</td>
<td>Milk products should not be eaten at the same meal that contains meat and meat products.</td>
</tr>
</tbody>
</table>
Chapter 18: Cultural Practices Influencing Nursing Care

TABLE 18.2  Continued

<table>
<thead>
<tr>
<th>Culture</th>
<th>Grains</th>
<th>Fruits</th>
<th>Vegetables</th>
<th>Meats</th>
<th>Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arab Americans (to include the Islamic religion)</td>
<td>All grains are allowed.</td>
<td>All fruits are allowed.</td>
<td>All vegetables are allowed.</td>
<td>Beef, pork, and some fowl are restricted; all meat must be slaughtered according to a ritual letting of blood.</td>
<td>Milk is allowed.</td>
</tr>
</tbody>
</table>

**TIP**

Do not assume that because a person is a member of a particular group that she will behave like others. The nurse must get to know the person.

Religious Beliefs and Refusal of Care Considerations

Various religious beliefs affect how the client is treated and can lead to a refusal of some traditional medicines. It is important for the nurse to understand these differences to assist the client with healthcare and teaching. Table 18.3 breaks down some religions, the treatments their practitioners might refuse, and how prayer plays a role in their medicinal views.

TABLE 18.3  Religious Beliefs Affecting Healthcare and Death

<table>
<thead>
<tr>
<th>Religion</th>
<th>Treatment Considerations</th>
<th>Role of Prayer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buddhism</td>
<td>Treatment is accepted, but beef and beef products are not allowed.</td>
<td>A priest is called for last rites to be performed.</td>
</tr>
<tr>
<td>Christian (Catholic)</td>
<td>They eat no meat on Fridays during Lent. They might want to attend mass during hospitalization on Friday, Saturday, or Sunday.</td>
<td>At the time of death, a priest is called for last rites.</td>
</tr>
<tr>
<td>Christian (Protestant)</td>
<td>All treatments are allowed to preserve life.</td>
<td>Practices vary in respect to death and burial.</td>
</tr>
<tr>
<td>Church of Jesus Christ of Latter-Day Saints (Mormon)</td>
<td>Most treatments are allowed.</td>
<td>At the time of death, the religious leader is called for last rites. Burial is preferred to cremation.</td>
</tr>
</tbody>
</table>
TABLE 18.3  Continued

<table>
<thead>
<tr>
<th>Religion</th>
<th>Treatment Considerations</th>
<th>Role of Prayer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindu</td>
<td>A priest is called in for consultation prior to treatments. Believe in reincarnation, so the body should be preserved. Amputations of limbs or removal of diseased body parts might be refused.</td>
<td>Believe in prayers and rituals.</td>
</tr>
<tr>
<td>Judaism</td>
<td>Pork is not allowed. The infant is circumcised on the eighth day of life.</td>
<td>At the time of death, the rabbi is called for last rites, the body is washed, and someone remains with the body until burial.</td>
</tr>
<tr>
<td>Jehovah’s Witness</td>
<td>Might refuse blood transfusions and surgery or treatments.</td>
<td>Believe prayer will save.</td>
</tr>
<tr>
<td>Russian Orthodox Church</td>
<td>All treatments are allowed. Followers observe fast days, and on Wednesdays and Fridays most eat no meat. During Lent, all animal products (including dairy products) are forbidden.</td>
<td>At the time of death, the religious leader is called for last rites.</td>
</tr>
<tr>
<td>Sikhism</td>
<td>Treatment is accepted. After death, the client will receive the five Ks: kesh (uncut hair), kangna (wooden comb), kara (wrist band), kirpan (sword), and kach (shorts).</td>
<td>The priest is called to perform ritualistic last rites.</td>
</tr>
</tbody>
</table>

Be sure that you do not assume that a client understands your teaching. The best indicator of understanding is demonstration.

CAUTION
Exam Prep Questions

1. The client is a practicing Hindu. Which food should be removed from the client's tray?
   - A. Bread
   - B. Cabbage
   - C. Steak
   - D. Apple

2. A Korean client is admitted to the postpartum unit following the delivery of a 9-pound infant. Although the client does not refuse to shower, the nurse notices that she stands in the shower but does not allow the water to touch her. The next action by the nurse should be:
   - A. Ask the client why she refuses to shower.
   - B. Call the doctor and report the client's refusal to shower.
   - C. Tell the client that the nurse will obtain a heat lamp to assist in healing the perineum.
   - D. Turn the shower so that the water sprays on the client.

3. An infant is admitted with a volvulus and scheduled for surgery. The parents are Jehovah's Witnesses and refuse to sign the permit. Which action by the nurse is most appropriate?
   - A. Obtain a court order.
   - B. Call the doctor.
   - C. Tell them that the surgery is optional.
   - D. Monitor the situation.

4. Which medication will most likely be refused by a Muslim client?
   - A. Insulin
   - B. Cough syrup
   - C. NSAIDs
   - D. Antacids
5. An Arabic or Muslim client who is terminally ill condition deteriorates and death seems imminent. If the client is hospitalized in the mainland United States, the nurse should position the bed facing:
   ○ A. Northeast
   ○ B. Southeast
   ○ C. West
   ○ D. South

6. An 88-year-old female Jewish client is admitted to the hospital and diagnosed with diabetes. Which type of insulin is refused by this client?
   ○ A. Beef
   ○ B. Pork
   ○ C. Synthetic
   ○ D. Fish

7. The nurse observes that a Hispanic client and his family have been late for their appointment the last three times. The best explanation for this behavior is:
   ○ A. A lack of concern for the health of the client.
   ○ B. An attempt to avoid talking to the nurse.
   ○ C. The client probably forgot the appointment time.
   ○ D. The client and family view time differently than does the nurse.

8. A 90-year-old client from Thailand is diagnosed with terminal cancer. The family seems unconcerned and, although they do not refuse treatment for the client, they do not assist with treatment. The nurse's likely assessment of this behavior is:
   ○ A. The family believes in the cycle of life and that death is a step into the next cycle.
   ○ B. The family is in denial concerning the diagnosis and needs further teaching.
   ○ C. The family is planning to get another opinion regarding the diagnosis.
   ○ D. The family is not concerned with the treatment and care of the client.
9. The nurse is assisting a client from Iraq with her bath. The nurse notices that the client uses only her left hand to bathe her genital area. The correct assessment of this behavior should be:
   ○ A. The client's dominant hand is her left hand.
   ○ B. The client is using her nondominant hand to more easily cleanse the perineum.
   ○ C. The client believes that the right hand is reserved for eating and touching others and that the left hand is the dirty hand.
   ○ D. The client has in some way injured her right hand, making it difficult to use it.

10. A Japanese client refuses to eat the ice cream or drink the milk on his tray. Which action by the nurse would indicate an understanding of the client's needs?
   ○ A. She obtains yogurt for the client instead.
   ○ B. She obtains an order for Lactaid dietary supplement.
   ○ C. She removes the milk from the tray and says nothing to the client.
   ○ D. She asks the client why he will not drink the milk.

**Answer Rationales**

1. Answer C is correct. In the Hindu religion, beef is prohibited. All breads, vegetables, and fruits are allowed, so answers A, B, and D are incorrect.

2. Answer C is correct. Many in Asian cultures believe that the postpartum period is a “cold” time when the body is open. This is treated with heat, and a shower is thought to be a cold therapy that allows illness to enter the body. The nurse should comply with the client’s wish not to shower at this time. A heat lamp might be accepted because it is a hot therapy and will assist with healing.

3. Answer B is correct. A volvulus is an emergency situation in which the bowel is twisted. Refusal of treatment can lead to death, so the next action to take is to call the doctor. It might require a court order to get a permit for the surgery or the court might comply with the parent’s wishes, so answer A is incorrect. The surgery is not optional, so answer C is incorrect. Volvulus is an emergency situation and action must be taken if the child is to survive. Monitoring only wastes precious time, so answer D is incorrect.

4. Answer B is correct. Most cough syrups contain alcohol, which is forbidden in the Muslim religion. Attempts should be made to obtain a cough suppressant that does not contain alcohol. The client will most likely take insulin, nonsteroidal anti-inflammatory drugs, and antacids, so answers A, C, and D are incorrect.

5. Answer B is correct. At the time of death, the Muslim client will wish to be positioned facing Mecca, which is to the southeast of the United States. Answers A, C, and D are therefore incorrect.
6. Answer B is correct. Pork is not allowed in the diet or medications of Jewish clients. Both synthetic and beef are allowed, so answers A and C are incorrect. There is no such thing as a fish insulin, so answer D is incorrect.

7. Answer D is correct. If the client misses an appointment or is late for the appointment, it is not necessarily true that the client is disinterested or forgot. Many in the Hispanic culture see time as a relative thing and live in the present.

8. Answer A is correct. Clients who practice the Hindu religion believe that death is part of the cycle of life. There is no data to support answers B, C, or D as an answer.

9. Answer C is correct. In the Muslim religion, the left hand is reserved for toileting. The right hand is considered clean and is used to eat and touch others. There is no data to support that the client is left handed or that the right hand might be injured, so answers A, B, and D are incorrect.

10. Answer B is correct. Many of Japanese descent are lactose intolerant—it is not that milk is not allowed in their culture. Yogurt also causes gas and bloating, so answer A is incorrect. Removing the items from the tray does not provide the needed calcium in the diet, so answer C is incorrect. It is inappropriate to ask “why” in most cultures, so answer D is incorrect.

**Suggested Reading and Resources**


CHAPTER NINETEEN

Legal Issues in Nursing Practice

Terms you’ll need to understand:

✓ Assault
✓ Battery
✓ Civil laws
✓ Common laws
✓ Consent
✓ Criminal laws
✓ Ethics
✓ Felony
✓ Incident report
✓ Informed consent
✓ Intentional torts
✓ Invasion of privacy
✓ Licensure
✓ Malpractice
✓ Malpractice insurance
✓ Misdemeanor
✓ Negligence
✓ Nursing Practice Act
✓ Patient’s Bill of Rights
✓ Regulatory laws
✓ Restraints
✓ Tort
Chapter 19: Legal Issues in Nursing Practice

Legal Issues in Nursing Practice

Safe nursing practice requires a knowledge of the practice boundaries of the registered nurse, the licensed practical nurse, and the nursing assistant.

In the United States, the state boards of nursing govern nursing practice. State boards of nursing are generally made up of practicing nurses, physicians, and consumers, as well as an attorney and an executive officer appointed by the governor of the state. Some boards of nursing are also made up of directors of nursing from nursing schools within the state. The state boards of nursing are responsible for ensuring that those licensed to practice nursing are safe practitioners and that they abide by approved standards of nursing practice. The state boards of nursing also have the ability to suspend, restrict, or revoke the license of a nurse who has been convicted of a felony or misdemeanor. In the case of alcohol and drug addiction, the state boards of nursing can require the nurse to enter a recovering nurse program under the direction of the board.

No matter in which state you become licensed to practice, you will be bound by the Nurse Practice Act of that state. Nurse Practice Acts vary from state to state, but in many ways they are all very much the same. Nurse Practice Acts define the authority of the board of nursing, define the boundaries of scope of nursing practice, state the requirements for licensure, identify grounds for disciplinary action, and identify titles and types of licensure. Boards of nursing are authorized to take legal action against a nurse or a group of nurses found to be in violation of the state’s nursing practice standards as set out by the legislature.

This chapter explores these laws and the impact they have on your nursing practice. It also defines and discusses issues affecting your nursing practice and some questions you will be asked on the NCLEX exam related to legal and ethical issues.

CAUTION

If you are asked to perform any activity or skill that is out of your scope of practice by a physician, a supervisor, an administrator, or any other person in direct authority over you, you have the right and the obligation to refuse. If you are asked to perform a skill that you were taught in school but have never performed, ask for help. If you are asked to operate a type of equipment that you are unfamiliar with, ask for help. Remember that the law and the National Council of State Boards of Nursing expect you to ensure the safety of the client and you are held responsible if harm comes to the client as a result of your care or lack of care.

Types of Laws

Several types of laws govern nursing practice: regulatory, civil, statutory, and criminal. The nurse is responsible for abiding by each type of law.
Statutory Laws/Regulatory Laws

Statutory laws are laws created by elected officials within the legislative body. An example of this type of law is the Nurse Practice Acts. These rules and regulations tell the nurse which activities he can perform. It is imperative that the newly licensed nurse be aware of these standards and that he abide by them in daily practice. Often the nurse is asked to perform duties he does not feel comfortable performing. Remember that, if a task or skill was not taught in your nursing school, it probably is out of your scope of practice. Nursing curriculums are routinely reviewed and approved by professional organizations, such as the National League for Nursing and others. So, you can be fairly certain that if you didn’t learn a task in school, it is not within your rights to perform that task.

Civil Law

Civil laws are laws passed to protect the rights of individuals within a group and to ensure fair treatment without bias or prejudice. These laws ensure that all clients are treated equally without regard to race, social status, ability to pay for services, or country of origin. If a violation of civil law is found, federal or state funds can be withheld or suit can be brought against the doctor, the nurse, or the facility for which they work. Damages usually involve money and sanctions. If the nurse can be found to have caused harm to the client, because of a lack of care, further damages can be filed.

Criminal Law

A felony is a crime of a serious nature that is punishable by jail time and loss of the nurse’s license. A misdemeanor, on the other hand, is a lesser crime that can result in imprisonment for less than one year or a fine. An example of a misdemeanor is the use of a controlled substance. A felony example is the possession of large quantities of drugs with the intent to sell. Many other types of crimes are considered criminal. Examples of these are stealing from a client or abusing a client. These acts involve action by the police and the board of nursing. Even if the nurse is not caring for clients at the time the crime is committed, the state board of nursing can take actions against the nurse. Actions taken by the board can include suspension or loss of the license to practice nursing.

Common Law

Common laws are laws created to provide consent for services that need to be rendered when the client is unable to give consent herself or to provide for the right to refuse consent. These provisions are described in the Patient’s Bill of Rights, which is listed here:
As a client you have the right to

- Receive respectful treatment that will be helpful in the course of your recovery.
- Refuse a treatment or to end treatment without harassment by the healthcare community. This is often a problem because physicians want the client to survive. However, the client and family might be more concerned with death and dignity while dying. Hospice care can help during this time.
- A safe environment that is free from fear of physical, emotional, or sexual abuse or neglect. This includes cleanliness of the facility and the healthcare providers.
- Refuse electronic recording of your conversations with healthcare workers. You can also request that conversations be recorded.
- Have written information regarding any care that is being provided or that the physician proposes. You also have the right to a written statement of all fees and services and the cost of each. You also have the right to see the licensure, educational training, and experience of your healthcare provider. You can also ask to see which professional organizations your healthcare providers belong and any limitations that have been placed on her by her regulatory organization.
- Report unethical or illegal behavior that you observe and to ask questions about your care.
- Refuse to answer questions or to disclose any information you choose not to share.
- Confidentiality. You can take legal action if the healthcare worker does not abide by the Health Information Protection Privacy Act (HIPPA).
- Receive a second opinion from another healthcare worker, physician, counselor, or nurse practitioner.
- See your files and receive a photocopy of your chart.
- Request that the doctor, counselor, or nurse inform you of your progress or lack of progress during your treatment.
- Know who will know about you and be able to see your chart.

**Code of Ethical Behavior in Nursing Practice**

Ethics are the principles that guide nursing decisions and conduct as they pertain to what is right or wrong. They also involve moral behavior. The nurse is expected to behave in a way
that maintains the integrity of the client and family. Situations often arise that require the nurse to make a judgment; a dilemma results when the nurse’s values differ from those of the client and family. The nurse must remember that the client has the right to make decisions for herself without the nurse expressing his opinion. In 2001, the American Nurses Association released the Code of Ethics for Nursing. This code discusses the obligation and duties of the nurse. The following list describes the Code of Ethics for Nursing:

- The nurse practices with compassion and respect for the dignity, worth, and uniqueness of the individual, unrestricted by social or economic status, personal attributes, or the nature of the disease. For example, the nurse might not be comfortable caring for the alcoholic client but is ethically obligated to provide the best and most compassionate care possible.

- The nurse is committed to the client, whether the client is an individual, a family, or a community. The home health nurse might be asked to care not only for the client, but also the family and or the whole community. In some cultures, the family and community are included in decision making. The nurse must respect the client’s wishes in this matter.

- The nurse is expected to promote the protection of the client and protect the health, safety, and rights of the client.

- The nurse is responsible for and accountable to delegate tasks consistent with optimal client care. The nurse is expected to be aware of the roles and responsibilities of other healthcare workers.

- The nurse is expected to preserve the integrity and safety to maintain competence and to continue personal and professional growth. This basically means that in states where continuing education units are required, the nurse will abide by these regulations to keep his license current.

- The nurse participates in activities that improve the conditions of the work environment. He is also responsible for promoting activities that foster ethical values in nursing.

- The nurse participates in the advancement of the profession through education, research, and development of nursing knowledge.

- The nurse collaborates with others in the health community to meet client needs.

- The nurse is responsible for maintaining the integrity of nursing and its practice and for shaping social policy. This is done through professional organizations.
Legalities That Affect Nursing Practice

Standards of care apply to the practice of nursing. Because legal actions can be taken against the nurse, it is important for the nurse to be familiar with legal terminology. Several issues affecting nursing practice are discussed in the following section. These include negligence, malpractice, assault, tort, and fraud. These are the most common charges taken against the nurse, so we will cover each in detail.

Negligence

First, negligence is defined as a lack of reasonable conduct and care. Negligence involves omitting an act expected of a person with knowledge. If the nurse fails to perform an act, such as putting the side rail up on a bed and the client falls out of bed, resulting in injury, the nurse can be charged with negligence. It is reasonable for the client to expect the nurse to know that the side rail should be used to prevent injury. Other examples of negligence are the failure to administer medications that are ordered by the physician and the nurse charting vital signs she has not obtained.

Malpractice

Malpractice is professional negligence, misconduct, or unreasonable lack of skill that results in injury or loss of professional services. A nurse can be charged with negligence and malpractice in the same context. If the nurse fails to take the vital signs and the client’s condition deteriorates and the client eventually dies, the nurse can be charged with both negligence and malpractice. Although malpractice is often thought of as more severe, both can result in harm to the client. Other examples of malpractice include medication errors, carelessness with heat and cold application, and failure to assess symptoms such as shock and respiratory distress.

Assault

Assault is the unjustifiable threat or attempt to touch or injure another person. An example is a nurse on the psychiatric unit who uses undue power to restrain the client during an altercation. In such a situation, the nurse can be charged with assault. Assault and battery is the unlawful touching or injuring of another. This might or might not involve the use of a weapon.

Torts

A tort is a legal wrong against a person or his property intentionally. If the psychiatric nurse is given the responsibility of searching the belongings of a client admitted to the unit and, during the search of the client’s luggage, the clothes are torn and the property destroyed, the nurse can be charged with a tort.
Fraud

*Fraud* is the attempt to mislead in any form. Examples of fraud are the recording of vital signs that are not taken and the recording of blood glucose levels that were not obtained.

Witnessing Consent for Care

The nurse is responsible for witnessing informed consent and can legally witness a will if asked by the client. The nurse is not responsible for obtaining informed consent, even though the nurse might get the client to sign the form before surgery or blood administration. This, however, is the ultimate responsibility of the physician. The nurse documents and communicates information regarding client care to the doctor.

Managing Client Care

A portion of the NCLEX exam, called Safe Effective Care, includes the management and delegation of client care. The nurse is responsible for delegating client assignments. The usual team of healthcare workers includes the registered nurses, the licensed practical nurses/licensed vocational nurses, and the nursing assistants (UAP-unlicensed assistive personnel). The National Council of State Boards of Nursing (NCSBN) and state boards of nursing are responsible for ensuring the safety of clients. They work with the American Hospital Association to formulate rules and regulations that govern the nursing practice of these workers. The nurse must utilize Maslow’s Hierarchy of Needs when delegating care to others. The most critical clients should be assigned to the most educated and experienced nurse, whereas the most stable clients should be assigned to the care of the less qualified personnel. The registered nurse coordinates the healthcare and makes assignments to other workers. When the client is admitted to the unit, the registered nurse should see the client first. A client being discharged home or to another unit must be seen by the registered nurse before discharge, as well.

The licensed practical nurse should be assigned to care for the client who needs skilled nursing care but is stable. Care of central venous infusions, blood transfusions, intravenous infusion of chemotherapy agents, and unstable clients are duties that should be assigned to the registered nurse. Administering medications orally or by injection, sterile dressing changes, and inserting nasogastric tubes are examples of duties that can be performed by the licensed practical nurse. The nursing assistant can perform activities of daily living, such as feeding and bathing the client. The nursing assistant can also be assigned to take the vital signs of the stable client. The following gives examples of activities that can be performed by the registered nurse and activities that licensed practical nurses can perform:
Ambulating the client—The nurse (RN/LPN) can measure the client for crutches, assist the client to ambulate using crutches, and teach him regarding the correct methods of ambulation with crutches. The nurse (RN/LPN) can ambulate the client, but the nursing assistant can only ambulate the stable client.

The nurse (RN/LPN) can measure the client for a walker, ambulate the client with a walker, and teach him how to use the walker.

The nurse (RN/LPN) can measure the client for a cane, ambulate the client with a cane, and teach him how to use the cane.

Applying heat and cold—The nurse (RN/LPN) can apply heat lamps, heating pads, warm, moist soaks. The nurse (RN/LPN) can also apply cold applications.

Applying restraints of all types—The RN and the physician are the only two who can place the client in seclusion on the psychiatric unit.

Bathing the client—The nurse (RN/LPN/ULP) can bathe the client and assist the client with performing the activities of daily living.

Central venous pressure monitoring—The nurse (RN/LPN) can check the central venous pressure and assist the doctor with inserting a central catheter. Even though both the RN and LPN have knowledge of the hemodynamics of the heart, the best nurse to assign to interpreting central venous pressures is the registered nurse.

Collecting specimens—The nurse (RN/LPN) can collect specimens such as sputum, wound, urine, and stool.

Electrocardiogram interpretations—The nurse (RN/LPN) can interpret the ECG monitor and should know the life-threatening arrhythmias and the management of each.

IV therapy—The registered nurse can start, manage, and discontinue intravenous infusions.

The RN can insert peripherally inserted central venous catheters (PICCs) with certification. The LPN, however, is not authorized to perform this skill.

The RN can hang and monitor blood transfusions. The LPN can take the vital signs of the client receiving the blood transfusion, but she should not be the primary nurse responsible for this client.

Medication administration—The nurse (RN/LPN) can insert suppositories vaginal and rectal. The registered nurse can administer IV medications, IV push, and IV piggyback medications. The licensed practical nurse should not be assigned to this task unless he is IV certified. Intravenous push medications are not usually included in this certification. The nurse (RN/LPN) can administer oral medications, topical medications, intramuscular medications, intradermal medications, and subcutaneous medications.
Managing Client Care

- **Nasogastric tubes**—The nurse (RN/LPN) can insert nasogastric tubes for Levine suction or gavage feeding. The nurse (RN/LPN) can insert medications through nasogastric feeding tubes and percutaneous esophagoscopy gavage feeding tubes (PEG tubes). The RN and LPN can discontinue nasogastric tubes.

- **Tracheostomy care/endotracheal care**—The nurse (RN/LPN) can suction and provide ventilator support (the nurse is expected to know how to manage the client on the ventilator). The RN and LPN can clean the tracheostomy and provide oxygenation.

- **Traction**—The nurse (RN/LPN) can set up and maintain skin traction but cannot implement skeletal traction.

- **Urinary catheters**—The nurse (RN/LPN) can insert Foley and French catheters. The RN and LPN can irrigate Foley catheters with a physician’s order. They both can discontinue Foley and French catheters, as well.

- **Vital signs**—The nurse (RN/LPN) can perform the task of taking the vital signs and evaluating them. The nursing assistant can take the vital signs of the stable client.

- **Wound care (sterile)**—The nurse (RN/LPN) can perform decubitus care, cast care, and sterile dressing changes.

**NOTE**

The Nurse Practice Act varies from state to state. Contact the state in which you want to be licensed to find specific details affecting nursing practice. The state board of nursing has been authorized to take action against a nurse who has been found guilty of failure to comply with rules and regulations set forth by the law. These examples are not a comprehensive list of all the skills registered nurses/licensed practical nurse can do.

**CAUTION**

Do not assign a nursing assistant to calculate hourly intake and output, take post-operative vital signs, or care for an unstable client. The registered nurse or licensed practical nurse should be assigned to these tasks.

The nurse must be aware of infection control and isolation needs. If the client has an infection, he should not be assigned to share a room with a client who is immune-suppressed or has had surgery. The pregnant client should not be assigned to share a room with a client with teratogenic infections or who is receiving medications that can be harmful to the fetus. The pregnant nurse should also not be assigned to care for the client who has a radium implant or one who is receiving chemotherapy or other medication that can harm the baby.
Another responsibility of the registered nurse and the licensed practical nurse is to serve as a client advocate. She must ensure that referrals are made and that facility policies are maintained. The registered nurse helps with formulating the policies and often serves as the head nurse, supervisor, or director of nursing. Often the registered nurse is the one assigned to call social services, dietary, and other services, although the licensed practical nurse can assist with these responsibilities. As the charge nurse, the RN also might be called on to council co-workers and settle differences that arise among personnel.
Exam Prep Questions

1. The registered nurse is making assignments for the day. Which client should be assigned to the pregnant nurse?
   - A. The client receiving linear accelerator radiation therapy for lung cancer
   - B. The client with a radium implant for cervical cancer
   - C. The client who has just been administered soluble brachytherapy for thyroid cancer
   - D. The client who returned from placement of iridium seeds for prostate cancer

2. The nurse is planning room assignments for the day. Which client should be assigned to a private room if only one is available?
   - A. The client with Cushing’s syndrome
   - B. The client with diabetes
   - C. The client with acromegaly
   - D. The client with myxedema

3. The charge nurse witnesses the nursing assistant hitting a client in the long-term care facility. The nursing assistant can be charged with:
   - A. Negligence
   - B. Tort
   - C. Assault
   - D. Malpractice

4. Which assignment should not be performed by the licensed practical nurse?
   - A. Inserting a Foley catheter
   - B. Discontinuing a nasogastric tube
   - C. Obtaining a sputum specimen
   - D. Starting a blood transfusion
5. The client returns to the unit from surgery with a blood pressure of 90/50, pulse 132, and respirations 30. Which action by the nurse should receive priority?
   - A. Continue to monitor the vital signs.
   - B. Contact the physician.
   - C. Ask the client how he feels.
   - D. Ask the LPN to continue the post-op care.

6. Which nurse should be assigned to care for the postpartal client with preeclampsia?
   - A. The RN with 2 weeks experience on postpartum
   - B. The RN with 3 years experience in labor and delivery
   - C. The RN with 10 years experience in surgery
   - D. The RN with 1 year experience in the neonatal intensive care unit

7. Which information should be reported to the state board of nursing?
   - A. The facility fails to provide literature in both Spanish and English.
   - B. The narcotic count has been incorrect on the unit for the past 3 days.
   - C. The client fails to receive an itemized account of his bills and services received during his hospital stay.
   - D. The nursing assistant assigned to the client with hepatitis fails to feed the client and give him a bath.

8. The nurse is found to be guilty of charting blood glucose results without actually performing the procedure. After talking to the nurse, the charge nurse should:
   - A. Call the board of nursing.
   - B. File a formal reprimand.
   - C. Terminate the nurse.
   - D. Charge the nurse with a tort.

9. The home health nurse is planning for the day's visits. Which client should be seen first?
   - A. The 78-year-old who had a gastrectomy 3 weeks ago with a gastric feeding tube
   - B. The 5-month-old discharged 1 week ago with pneumonia who is being treated with amoxicillin liquid suspension
   - C. The 50-year-old with MRSA being treated with Vancomycin via a PICC line
   - D. The 30-year-old with an exacerbation of multiple sclerosis being treated with cortisone via a centrally placed venous catheter
10. The emergency room is inundated with clients injured in a tornado. Which clients can be assigned to share a room in the emergency department during the disaster?

- **A.** A client with schizophrenia having visual and auditory hallucinations and the client with ulcerative colitis
- **B.** A client who is 6 months pregnant with abdominal pain and the client with facial lacerations and a broken arm
- **C.** A child whose pupils are fixed and dilated and his parents and a client with a frontal head injury
- **D.** The client who arrives with a large puncture wound to the abdomen and the client with chest pain

**Answer Rationales**

1. **Answer A** is correct. The pregnant nurse should not be assigned to any client with radioactivity present. The client receiving linear accelerator therapy travels to the radium department for therapy, and the radiation stays in the department. Thus, the client is not radioactive. The client in answer B does pose a risk to the pregnant client, so answer B is incorrect. Answer C is incorrect because the client is radioactive in very small doses. For approximately 72 hours, the client should dispose of urine and feces in special containers and use plastic spoons and forks. The client in answer D is also radioactive in small amounts, especially on return from the procedure, so D is incorrect.

2. **Answer A** is correct. The client with Cushing’s syndrome has adrenocortical hypersecretion. This increase in the level of cortisone causes the client to be immune suppressed. The client with diabetes poses no risk to other clients and is not immunosuppressed, so answer B is incorrect. The client in answer C has an increase in growth hormone and poses no risk to himself or others, so it is incorrect. The client in answer D has hyperthyroidism or myxedema poses no risk to others or himself, so it is incorrect.

3. **Answer C** is correct. Assault is defined as striking or touching the client inappropriately. Negligence is failing to perform care for the client, so answer A is incorrect. A tort is a wrongful act committed on the client or his belongings, so answer B is incorrect. Malpractice is failing to perform an act that the nurse knows should be done or doing something wrong that causes harm to the client, so answer D is incorrect.

4. **Answer D** is correct. The LPN can be assigned to insert Foley and French urinary catheters, discontinue Levine and gavage gastric tubes, and obtain all types of specimens.

5. **Answer B** is correct. The vital signs are abnormal and should be reported immediately. Continuing to monitor the vital signs can result in deterioration of the client’s condition, so answer A is incorrect. Asking the client how he feels would supply only subjective data, so answer C is incorrect. The LPN is not the best nurse to be assigned to this client because he is unstable, so answer D is incorrect.
6. Answer B is correct. The nurse in answer B has the most experience in knowing the possible complications involved with preeclampsia. The nurse in answer A is a new nurse to this unit, so it is incorrect. The nurse in answer C has no experience with the postpartum client, so it is incorrect. The nurse in answer D also has no experience with postpartal clients, so it is incorrect.

7. Answer B is correct. The Joint Commission on Accreditation of Hospitals will probably be interested in the problems in answers A and C, so they are incorrect. The failure of the nursing assistant to assist the client with hepatitis should be reported to the charge nurse. If the behavior continues, termination can result, but it doesn’t need to be reported to the board, so answer D is incorrect.

8. Answer B is correct. The next action after discussing the problem with the nurse is to document the incident. If the behavior continues or if harm has resulted to the client, the nurse might be terminated and reported to the board of nursing, so answers A and C are incorrect. A tort is a wrongful act to the client or her belongings, so answer D is incorrect.

9. Answer D is correct. The client who should receive priority is the client with multiple sclerosis being treated with cortisone via the central line because this client is at highest risk for complications. The clients described in A and B are stable at the time of the assigned visit. They can be seen later. The client in C has methicillin-resistant staphylococcus aureas. Vancomycin is the drug of choice and can be administered later, but it must be scheduled at specific times of the day to maintain a therapeutic level, so answer C is incorrect.

10. Answer B is correct. Out of all these clients, it is best to hold the pregnant client and the client with a broken arm and facial lacerations in the same room. The other clients need to be placed in separate rooms, so answers A, C, and D are incorrect.

Suggested Reading and Resources

- National Council of State Boards of Nursing (http://www.ncsbn.org/).
1. The client is receiving furosemide (Lasix) 80 mgm IV push. Which is a sign of a possible complication of the IV administration of furosemide?
   - A. Tachycardia
   - B. Hypertension
   - C. Polyuria
   - D. Eupnea

2. The nurse working on the renal unit is preparing to make rounds for the day. Which client should the nurse visit first?
   - A. The client maintained on hemodialysis
   - B. The client with chronic glomeronephritis
   - C. The client one hour post-renal transplant
   - D. The client scheduled for an IVP

3. While caring for a client with a pulmonary embolus, the nurse notes several petechiae on his chest and abdomen. Which action should the nurse take first?
   - A. Administer an anticoagulant.
   - B. Begin a blood transfusion.
   - C. Contact the physician.
   - D. Order a stat complete blood count.

4. A client admitted to the floor 3 days after a bowel resection suddenly develops chest pain and shortness of breath. Assessment of the client reveals rales, BP 160/40, and severe tachycardia. The nurse’s first action should be to:
   - A. Apply O₂ at 2 L/minute via mask.
   - B. Begin CPR.
   - C. Place the client in high Fowler’s position.
   - D. Administer a prescribed sedative.
5. A client has just been diagnosed with diabetes and is admitted for insulin regulation. The client asks the nurse, “Why do I need to be stuck so many times per day?” Which of the following statements best explains the rationale for checking the client’s blood glucose level frequently?

- A. “Blood glucose levels need to be checked every hour to ensure constant insulin needs.”
- B. “Any fluctuation in blood glucose levels must be avoided.”
- C. “Blood glucose levels are checked to be able to adjust the dosage of your insulin.”
- D. “Elevations in glucose can result in alkalosis.”

6. A diabetic client asks the nurse why she should use a diaphragm as a method of contraception instead of birth control pills. The best explanation for the use of a diaphragm is:

- A. A diaphragm will best prevent pregnancy because oral contraceptives are rendered ineffective by increased glucose levels.
- B. A diaphragm is a noninvasive method of contraception that will not alter the blood glucose levels.
- C. A diaphragm will provide intrauterine contraception by preventing implantation of the embryo.
- D. A diaphragm is a noninvasive method of contraception that prevents the egg from being released from the ovary.

7. A client with diabetes phones the clinic stating, “I have a terrible cold and I don’t know what to do about taking my insulin.” Which of the following should be included in the nurse’s teaching regarding the client’s insulin needs?

- A. Infections decrease insulin needs, so she should withhold insulin injections until her cold symptoms improve.
- B. Infections cause a drop in blood glucose levels, so she should base her insulin needs on the results of urine glucose tests.
- C. Infections cause alterations and increase insulin needs, so she should check her blood glucose levels and urine ketones at least every 4 hours.
- D. Infections cause no change in insulin requirements, but she should avoid crowds and overfatigue.

8. A client with a fractured hip asks the nurse about activity after discharge. The nurse should explain to the client that she should refrain from which of the following activities?

- A. Crossing her legs at the knee
- B. Sitting in a recliner
C. Walking up stairs
D. Carrying objects that weigh more than 10 pounds

9. The nurse is caring for a client with Grave’s disease. Which finding would indicate a complication of the client’s disease?
A. Extreme fatigue
B. Tachycardia
C. Shortness of breath
D. Urinary frequency

10. The nurse is making assignments for the day’s care. Which assignment should not be given to the nursing assistant?
A. Emptying the Foley catheter
B. Administering Fleet’s enema
C. Measuring the oral intake
D. Feeding a client with depression

11. The nurse is caring for a client who is terminally ill. When the client dies, the nurse should:
A. Pronounce the client dead and call the doctor.
B. Contact the coroner.
C. Tag the body prior to the funeral home notification.
D. Request an autopsy.

12. The client with multiple myeloma is admitted and prescribed cyclophosphamide (Cytoxan). During the treatment, the nurse should instruct the client to:
A. Increase the fiber in his diet.
B. Report hematuria.
C. Avoid antacid consumption.
D. Increase his activity.

13. The client with cancer has an order for Adriamycin. Which of the following untoward effects is of particular concern to the nurse?
A. Alopecia
B. Fatigue
C. Cardiac dysrhythmias
D. Nausea
14. The client taking allopurinol (Zyloprim) should be taught to:
   - A. Drink eight glasses of water per day.
   - B. Avoid the intake of fruits.
   - C. Allow 6 weeks for the drug to work.
   - D. Eat foods containing purine.

15. A client admitted with tuberculosis asks the nurse how long he will have to take his prescription for INH. The best answer for the nurse to give the client is:
   - A. “It depends on the type of tuberculosis you have.”
   - B. “You will need to take the INH for approximately 1 year and then be reevaluated.”
   - C. “After about 6 weeks, the doctor will discontinue the medication.”
   - D. “You will remain on INH for an indefinite time period.”

16. A client with MRSA is receiving Vanomycin IV. If the client experiences “red man” syndrome, the nurse should:
   - A. Slow the infusion and monitor the blood pressure.
   - B. Check the client for signs of infection.
   - C. Discontinue the medication and document the action.
   - D. Continue the infusion because this is a normal reaction.

17. The charge nurse is making room assignments for the day. Which client should be assigned to the licensed practical nurse?
   - A. The client maintained on ventilator support
   - B. The client who has a cast applied for the treatment of a fractured femur
   - C. The client who has just returned from the operating room with a thyroidectomy
   - D. The client receiving interferon for the treatment of hepatitis

18. Which clients can be assigned to share the same room?
   - A. The client scheduled for a hysterectomy and the client with a tubal ligation
   - B. The client with pneumonia and the client just returned from having a cardiovascular catheterization
   - C. The client with AIDS and the client with bronchietasis
   - D. The client with rheumatoid arthritis being treated with steroids and the client with emphysema
19. The nurse assessing a newborn with physiologic jaundice knows that physiologic jaundice is caused by:
   - A. Failure of the ductus venosus to close
   - B. An immature liver
   - C. An ABO incompatibility
   - D. A lack of surfactant

20. The nurse is using Naegel's Rule to estimate the expected date of delivery. The correct method of determining date of delivery is to:
   - A. Subtract 30 days and add 3 months to the first day of the last menstrual period.
   - B. Subtract 3 months and add 30 days to the last day of the last menstrual period.
   - C. Subtract 3 months and add 7 days to the first day of the last menstrual period.
   - D. Subtract 10 days and add 7 months to the last menstrual period.

21. Which is an expected finding in the normal newborn?
   - A. Undescended testicles
   - B. Acrocyanosis
   - C. Absent sucking pads
   - D. Substernal retractions

22. A client on the psychiatric unit is in an uncontrolled rage and is threatening other clients and staff. Which of the following personnel can legally place the client in seclusion?
   - A. The licensed practical nurse
   - B. The orderly
   - C. The security officer
   - D. The registered nurse

23. A depressed client is threatening to harm himself. Which statement made by the nurse indicates an understanding of the appropriate care of the suicidal client?
   - A. The nurse asks the client whether he has a plan.
   - B. The nurse places the client in seclusion.
   - C. The nurse administers a sedative.
   - D. The nurse calls the family and asks them to come visit the client.
24. The output from a client's indwelling catheter is 500 mls for the past 10 hours. The nurse should:
   - A. Do nothing because the output is within normal limits.
   - B. Notify the doctor because the output is too low.
   - C. Replace the indwelling catheter.
   - D. Force fluids to increase the output in the next 8 hours.

25. The nurse is assigned to a client with a radical mastectomy. Which intervention by the nurse demonstrates the concept of caring?
   - A. Explaining the importance of doing post-mastectomy exercises
   - B. Providing the client with information about breast prosthesis
   - C. Arranging for a visit from a member of Reach for Recovery
   - D. Discussing modifications in clothing to minimize body image changes

26. An elderly client with peripheral vascular disease has been using a heating pad. The first sign of thermal injury related to the use of a heating pad or a hot compress is:
   - A. Swelling
   - B. Redness
   - C. Blanching
   - D. Blister formation

27. The doctor has ordered two medications to be given intramuscularly. The nurse should:
   - A. Ask the doctor to clarify the order.
   - B. Give one injection, wait 30 minutes, and give the other.
   - C. Determine whether the medications can be combined.
   - D. Administer the injections, one in each hip.

28. The nurse is performing tracheal suctioning and notes a previously used bottle of saline at the client's bedside. The nurse should:
   - A. Lip the bottle and use a pack of sterile 4 × 4 for the dressing.
   - B. Obtain a new bottle and label it with the date and time.
   - C. Ask the RN when the solution was requested.
   - D. Label the existing bottle with the current date and time.
29. Based on knowledge of cultural diversity, the nurse knows that obtaining a CBC will be most distressing for the client who is:
   ○ A. Asian
   ○ B. African-American
   ○ C. Hispanic
   ○ D. Native American

30. A client recovering from a head injury is receiving medication and nutritional feedings by nasogastric tube. The doctor has ordered medication to prevent seizure activity. The medication is supplied by the pharmacy in tablet form. Before administering the medication, the nurse should:
   ○ A. Crush the medication and envelop it in a small amount of ice cream before giving.
   ○ B. Help the client to sit upright while giving the tablet by mouth.
   ○ C. Crush the tablet, mix in 100 ccs of tube feeding, and administer via NG tube.
   ○ D. Ask the pharmacist if the medication is available in liquid form.

31. The nurse is to apply an Ace wrap to the client's right lower leg. Which action should the nurse take to ensure that the dressing is not too tight?
   ○ A. Remove it every hour and reapply it.
   ○ B. Check the pedal pulses.
   ○ C. Obtain a Doppler study to determine circulation.
   ○ D. Allow the wrap to remain in place for a minimum of 24 hours.

32. A client scheduled for a computerized axial tomography (CAT) using a contrast medium scan of the brain should be assessed for:
   ○ A. Claustrophobia
   ○ B. Iodine sensitivity
   ○ C. Liver function
   ○ D. Metallic implants
33. The nurse has an order to administer ophthalmic drops and ophthalmic ointment to a client being treated for conjunctivitis. The nurse should:
   ○ A. Apply the eye ointment and eye drops together.
   ○ B. Apply the eye drops, wait 5 minutes, and apply the eye ointment.
   ○ C. Apply the eye ointment, wait 30 minutes, and apply the eye drops.
   ○ D. Ask the pharmacist to supply the two medications in the same form.

34. A client involved in a motor vehicle accident has a 4-inch laceration on her left lower leg. Which finding is consistent with an acute inflammatory reaction?
   ○ A. Increased pain caused by the release of histamine
   ○ B. Blanching of the skin proximal to the laceration
   ○ C. A decrease in the white blood count
   ○ D. Granulation of tissue at the edges of the laceration

35. After obtaining a nutritional assessment of an elderly client, the nurse determines that the client’s diet lacks sufficient protein. Which foods represent low-cost sources of protein?
   ○ A. Potatoes and beef
   ○ B. Peas and beans
   ○ C. Tomatoes and beets
   ○ D. Pork and rice

36. When writing in the client’s chart, the nurse makes an error in documentation. The nurse should:
   ○ A. Attempt to erase the error.
   ○ B. Blacken the entry with a felt tipped pen.
   ○ C. Remove the sheet, rewrite each entry, and initial.
   ○ D. Draw a single line through the entry and initial.

37. The nurse is administering a tap water enema when the client begins to complain of abdominal cramping. The nurse should:
   ○ A. Stop the administration of the enema.
   ○ B. Lower the height of the enema container.
   ○ C. Clamp the enema tubing and withdraw it slowly.
   ○ D. Advance the tubing 1–2 inches.
38. The nurse is instructing the client with a fractured femur in crutch walking. When instructing the client in the best method of manipulating stairs, the nurse should tell the client to:
   - A. Start up the stairs with the crutches first.
   - B. Start up the stairs with the unaffected leg first.
   - C. Use the affected leg to move up the stairs first.
   - D. Use the unaffected leg to move down the stairs.

39. The physician has ordered a sterile urine specimen to be collected from a client who has a Foley catheter. To obtain a sterile urine specimen, the nurse should:
   - A. Use a luer lock syringe and withdraw from the bulb port.
   - B. Disconnect the catheter from the drainage bag.
   - C. Open the urine bag and remove the specimen.
   - D. Use a syringe and withdraw from the catheter port.

40. The nurse is assessing a dark-skinned client with anemia. Which part of the body would the nurse assess for pallor?
   - A. Nail beds
   - B. Hard palate
   - C. Sclera
   - D. Buccal mucosa

41. Which one of the following rights is included in the Patient’s Bill of Rights?
   - A. The right to expect reasonable continuity of care
   - B. The right to complete privacy
   - C. The right to confidentiality
   - D. The right to advanced directives concerning treatment

42. A transfer truck carrying toxic chemicals derails, spilling the contents and emitting toxic fumes over several miles. As a result, many of the area residents complain of nausea, vomiting, and headache. According to the agent-host model, the host is:
   - A. The train carrying the toxic chemicals
   - B. Toxic fumes emitted by the derailed box cars
   - C. Physical problems experienced by the residents
   - D. The residents living in the area
43. The nurse is preparing to change the dressing of a client with a venous access device. Because it is the first time the nurse has performed the skill, he reads the unit policy manual and asks another nurse how to best perform the dressing change. The skill level of the nurse at this time is best described as:
   ○ A. Novice
   ○ B. Proficient
   ○ C. Competent
   ○ D. Expert

44. A client with clotting disorder has an order to continue Lovenox injections after discharge. In assessing the client's readiness for teaching, the most important factor for the nurse to assess is the client's:
   ○ A. Prior knowledge of anticoagulants and their role in controlling his disease
   ○ B. Willingness to learn about injection techniques and site selection
   ○ C. Adaptation to the need for daily injections to control his symptoms
   ○ D. Overall intelligence and developmental level

45. When describing the correct way for cleansing a wound site, the nurse understands that the wound should be cleaned:
   ○ A. From the top to the bottom two times, with the swab discarded
   ○ B. From the outermost region to the center
   ○ C. With circular motions from the drainage site to the outermost edges
   ○ D. With normal saline followed by an astringent wash

46. The nurse has a pre-op order to insert a Foley catheter in a male client. The catheter should be inserted:
   ○ A. 1–2 inches
   ○ B. 3–4 inches
   ○ C. 5–6 inches
   ○ D. 7–9 inches

47. A client going to surgery tells the nurse that she is an active member of the Jehovah's Witness religion. The nurse is aware that the client's spiritual beliefs prohibit:
   ○ A. The use of antibiotics and antivirals
   ○ B. The use of medication from pork sources
   ○ C. The eating of shellfish
   ○ D. The use of blood or blood products
48. The nurse and a nursing assistant are preparing to move an elderly immobile client up in the bed using a sheet. The staff should be standing on opposite sides of the bed even with the client's:
   - A. Hips
   - B. Knees
   - C. Shoulders
   - D. Chest

49. The doctor has ordered a stool specimen for culture. When collecting a stool specimen, the nurse should:
   - A. Extract a portion from the center of the specimen.
   - B. Collect a specimen at the same time the client voids.
   - C. Place the specimen on ice before taking it to the lab.
   - D. Place a paper towel on the commode to catch the specimen.

50. While installing electrical wiring in the intensive care unit, the workmen start an electrical fire. The nurse's first action when caring for a ventilator-dependent client should be:
   - A. Extinguish the fire.
   - B. Notify the nursing supervisor.
   - C. Remove the client and ambu.
   - D. Activate the fire alarm.

51. Anasarca, a characteristic finding in clients with nephritic syndrome, is due to renal changes that result in:
   - A. Hypoalbuminemia
   - B. Hypertension
   - C. Hyperalbuminemia
   - D. Hyperthermia

52. Which of the following findings is most typical of a client with a fractured hip?
   - A. Pain in the hip and affected leg
   - B. Diminished sensation in the affected leg
   - C. Absence of pedal and femoral pulses in the affected extremity
   - D. Disalignment of the affected extremity
53. A client receiving aminophylline complains of nausea and “feeling jittery.” The nurse’s first action should be to:
   ○ A. Administer an antiemetic.
   ○ B. Check the client’s blood pressure.
   ○ C. Request a sedative.
   ○ D. Check the aminophylline level.

54. A gravida 2 para 0 is admitted from the ER with spontaneous rupture of membranes. She states that she has seen the doctor only twice during the pregnancy and that she is unsure of her exact due date. Exam reveals the presence of green-tinged fluid in the vaginal vault. The fetus is noted to be in a LOP position with an FHR of 110 BPM. Based on the assessment, the nurse suspects:
   ○ A. Fetal distress
   ○ B. The presence of an intrauterine infection
   ○ C. A post-mature fetus
   ○ D. That the fetus has a TE fistula

55. A male client is admitted for evaluation of a sudden hearing loss. No physical cause can be found for his sudden deafness; however, a friend reveals that the client’s fiancée recently canceled their engagement, saying that she needed more time to think about the marriage. The client’s deafness is an example of:
   ○ A. Conversion reaction
   ○ B. Hypochondriasis
   ○ C. Reaction formation
   ○ D. Histrionic personality disorder

56. The best choice for the child following a tonsillectomy is:
   ○ A. Fruit punch
   ○ B. Grape soda
   ○ C. A banana Popsicle
   ○ D. Ice cream
57. The licensed practical nurse is monitoring a client receiving an IV of Nipride in D5W. The IV bag has a foil covering, and the nurse notes that the IV fluid has a light brownish tint. The nurse should:
   - A. Discard the solution.
   - B. Obtain a bag of normal saline.
   - C. Cover both the solution bag and the IV tubing with foil.
   - D. Do nothing because the solution is expected to be a light brown in color.

58. A client is admitted to the ER with reported heroin intoxication. Which of the following signs is consistent with opiate use?
   - A. The client's pupils are dilated.
   - B. The client's speech is rapid.
   - C. The client's BP is elevated.
   - D. The client's pupils are constricted.

59. A client with seizure disorder has an order for Dilantin IVP. The nurse knows that Dilantin should:
   - A. Be administered in a solution of D5W
   - B. Be administered in a solution of LR
   - C. Not be administered any faster than 50 mg/minute
   - D. Not be administered IVP

60. The best position for the client with a right total hip replacement is:
   - A. With the right hip flexed 90°
   - B. With the right hip flexed 35°
   - C. Supine with pillows supporting the right leg
   - D. Sims position with the right leg adducted
61. An 18-month-old has been hospitalized six times for upper airway infections. Diagnostic studies including sweat analysis confirm the diagnosis of cystic fibrosis, an autosomal recessive disorder affecting the exocrine system. Which of the following statements describes the inheritance pattern for autosomal recessive disorders?

- A. An affected gene is inherited from both the father and mother, who remain symptom free.
- B. Males are at risk at twice the rate as females.
- C. Autosomal recessive disorders tend to skip generations, so the children of affected parents will have children with the disorder.
- D. The disorder is transmitted by an affected gene on one of the six chromosomes.

62. A 9-month-old is seen in the well child clinic. During the nursing assessment, the mother asks, “Shouldn’t he be making baby sounds by now? My friend’s little boy is the same age and he is already saying dada.” The nurse reports the mother’s concerns to the doctor for follow-up based on the knowledge that infants should be making rudimentary sounds by age:

- A. 1 month
- B. 2 months
- C. 4 months
- D. 8 months

63. A football player is well paid for his superior athletic ability. Described by his friends as quiet and brooding, on the field he is known for his overly aggressive plays. The client’s behavior is an example of:

- A. Displacement
- B. Conversion
- C. Sublimation
- D. Repression

64. A 15-month-old continually turns his cup upside down and shakes milk from the spout. The mother is convinced that he does this on purpose and asks the nurse what she should do. The nurse’s response should be guided by the knowledge that:

- A. Toddlers often misbehave to get the attention of adults.
- B. Toddlers are able to use thought processes to experience events and reactions.
- C. Negative actions that are not immediately punished will be repeated.
- D. Manipulation of objects in their environment enables the toddler to learn about spatial relationships.
65. A father suspected of child abuse tells the nurse, “I shouldn’t have grabbed him so hard. I had a really bad day at work and got all stressed out. The kid just wouldn’t listen to me.” The defense mechanism used by the father is:

- A. Projection
- B. Displacement
- C. Undoing
- D. Compensation

66. A female client seen in the health department’s STD clinic is diagnosed with chlamydia. Before the client leaves the clinic, the nurse should:

- A. Obtain the names and addresses of the client’s sexual contacts.
- B. Tell the client to avoid alcohol while taking her prescription for Flagyl.
- C. Instruct the client to avoid sexual relations until the infection is resolved.
- D. Tell the client to douche after sexual intercourse.

67. A client with iron deficiency anemia is started on ferrous sulfate tablets. The nurse has instructed the client on the appropriate way to take her medication. Which of the following statements indicates that the client understands the nurse’s teaching?

- A. “I can take my iron tablets with a glass of milk.”
- B. “I need to take my iron tablets daily before breakfast.”
- C. “Taking my iron tablets before I go to bed will cut down on stomach upset.”
- D. “Taking my iron tablets with a glass of orange juice will help me absorb more of the medicine.”

68. Which of the following infants is in need of additional growth assessment?

- A. Baby girl A: age 4 months, BW 7 lbs. 6 oz., present weight 14 lbs. 14 oz.
- B. Baby girl B: age 2 weeks, BW 6 lbs. 10 oz., present weight 6 lbs. 11 oz.
- C. Baby girl C: age 6 months, BW 8 lbs. 9 oz., present weight 15 lbs. 0 oz.
- D. Baby girl D: age 2 months, BW 7 lbs. 2 oz., present weight 9 lbs. 10 oz.

69. A client on assisted ventilation develops a right-sided tension pneumothorax. Which of the following signs is associated with a right-sided tension pneumothorax?

- A. Diminished breath sounds on the right
- B. Left-sided tracheal deviation
- C. Right-sided tracheal deviation
- D. Presence of bilateral ronchi
70. A client arrives at the emergency room with an HR of 120, an RR of 48, and hemophtysis. The nurse should give priority to:

- A. Obtaining a history of the current illness
- B. Applying oxygen via mask
- C. Obtaining additional vital signs
- D. Checking arterial blood gases

71. The nurse is performing a post-op assessment of an elderly client with a total hip repair. Although he has not requested medication for pain, the nurse suspects that the client's discomfort is severe and prepares to administer pain medication. Which of the following signs would not support the nurse's assessment of acute post-op pain?

- A. Increased blood pressure
- B. Inability to concentrate
- C. Dilated pupils
- D. Decreased heart rate

72. An obstetrical client elects to have epidural anesthesia with Marcaine. After the epidural anesthesia is given, the nurse should monitor the client for signs of:

- A. Seizure activity
- B. Respiratory depression
- C. Postural hypotension
- D. Hematuria

73. A client in the intensive care unit is overheard telling his wife, “It's impossible to get any sleep in this place with all the noise and lights on all the time.” After talking with the client, the nurse determines that the client is bothered by sensory disturbance related to being in the ICU. Which laboratory finding would confirm the nurse's assessment of sensory disturbance?

- A. Increased urine catecholamines
- B. Decreased TSH
- C. Erratic changes in BUN levels
- D. Increased blood glucose levels
74. Immediately after surgery the client with an above-the-knee amputation of the right leg refuses to look at the operative site. The most immediate diagnosis that can be made is:
   - **A.** Self-care deficit
   - **B.** Potential for infection
   - **C.** Disturbance in self-concept
   - **D.** Cognitive deficit

75. Which of the following describes the proximodistal development in the infant?
   - **A.** The infant is able to raise his head before he is able to sit.
   - **B.** The infant can control movements of his arms before he can control movements of his fingers.
   - **C.** The infant responds to pain with his whole body before he can localize pain.
   - **D.** The infant is able to make rudimentary vocalizations before using spoken words.

76. The licensed practical nurse is assisting the RN with preparation for administering a transfusion of whole blood. Which action by the nurse predisposes the client to the development of hyperkalemia?
   - **A.** Allowing the blood to warm to room temperature
   - **B.** Administering blood that is 24 hours old
   - **C.** Administering blood with an 18-gauge needle
   - **D.** Filling the drip chamber below the level of the filter

77. A client with abdominal surgery is admitted to the recovery room with an NG tube to low suction. Which of the following lab values indicates a complication of NG suction?
   - **A.** Hgb 13.0 gm
   - **B.** Na 150 mEq/L
   - **C.** K 3.4 mEq/L
   - **D.** Cl 90 mEq/L

78. Which of the following statements regarding wound healing is correct?
   - **A.** Healing occurs within 10 days.
   - **B.** Healing by second intention results in excessive scar formation.
   - **C.** Third intention healing involves an open wound with healing taking place from the inside out.
   - **D.** Healing by third intention is accomplished through immediate wound closure by staples or sutures.
79. The nurse is teaching bladder management to a client with paraplegia. Which of the following statements indicates the client needs further teaching on dietary modifications to accommodate bladder changes?
   - A. “I need to eat plenty of citrus fruits to prevent bladder infections.”
   - B. “I need to drink at least eight glasses of water a day.”
   - C. “Including cranberry juice in my diet will prevent urinary infections.”
   - D. “I need to avoid milk and milk products.”

80. A client with mastoiditis has a left mastoidectomy with tympanoplasty. The nurse should observe the client for signs of damage to the sixth cranial nerve, which include:
   - A. Inability to chew
   - B. Inability to look laterally
   - C. Inability to swallow
   - D. Loss of scalp sensation

81. The nurse caring for a client with Meniere’s syndrome can help minimize attacks by teaching the client to limit her dietary intake of:
   - A. Fats
   - B. Carbohydrates
   - C. Sugars
   - D. Salt

82. The nurse is caring for a dark-skinned client hospitalized with hepatitis. The nurse can best observe the presence of jaundice in the client by assessing the client’s:
   - A. Palms and soles
   - B. Nail beds
   - C. Sclera
   - D. Hard palate

83. A 2-year-old is hospitalized with gastroenteritis and dehydration. Which of the following methods is best for evaluating changes in skin turgor?
   - A. Pinching the abdominal tissue while the client is supine
   - B. Pinching the tissue of the forearm while the client is sitting
   - C. Pressing the skin of the lower extremities while the client is supine
   - D. Pinching the skin of the lower extremities while the client is sitting
84. Which of the following meals would be best tolerated by the client receiving Leukeran?
   - A. Peanut butter sandwich, orange juice, and Jell-O
   - B. Warm pea soup, apricot fruit slush, and ice cream
   - C. Lasagna with meat sauce, salad, and tea
   - D. Steak, baked potato, and milk

85. A client with myxedema should be prescribed which diet?
   - A. A diet low in fats
   - B. A diet high in carbohydrates
   - C. A diet high in sugars
   - D. A diet low in salt

86. The nurse is caring for a client from the Middle East. The nurse is aware that the client will most likely:
   - A. Want to take time for prayer during the day.
   - B. Ask for specially prepared foods.
   - C. Refuse blood products.
   - D. Want to be treated by a medicine man.

87. A 15-year-old hospitalized with a sarcoma is being treated with Adriamycin. Which action by the nurse would indicate an understanding of the drug?
   - A. The nurse asks the client whether she would like to talk about the treatment she’s receiving.
   - B. The nurse implements isolation precautions.
   - C. The nurse provides the client with a wig.
   - D. The nurse strains the client’s urine.

88. Which of the following activities would be best tolerated by a client with muscular dystrophy?
   - A. Swimming
   - B. Riding a bicycle
   - C. Playing golf
   - D. Skating
89. A client undergoes cryosurgery for the removal of a basal cell carcinoma on the ear. Which of the following best describes the appearance of the area a few days after surgery?

- A. It’s dry, crusty, and itchy.
- B. It’s oozing and painful.
- C. It’s dry and tender.
- D. It’s swollen, tender, and blistered.

90. A culture is taken of a lesion suspected of being herpes. The nurse knows that the specimen:

- A. Should be packed on ice
- B. Should be kept warm
- C. Should be double bagged
- D. Requires no special handling

91. A client with AIDS shows symptoms of herpes simplex stomatitis. Which drug therapy can be anticipated for the client?

- A. Lypressin
- B. Liothyroxine
- C. Acyclovir
- D. Dexamethasone

92. While assisting a client with AM care, the nurse notes small elevated skin lesions less than 0.5 cm in diameter over the client’s back. The nurse should describe the lesions as:

- A. Macules
- B. Plaques
- C. Wheals
- D. Papules

93. A 6-month-old is brought to the ER by her mother. During the assessment, the nurse finds multiple bruises in different stages of healing and decreased range of motion of the right leg. X-ray confirms a fracture of the right femur. Which statement made by the mother would contribute to a diagnosis of child abuse?

- A. “She got her leg caught in the crib and twisted it.”
- B. “She hurt her leg while she was crawling.”
- C. “I can’t remember her falling or getting hurt.”
- D. “She fell out of her car seat before I could get the belt fastened.”
94. A client with a pyloric obstruction is admitted to the hospital with persistent vomiting. Which of the following blood gases would the nurse expect to see in the client with vomiting?

- A. pH 7.33, PCO₂ 30 mm Hg
- B. pH 7.50, PCO₂ 32 mm Hg
- C. pH 7.30, PCO₂ 50 mm Hg
- D. pH 7.47, PCO₂ 40 mm Hg

95. The doctor has ordered the insertion of an NG tube to determine the extent of gastric bleeding in a client with a gastric ulcer. To facilitate the insertion of the NG tube, the nurse should:

- A. Place the NG tube in warm water prior to insertion.
- B. Place the client in a supine position.
- C. Ask the client to swallow as the tube is advanced.
- D. Ask the client to hyper-extend his neck as the nurse begins to insert the tube.

96. A client with acute leukemia has developed oral ulcerations. The nurse can increase the client's comfort by suggesting that he:

- A. Avoid brushing his teeth until the ulcers heal.
- B. Rinse his mouth frequently with normal saline.
- C. Rinse his mouth frequently with hydrogen peroxide.
- D. Cleanse his teeth and mouth with lemon and glycerin swabs.

97. The parents of a child with cystic fibrosis discuss nutritional requirements and the need for vitamin supplements with the nurse. The nurse explains that it is necessary to give daily supplements of vitamins A, D, E, and K because:

- A. Children with cystic fibrosis require vitamin supplements because their metabolism is increased.
- B. Children with cystic fibrosis do not eat a well-balanced diet.
- C. Children with cystic fibrosis do not absorb fat-soluble vitamins.
- D. Children with cystic fibrosis have an increased excretion of water-soluble vitamins.
98. A client with a gastric ulcer is losing a significant amount of blood via the NG tube. The client's pulse is weak and thready, and she is hypotensive. A continuous irrigation of normal saline is ordered. How should the client be positioned?
   ○ A. High Fowler's
   ○ B. Semi-Fowler's
   ○ C. Supine
   ○ D. Left-side lying

99. A client with diabetes insipidus will require lifelong therapy with vasopressin. Which of the following should the nurse include in his teaching plan for the client?
   ○ A. The client will need to take her medication with meals.
   ○ B. The client will need to learn how to check the specific gravity of her urine.
   ○ C. The client will need to modify her daily activities.
   ○ D. The client will need to learn the proper method of drug administration.

100. Which of the following instructions should be included in the pre-op teaching of a client scheduled for a transphenoidal hypophysectomy for the removal of a pituitary tumor?
   ○ A. “It will be necessary to shave some of your hair.”
   ○ B. “It will be important for you to cough and deep breathe after the surgery.”
   ○ C. “You will need to lie supine for 24 hours after surgery.”
   ○ D. “You will not be able to brush your teeth for at least a week after surgery.”

101. A 34-year-old male is admitted to the hospital with a possible diagnosis of pheochromocytoma. Which of the following symptoms would the nurse not expect to see during an attack?
   ○ A. Orthostatic hypotension
   ○ B. Diaphoresis
   ○ C. Apprehension
   ○ D. Bradycardia

102. A client with suspected Addison's disease is scheduled for a rapid corticotrophin stimulation test. Which of the following will the nurse include in her teaching?
   ○ A. The need to limit fluid intake
   ○ B. The need for periodic blood samples
   ○ C. The need for collection of a 24-hour urine
   ○ D. The need for frequent IV injections
103. Which of the following lab values might the nurse expect to see in a client with Addison's disease?

- A. WBC 10,000
- B. BUN 22
- C. K+ 3.5 mEq/L
- D. Na+ 142 mEq/L

104. A 56-year-old male is admitted with a diagnosis of gastroesophageal reflux disease (GERD). The client is most likely to report esophageal discomfort following a meal of:

- A. Chicken in lemon sauce, rice, and fruit juice
- B. Turkey, salad, and a glass of red wine
- C. Poached salmon, mashed potatoes, and milk
- D. Hamburger, peas, and cola

105. A 28-year-old client is being treated with acute pelvic inflammatory disease. Which of the following positions will afford the most comfort for this client?

- A. Prone
- B. Flat, left Sims
- C. Semi-Fowler's
- D. Flat, with legs elevated

106. A client with ulcerative colitis is placed on Azulfidine. Which of the following instructions should be included in the nurse's teaching?

- A. The client should be instructed to avoid exposure to sunlight because the drug causes sun sensitivity.
- B. The client should be instructed to take the medication with meals.
- C. The client should be instructed to take the medication even when he is feeling well.
- D. The client should be instructed to take the medication as prescribed because it will stop the loss of blood in the stools.
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107. A client with a C6 spinal injury begins to complain of a severe headache. When assessing the client, the nurse notes that her BP is 190/100 and she is diaphoretic. Which of the following nursing actions is most appropriate at this time?
   ○ A. Increase the rate of IV fluids.
   ○ B. Make sure the Foley catheter is patent.
   ○ C. Place the client flat in bed.
   ○ D. Administer oxygen.

108. Which of the following lab reports indicates that a client with acute glomerulonephritis is improving?
   ○ A. Positive ASO titer
   ○ B. Increased C reactive protein
   ○ C. Negative eosinophil count
   ○ D. Decreased erythrocyte sedimentation rate

109. Which of the following snacks would be permitted for a child with acute renal failure?
   ○ A. Peanut butter and jelly sandwich
   ○ B. Orange juice and graham crackers
   ○ C. Marshmallows
   ○ D. Cheese and crackers

110. Which of the following dietary choices should be avoided by a client with a recent bone marrow transplant?
   ○ A. Applesauce
   ○ B. Apple juice
   ○ C. Apple pie
   ○ D. Raw apple

111. Which of the following activities is most suitable for a 10-year-old with asthma?
   ○ A. Soccer
   ○ B. Swimming
   ○ C. Basketball
   ○ D. Constructing model cars
112. Which of the following musical instruments is best for a teen with asthma?
   ○ A. Guitar
   ○ B. Piano
   ○ C. Drums
   ○ D. Clarinet

113. A client returns from surgery after having a suprapubic prostatectomy. Upon assessing the client, the nurse notes that his urine is bright red with many clots. Which of the following nursing actions is most appropriate?
   ○ A. Check the client’s vital signs and notify the physician.
   ○ B. Check whether the continuous irrigation is working properly.
   ○ C. Recognize that this is a normal finding after surgery and continue post-op care.
   ○ D. Apply traction on the catheter and notify the physician.

114. Diuretic therapy for hypertension often necessitates the addition of high-potassium foods in the client’s diet. Which of the following diuretics does not require the client to increase his intake of potassium?
   ○ A. Spironolactone (Aldactone)
   ○ B. Furosemide (Lasix)
   ○ C. Hydrochlorothiazide (Hydrodiuril)
   ○ D. Ethacrynic acid (Edecrin)

115. Which of the following meals provides the lowest amount of potassium?
   ○ A. Orange, cream of wheat, bacon
   ○ B. Toast, jelly, soft boiled egg
   ○ C. Raisin bran, milk, grapefruit
   ○ D. Melon, pancakes, milk

116. Which of the following instructions should be included for the client taking calcium supplements?
   ○ A. The client should take her calcium with meals.
   ○ B. The client should take all her daily calcium supplement at one time.
   ○ C. The client should take her calcium supplement after meals to prevent stomach upset.
   ○ D. The client can use calcium-based antacids to supplement her diet.
117. When caring for a client with hypocalcaemia, the nurse should assess for:
   - A. A decreased level of consciousness
   - B. Tetany
   - C. Bradycardia
   - D. Respiratory depression

118. A client is admitted to the burn unit with an electrical burn. Which of the following areas probably sustained the greatest degree of injury?
   - A. The skin
   - B. The intrathoracic
   - C. The muscles supporting the long bones
   - D. The bones

119. A client with hyperkalemia is to receive an infusion of 250 ml of 20% glucose with 20 units of regular insulin. The rationale for this therapy is:
   - A. Potassium elimination is enhanced.
   - B. Potassium binds with the glucose and is excreted by the kidneys.
   - C. Glucose uptake by the cell drives the potassium into the cell.
   - D. Insulin lowers the potassium by lowering blood glucose.

120. Which of the following organs is most likely to suffer permanent damage from shock?
   - A. The heart
   - B. The skin
   - C. The brain
   - D. The kidneys

121. A client has sustained second- and third-degree burns over her entire left arm and posterior trunk. Using the Rule of Nines, which percentage of the client's body is burned?
   - A. 9%
   - B. 18%
   - C. 27%
   - D. 36%
122. A client who received complete thickness burns at 7:30 a.m. was rushed to the emergency room where IV therapy with Lactated Ringer’s was begun. He is to receive 8,000 ml of solution in 24 hours. According to the Parkland formula, how much solution should he receive by 11:30 p.m.?

- A. 4,000 ml
- B. 5,000 ml
- C. 6,000 ml
- D. 7,000 ml

123. The drug of choice for managing status epileptics is:

- A. Carbamazepine (Tegretol)
- B. Diazepam (Valium)
- C. Clonazepam (Klonopin)
- D. Valproic acid (Depakene)

124. Which of the following electrolytes must be maintained in a steady state for a client receiving lithium?

- A. Sodium
- B. Potassium
- C. Chloride
- D. Magnesium

125. The greatest threat during the immediate post-burn period results from burn shock. Which of the following statements best describes why burn shock occurs?

- A. Damaged tissues release histamine and other substances that can result in vasodilatation and increased capillary permeability with a loss of fluid from the vascular compartment to the interstitial space.
- B. Large amounts of fluid are lost from the burn site, which results in a decrease in circulating volume.
- C. Large amounts of epinephrine are released, leading to severe vasoconstriction and shock.
- D. Release of epinephrine leads to tachycardia, ineffective cardiac output, and shock.
126. A client with an acute attack of gout is started on colchicines. She should be instructed to report which of the following symptoms?

- A. Diarrhea
- B. Headache
- C. Itching
- D. Fever

127. A baby girl is born with a meningomyelocele. To prevent trauma to the sac, the nurse should place the infant:

- A. Supine and flat
- B. Prone with the hips slightly elevated
- C. Prone with the head slightly elevated
- D. Side lying

128. A client with a cholesterol level of 240 mg is instructed to modify his diet. Which of the following diets provides a low-cholesterol, low-saturated fat breakfast?

- A. Oatmeal, skim milk, toast with margarine, orange juice, coffee
- B. French toast, margarine, syrup, crisp bacon, coffee
- C. Pancake, margarine, syrup, sausage, fresh fruit, tea
- D. Toasted bagel, cream cheese, poached egg, coffee

129. While caring for a child who had a revision of a ventriculoperitoneal shunt, the nurse notes clear drainage from the incision. Which of the following actions should the nurse take first?

- A. Notify the physician to obtain further orders.
- B. Mark the dressing and continue to monitor.
- C. Check the dressing for the presence of glucose with a Dextrostik.
- D. No action is necessary because some drainage is expected.

130. Which of the following findings distinguishes a hydrocele from an inguinal hernia?

- A. The swelling cannot be reduced and is translucent.
- B. The swelling cannot be reduced and is opaque.
- C. The swelling can be reduced and is translucent.
- D. The swelling can be reduced and is opaque.
131. A client with lung cancer is advised to increase the protein and kilocalorie content of his diet. Which of the following choices will best meet his need for increased protein and calories?

- A. Toast, jelly, chicken broth
- B. Crackers, butter, fresh vegetables
- C. Crackers, fresh fruit, ginger ale
- D. Crackers, cheese, fruit yogurt

132. A child at summer camp comes to see the camp nurse 10 minutes after being stung by a bee. The child complains of tingling around her mouth and tightness in her chest. The nurse’s first action is summon help and to:

- A. Administer O₂ at 4 L/min by nasal cannula.
- B. Apply a tourniquet proximal to the bee sting and give epinephrine subcutaneously.
- C. Administer O₂ at 6 L/min. and give Benadryl 25 mg PO.
- D. Reassure the child that she is only excited due to the sting.

133. A 14-month-old is receiving Digoxin and Lasix twice a day. In planning his care, the nurse should assess for which complication?

- A. Hypokalemia
- B. Hyperkalemia
- C. Hypercalcemia
- D. Hyponatremia

134. The first postpartal bleeding noted by the mother after delivery is:

- A. Lochia rubra
- B. Lochia serosa
- C. Lochia alba
- D. Lochia canta

135. An elderly client has reduced hepatic functioning. Before giving medication, the nurse should be aware that diminished hepatic function will:

- A. Decrease the possibility of drug toxicity.
- B. Prevent analgesics from being given.
- C. Reduce the blood level of certain drugs.
- D. Increase the possibility of drug toxicity.
136. A client with seizure disorder is to receive phenytoin and Phenobarbital. The nurse knows that when she administers Phenobarbital and phenytoin:
   - A. A larger dose of Phenobarbital might be required because of an increase in metabolism.
   - B. A smaller dose of Phenobarbital might be required because of a decrease in metabolism.
   - C. There will be no need to alter the amount of Phenobarbital given.
   - D. The two drugs cannot be given together.

137. While assessing a pre-op client, the nurse learns that the client is allergic to shellfish. How might this data affect the client's surgical experience?
   - A. The anesthesiologist might need to alter the type of anesthesia used.
   - B. The physician might need to alter the type of skin preparation used.
   - C. The physician might need to alter the type of antibiotics ordered post-operatively.
   - D. The physician might need to monitor the client's thyroid levels post-operatively.

138. The nurse is reviewing a client's pre-op lab values. Which of the following lab results warrants immediate attention?
   - A. Prothrombin time of 1 minute and 20 seconds
   - B. Hematocrit 38 ml/dl
   - C. Hemoglobin 14 g/dl
   - D. White blood count 6,000/mm

139. Spinal headaches are a common occurrence following spinal anesthesia. Which of the following nursing interventions can help prevent a spinal headache?
   - A. Placing the client in a quiet room.
   - B. Significantly increasing the client's fluid intake.
   - C. Administering PRN pain medication.
   - D. Raising the head of the bed to 45°.

140. A client with a recent spinal cord injury is experiencing dysreflexia and is noted to have a BP of 240/110. The nurse's initial response should be to:
   - A. Check the client's pulse and respiratory rate.
   - B. Elevate the client's head to a 45° angle.
   - C. Place the client flat and supine.
   - D. Administer antihypertensive and recheck BP in 15 minutes.
141. Which of the following instructions should be given to a client regarding testicular self-exam?
   - A. The testicular exam should be done bimonthly.
   - B. The testicular exam should be done while in the shower or tub.
   - C. A small pen light should be used to transilluminate the scrotal sac.
   - D. The testicular exam should be done yearly.

142. A 6-month-old has been hospitalized for the treatment of acute diarrhea. Discharge diet includes the use of Isomil instead of Similac formula until the next clinic appointment. Which of the following statements explains the change in infant formula?
   - A. Isomil is less expensive than Similac.
   - B. The infant has developed a permanent lactose intolerance.
   - C. Isomil is an excellent oral rehydration formula.
   - D. Infants commonly have a lactose intolerance after a diarrheal illness.

143. The client has a cast applied following a fracture of the femur. The doctor tells the nurse to petal the cast. The nurse is aware that he intends for her to:
   - A. Cut the cast down both sides.
   - B. Cut a window in the cast.
   - C. Cover the edges with cast batting.
   - D. Cut the cast down one side.

144. The client with a colostomy does not feel that the irrigating solution has drained completely. The nurse can enhance the effectiveness of the colostomy irrigation by telling the client to:
   - A. Massage the abdomen gently.
   - B. Reduce the amount of irrigation solution.
   - C. Increase his oral intake.
   - D. Place a heating pad on the abdomen.

145. A client with a partial bowel obstruction has a Miller-Abbot tube inserted to decompress the bowel. While the tube is in place, the nurse should give priority to:
   - A. Using only normal saline to irrigate the tube every 4 hours.
   - B. Advancing the tube 3–4 inches as ordered by the physician.
   - C. Changing the tape securing the tube to the client's face daily to prevent skin breakdown.
   - D. Attaching the tube to high constant suction.
A client is brought to the emergency room with injuries sustained in an auto accident. While performing his assessment, the nurse notes the presence of Cullen's sign. Cullen's sign is suggestive of:

- A. A neurological injury
- B. A ruptured spleen
- C. A bowel perforation
- D. Retroperitoneal bleeding

A client with chronic pancreatitis is receiving Pancreatin. Which of the following observations is most indicative that the drug treatment is having the desired effect?

- A. The client's appetite is improved.
- B. The client's weight loss is greater than 10 pounds.
- C. The client's stools contain less fat and occur with less frequency.
- D. The client's tissue bruises less easily.

A non-stress test has been ordered for a pregnant client with diabetes mellitus. Non-stress testing is a part of the diabetic's prenatal care because:

- A. Fetal movement is adversely affected by diabetes.
- B. Maternal insulin levels can have a negative effect on fetal energy.
- C. Diabetes can adversely affect development of placental vessels.
- D. Fetal lung maturity is most easily determined by non-stress testing.

The obstetric client is determined to have oligohydramnios. Which fetal anomaly is associated with oligohydramnios?

- A. Diabetes
- B. Renal agenesis
- C. Tracheo-esophageal fistula
- D. Tracheo-esophageal atresia

A client receiving aminophylline IV complains of feeling nervous and shaky. The nurse is aware that these are symptoms of:

- A. CNS depression that accompanies xanthine derivatives
- B. CNS stimulation that sometimes accompanies xanthine derivatives
- C. The anticholinergic effects of aminophylline
- D. Cardiovascular depression that can accompany xanthine derivatives
151. The client with herpes zoster will most likely have an order for which category of med-
ication?
   - A. Antibiotics
   - B. Antipyretics
   - C. Antivirals
   - D. Anticoagulants

152. A client with chronic bronchitis is admitted with complaints of chest pain. Which of the
   following drug orders should the nurse question?
   - A. Nitroglycerin
   - B. Ampicillin
   - C. Propranolol
   - D. Verapamil

153. Which of the following instructions should be included in the teaching for the client
   with arthritis?
   - A. Avoid exercise because it fatigues the joints.
   - B. Take prescribed anti-inflammatory medications with meals.
   - C. Alternate heat and cold packs to the affected joints.
   - D. Avoid weight bearing activity.

154. An elderly client with a fractured hip is placed in Buck’s traction. The primary purpose
   for Buck’s traction in for this client is:
   - A. To decrease muscle spasms
   - B. To prevent the need for surgery
   - C. To alleviate the pain associated with the fracture
   - D. To prevent bleeding associated with hip fractures

155. Triage refers to the classification of injury severity during a disaster. Which of the fol-
   lowing clients should receive priority during triage?
   - A. Open fractures of the tibia and fibula
   - B. Burns of the head and neck
   - C. Crushing injury of the arm
   - D. Contusions and lacerations of the head without loss of consciousness
156. The client is admitted to the unit with the following lab values. Which of the following lab values should be reported immediately?
   - A. BUN 18 mg/dl
   - B. PO2 72%
   - C. Hemoglobin 10 mg/dl
   - D. White blood cell count of 5500

157. Which of the following findings is consistent with a diagnosis of congestive heart failure?
   - A. Jugular vein distention.
   - B. Carbon dioxide reading of 30
   - C. Hemoglobin of 18
   - D. Potassium level of 5.5

158. A 28-year-old primigravida with pregestational diabetes visits the clinic 6 weeks gestation. Which of the following statements indicates that she understands the nurse’s teaching regarding her insulin needs during pregnancy?
   - A. “As the baby grows, I will need more insulin because the baby will not be able to make insulin.”
   - B. “Changes in hormone levels will make my body more resistant to insulin, so I will need more insulin as the pregnancy progresses.”
   - C. “As the baby grows, I will need less insulin because the baby uses up any extra glucose.”
   - D. “If I maintain an adequate balance of diet and exercise, my insulin requirements will be the same.”

159. Which of the following positions is best for a client with preeclampsia who is in labor?
   - A. Left Sims
   - B. High Fowler’s
   - C. Trendelenburg
   - D. Supine

160. A symptom of impending cardiac decompensation in a pregnant client with heart disease is:
   - A. Increasing dyspnea
   - B. Transient palpitations
   - C. Occasional activity intolerance
   - D. Periodic shortness of breath
161. A client with acute pancreatitis is experiencing severe abdominal pain. Which of the following orders should be questioned by the nurse?
   ○ A. Meperidine 100 mg IM q 4 hours PRN pain
   ○ B. Mylanta 30 ccs q 4 hours via NG
   ○ C. Cimetadine 300 mg PO q.i.d.
   ○ D. Morphine 8 mg IM q 4 hours PRN pain

162. The client is admitted, and an order for continuous observation is written. The nurse is aware of this order because he knows that hallucinogenic drugs differ from other drugs of abuse in their capacity to:
   ○ A. Create both stimulant and depressant effects
   ○ B. Induce states of altered perception
   ○ C. Produce severe respiratory depression
   ○ D. Induce rapid physical dependence

163. A client with a history of abusing amphetamines abruptly stops her drug use. The nurse should give priority to assessing the client for:
   ○ A. Depression and suicidal ideation
   ○ B. Diaphoresis and tachypnea
   ○ C. Muscle cramping and abdominal pain
   ○ D. Tachycardia and euphoric mood

164. During the assessment of a laboring client, the nurse notes that the FHT are loudest in the upper-left quadrant. The infant is most likely in which position?
   ○ A. Left mentum anterior
   ○ B. Left occipital anterior
   ○ C. Left sacral anterior
   ○ D. Left occipital transverse

165. The primary physiological alteration in the development of asthma is:
   ○ A. Bronchiolar inflammation and dyspnea
   ○ B. Hypersecretion of abnormally viscous mucus
   ○ C. Induction of histamine mucosal edema
   ○ D. Spasm of bronchiolar smooth muscle
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166. A client with mania is busy investigating the unit and overseeing the activities of others. She is unable to finish her dinner. To help her maintain sufficient nourishment, the nurse should:

- **A.** Serve high-calorie foods she can carry with her.
- **B.** Encourage her appetite by sending out for her favorite foods.
- **C.** Serve her small, attractively arranged portions.
- **D.** Allow her in the unit kitchen for extra food whenever she pleases.

167. To maintain Bryant's traction, the nurse must make certain that the child's:

- **A.** Hips are resting on the bed with the legs suspended at a right angle to the bed
- **B.** Hips are slightly elevated above the bed with the legs suspended at a right angle to the bed
- **C.** Hips are elevated above the level of the body on a pillow with the legs suspended parallel to the bed
- **D.** Hips and legs are flat on the bed with the traction positioned at the foot of the bed

168. Which of the following signs is highly suggestive of impaired hearing in an infant?

- **A.** The absence of the Moro reflex
- **B.** The absence of babbling by age 7 months
- **C.** A lack of eye contact when spoken to
- **D.** A lack of hand gesture to indicate wants

169. After 4 days of extreme anxiety, a hospitalized toddler appears to settle in. He seems unconcerned when his parents come to visit. The nurse knows that:

- **A.** He is experiencing detachment.
- **B.** He has successfully adjusted to the hospital environment.
- **C.** He has accepted hospitalization and seeing his parents too frequently will only renew his anxiety.
- **D.** He has transferred his attachment to the nursing staff.
170. The client has an order for a peak to be drawn on a client receiving Garamycin. The nurse is aware that he should contact the lab for them to draw the blood:
   - A. 15 minutes after the infusion
   - B. 30 minutes after the infusion
   - C. 1 hour after the infusion
   - D. 2 hours after the infusion

171. A client with an embolus is started on a continuous heparin infusion to run at 1,200 units per hour. The solution contains 12,500 units of heparin per 250 ml of normal saline. The IV set should be regulated to deliver how many milliliters per hour?
   - A. 12
   - B. 24
   - C. 36
   - D. 48

172. A client using a diaphragm should be instructed to:
   - A. Refrain from keeping the diaphragm in longer than 8 hours.
   - B. Keep the diaphragm in a warm location.
   - C. Have the diaphragm resized if she gains 5 pounds.
   - D. Have the diaphragm resized if she has any surgery.

173. The nurse is providing postpartum teaching for a non-nursing mother. Which of the client's statements indicates the need for additional teaching?
   - A. “I'm wearing a support bra.”
   - B. “I'm expressing milk from my breast.”
   - C. “I'm drinking four glasses of fluid during a 24-hour period”
   - D. “While I'm in the shower, I'll keep the water from running over my breasts”

174. Damage to the VIII cranial nerve results in:
   - A. Air conduction loss
   - B. Sensorineural loss
   - C. Mixed hearing disorders
   - D. Tinnitus
175. A client is receiving vincristine. The client should be taught that the medication can:
   - A. Cause diarrhea
   - B. Change the color of her urine
   - C. Cause mental confusion
   - D. Cause changes in taste

176. Which of the following nursing interventions is essential when caring for a client who is receiving cyclophosphamide?
   - A. Monitoring vital signs q 1 hour
   - B. Carefully monitoring of urine output
   - C. Monitoring apical pulse
   - D. Assessing for signs of increased intracranial pressure

177. A client with AIDS has lesions from herpes simplex virus. He is receiving intravenous acyclovir. Which nursing intervention is most critical during the administration of acyclovir?
   - A. Limit the client's activity.
   - B. Encourage a high-carbohydrate diet.
   - C. Utilize an incentive spirometer to improve respiratory function.
   - D. Encourage fluids.

178. A danger following bone marrow transplantation is graft-host disease. The first sign of graft-host disease is:
   - A. Chest pain
   - B. Rash
   - C. EKG changes
   - D. Fever

179. A client is admitted for an MRI, a CT scan, and a myelogram. Which of the following medication orders should be questioned for the client who is to have a myelogram?
   - A. Ampicillin 250 mg PO q 6 hours
   - B. Motrin 400 mg PO q 4 hours PRN for headache
   - C. Seconal 50 mg HS PRN for sleep
   - D. Darvon 65 mg PO q 4 hours for pain
180. A client admitted with a severe head injury following an MVA is placed on a ventilator and hyperventilation is maintained. The primary reason for maintaining hyperventilation is:
   - A. To increase oxygen to the brain
   - B. To dilate the cerebral blood volume
   - C. To increase the cerebral blood volume
   - D. To promote cerebral vasoconstriction and decrease cerebral blood flow

181. While monitoring the urine specific gravity of a client with a head injury, the nurse notes that the client’s specific gravity is decreasing and is currently 1.004. The most likely explanation for this finding is:
   - A. The client is adequately hydrated.
   - B. The client is experiencing renal failure.
   - C. The client has adequate ADH secretion.
   - D. The client is experiencing diabetes insipidus.

182. The nurse should visit which of the following clients first?
   - A. The client with diabetes with a blood glucose of 95 mg/dl
   - B. The client with hypertension being maintained on Lisinopril
   - C. The client with chest pain and a history of angina
   - D. The client with Raynaud’s disease

183. Following a stroke, a client is found to have receptive aphasia. This finding is consistent with damage to:
   - A. The frontal lobe
   - B. The parietal lobe
   - C. The temporal lobe
   - D. The occipital lobe

184. During the first 72 hours post CVA, the nurse should position the client:
   - A. Flat in bed with the head elevated on a small pillow
   - B. With the head of the bed elevated at 30° and the client’s head in a midline neutral position
   - C. In semi-Fowler’s and the knee gatch elevated
   - D. Flat in bed and lying on the side
185. A client has undergone a lumbar puncture for examination of the CSF. Which of the following findings should be considered abnormal?

- A. Total protein 40 mg/100 ml
- B. Glucose 60 mg/100 ml
- C. Clear, colorless appearance
- D. White blood cells 100/cu. mm

186. Which of the following interventions is appropriate when caring for a client who has lost function of cranial nerve V on the left side?

- A. Helping the client select foods that are easy to swallow
- B. Speaking to the client on his right side
- C. Applying an eye patch to the left eye
- D. Speaking to the client on his left side

187. Following a CT scan with contrast medium, the nurse should give attention to:

- A. Maintaining bed rest for 8 hours
- B. Forcing fluids
- C. Observing the puncture site for hemorrhage
- D. Administering pain medication

188. A client whose father died from Huntington’s chorea asks what the chances are that he will develop the disease. The nurse knows that the chances of the client developing the disease are:

- A. 25%
- B. 50%
- C. 100%
- D. 0%

189. Cataracts result in opacity of the crystalline lens. Which of the following best explains the functions of the lens?

- A. The lens controls stimulation of the retina.
- B. The lens orchestrates eye movement.
- C. The lens focuses light rays on the retina.
- D. The lens magnifies small objects.
190. A client scheduled for a fluorescein angiography is to have mydriatic eye drops instilled in both eyes 1 hour prior to the test. The nurse knows that the purpose of the medication is:

- A. To anesthetize the cornea
- B. To dilate the pupils
- C. To constrict the pupils
- D. To paralyze the muscles of accommodation

191. A client with a severe corneal ulcer has an order for Gentamycin gtt q 4 hours and Neomycin 1 gtt q 4 hours. Which of the following schedules should be used when administering the drops?

- A. Allow 5 minutes between the two medications.
- B. The medications can be used together.
- C. The medications should be separated by a cycloplegic drug.
- D. The medications should not be used in the same client.

192. While assessing a client with AIDS, the nurse notes a reddish-purple discoloration on the client's eyelid. This finding is most consistent with:

- A. Cytomegalovirus retinitis
- B. AIDS entropion
- C. Retinitis pigmentosa
- D. Kaposi's sarcoma

193. An elderly client has difficulty distinguishing colors. Which colors are often misinterpreted by elderly clients?

- A. Orange
- B. Violet
- C. Red
- D. White

194. The rationale for refrigerating urine specimens that cannot be analyzed immediately is:

- A. Urine becomes more acidic and kills bacteria that might be present.
- B. Urea breaks down into ammonia, causing urine to become more alkaline and promoting cellular breakdown.
- C. Components in the urine become consolidated so that the urine cannot be analyzed.
- D. Red cells appear in stagnant urine.
The client with enuresis is being taught regarding bladder retraining. The ability to remain continent depends on the:

- A. Sympathetic nervous system
- B. Parasympathetic nervous system
- C. Central nervous system
- D. Lower motor neurons

A client with a history of renal calculi passes a stone made up of calcium oxalate. Which of the following diet instructions should be given to the client?

- A. Increase intake of meats, eggs, fish, plums, and cranberries.
- B. Avoid citrus fruits and juices.
- C. Avoid dark green, leafy vegetables.
- D. Increase intake of dairy products.

Which of the following drugs would be least helpful for a client who is experiencing an acute attack of bronchial asthma?

- A. Cromolyn sodium
- B. Epinephrine
- C. Metaproterenol
- D. Theophylline

Which of the following interventions is most helpful in determining the need for oxygen therapy for a client with COPD?

- A. Asking the client whether he needs \( O_2 \)
- B. Assessing the client's level of fatigue
- C. Evaluating the hemoglobin level
- D. Using a pulse oximeter on the client's ear lobe

The nurse is evaluating the security of the client's tracheostomy ties. Which of the following methods is used to assess for tie tightness?

- A. The nurse places one finger between the tie and the neck.
- B. The tracheostomy can be pulled slightly away from the neck.
- C. There are no tie marks present.
- D. The nurse uses a Velcro fastener instead of a tie.
200. Which of the following clients is at highest risk for developing Sarcoidosis?

- A. A 40-year-old Caucasian with a history of bronchitis atrial tachycardia
- B. A 30-year-old African-American who is pregnant
- C. A 50-year-old Asian male with emphysema
- D. A 60-year-old Hispanic male with cancer
Answers to Practice Exam 1

1. A   26. B   51. A
2. C   27. C   52. D
5. C   30. D   55. A
7. C   32. B   57. D
9. C   34. A   59. C
11. C   36. D   61. A
13. C   38. B   63. C
14. A   39. D   64. D
16. A   41. D   66. A
17. B   42. D   67. D
18. A   43. A   68. A
20. C   45. C   70. B
22. D   47. D   72. B
23. A   48. D   73. A
25. C   50. C   75. B
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Answer Rationales

1. Answer A is correct. If the client is experiencing a side effect of Lasix administration, he will experience tachycardia. He also might experience hypotension but not hypertension, making answer B incorrect. Polyuria is not a side effect of the medication, and eupnea is normal respirations; therefore, answers C and D are incorrect.

2. Answer C is correct. The client who should be seen first when making rounds for the day is the client one hour after a renal transplant. The client being maintained on hemodialysis is not in distress, so answer A is incorrect; nor is the client with chronic glomeronephritis, so answer B is incorrect. The client scheduled for an IVP is also not in distress and can be seen later, so answer D is incorrect.

3. Answer C is correct. If the nurse notes petechiae on the chest of the client diagnosed with pulmonary emboli, the doctor should be notified immediately. This can indicate disseminated intravascular coagulation (DIC). Answers A, B, and D can be ordered after calling the doctor, so they are incorrect.

4. Answer C is correct. The client during the post-operative period with a widening pulse pressure, shortness of breath, and rales may have a pulmonary emboli. To facilitate breathing, he should be placed in high Fowler's position. Oxygen should be applied by mask at approximately 10 liters/minute, so answer A is incorrect. CPR is not indicated so answer B is incorrect. Pain medication not a sedative may be ordered, so answer D is incorrect.

5. Answer C is correct. A sliding scale insulin can be ordered according to the blood glucose findings. To determine the need for insulin, the client will need to have several samples checked frequently. Answer A is wrong because checking every hour is unnecessary. Answer B is incorrect because fluctuations in blood glucose will occur with food ingestion. Answer D is wrong because elevations in glucose will result in acidosis, not alkalosis.

6. Answer B is correct. The client with diabetes should use barrier methods of birth control instead of hormonal preparations. Answer A is not a true statement, so it is incorrect. The diaphragm does not provide intrauterine contraception, so answer C is incorrect. Answer D is wrong because a diaphragm does not prevent ovulation.

7. Answer C is correct. Infections cause alterations and increases in insulin needs, as does stress, pregnancy, and many disorders. Answer A is incorrect because infections do not decrease insulin needs. Insulin dosage should not be based on the urine checks, making answer B incorrect. Answer D is wrong because infections do cause changes in insulin needs.

8. Answer A is correct. The client with a fractured hip should be taught not to adduct the hip joint, which includes refraining from crossing her legs at the knee. She can sit in a recliner, walk stairs, and carry objects weighing more than 10 pounds, so answers B, C, and D are wrong.

9. Answer C is correct. Clients with Grave's disease, or hyperthyroidism, who experience shortness of breath are most likely experiencing cardiac and lung complications of their disease. Answer A is incorrect because clients with Grave's disease do not have extreme fatigue. Answer B is incorrect because clients with hyperthyroidism do experience tachycardia in association with their disease. Urinary frequency is not associated with Grave's disease, so answer D is incorrect.
10. Answer B is correct. The nursing assistant should not be assigned to perform the Fleet's enema because this is considered a medication. Nursing assistants can empty Foley catheters, measure oral intake, and feed depressed clients, so answers A, C, and D are wrong.

11. Answer C is correct. Tagging the body must be done prior to contacting the funeral home. The nurse does not pronounce the client dead—this is done by the doctor or coroner, so answer A is incorrect. If the client is in the hospital, contacting the coroner is unnecessary, so answer B is incorrect. The nurse does not request an autopsy, making answer D wrong.

12. Answer B is correct. Cytoxan can cause hemmoragic cystitis or bleeding into the bladder. Increasing fiber in the diet and avoiding antacids are unnecessary, so answers A and C are wrong. He will be fatigued, so increasing the activity is not ordered, making answer D wrong.

13. Answer C is correct. The client with an order for Adriamycin should be evaluated for cardiac dysrythmias prior to beginning the drug. He will probably experience hair loss (alopecia), fatigue, and nausea, so answers A, B, and D are incorrect.

14. Answer A is correct. The client being treated with allopurinol (Zyloprim) for gout should drink at least eight glasses of water per day. Fruits are allowed with gout and have nothing to do with the allopurinol, making answer B wrong. This drug helps to decrease the symptoms of gout quickly, so answer C is incorrect. Answer D is incorrect because foods containing purine should be avoided.

15. Answer B is correct. The client with tuberculosis will take INH for at least 1 year. After that time, he will be evaluated. Answers A, C, and D are untrue statements, so they are incorrect.

16. Answer A is correct. The client with MRSA receiving Vanomycin might experience red man syndrome. This is a sign that the client's medication is infusing too rapidly. Answer B is incorrect because the client is being treated for an infection so there is no need to further check for an infection. Answer C is incorrect because, if the nurse decides to discontinue the medication, the doctor will have to be notified. The second portion of the answer says to document the action, which is always required. Answer D is incorrect because just continuing the infusion is not the correct action.

17. Answer B is correct. The best client to assign to the license practical nurse is the client with a cast. The client with ventilator support should be assigned to the RN, so answer A is wrong. The client just returned from surgery should be assessed by the RN, as should the client receiving interferon, making answers C and D wrong.

18. Answer A is correct. The client scheduled for a hysterectomy and the client with a tubal ligation are good roommates because they are both surgery clients. The other client pairs include an immune-suppressed client and a potentially communicable one, so answers B, C, and D are wrong.

19. Answer B is correct. The nurse caring for the newborn with physiologic jaundice knows that this problem is related to an immature liver. Answer A is incorrect because physiologic jaundice is not associated with failure of the ductus venosus to close. Answer C is wrong because it would cause pathologic jaundice, not physiologic jaundice. Answer D is also incorrect because lack of surfactant is not associated with jaundice.

20. Answer C is correct. Nagel's rule is calculated by subtracting 3 months and adding 7 days to the first day of the last menstrual period. Answers A, B, and D are incorrect ways to calculate Nagel's rule, so they are incorrect.
21. Answer B is correct. An expected finding in the normal newborn is acrocyanosis, or blue hands and feet, due to slow circulation of blood to the extremities. Undescended testicles, absent sucking pads, and substernal retractions are abnormal, so answers A, C, and D are incorrect.

22. Answer D is correct. The registered nurse can place the client in seclusion. Answers A, B, and C are wrong because the only other member of the staff who can initiate seclusion is the doctor.

23. Answer A is correct. When the client is threatening suicide, the nurse should find out whether he has a plan. Answers B, C, and D are incorrect because they do not show caring.

24. Answer A is correct. A urinary output of 500 mls in the past 10 hours is within normal limits. This finding does not require notifying the doctor, replacing the catheter, or forcing fluids, so answers B, C, and D are wrong.

25. Answer C is correct. The client with a radical mastectomy can be helped with accepting the diagnosis by a support group such as Reach for Recovery. Answers A, B, and D do not support the concept of caring, so they are wrong.

26. Answer B is correct. The client with a thermal burn will first show signs of a burn by the skin turning red. Answers A, B, and D are incorrect because they appear later in the burn process.

27. Answer C is correct. To safely give the two medications, the nurse should check whether it is safe to mix them. There is no need to ask the doctor, so answer A is incorrect. You also don’t need to give one injection and wait 30 minutes and then give the other, so answer B is wrong. Because the medications can be mixed, answer D is unnecessary and therefore wrong.

28. Answer B is correct. Because the nurse does not know when the bottle was opened, it is best to obtain a new bottle. Answers A and D are insufficient actions by the nurse to ensure that the saline is sterile. Answer C is incorrect because the ward secretary probably will not know because it is not her job to document such procedures.

29. Answer A is correct. An Asian client will most likely be extremely distressed by blood sampling because Asians believe that life is in the blood and that a part of the body is taken when blood is withdrawn. The African-Americans, Hispanics, and Native Americans will not be particularly distressed by this, so answers B, C, and D are wrong.

30. Answer D is correct. The best action for the nurse when administering medication via nasogastric tube is to call the pharmacist to see whether the medication can be given in liquid form. Crushing the medication and giving it with ice cream down the nasogastric tube can cause the tube to become clogged, so answer A is incorrect. Answer B is incorrect because the client is being given medication through the nasogastric tube, not orally. Answer C is wrong because it’s not the best method of administering the medication and can result in occlusion of the tube. If a pill has to be crushed it should be mixed with water or some other clear liquid.

31. Answer B is correct. To ensure that the Ace wrap is not too tight, the nurse should check the pulses, color, and temperature of the extremity. Removing it every hour is unnecessary, making answer A incorrect. Obtaining a Doppler study is also unnecessary and requires an order, making answer C incorrect. Allowing the wrap to remain in place for a minimum of 24 hours will not ensure circulation, so answer D is incorrect.
32. Answer B is correct. A CAT scan using dyes requires that the client be assessed for iodine allergies. Only if the client has an MRI should he be evaluated for claustrophobia and metallic implants, so answers A and D are incorrect. Liver function is not directly related to this test, so answer C is wrong.

33. Answer B is correct. The correct way to administer eye drops and ointment is to administer the drops first, wait 5 minutes, and administer the ointment. Answers A, C, and D are incorrect because they are incorrect methods of administering eye drops and eye ointment.

34. Answer A is correct. Pain is a sign of an inflammatory response. Blanching is not necessarily present with a laceration, so answer B is wrong. Answer C is wrong because an increase in the white count might be seen not a decreased WBC. Granulation is a sign of healing, so answer D is wrong.

35. Answer B is correct. Peas and beans are an excellent source of protein and are low in cost. Answers A and D are good sources, but they can be expensive, so those answers are wrong. Answer C is not a good source of protein, so it's incorrect.

36. Answer D is correct. If an error in documentation occurs, the nurse should place a single line through the entry and initial it. Answers A, B, and C are wrong because the nurse should not erase an entry, put a black mark through the entry, or start over by removing the sheet.

37. Answer B is correct. Lowering the height of the enema will decrease the pressure and relieve some of the discomfort. Answer A, stopping the enema, is incorrect because the stem does not say how much of the enema the client has had. This is also true for answer C, so it is incorrect as well. Advancing the tubing 1–2 inches might increase the discomfort, making answer D wrong.

38. Answer B is correct. The correct way to manipulate stairs is to go up the stairs with the unaffected leg first. Answers A, C, and D are incorrect because they describe incorrect methods of ambulating up stairs and can cause the client to fall.

39. Answer D is correct. The nurse should collect the specimen from the catheter port provided for obtaining a specimen. Using a luer lock syringe is correct, but you should not withdraw it from the bulb port because this would deflate the balloon, so answer A is wrong. Answer B, disconnecting the catheter from the drainage, is incorrect because the urine in the bag is more contaminated and has been in the bag longer. Answer C, opening the urine bag, is incorrect for the same reason.

40. Answer B is correct. The best place to assess for anemia in a dark-skinned client is the hard palate. The nail beds, sclera, and buccal mucosa are not areas of the body that are useful in evaluating a dark-skinned client, so answers A, C, and D are wrong.

41. Answer D is correct. One of the Patient's Bill of Rights is the right to advanced directives concerning treatment. The client has the right to know what is being done in his treatment and when the treatment will be carried out. Answers A, B, and C are all expected but are not listed in the Patient's Bill of Rights, so they are incorrect.

42. Answer D is correct. The host is the person affected by the toxic waste. Answers A, B, and C are incorrect because they do not describe the host.

43. Answer A is correct. A nurse who has never performed the skill is considered to be a new nurse or a novice. Answers B, C, and D are all descriptions of an experienced nurse, making them incorrect.
44. Answer B is correct. Answer A is unrelated to the question, so it is incorrect. Answer C is also unrelated to Lovenox injections, making it wrong. Answer D is not the most important factor in assessing the client's readiness to learn, so it's wrong.

45. Answer C is correct. The correct way to clean a wound site is to use a circular motion from the drain site out. Answers A and B are incorrect ways to clean a wound because they can cause bacteria to enter the wound; therefore, they are incorrect. An astringent wash is not used, and if it were, it would be followed by the normal saline, so answer D is incorrect.

46. Answer D is correct. The client with a Foley catheter should have the catheter inserted approximately 8 inches. Answers A, B, and C are wrong because they are not far enough.

47. Answer D is correct. Clients who are of the Jehovah's Witness religion might not give permission for blood or blood products. They will most likely take antibiotics and antivirals, take medications made from pork, and eat shellfish, so answers A, B, and C are incorrect.

48. Answer D is correct. While moving the client up in the bed, the nurses should stand even with the client's chest. This gives the most support and allows for easier mobility. Standing at the hips or knees would not support the client's upper body, so answers A and B are incorrect. Standing at the shoulders would be too high, so answer C is incorrect.

49. Answer A is correct. The center of the stool specimen is the best specimen for evaluation. Answer B is incorrect because the urine would contaminate the specimen. Answers C and D are wrong because they are unnecessary.

50. Answer C is correct. The client is the priority of care. You must make sure that the client is safe; then you can take the other actions mentioned. Therefore, answers A, B, and D are incorrect.

51. Answer A is correct. Anasarca, severe generalized edema, is associated with a loss of albumin from the circulating blood volume. It is not associated with hypertension, hyperalbuminemia, or hyperthermia, so answers B, C, and D are wrong.

52. Answer D is correct. The most typical sign of a fractured hip is disalignment. Pain, paresthesia, and pulselessness are characteristics associated with all fractures, so answers A, B, and C are wrong.

53. Answer D is correct. Nausea, jitteriness, tachycardia, hypotension, and irritability are associated with aminophylline toxicity. Administering an antiemetic or a sedative will mask the symptoms of toxicity, making answers A and C wrong. The blood pressure might or might not be associated with the aminophylline, so answer B is incorrect.

54. Answer A is correct. The green-tinged fluid indicates meconium staining from fetal distress, as does the FHR of 110 BPM. Yellow malodorous discharge indicates infection, so answer B is wrong. Answers C and D are incorrect because there is no data to support the diagnosis of a post-mature infant or that the fetus has a tracheo-esophageal fistula.

55. Answer A is correct. Conversion reaction is the development of physical symptoms in response to emotional distress. Answers B, C, and D are not related to the situation given in the stem and are therefore incorrect.
56. Answer C is correct. The banana Popsicle provides a source of fluid, and the cold helps soothes the mucus membranes and provides for vasoconstriction. The fruit punch is not the best snack for this child because it is red and can be mistaken for blood. The grape soda is carbonated and is also purple, so when it’s mixed with mucous, it can be mistaken for blood. Ice cream will thicken secretions, so answer D is wrong.

57. Answer D is correct. Nipride is administered in D5W and is a light brownish tint in color. A new bag should be prepared after 24 hours. Answer A is incorrect because the solution should be discarded if it is highly colored—that is, blue, green, or dark red. Answer B is wrong because the IV fluid has been chosen. Answer C is wrong because the stem says that the bag is already covered.

58. Answer D is correct. The client with opiate use has constricted pupils. However, opiate overdose results in dilated pupils due to cerebral anoxia. But, because the stem doesn’t mention overdose, answer A is incorrect. The client’s speech will be slowed and her blood pressure will be decreased with opiate use, so answers B and C are incorrect.

59. Answer C is correct. Dilantin should not be administered any faster than 50 mg per minute. It should be given in normal saline to prevent crystallization in the tubing, so answers A and B are incorrect. This medication can be given IV push, so answer D is wrong.

60. Answer B is correct. The client with a total hip replacement should be positioned with the hip slightly flexed. Use of a recliner allows for slight hip flexion and promotes comfort. The client should not be placed in a straight chair, and the hip should not be flexed more than 45°. Use of abduction pillow prevents hip adduction. The hip should not be flexed 90°, so answer A is wrong. C is not the best answer because the client should sit up. Because the hip should not be adducted, answer D is incorrect.

61. Answer A is correct. Autosomal recessive disorders arise when an affected gene is transmitted from each parent. Persons who carry the trait show no signs of the disorder. Answer B is incorrect because there are no autosomal recessive disorders that are not sex linked. Answers C and D are incorrect because they do not describe the inheritance pattern.

62. Answer B is correct. Infants should be making rudimentary sounds for speech by 6 weeks of age and certainly by 3 months. An infant who fails to coo or babble by 3 months should be evaluated for hearing loss. Answer A is too early to expect the infant to make sounds, so it is incorrect. Answers C and D are wrong because they are too late.

63. Answer C is correct. Sublimation is the channeling of unacceptable behaviors into behaviors that are socially acceptable. The other defense mechanisms have nothing to do with the situation, so answers A, B, and D are incorrect.

64. Answer D is correct. Turning objects upside down, moving objects from one location to another, and dropping items from the high chair all teach the child about spatial relationships. Turning the cup upside down is not a sign of misbehavior or a negative action, so answers A and C are incorrect. Answer B is incorrect because toddlers are not able to use thought processes to experience events and reactions.

65. Answer B is correct. Displacement is the transference of emotions onto another other than the intended. Projection is projecting feelings onto others, making answer A wrong. Undoing is making up for loss, so answer C is wrong. Answer D is incorrect because compensation has nothing to do with abuse.
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66. Answer A is correct. The names and addresses of the sexual contacts should be obtained. Chlamydia is treated with antibiotics such as tetracycline or ampicillin and is not treated with Flagyl, so answer B is incorrect. Instructing the client to avoid sexual relations is good, but it is best to tell her to use condoms, so answer C is wrong. Douching will do no good, making answer D wrong.

67. Answer D is correct. Ascorbic acid increases the absorption of iron. Taking the medication with a glass of milk will decrease the absorption of the medication, so answer A is wrong. Answer B is incorrect because, if the client takes the medication on an empty stomach, nausea can occur. Answer C is incorrect because it is an untrue statement.

68. Answer A is correct. An infant should be expected to double her birth weight by 6 months and triple her birth weight by 12 months of age. Baby girl A's weight gain might be due to overfeeding or the result of a metabolic disorder. Either instance would warrant follow-up. The other infants are within normal limits; therefore, answers B, C, and D are incorrect.

69. Answer B is correct. A pneumothorax results in tracheal deviation toward the unaffected side. Answers A and D are incorrect because there will be no breath sounds. Answer C is incorrect because the right side is the affected side.

70. Answer B is correct. The nurse should give priority to improving the client's oxygenation. Because the question asks for the priority action, answers A, C, and D are wrong because they should be done after the oxygen is applied.

71. Answer D is correct. The client in acute pain experiences physiological arousal similar to the fight or flight response—for example, an increased (not decreased) heart rate, an increased BP, and dilated pupils. Answers A and C would therefore support the diagnosis of post-op pain, making them incorrect. Answer B is incorrect because the inability to concentrate could be related to many things other than pain.

72. Answer B is correct. The client receiving epidural anesthesia should be carefully monitored for respiratory depression that might result from plasma and central nervous system concentrations of the drug. Answer A is incorrect because seizure activity usually is not present with epidural anesthesia. The client will be lying down, so postural hypotension is not a risk, making answer C incorrect. Answer D is wrong because hematuria is not a risk.

73. Answer A is correct. Physiological responses to sensory alterations include increased urinary levels of catecholamines, 17-ketosteroids, and lutenizing hormones. Answers B, C, and D are incorrect because they are not related to catecholamines.

74. Answer B is correct. Refusal to look at the body or body part involved can indicate an alteration in body image, but this finding alone is not enough to make the nursing diagnosis. The most immediate diagnosis that can be made based on the available data is potential for infection. Answers A, C, and D are not immediate diagnosis, so they are incorrect.

75. Answer B is correct. Proximodistal development is defined as development from the axis of the body to the periphery. An infant can control the movement of his arms before he can control the movement of his fingers. Answer A refers to cephalocaudal, or head-to-tail, development; therefore, it is incorrect. Answer C refers to general-to-specific development; therefore, it is incorrect. Answer D refers to simple-to-complex development; therefore, it is incorrect.
76. Answer D is correct. Intracellular K+ quickly leaks from damaged cell membranes. Blood cells falling directly onto the ball or filter apparatus can break and release K+. Administering blood that is warmed to room temperature can grow bacteria but is not associated with potassium, so answer A is wrong. Answers B and C are wrong because administering blood that is 24 hours old is allowed and an 18-gauge needle is best.

77. Answer C is correct. Complications of the prolonged use of NG suction include dehydration, hypokalemia, hyponatremia, and metabolic alkalosis. The laboratory results in answers A, B, and D are within normal limits, so those answers are wrong.

78. Answer B is correct. Healing by a second intention results in extensive scar formation because the wound is left open and allowed to heal from the inside out. Healing by first intention involves the use of staples or sutures. Healing can appear to take place in 10 days, but is not complete until the scar is strengthened; therefore, answer A is incorrect. Answers C and D are incorrect because they do not describe wound healing.

79. Answer A is correct. Foods and fluids that promote urine alkalinity are discouraged. These include citrus fruits and juices, excessive milk and milk products, and carbonated beverages. Answers B, C, and D are incorrect because they indicate that the client understands.

80. Answer B is correct. The sixth cranial nerve is the abducens that controls lateral movement of the eyes. The ability to chew is controlled by the fifth cranial nerve, so answer A is wrong. Answer C is incorrect because the ability to swallow is controlled by the ninth cranial nerve. Answer D is incorrect because scalp sensation is controlled by the fifth cranial nerve.

81. Answer D is correct. Limiting salt intake will help prevent edema formation, which increases attacks of Meniere’s syndrome. The other foods are allowed, so answers A, B, and C are incorrect.

82. Answer D is correct. The hard palate is the best area to detect true jaundice in a dark-skinned client because it is the one place that is most often not yellowed from normal use or inheritance. Answers A, B, and C are incorrect because dark-skinned individuals often have yellowish discoloration of the palms, soles of the feet, nail beds, and sclera.

83. Answer A is correct. Evaluation of tissue turgor is best achieved by pinching the abdominal tissue or the tissue of the forehead while the client is in a supine position. Placing the client in other positions does not provide the most objective way of evaluating skin turgor, so answers B and D are incorrect. Pressing the skin is an incorrect method, making answer C wrong.

84. Answer B is correct. A side effect of Leukeran is ulcerations of the mouth and GI tract. Foods that are pureed or liquid are therefore best tolerated. The foods in answers A, C, and D are difficult to chew, so they are wrong.

85. Answer D is correct. The client with myxedema should be placed on a low-sodium diet because cortisol causes sodium retention. Answers A, B, and C are incorrect because the client with myxedema can eat these foods.

86. Answer A is correct. Middle Easterners are typically Muslim, so they pray five times per day facing the southeast (if in the United States). Answers B and C are incorrect because most of these individuals do not need specially prepared foods and will take blood products. The medicine man is a healer in Hispanic and Native American cultures, so answer D is incorrect.
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87. Answer B is correct. A client receiving Adriamycin will have a decrease in neutrophils and other white blood cells, resulting in decreased immunity. Answer A is incorrect because it does not address the stem. Answer C is incorrect because providing a wig is presumptive. Answer D is incorrect because straining the urine is unnecessary.

88. Answer A is correct. Swimming is the best sport for a client with muscular dystrophy. The other sports put too much stress on the muscles and increase fatigue, so answers B, C, and D are wrong.

89. Answer D is correct. Liquid nitrogen leads to cell death and tissue destruction. Tissue freezing is followed by tenderness and hemorrhagic blister formation. Dry, crusty, and itchy skin occurs much later, so answer A is wrong. Oozing and painful skin occurs immediately after cryosurgery, so answer B is wrong. Dry and tender skin occurs much later, so answer C is wrong.

90. Answer A is correct. Viral cultures should be placed on ice. Answer B is wrong because bacterial cultures and fungal cultures, not viral cultures, are transported at room temperature. There is no need to double bag it, so answer C is incorrect. Answer D is incorrect because there is special handling in that the nurse should wear gloves.

91. Answer C is correct. Clients with AIDS who develop herpes simplex lesions should be treated immediately with intravenous Acyclovir. The other medications are not used to treat herpes lesions, so answers A, B, and D are incorrect.

92. Answer D is correct. A papule is a small, elevated skin lesion less than 1.0 cm in diameter. Answer A is wrong because macules are larger. A plaque is a dry lesion, so answer B is wrong. Answer C is wrong because a wheal is a raised, well-circumscribed lesion that is firm to touch.

93. Answer B is correct. Infants do not crawl until 9 or 10 months of age. The injuries observed are not consistent with the history given by the mother. The statements in answers A, C, and D are possible, so they are incorrect.

94. Answer D is correct. Persistent vomiting leads to alkalosis. Answer A is incorrect because it is acidosis. Answer B is incorrect because it is alkalosis but is respiratory. Answer C is incorrect because it is acidosis.

95. Answer C is correct. Asking the client to swallow as the tube is advanced will facilitate insertion. Placing the tube in warm water will make it more difficult to insert, so answer A is wrong. The client should be placed with his head elevated, making answer B incorrect. If the client hyperextends his neck, it will open the epiglottis, so answer D is wrong.

96. Answer B is correct. Rinsing the mouth with normal saline will provide for oral hygiene and make the client more comfortable. The client should use a soft tooth brush or a gauge to clean his teeth, so answer A is wrong. Answer C is wrong because, if hydrogen peroxide is used, it should be diluted. Use of lemon and glycerin swabs will cause drying, so answer D is wrong.

97. Answer C is correct. Clients with cystic fibrosis are unable to absorb fat-soluble vitamins. Water-soluble preparations of the fat-soluble vitamins are given daily. Answer A is wrong because a client with cystic fibrosis does not have an increased metabolism. Answer B is incorrect because there is no correlation to cystic fibrosis and not eating well. A child with cystic fibrosis does not have an increased excretion of water-soluble vitamins, making answer D incorrect.
98. Answer D is correct. The client should be positioned on the left side to limit the flow of saline out of the stomach and to help prevent aspiration. The positions in answers A, B, and C are not recommended and are therefore incorrect.

99. Answer D is correct. Long-term therapy for diabetes insipidus involves vasopressin given nasally. The client should be told to hold her breath while using the spray because inhalation can result in pulmonary problems. Vasopressin preparations include DDAVP, desmopressin and lypressin. Answer A is incorrect because vasopressin is not taken with meals. Answer B is incorrect because the client does not need to check the specific gravity of his urine. Answer C is incorrect because the client does not need to modify his daily activity.

100. Answer D is correct. The client can use dental floss and mouth rinses, but should not brush his teeth until swelling from the surgery resolves. Answers A and B are incorrect because the surgery is through the nose, so there is no need to shave any hair. Coughing increases intracranial pressure and should be avoided if at all possible. He will be placed with his head elevated to facilitate breathing, so answer C is wrong.

101. Answer D is correct. Pheochromocytoma is a catecholamine-producing tumor of the adrenal gland. Most are benign; however, the tumor synthesizes the catecholamines epinephrine and norepinephrine, which stimulates beta receptors. This stimulation results in tachycardia, peripheral vasodilatation, diaphoresis, and postural hypotension from decreased blood flow to the brain. Answers A and B are incorrect because orthostatic hypotension and diaphoresis do not occur in these clients. Answer C is incorrect because apprehension is not specific to pheochromocytoma.

102. Answer B is correct. A rapid corticotrophin stimulation test involves the administration of corticotropin. 25 mg–1 mg IM or IV after obtaining a base-line level. Blood samples are taken 30 minutes and 1 hour after administration of the drug. If there is cortical insufficiency, the cortisol response will decrease or be absent. Answers A, C, and D are incorrect because they are not associated with this exam.

103. Answer B is correct. The blood urea nitrogen is elevated due to metabolic acidosis. The white blood cell count will be normal, so answers A, C, and D are incorrect because all these levels are within the normal limits.

104. Answer D is correct. Fatty foods and xanthine-containing beverages such as tea, cola, and coffee affect the tone and contractility of the low esophageal sphincter. These substances lower esophageal pressure and allow gastric contents to flow back into the esophagus. Answers A, B, and C are incorrect because these foods should not cause any problems for the client.

105. Answer C is correct. Semi-Fowler's position promotes drainage, which can relieve pain. Other relief measures include the use of analgesics, sitz baths, and heat applications to the lower abdomen. The positions in answers A, B, and D will not relieve pain and might increase it, so they are wrong.

106. Answer C is correct. Antimicrobial drugs such as sulfasalazine help prevent secondary infection, decrease the frequency of exacerbation, and block folic acid synthesis so that bacteria is more susceptible to destruction. The usual dosages is 3 gms daily in divided doses. Answer A is incorrect because exposure to sunlight is not specific to this drug. Answer B is incorrect because taking the medication with meals is not recommended; however, it should not be taken on an empty stomach because it can cause nausea. Answer D is incorrect because it is untrue.
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107. Answer B is correct. Autonomic dysreflexia results from uninhibited sympathetic discharges. Symptoms include pounding headache, marked increase in the blood pressure, tachycardia, flushed skin, nasal congestion, and visual disturbances. Interventions include raising the head of the bed to high Fowler’s position, checking the Foley catheter to ensure patency, administering antihypertensive medication, and notifying the doctor. After the client is stabilized, you should check for fecal impaction. Answers A, C, and D are not associated with the treatment of autonomic dysreflexia, so they are incorrect.

108. Answer D is correct. The sedimentation rate indicates inflammation. If the sedimentation rate is decreasing, this means that the inflammation is resolving. Answer A is incorrect because a positive ASO titer indicates prior infection with a beta hemolytic streptococcal infection. Answer B is incorrect because an increased C reactive protein rate indicates inflammation. Changes in eosinophil counts are associated with allergic responses and infections with helminthes, so answer C is wrong.

109. Answer C is correct. Peanut butter, crackers, and cheese are high in protein and sodium. Orange juice is high potassium. The client with acute renal failure should select a diet that is low in protein, sodium, and potassium. Therefore, answers A, B, and D are wrong.

110. Answer D is correct. The client with a transplant should eliminate foods that pose the threat of contamination. Answers A, B, and C are all processed foods, so they don’t pose a threat of contamination and are therefore incorrect.

111. Answer B is correct. Swimming promotes controlled rhythmic breathing. Soccer and basketball are too strenuous, so answers A and D are incorrect. Construction of model cars uses glues with noxious vapors, which can aggravate respiratory conditions, making answer D incorrect.

112. Answer D is correct. Reed instruments such as the clarinet help promote purse-lipped breathing and prolong the expiratory phase of respiration. The instruments in answers A, B, and D do not assist with this, so they are wrong.

113. Answer A is correct. Bright red bleeding with many clots indicates arterial bleeding. The vital signs should be obtained and the doctor notified at once. Answer B is not associated with the symptoms, so it is incorrect. Answer C is incorrect because bright red urine after surgery is not normal. Answer D is wrong because applying traction will not help.

114. Answer A is correct. Potassium-sparing diuretics such as Aldactone, midomor, and dyrenium do not require additional sources of potassium in the diet. Answers B, C, and D are incorrect because these drugs are not potassium-sparing diuretics.

115. Answer B is correct. Toast, jelly and soft-boiled egg contain the least amount of potassium. Answers A, C, and D are incorrect because bacon, citrus fruits, raisins, milk, and melons, all contain high levels of potassium.

116. Answer D is correct. Many people prefer to supplement their calcium intake with calcium-based antacids. If calcium supplements are used, they should be administered 30 minutes before meals to maximize absorption, so answer A is wrong. Calcium absorption is better if it is administered throughout the day rather than in a single dose, making answer B wrong. Calcium supplements do not cause stomach upset, so answer C is wrong.
117. Answer B is correct. The most common complication of hypocalcemia is overstimulation of the nerves and muscles. Tetany, which can progress to convulsions, indicates that the client's condition is worsening. Answer A is incorrect because a decreased level of consciousness is not associated with hypocalcemia. Tachycardia, not brachycardia, is associated with hypocalcemia, making answer C incorrect. Answer D is incorrect because respiratory depression is not associated with hypocalcemia.

118. Answer C is correct. The resistance to the electrical current is greatest in the muscles surrounding the long bones; therefore, they are usually subjected to the greatest amount of damage due to heat. Answers A, B, and D are incorrect because electrical burns do not affect the bones, skin, or intrathoracic area.

119. Answer C is correct. As glucose moves form the blood into the cell, potassium is moved from the extracellular to the intracellular fluid. Answer A is incorrect because potassium elimination is not enhanced in this client. Answer B is incorrect because potassium does not bond with glucose. Answer D is incorrect because insulin does not lower the potassium by lowering blood glucose.

120. Answer D is correct. Severe shock leads to decreased pressure in the renal artery and constriction of the afferent arterioles of the nephrons. If the tubular basement membrane is destroyed, the renal tubular epithelium cannot regenerate and renal failure becomes chronic. Answer A and C are incorrect because, during shock, blood is sent to the heart and brain. The skin does not suffer the most damage, making answer B wrong.

121. Answer C is correct. The entire arm represents 9% of the total body surface, and the posterior trunk represents 18% of the total body surface. Answers A, B, and D are incorrect calculations.

122. Answer C is correct. According to the Parkland formula, three fourths of the calculated fluid volume should infuse within 16 hours of the burn injury. The remaining one fourth of the volume should infuse over the last hours. Answers A, B, and D are incorrect calculations.

123. Answer C is correct. Diazepam (Valium) is used for seizures in extreme circumstances such as status epilepticus. Status epilepticus means that seizures continue unrelentingly. Carbamazepine (Tegretol) is used to treat psychomotor seizures, so answer A is wrong. Clonazepam (Klonopin) is used to treat myoclonic seizures, so answer C is wrong. Valproic acid (Depakene) is used to treat petit mal seizures, making answer D incorrect.

124. Answer A is correct. Approximately 80% of the lithium dose is absorbed in the proximal tubule of the kidney. The amount of reabsorption depends on the concentration of sodium. A deficiency in sodium causes greater absorption, leading to toxicity. Lithium dosages are not related to potassium, chloride, or magnesium, so answers B, C, and D are wrong.

125. Answer A is correct. In the immediate post-burn period, enlargement of capillary pores allows plasma, electrolytes, and protein molecules to move into the interstitial space, which creates a deficit in the vascular fluid volume. The decrease in the vascular volume results in a drop in the mean arterial pressure. Although fluid is lost from the site, this is not the reason for the major loss, so answer B is incorrect. Answer C is incorrect because epinephrine helps cause vasoconstriction, thus helping prevent shock. Answer D is incorrect because the release of epinephrine leads to increased cardiac output and helps prevent shock.

126. Answer A is correct. Nausea, vomiting, and diarrhea are all symptoms of colchicines toxicity. Answers B, C, and D are not signs of toxicity and are therefore incorrect.
127. Answer B is correct. Positioning the infant on the abdomen with the hips slightly elevated prevents trauma and pressure on the sac. The other positions do not relieve pressure on the site, so answers A, C, and D are incorrect.

128. Answer A is correct. Bacon, French toast, sausage, cream cheese, and eggs are all high in cholesterol, so answers B, C, and D are incorrect.

129. Answer C is correct. A ventriculoperitoneal shunt is used to remove excessive cerebrospinal fluid from the ventricles of the brain in clients with hydrocephalus. The presence of cerebrospinal fluid would be indicated by a positive glucose. This can be measured by checking with a Dextrostix. After checking the fluid to assess for cerebrospinal fluid, if it’s positive, the nurse should contact the doctor. Answer A is incorrect because, even though the doctor should be notified, the first action should be to check for the presence of cerebrospinal fluid. Answer B is incorrect because simply marking the dressing is not enough action. Answer D is incorrect because the nurse must take action to prevent deterioration of the client’s condition.

130. Answer A is correct. A hydrocel or fluid in the scrotal sac is indicated by the inability to reduce the swelling by trasillumination of the scrotum. Answers A, B, and D are wrong because they are not true statements.

131. Answer D is correct. Cheese and yogurt provide needed calories and protein while being acceptable sources for the client with cancer. Answers A and B are low in protein and are therefore wrong. Although fresh fruit and vegetables would provide needed vitamins, they are less likely to be tolerated, making answer C incorrect.

132. Answer B is correct. The child is experiencing symptoms of an allergic reaction, which can involve the respiratory system. Applying the tourniquet helps to slow the spread of the bee toxin, and the epinephrine helps to maintain cardiovascular stability. Answer A will not help, so this is an incorrect answer. Answer C will be of little help, although Benadryl might be given after applying the tourniquet, but it is not the first action to take. Reassuring the client will not treat the allergic reaction, so answer D is incorrect.

133. Answer A is correct. Clients receiving Digoxin and Lasix are at risk for hypokalemia. They are not at risk for other electrolyte abnormalities, so answers B, C, and D are wrong.

134. Answer A is correct. Lochia rubra is the first bright red bleeding after delivery. Answer B is incorrect because lochia serosa contains serous fluid and lasts for approximately 7 days. Answer C is incorrect because lochia alba is clear and lasts approximately 4–6 weeks. There is no such thing as lochia canta, so answer D is wrong.

135. Answer D is correct. Diminished hepatic function and decreased liver enzymes contribute to slower metabolism and slower detoxification threshold, thereby increasing the risk of drug accumulation and toxic effect. Answers A, B, and C are not correct because diminished hepatic function will not result in decreased toxicity, prevent analgesics being given, or reduce the blood level of certain drugs.

136. Answer A is correct. Barbiturates increase the liver’s ability to metabolize itself and other drugs, including phenytoin (Dilantin). Large doses can be required to produce the desired effect. An increase in metabolism occurs, so answer B is incorrect. The dosage does need to be altered/increased, so answer C is wrong. The two drugs can be given together, making answer D wrong.
137. Answer B is correct. Skin preparations containing povidone-iodine should not be used on those with known or suspected allergies to shellfish. Anesthetics and antibiotics do not contain iodine, so answers A and C are incorrect. There is no need to monitor the client’s thyroid levels post-operatively, so answer D is incorrect.

138. Answer A is correct. Normal prothrombin time is 12–20 seconds. Prolonged prothrombin time increases the chance of post-op hemorrhage. The other laboratory results are within normal range, so answers B, C, and D are wrong.

139. Answer B is correct. Measures to prevent spinal headache include placing the client flat in bed for 6–12 hours as well as maintaining adequate hydration. Answer A is incorrect because placing the client in a quiet room will not help to prevent a spinal headache, although noise can make the headache worse. Answer C is incorrect because administering a PRN pain medication might treat the headache but will not prevent it. Raising the head of the bed is contraindicated, so answer D is wrong.

140. Answer B is correct. Initial treatment of autonomic dysreflexia includes elevating the head of the bed to 45° to create orthostatic hypotension. Taking the client’s pulse and respirations should be done next, but not first, so answer A is incorrect. Placing the client flat, supine will increase the blood pressure, making answer C incorrect. Answer D is wrong because it requires a doctor’s order.

141. Answer B is correct. Testicular exam should be performed monthly while the client is in the tub or shower. Answer A is incorrect because testicular exams need not be done two times per month. Answer C is incorrect because a small light is not used to check for testicular tumors. Answer D is incorrect because testicular exams should be done more frequently than once per year.

142. Answer D is correct. Following diarrheal illnesses, the villi often become lactose intolerant; therefore, the client should be placed on a soy-based formula with gradual reintroduction of regular formula. Isomil is not less expensive than other formulas, so answer A is wrong. There is no evidence to support answer B, so it is incorrect. Isomil or any other formula will cause further diarrhea if given during the illness and Isomil is not used to rehydrate the client, so answer C is incorrect.

143. Answer C is correct. Petaling the cast is covering the edges with cast batting to soften them and prevent the cast material from flaking inside the cast. Cutting down the cast down both sides is bi-valving, so answer A is wrong. Cutting a window in the cast is done to examine the incision, so answer B is incorrect. Answer D is wrong because it is a distractor.

144. Answer A is correct. Changing position, gently massaging the abdomen, ambulating, and drinking hot liquids helps in the return of the irrigating solution. Warm liquids such as hot tea or coffee stimulate the gastrocolonic reflex and help with elimination. Answer B is incorrect because reducing the amount of irrigation solution is not suggested to help with enhancing the return of the irrigant. Answer C is incorrect because just increasing the oral intake will not help. Answer D is incorrect because placing a heating pad on the abdomen will not help.

145. Answer B is correct. The nurse should give priority to assisting with the tube’s progression by changing the client’s position every 2 hours and by advancing the tube 3–4 inches as the physician directs. Answer A is wrong because the tube should not be irrigated routinely. Answer C is wrong because changing the tape is unnecessary. Answer D is incorrect because the tube is not connected to high suction—it is connected to low suction.
146. Answer D is correct. Ecchymosis around the umbilicus is known as Cullen's sign and is suggestive of retroperitoneal bleeding into the abdominal wall. Cullen's sign is not associated with neurological injury, ruptured spleen, or bowel perforation, so answers A, B, and C are incorrect.

147. Answer C is correct. Pancreatin supplies enzymes that assist in the digestion of fats. Drug management is determined to be effective when the stools become less fatty and less frequent. Answers A and B are subjective answers and so are not the best choices. Answer D is incorrect because decreased bruising does not indicate that the pancreatin is being effective.

148. Answer C is correct. Diabetes mellitus in the pregnant client places the infant at risk for changes in placental vasculature. Answer A is incorrect because, in and of itself, fetal movement is not adversely affected by diabetes. Answer B is incorrect because maternal insulin levels are not measured by a non-stress test. Answer D is wrong because fetal lung maturity is not measured by a non-stress test.

149. Answer B is correct. Renal agenesis is associated with oligohydramnios, or lower-than-normal amounts of amniotic fluid. Answers A, C, and D are incorrect because they are associated with polyhydramnios.

150. Answer B is correct. Aminophylline is a xanthine derivative that can cause central nervous system stimulation. Nervousness and tremulousness are common side effects. Answer A is incorrect because central nervous system depression is not associated with xanthine use. Xanthines do not have an anticholinergic effect, so answer C is wrong. Answer D is incorrect because cardiovascular depression is not associated with aminophylline.

151. Answer C is correct. Herpes zoster, also called shingles, is a viral infection that is treated with antiviral medications. It is not treated with the categories in answers A, B, and D, so those are incorrect.

152. Answer C is correct. Propranolol (Inderal) is a beta blocker that can produce bradycardia and bronchospasm. Answer A, nitroglycerin, is incorrect because it is a medication that is given to clients with chest pain related to chronic lung disorders. Answer B is incorrect because it is an antibiotic that can be given to these clients. Answer D is incorrect because verapamil can be given to clients with chest pain and bronchitis.

153. Answer B is correct. The client should be instructed to take her medication with meals to avoid gastric irritation. Answer A is incorrect because the client need not avoid regular exercise. Regular exercise with light passive resistance, such as water exercises, walking, and weight bearing, is important to keep the joints movable and to prevent calcium loss. Answer C is incorrect because heat packs will promote comfort and movement, but the client should not use alternating heat and cold. It should be noted, however, that some clients feel better using heat and some feel better after using cool compresses.

154. Answer A is correct. Buck's traction is a skin traction used to decrease muscle spasms. Buck's traction will not prevent the need for surgery, making answer B wrong. It also will not alleviate the pain associated with the fracture or prevent bleeding, so answers C and D are wrong.

155. Answer B is correct. Burns of the head and neck pose the immediate threat of airway compromise. The conditions in answers A, C, and D might be painful, but they do not present an immediate threat to life, so they are incorrect.

156. Answer B is correct. A PO₂ of 72% is very low. The normal is 95–105. Answer A is wrong because the BUN is normal. Answer C is wrong because the hemoglobin is low but does not have to be reported immediately. Answer D is wrong because the white blood cell count is normal.
157. Answer A is correct. Normal central venous pressure reading is approximately 5–10 cm of water. Answer B is incorrect because carbon dioxide has nothing to do with fluid overload. The normal CO₂ range is 35–45. Answer C is incorrect because the hemoglobin has nothing to do with fluid overload. The normal Hgb range is 12–18. Answer D is wrong because the potassium is within normal limits.

158. Answer B is correct. The placenta produces insulinase, an insulin antagonist. As the pregnancy increases, so does the need for additional amounts of insulin. Answers A, C, and D are incorrect because they do not indicate understanding of the nurse’s teaching.

159. Answer A is correct. Lying on the left side takes the weight of the uterus off the vena cava and provides for greater perfusion to the kidneys. Answers B, C, and D are incorrect because these other positions do not help with uteroplacental perfusion.

160. Answer A is correct. Increasing dyspnea is associated with cardiac decompensation and congestive heart failure. The other symptoms are common to all pregnant clients, so answers B, C, and D are incorrect.

161. Answer D is correct. Opiates such as morphine should not be used because they cause spasms in the sphincter of Oddi. The other medications can be given to the client with pancreatitis, so answers A, B, and C are wrong.

162. Answer B is correct. Hallucinogens produce altered states of perceptions. Answer A is incorrect because they do not create both stimulant and depressant effects. Answer C is incorrect because they do not produce severe respiratory depression. Answer D is incorrect because hallucinogenic drugs do not induce rapid physical dependence—they produce psychological dependence.

163. Answer A is correct. Abrupt cessation of amphetamines produces depression and suicidal thinking. Clients withdrawing from amphetamines need to be watched closely for suicidal gestures. Answers B and C are incorrect because the client will not have diaphoresis and tachypnea or muscle cramps and abdominal pain. He could have constipation, however. Answer D is incorrect because withdrawal from amphetamines causes bradycardia and depression, not tachycardia and euphoric mood.

164. Answer C is correct. When the infant is positioned in the sacral position, the fetal heart tones are likely to be heard above the umbilicus. Answers A, B, and D are incorrect because these are the wrong positions to hear the heart tones in the upper-left quadrant.

165. Answer D is correct. Although all the choices are involved in the process of asthma, the primary physiological alteration involves spasms of bronchiolar smooth muscle. Therefore, answers A, B, and C are wrong.

166. Answer A is correct. During periods of mania, the client might be unable to sit long enough to complete a meal. Providing high-calorie finger foods will allow the client to move about while maintaining adequate nutrition. Answers B, C, and D are not directed at the mania that the client is experiencing, so they are wrong.

167. Answer B is correct. To maintain Bryant’s traction, the legs are suspended at a right angle to the bed with the hips slightly above the bed surface. Answers A, C, and D are incorrect because they do not ensure correct alignment in a client with Bryant’s traction.

168. Answer B is correct. Absence of babbling by age 7 months suggests that the infant might not be able to hear. Answers A, C, and D are not related to impaired hearing and are therefore incorrect.
169. Answer A is correct. Toddlers are extremely sensitive to separation anxiety. Failure to respond to his parents indicates detachment. This is the third stage of separation anxiety. Answer B is incorrect because it does not indicate successful adjustment. Answer C is incorrect for the same reason. There is not enough data to support answer D, so it is incorrect.

170. Answer B is correct. A peak is the highest blood level. The peak should be drawn 30 minutes after the infusion. Answers A, C, and D are incorrect because they do not describe the correct times for a peak to be drawn.

171. Answer B is correct. Each ml contains 50 units. To deliver 1,200 units per hour, the IV set must deliver 24 ml per hour. Answers A, C, and D are incorrectly calculated, so they are incorrect.

172. Answer A is correct. Due to the possibility of toxic shock syndrome, the client should remove the diaphragm in 6–8 hours. It should be kept in a cool place, not a warm one, so answer B is wrong. The diaphragm should be resized if the client gains or loses 10 pounds, not 5, so answer C is wrong. If the client has abdominal surgery, not just any surgery, the diaphragm should be resized.

173. Answer B is correct. Expressing milk from the breast promotes milk production rather than facilitating drying of the milk. Answers A, C, and D indicate understanding, so they are incorrect.

174. Answer B is correct. Cranial nerve VIII, or the vestibulocochlear nerve, is responsible for hearing and equilibrium. Damage results in sensorineural hearing loss. Answers A, C, and D are not related to nerve damage, making them incorrect.

175. Answer D is correct. Antineoplastic drugs such as Vincristine and cyclophasphamide can be tasted during and after administration. Vincristine does not cause the symptoms in answers A, B, or C, so they are incorrect.

176. Answer B is correct. Cyclophosphamide is toxic to the bladder and can cause hemorrhagic cystitis. Monitoring vital signs every hour, monitoring the apical pulse, and assessing for intracranial pressure are not of particular concern with this medication because it does not have these side effects. Therefore, answers A, C, and D are incorrect.

177. Answer D is correct. Acyclovir is nephrotoxic, so the client must stay well hydrated. Answers A, B, and C are not necessary for the client taking acyclovir, making them incorrect.

178. Answer B is correct. A rash is usually the first sign of a graft-host disease. Chest pain and EKG changes are not directly associated with this, so answers A and C are incorrect. Answer D is incorrect because an extremely high fever might be a reaction, but a slight fever is expected.

179. Answer C is correct. Seconal is a barbiturate, and CNS depressants and stimulants, as well as phenothiazines, should not be given for 48 hours prior to a myelogram because they decrease the seizure threshold. Ampicillin is an antibiotic, Motrin is an NSAID, and Darvon is an analgesic, so they can all be given, making answers A, B, and D incorrect.

180. Answer D is correct. Hyperventilation to maintain a PCO2 of 25–30 mm Hg causes vasoconstriction and leads to a decrease in cerebral blood volume. Answer A is wrong because the purpose of hyperventilation at this time is not to increase oxygen to the brain. Answers B and C are wrong because its purpose also isn’t to dilate the cerebral blood volume or to increase the blood volume.
181. Answer D is correct. The client with craniocerebral trauma is at risk for diabetes insipidus due to trauma to the pituitary gland. The specific gravity is very low. The normal is 1.010–1.020. Answer A is incorrect because the specific gravity does not indicate adequate hydration. Answer B is incorrect because this finding does not indicate renal failure. Answer C is incorrect because this finding does not indicate an adequate antidiuretic hormone.

182. Answer C is correct. The client in answer C needs further evaluation. Answer A is wrong because that client's blood glucose is within normal limits. Answer B is wrong because that client is maintained on his medication. Answer D is incorrect because that client is in no distress.

183. Answer C is correct. The temporal lobe contains the auditory center, where sounds are interpreted, and the association areas, where words are processed into coherent thought. Answers A, B, and D are incorrect because these other areas of the brain do not control thoughts.

184. Answer B is correct. During the first 72 hours, the client is at greatest risk for cerebral edema and increased intracranial pressure. Elevating the head of the bed 30°–45° and maintaining the client's head midline in a neutral position facilitates venous drainage from the brain. The client should not be positioned flat because this can increase intracranial pressure, making answer A incorrect. Answer C is incorrect because there is a history of clotting, meaning the knee gatch should not be elevated. Answer D is incorrect because the client's head should be elevated.

185. Answer D is correct. The presence of white blood cells in the cerebrospinal fluid should be less than 5/cubic mm. An elevated white blood cell count indicates infection, tumors, or blood. Answers A, B, and C are incorrect because the levels are normal.

186. Answer C is correct. Loss of function of cranial nerve V results in loss of feeling in the face and nose. It is also responsible for mastication, so the nurse should help the client select foods that are easily swallowed. Answer B is incorrect because vision is not lost. Answer C is incorrect because cranial nerve VII controls blinking and the blink reflex. Answer D is incorrect because cranial nerve V does not control hearing.

187. Answer B is correct. Contrast medium used in CT scans are excreted through the kidneys. Forcing fluids helps to remove the dye from the body. Answer A is incorrect because there is no need to maintain bed rest. There is no puncture site, so answer C is incorrect. Answer D is incorrect because there is no need to administer pain medication.

188. Answer B is correct. Huntington's chorea is inherited as an autosomal dominant disorder. The offspring of a parent with the disease has a 50% chance of developing the disease. Answers A, C, and D are incorrect calculations.

189. Answer C is correct. The lens bends light rays as they enter the pupil, causing them to fall on the retina. The lens does not control stimulation of the retina, making answer A wrong. Answer B is wrong because the lens does not orchestrate eye movement; this is done by the oculomotor nerve. Answer D is wrong because the lens does not magnify small objects.

190. Answer B is correct. Mydriatics dilate the pupil. They do not anesthetize the cornea, constrict the pupil, or paralyze the muscles, so answers A, C, and D are incorrect.
Answer A is correct. If two medications are administered at the same time, administer the two drugs 5 minutes apart starting with the eye drops. Answer B is incorrect because the medications should not be given together. Answers C and D are incorrect because there is no need for a cycloplegic and the medication can be given to the same client.

Answer D is correct. Kaposi sarcoma lesions are multifocal lesions with reddish purple discoloration or nodules that commonly appear on the lower fornix or eyelid. They are not associated with cytomegalovirus, AIDS entropion, or retinitis pigmentosa, so answers A, B, and C are incorrect.

Answer B is correct. Elderly clients often experience loss of color vision as they age. The colors that are often lost are blue, violet, and green. Answers A, C, and D are incorrect because these colors are more easily distinguished.

Answer B is correct. Urine that is allowed to stand at room temperature becomes more alkaline. Alkalinity of the urine promotes cellular breakdown. Abnormal urinary sediment can go undetected in stagnant urine. Answer A is incorrect because the urine does not become more acidic and kill bacteria. Answer C is incorrect because components in the urine do not become consolidated. Answer D is incorrect because red cells do not appear in stagnant urine.

Answer A is correct. During bladder filling, the sympathetic nervous system fibers dominate and override detrusor muscle contractions. This prevents the involuntary emptying of the bladder. Bladder control is not directly dependent on the parasympathetic nervous system, the central nervous system, or the lower motor neurons; therefore, answers B, C, and D are wrong.

Answer C is correct. Dark green, leafy vegetables such as spinach contain oxalate. Answers A, B, and D are wrong because these foods are allowed with oxalate stones but are not allowed with uric acid stones.

Answer A is correct. Cromolyn sodium (Intal) is used before an attack and is of little use during an acute attack. Answers B and C are not bronchodilators, so they are incorrect. Theophylline is used routinely during acute attacks, so answer D is incorrect.

Answer D is correct. The pulse oximeter uses waves of light and a sensor to measure oxygen saturation. Asking the client whether he needs oxygen is not adequate, so answer A is incorrect. Assessing the client's level of fatigue is also inadequate, so answer B is wrong. Evaluating the hemoglobin will not tell oxygen saturation, so answer C is wrong.

Answer A is correct. A properly secured tie allows space for only one finger to be placed between the tie and neck. Answers B and C are wrong because they are subjective. Although Velcro fasteners can be used, answer D does not assess whether the ties are correctly applied, so it is wrong.

Answer B is correct. Sarcodosis is most common in African-American females. The other clients are not at particular risk, so answers A, C, and D are incorrect.
Practice Exam 2

1. A 6-year-old is admitted with a diagnosis of childhood autism. Which behavior is most typical of the child with autism?
   - A. A willingness to talk to strangers
   - B. A disinterest in inanimate objects
   - C. Engaging in ritualistic behavior
   - D. A dislike of music

2. The nurse is caring for a client hospitalized with bipolar disorder, manic phase who is taking Eskalith (lithium carbonate). Which of the following snacks would be best for the client?
   - A. Potato chips
   - B. Diet cola
   - C. An apple
   - D. A milkshake

3. A client scheduled for a femoral popliteal bypass is to be assigned to a semi-private room. Which client would be the most suitable roommate for the client with a femoral popliteal bypass graft?
   - A. A client with a pituitary tumor
   - B. A client with respiratory sarcoidosis
   - C. A client with a diabetic ulcer
   - D. A client with a closed fracture of femur

4. A client hospitalized with severe depression and suicidal ideation refuses to talk with the nurse. The nurse recognizes that the suicidal client has difficulty:
   - A. Expressing feelings of low self-worth
   - B. Discussing remorse and guilt for actions
   - C. Displaying dependence on others
   - D. Expressing anger toward others
5. The nurse is caring for a client with a fiberglass cast applied to a distal fracture of the right tibia. The client should be able to bear weight on the cast within:
   ○ A. 10 minutes
   ○ B. 30 minutes
   ○ C. 3 hours
   ○ D. 24 hours

6. A client is to be discharged following the removal of a cataract on the right eye. The nurse should tell the client to:
   ○ A. Wear the metal eye shield only during waking hours.
   ○ B. Report any eye pain to the doctor immediately.
   ○ C. Refrain from using a pillow under his head.
   ○ D. Avoid wearing dark glasses inside.

7. The physician has prescribed Elavil (amitriptyline) for a client with depression. The nurse should continue to monitor the client's mood because the maximal effects of tricyclic antidepressant medication does not occur for:
   ○ A. 48–72 hours
   ○ B. 5–7 days
   ○ C. 2–4 weeks
   ○ D. 3–6 months

8. A client receiving HTZ (hydrochlorothiazide) is instructed to increase her dietary intake of potassium. The best snack for the client requiring increased potassium is:
   ○ A. A pear
   ○ B. An apple
   ○ C. An orange
   ○ D. A banana

9. The physician has ordered a low-magnesium diet for a client with end-stage renal failure. Which of the following diet selections should be removed from the client's meal tray?
   ○ A. Fruit compote
   ○ B. Spinach salad
   ○ C. Baked potato
   ○ D. Custard
10. A client with bipolar disorder receives Eskalith (lithium carbonate) bid. Which observation is associated with lithium toxicity?
   - A. Hyporeflexia
   - B. Akathesia
   - C. Ataxia
   - D. Petechiae

11. Which of the following statements best describes the gross motor development of a 2-year-old?
   - A. She skips without falling.
   - B. She walks up and down stairs.
   - C. She rides a tricycle.
   - D. She is able to broad jump.

12. The nurse is caring for a client following removal of the thyroid. Immediately post-op the nurse should:
   - A. Maintain the client in a semi-Fowler's position with her head and neck supported by pillows.
   - B. Encourage the client to turn her head side to side to promote drainage of oral secretions.
   - C. Maintain the client in a supine position with sandbags placed on either side of her head and neck.
   - D. Encourage the client to cough and deep breath every 2 hours with her neck in a flexed position.

13. A toddler with Tetralogy of Fallot is hospitalized with a diagnosis of pneumonia. During the nursing assessment, the child develops a tet episode. The nurse should:
   - A. Provide the child his favorite toy.
   - B. Place the child in a supine position.
   - C. Pick the child up and comfort him.
   - D. Place the child in knee chest position.
14. A newly diagnosed diabetic is learning to administer her injections of NPH and regular insulin. Which statement indicates that the client understands the nurse's teaching regarding proper insulin administration?
   ○ A. “I will administer the NPH and regular insulin in two separate injections.”
   ○ B. “I will withdraw the dose of regular insulin before withdrawing the NPH insulin.”
   ○ C. “It does not matter which insulin is withdrawn first as long as the amount is correct.”
   ○ D. “I will withdraw the dose of NPH insulin before withdrawing the regular insulin.”

15. An elderly client with glaucoma is scheduled for an exploratory laparotomy. Which of the following pre-op medications should be questioned?
   ○ A. Demerol (meperidine)
   ○ B. Atropine (atropine)
   ○ C. Tagamet (cimetadine)
   ○ D. Polycillin (ampicillin)

16. A client hospitalized with chronic dyspepsia is diagnosed with gastric cancer. Which of the following is associated with an increased incidence of gastric cancer?
   ○ A. Dairy products
   ○ B. Carbonated beverages
   ○ C. Refined sugars
   ○ D. Luncheon meats

17. An elderly client has returned to her room following internal fixation of a fractured hip. To prevent dislocation of the hip prosthesis, the nurse should:
   ○ A. Maintain the affected hip in an adducted position.
   ○ B. Position the client on the affected side.
   ○ C. Place the client in a supine position.
   ○ D. Maintain the affected hip in an abducted position.

18. Three days after a cast is applied to a fracture of the right lower leg the client begins to complain of pain beneath the cast. The nurse should give priority to:
   ○ A. Elevating the extremity
   ○ B. Administering pain medication
   ○ C. Explaining that cast pain is normal
   ○ D. Notifying the physician
19. The physician has prescribed an NSAID for a client with rheumatoid arthritis. During medication teaching, the nurse should tell the client that:
   - A. Taking the medication with milk will render it ineffective.
   - B. Fluids should be restricted to prevent renal excretion.
   - C. Taking the medication with food will lessen gastric upset.
   - D. Exposure to sunlight will cause bronze pigmentation.

20. A client is sent to the psychiatric unit for forensic evaluation after he is accused of arson. His tentative diagnosis is antisocial personality disorder. In reviewing the client's record, the nurse could expect to find:
   - A. A history of consistent employment
   - B. A below-average intelligence
   - C. A history of cruelty to animals
   - D. An expression of remorse for his actions

21. A 65-year-old female is planning for retirement. Which statement indicates that the client has achieved ego integrity?
   - A. “After retirement, I plan to join a senior's travel club.”
   - B. “I need to consider selling my home and moving closer to my daughter.”
   - C. “I've worked most all my life. I'm not sure how to spend my days now.”
   - D. “Few of my relatives live past their 70s.”

22. The licensed practical nurse is making assignments for the nursing assistant. Which client should be assigned to the nursing assistant?
   - A. A 70-year-old with Alzheimer's dementia
   - B. A 65-year-old with total knee repair
   - C. A 72-year-old with exploratory laparotomy
   - D. An 80-year-old with diverticulitis

23. The nurse is providing dietary teaching for an elderly client living on fixed income. Which food choices would provide the client with needed nutrients and be cost effective?
   - A. Potatoes, green beans, bacon
   - B. Spinach, dried beans, tomatoes
   - C. Ham, corn, strawberries
   - D. Beef, cheese, milk
24. The licensed vocational nurse cannot assume the primary care for a client:
   - A. In the fourth stage of labor
   - B. Two days post appendectomy
   - C. With a venous access device
   - D. With bipolar disorder

25. The nurse is caring for a client with Cushing’s syndrome. The nurse should carefully assess the client for signs of:
   - A. Hypoglycemia
   - B. Infection
   - C. Hypovolemia
   - D. Hyperinsulinemia

26. A client is admitted with suspected pheochromocytoma. The physiological alteration associated with pheochromocytoma is:
   - A. An extreme elevation in blood pressure
   - B. Petechial rash across the chest and axilla
   - C. White flecks in the iris
   - D. Yellow creases at the nasolabial folds

27. A client with osteoporosis has been advised to increase the amount of calcium in her diet. Which food provides the most calcium?
   - A. An 8-ounce glass of milk
   - B. An ounce of cheddar cheese
   - C. A half cup of raw broccoli
   - D. A 4-ounce salmon croquet

28. The physician has ordered dressings with sulfamylon cream for a client with full thickness burns of his hands and arms. Before dressing changes, the nurse should give priority to:
   - A. Administering pain medication
   - B. Checking the adequacy of urinary output
   - C. Requesting a daily complete blood count
   - D. Obtaining a blood glucose by finger stick
29. A client with acquired immunodeficiency syndrome is hospitalized with pneumocystis pneumonia. Lab reports reveal a T cell count of 180. The medication frequently used for the client with T cell counts less than 200 is:

- A. Garamycin (gentamicin)
- B. Zovirax (acyclovir)
- C. Pentam (pentamidine)
- D. Immune globulin

30. A primigravida arrives at the labor unit stating that she is having contractions. Which statement describes the presence of true contractions?

- A. True contractions begin in the lower abdomen.
- B. True contractions have a consistent frequency.
- C. True contractions lessen with physical activity.
- D. True contractions are inconsistent in frequency.

31. The nurse is caring for a client receiving Theodur (theophylline). Side effects associated with bronchodilators include:

- A. Irritability, rapid pulse, and palpitations
- B. Slow pulse, increased appetite, and sweating
- C. Anxiety, nausea, and increased blood pressure
- D. Drowsiness, vomiting, and decreased blood sugar

32. The nurse is teaching a group of parents about gross motor development of a 2-year old. Which behavior is an example of the normal gross motor skill of a 2-year old?

- A. She can pull a toy behind her.
- B. She can copy a horizontal line.
- C. She can build a tower of eight blocks.
- D. She can broad jump.

33. A client with schizophrenia is experiencing auditory hallucinations and is admitted for evaluation and treatment. A suitable activity for a client with schizophrenia who is experiencing hallucinations is:

- A. Watching a movie with other clients
- B. Working on a large-piece puzzle
- C. Playing a game of solitaire
- D. Taking a walk with the nurse
34. The nurse is assisting the physician with an examination of a client with Addison's disease. During the examination, the nurse will note which change in the client's integumentary system?
   - A. Edema of the hands and feet
   - B. Hirsutism
   - C. Bronze skin
   - D. Pendulous abdomen

35. While sitting at the nurse's station, the nurse observes that a client uses a tissue to pick up magazines and change channels on the television. There has been no such behavior in the past. The nurse should:
   - A. Talk with the client about the behavior.
   - B. Provide the client with a pair of nonsterile gloves.
   - C. Take the tissues away from the client.
   - D. Recognize the behavior as a means of getting attention.

36. A client hospitalized with a fractured mandible is to be discharged. Which piece of equipment should be kept on the client with a fractured mandible?
   - A. Wire cutters
   - B. Oral airway
   - C. Pliers
   - D. Tracheostomy set

37. A client is admitted with suspected fracture of the left hip. The most consistent finding in the client with the hip fracture is:
   - A. Pain in the hip and affected leg
   - B. Absence of pedal pulses
   - C. Disalignment of the leg
   - D. Diminished sensation

38. The physician has ordered insertion of a nasogastric tube to provide supplemental feedings for a client recovering from a stroke. To facilitate insertion of the nasogastric tube, the nurse should:
   - A. Place the tube in ice water.
   - B. Tell the client to flex his neck on his chest.
   - C. Tell the client to hyperextend his neck.
   - D. Place the tube in warm water.
39. A pregnant diabetic client, 37 weeks gestation, is scheduled for an amniocentesis. The client asks the nurse the purpose of the test. The nurse should explain that the primary reason for performing an amniocentesis is:
○ A. To determine the effect of the diabetes on the fetus
○ B. To estimate the skeletal age of the fetus
○ C. To determine the maturity of the fetus
○ D. To obtain information about aberrant fetal genes

40. The nurse is to administer Lanoxin (digoxin) elixir to a 6-month-old with a congenital heart defect. The nurse auscultates an apical pulse rate of 100. The nurse should:
○ A. Record the heart rate and call the physician.
○ B. Record the heart rate and administer the medication.
○ C. Administer the medication and recheck the heart rate in 15 minutes.
○ D. Hold the medication and recheck the heart rate in 30 minutes.

41. After receiving an annual influenza immunization, a client develops symptoms suggestive of Guillain-Barré syndrome. Which symptom is associated with Guillain-Barré syndrome?
○ A. Paresthesia and weakness of the lower extremities
○ B. Hyperactive deep tendon reflexes
○ C. Emotional lability
○ D. Flapping tremors of the hand and feet

42. The licensed practical nurse is caring for a 1-year-old with a history of prematurity. Which developmental finding requires further evaluation by the physician?
○ A. The child has been creeping for 3 months.
○ B. The child can pull to a standing position.
○ C. The child uses a pincer grasp.
○ D. The child can sit with support.

43. A withdrawn, depressed client sits in the day room but refuses to participate in scheduled group activities. When implementing a plan of care the nurse should:
○ A. Plan activity that will allow the client to interact with a staff member.
○ B. Tell the client that participation in group activities is expected.
○ C. Allow the client to select an activity that he can enjoy doing alone.
○ D. Ask the client to prepare a list of activities or hobbies he enjoys.
44. The mother of a 3-year-old hospitalized with lead poisoning asks the nurse to explain the treatment for her daughter. The nurse's explanation is based on the knowledge that lead poisoning is treated with:
   ○ A. Gastric lavage
   ○ B. Chelating agents
   ○ C. Antiemetics
   ○ D. Activated charcoal

45. The nurse is implementing a plan of care for a client with myxedema. Based on the client's diagnosis, the nurse should:
   ○ A. Provide high-calorie snacks for the client.
   ○ B. Tell the client to elevate her feet when sitting.
   ○ C. Provide an additional blanket.
   ○ D. Perform urine checks for ketones.

46. An adolescent bodybuilder has been taking anabolic steroids to increase his weight and the size and definition of his muscles. Psychological effects of anabolic steroids include:
   ○ A. Confusion and self-doubt
   ○ B. Aggression and uncontrolled rage
   ○ C. Elation and excitability
   ○ D. Decreased inhibitions and humor

47. A female client with mania has become very expansive and insists on playing strip poker with a group of male clients. In anticipation of the game, the client begins to undress. The most therapeutic response by the nurse would be:
   ○ A. To observe the reaction of the other clients
   ○ B. To take the cards away from the group
   ○ C. To tell the client her behavior is inappropriate
   ○ D. To escort the client to her room

48. Following the death of a client, a nursing assistant begins to cry uncontrollably and is unable to provide care for the other assigned clients. The nurse should:
   ○ A. Send the nursing assistant home for the remainder of the day.
   ○ B. Explain to the nursing assistant that she will have to learn to cope with loss.
   ○ C. Send the nursing assistant to the lounge and care for the clients herself.
   ○ D. Encourage the nursing assistant to express her feelings about dying.
49. An 18-month-old is scheduled for a cleft palate repair. The usual type of restraints for a child with a cleft palate repair are:
   - A. Elbow restraints
   - B. Full arm restraints
   - C. Wrist restraints
   - D. Mummy restraints

50. The nurse is caring for a client with bleeding from esophageal varices. The factor that most likely contributed to the development of esophageal varices is:
   - A. Exposure to hydrocarbons
   - B. Being morbidly obese
   - C. Heavy alcohol consumption
   - D. Adherence to a lacto-vegetarian diet

51. At 26 weeks gestation, a client is admitted to the ER stating that she has been having a painless bloody vaginal discharge since last evening. The nurse should give priority to:
   - A. Reporting the findings to the physician
   - B. Evaluating the color of the discharge
   - C. Evaluating the client's vital signs
   - D. Applying an external fetal monitor

52. A 4-year-old is scheduled for a routine tonsillectomy. Which of the following lab findings should be reported to the doctor?
   - A. A hemoglobin of 12 Gm.
   - B. A platelet count of 200,000
   - C. A white cell count of 16,000
   - D. A urine specific gravity of 1.010

53. A client with glaucoma has been prescribed Timoptic (timolol) eye drops. Timoptic should be used with caution in the client with a history of:
   - A. Diabetes
   - B. Gastric ulcers
   - C. Emphysema
   - D. Pancreatitis
54. Which of the following instructions would not be included in the discharge teaching for a client receiving Thorazine (chlorpromazine)?
   - A. Wear protective clothing when working outside.
   - B. Avoid eating aged cheese.
   - C. Carry hard candy to decrease dryness of the mouth.
   - D. Report a sore throat immediately.

55. The nurse knows that a client with right-sided hemiplegia understands teaching regarding ambulation with a cane if she states:
   - A. “I will hold the cane in my right hand.”
   - B. “I will advance the cane and the right leg together.”
   - C. “I will be able to walk only by using a walker.”
   - D. “I will hold the cane in my left hand.”

56. An elderly client who experiences night time confusion wanders from his room into the room of another client. The nurse can best help decrease the client’s confusion by:
   - A. Assigning a nursing assistant to sit with him until he falls asleep
   - B. Allowing the client to room with another elderly client
   - C. Administering a bedtime sedative
   - D. Leaving a night light on during the evening and night shifts

57. A nursing assistant assigned to care for a client with a radium implant tells the nurse, “I don’t want to be assigned to that radioactive patient.” The best action for the nurse to take is to:
   - A. Tell the nursing assistant that the client’s body acts as a shield.
   - B. Point out that her behavior is uncaring.
   - C. Instruct her regarding the use of a lead-lined apron.
   - D. Ask the nursing assistant why she is afraid of the client.

58. A client with cancer of the stomach has a gastric resection. The nurse should tell the client that following surgery:
   - A. He can eat any type food he wants to eat.
   - B. Eating carbohydrates will give him extra energy.
   - C. He will only be able to have high-calorie liquids.
   - D. Increasing his fat intake will help promote healing.
59. A client with psychotic depression is receiving Haldol (haloperidol). Which of the following side effects is associated with haloperidol?
   - A. Akathesia
   - B. Cataracts
   - C. Diaphoresis
   - D. Polyuria

60. While assisting a doctor with a sterile dressing change, the nurse notices that the doctor has contaminated his left hand. Which action should the nurse take?
   - A. Hand the doctor another pair of gloves.
   - B. Tell the doctor that he has contaminated his gloves.
   - C. Say nothing because the client will be placed on prophylactic antibiotics.
   - D. Report the incident to the infection control nurse.

61. Which of the following is a common complaint of the client with end-stage renal failure?
   - A. Weight loss
   - B. Itching
   - C. Ringing in the ears
   - D. Bruising

62. The nurse caring for a client scheduled for an angiogram should prepare the client for the procedure by telling him to expect:
   - A. Dizziness as the dye is injected.
   - B. Nausea and vomiting after the procedure is completed.
   - C. A decreased heart rate for several hours after the procedure is completed.
   - D. A warm sensation as the dye is injected.

63. A client with Parkinson’s disease complains of “choking” when he swallows. Which intervention will improve the client’s ability to swallow?
   - A. Withholding liquids until after meals
   - B. Providing semi-liquid foods when possible
   - C. Providing a full liquid diet
   - D. Offering small, more frequent meals
64. Which of the following medication orders needs further clarification?
   - A. Darvocet (propoxyphene/acetaminophen) 65 mg q 4–6 hrs. PRN
   - B. Nembutal (pentobarbital) 100 mg at bedtime
   - C. Coumadin (sodium warfarin) 10 mg
   - D. Estrace (estradiol) 2 mg q day

65. The nurse assesses an 18-month-old child brought to the well child clinic for a routine check-up. Which finding would be of most concern to the nurse?
   - A. The child can creep up stairs.
   - B. The child is not toilet trained.
   - C. The child drops objects handed to him.
   - D. The child cries when his mother leaves him with a stranger.

66. The nurse is assisting the physician with the insertion of a central venous catheter. Which statement best explains the rationale for placing the client in Trendelenburg position?
   - A. It will make catheter insertion easier.
   - B. It will make the client more comfortable.
   - C. It will prevent ventricular tachycardia.
   - D. It will prevent the development of pulmonary emboli.

67. The doctor has ordered the removal of a Davol drain. Which of the following instructions should the nurse give to the client prior to removing the drain?
   - A. The client should be told to breathe normally.
   - B. The client should be told to take two or three deep breaths as the drain is being removed.
   - C. The client should be told to hold his breath as the drain is being removed.
   - D. The client should breathe slowly as the drain is being removed.

68. The best diet for the client with a Meniere's syndrome is one that is:
   - A. High in fiber
   - B. Low in sodium
   - C. High in iodine
   - D. Low in fiber
69. A client with chronic obstructive pulmonary disease is receiving O₂ at 2 L/ min. He is anxious and short of breath, and his mental status is clouded. The nurse should:
   ○ A. Increase the O₂ to 3 L/ min.
   ○ B. Monitor for signs of impending respiratory failure.
   ○ C. Maintain the O₂ at 2 L/ min, but increase the humidity.
   ○ D. Check the vital signs and oxygen saturation level.

70. Which of the following findings is associated with right-sided heart failure?
   ○ A. Shortness of breath
   ○ B. Nocturnal polyuria
   ○ C. Daytime oliguria
   ○ D. Crackles in the lungs

71. Which finding indicates a need for further assessment of the client scheduled for a magnetic resonance imaging?
   ○ A. The client is an insulin-dependent diabetic.
   ○ B. The client refuses a corner bed.
   ○ C. The client is allergic to shellfish.
   ○ D. The client has a history of asthma.

72. A client with a total knee replacement returns from surgery. Which finding requires immediate nursing intervention?
   ○ A. There is 30 ml of bloody drainage from the Davol drain.
   ○ B. The continuous passive motion machine is set on 90° flexion.
   ○ C. The client is unable to ambulate to the bathroom.
   ○ D. The client is complaining of muscle spasms.

73. A nurse assigned to the rural health clinic is to administer a Mantoux test to a group of factory workers. The nurse should administer the vaccine in each client’s:
   ○ A. Thigh
   ○ B. Buttock
   ○ C. Forearm
   ○ D. Upper arm
74. A client with end-stage renal disease received a renal transplant 2 weeks ago. Which of the following is an early sign of rejection of the transplant?

- A. Increased urinary output
- B. Tenderness over the operative site
- C. Decreased urinary output
- D. Blood pressure of 150/90

75. The physician has ordered a lumbar puncture on a client suspected of having meningitis. Following the procedure, the nurse should:

- A. Place the collection vials on ice.
- B. Number the collection vials.
- C. Rotate the collection vials to prevent settling.
- D. Carry the second and third vials to the lab after discarding the first vial.

76. Which of the following postpartal clients is at greatest risk for hemorrhage?

- A. A gravida 1 para 1 with an uncomplicated delivery of a 7-pound infant
- B. A gravida 1 para 0 with a history of polycystic ovarian disease
- C. A gravida 3 para 3 with a history of low birth weight infants
- D. A gravida 4 para 3 with a Caesarean section

77. An 8-year-old admitted with an upper respiratory infection has an order for $O_2$ saturation via pulse oximeter. To ensure an accurate reading, the nurse should:

- A. Place the probe on the child’s abdomen.
- B. Recalibrate the oximeter at the beginning of each shift.
- C. Apply the probe and wait 15 minutes before obtaining a reading.
- D. Place the probe on the child’s finger or earlobe.

78. A client with polysubstance abuse has been admitted to the hospital for detoxification. Which of the following drugs represents the most serious life-threatening situation during the withdrawal period?

- A. Methadone
- B. Secobarbital
- C. Heroin
- D. Cocaine
79. A client with allergic rhinitis has an order for a long-acting nasal spray that contains oxymetazoline. The client should be instructed to use the spray as directed to prevent:

- A. Bleeding tendencies
- B. Increased nasal congestion
- C. Nasal polyps
- D. Tinnitus

80. An infant with Tetralogy of Fallot is discharged with a prescription for Lanoxin (digoxin) elixir. The nurse should instruct the mother to:

- A. Administer the medication using a nipple.
- B. Administer the medication using the calibrated dropper in the bottle.
- C. Administer the medication using a plastic baby spoon.
- D. Administer the medication in a baby bottle with 1 ounce of water.

81. A client with schizophrenia is ready to begin participating in therapeutic activities. The nurse should suggest that the client:

- A. Participate on the unit softball team.
- B. Attend a class on psychotropic medication.
- C. Participate in art activities with three other clients.
- D. Watch TV in the unit day room.

82. A 5-year-old with a suspected ventricular septal defect is scheduled for a cardiac catheterization. The child’s mother asks the nurse, “Why does my little girl have to have that tube put into her heart?” The nurse should tell the mother that the cardiac catheterization will:

- A. Identify how much her heart is enlarged.
- B. Show exactly where the defect is.
- C. Show whether the ventricles are enlarged.
- D. Determine the existence of a murmur.

83. A client is seen in the clinic and determined to have a hydatidiform mole. Which diagnostic test can confirm the diagnosis of a hydatidiform mole?

- A. An ultrasound
- B. Alpha-fetoprotein
- C. Human chorionic gonadotrophin
- D. Lecithin sphingomyelin ratio
A client scheduled for electroconvulsive therapy tells the nurse, “I’m so afraid. What will happen to me during the treatment?” Which of the following statements is most therapeutic for the nurse to make?

- A. “You will be given medicine to relax you during the treatment.”
- B. “The treatment will produce a controlled grand mal seizure.”
- C. “The treatment can produce nausea and headache.”
- D. “You can expect to be sleepy and confused for a time after the treatment.”

A 14-year-old with leukemia tells the nurse, “All I really want to eat is frozen yogurt.” The nurse should:

- A. Explain the importance of eating a balanced diet.
- B. Ask the dietician to talk with the client to find out which foods he prefers.
- C. Ask the kitchen to send the yogurt.
- D. Document the client’s refusal to eat the diet as ordered.

The nurse reports that a client with a Mantoux test has an induration of 10 mm. The nurse knows that the induration indicates:

- A. Infection with the tubercle bacillus
- B. Exposure to the tubercle bacillus
- C. Questionable exposure to the tubercle bacillus
- D. No exposure to the tubercle bacillus

Which of the following cutaneous manifestations is associated with Lyme disease?

- A. Annular rash
- B. Papular crusts
- C. Bullae
- D. Plaques

A gravida para 1 reports that a prior pregnancy ended in loss of the baby early in the pregnancy. Which of the following instructions should be given to the client?

- A. She should refrain from sex during this pregnancy.
- B. She should avoid stimulation of the breasts.
- C. She should quit work until after the baby is born.
- D. She should report any nausea and vomiting.
89. A client is admitted to the coronary care unit with an acute myocardial infarction. The pain associated with acute myocardial infarction results from:
   ○ A. Spasm of the coronary artery
   ○ B. Ischemia of the myocardium
   ○ C. Vasodilation of the coronary veins
   ○ D. Ischemia of the carotid artery

90. Following an arteriogram, the nurse should give priority to:
   ○ A. Allowing the client to rest
   ○ B. Administering O2 via nasal mask
   ○ C. Checking the ECG monitor
   ○ D. Checking the pulses distal to the catheterization site

91. The most common complication following a myocardial infarction is:
   ○ A. Hyperkalemia
   ○ B. Cardiac dysrhythmia
   ○ C. Acute respiratory distress
   ○ D. Hypovolemic shock

92. Which of the following snacks would be suitable for a child with gluten-induced enteropathy?
   ○ A. A soft oatmeal cookie
   ○ B. Buttered popcorn
   ○ C. A peanut butter and jelly sandwich
   ○ D. Cheese pizza

93. Following a coronary artery bypass, a client develops a temperature of 102°. The nurse should notify the doctor because an elevation in temperature:
   ○ A. Increases the cardiac output
   ○ B. Decreases the cardiac output
   ○ C. Indicates a cardiac tamponade
   ○ D. Increases diaphoresis and the likelihood of hypothermia
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94. A client with a family history of Huntington’s disease asks the nurse for information on how the disease is transmitted. Which of the following statements indicates that she understands the nurse’s teaching?

- **A.** “The chances of my passing the disease to my child are 1 in 2.”
- **B.** “I have no chance of passing the disease to a male child, but a female child would carry the disease.”
- **C.** “I have no chance of passing the disease to a female child, but a male child will have the disease.”
- **D.** “The chances of my passing the disease to my child are 1 in 4.”

95. A client is being discharged following insertion of a permanent set pacemaker. A client with a permanent set pacemaker should be taught:

- **A.** To keep a loose dressing over the insertion site at all times
- **B.** That the pacemaker will function continuously at a set rate
- **C.** That increases in activity will require adjustments in the pacemaker setting
- **D.** That he will have to modify his lifestyle to allow for afternoon rest periods

96. A client with schizophrenia is receiving Clozaril (clozapine) 150 mg twice a day. An adverse side effect of the medication is:

- **A.** Photosensitivity
- **B.** Extreme elevations in temperature
- **C.** Weight gain
- **D.** Elevated blood pressure

97. To prevent symptoms of Raynaud’s, the client should:

- **A.** Avoid a high-sodium diet.
- **B.** Take a brisk, 15-minute walk daily.
- **C.** Avoid exposure to cold.
- **D.** Increase her vitamin C intake.

98. A client with end-stage renal failure is to receive a kidney transplant from her sister. Prior to surgery, the client will be scheduled for:

- **A.** An intravenous pyelogram
- **B.** Hemodialysis
- **C.** A voiding cystogram
- **D.** A renal biopsy
99. A client is admitted with acute abdominal pain. Which of the following findings would require immediate attention?
   - A. BP 100/50, P 96, abdominal distention
   - B. Temperature 99°, flatulence, nausea
   - C. Urinary frequency and dysuria
   - D. Temperature 99.2°, amber-colored urine

100. Which information should be given to a client taking Dilantin (phenytoin)?
   - A. Taking the medication with meals will increase its effectiveness.
   - B. The medication can cause sleep disturbances.
   - C. More frequent dental appointments will be needed for special gum care.
   - D. The medication decreases the effects of oral contraceptives.

101. A client complains of pain and burning from herpes zoster. Which of the following provides temporary relief?
   - A. Applying a topical corticosteroid
   - B. Blowing cool air over the affected area
   - C. Applying warm, moist compresses
   - D. Applying an antifungal ointment

102. The physician has ordered thiamine 100 mg IM for a client with chronic alcoholism. The primary reason for giving thiamine is:
   - A. To increase the client's appetite
   - B. To reduce the client's craving for alcohol
   - C. To treat the client's neurological symptoms
   - D. To prevent the development of delirium tremens

103. Which of the following complications is associated with a below-the-knee amputation?
   - A. Hip contracture
   - B. Knee contracture
   - C. Abduction of the hip
   - D. Adduction of the hip
104. A client has returned to his room following an esophagoscopy. Before offering fluids, the nurse should give priority to assessing the client's:

- A. Level of consciousness
- B. Gag reflex
- C. Urinary output
- D. Movement of extremities

105. Which client is at risk for the development of pernicious anemia?

- A. A client with a gastric resection
- B. A client exposed to industrial toxins
- C. A client of Mediterranean descent
- D. A client with a limited intake of selenium

106. Which instruction should be included in the discharge teaching for a client with cataract surgery?

- A. Over-the-counter eye drops can be used to treat redness and irritation.
- B. The eye shield should be worn at night.
- C. It will be necessary to wear special cataract glasses.
- D. A prescription for medication to control postoperative pain will be needed.

107. Which of the following indicates that the client taking an anticoagulant needs further teaching?

- A. The client states that he will report bruising.
- B. The client states that he eats green, leafy vegetables at least three times weekly.
- C. The client states that he will return to the doctor's office for scheduled lab work.
- D. The client states that his insulin dose might have to be adjusted while he is taking an anticoagulant.

108. Which of the following indicates failure of a ventriculoperitoneal shunt?

- A. Projectile vomiting
- B. Abdominal distention
- C. Decreased urinary output
- D. Hemodilution
109. During the discharge teaching of a client with Buerger's disease, the nurse should teach the client:

- A. Exercises for improving vascular return from the lower extremities
- B. The importance of wearing mittens or gloves
- C. Dietary choices for reducing triglycerides
- D. The role of weight bearing exercises in preventing bone loss

110. Which of the following findings suggests a complication in a client with surgical removal of a pituitary tumor?

- A. Polyuria
- B. Anuria
- C. Oliguria
- D. Dysuria

111. A 19-year-old primigravida is admitted for observation due to a sudden increase in blood pressure. The doctor suspects a diagnosis of pregnancy-induced hypertension. Which of the following is considered a significant factor in the development of pregnancy-induced hypertension?

- A. Maternal age
- B. Nutritional status of mother
- C. Pre-pregnant weight
- D. History of hypertension

112. An 8-year-old is admitted with drooling, muffled phonation and a temperature of 102.6°. The nurse should immediately notify the doctor because the child's symptoms are suggestive of:

- A. Strep throat
- B. Epiglottitis
- C. Laryngotracheo bronchitis
- D. Bronchiolitis

113. A client with severe hypertension is receiving Capoten (captopril). The nurse should instruct the client to report which of the following to the doctor?

- A. Coughing
- B. Drowsiness
- C. Frequent urination
- D. Hunger
114. The doctor has ordered an IV of magnesium sulfate for a G1 P0 with preeclampsia. Which of the following symptoms is an expected side effect of magnesium sulfate?

- A. Oliguria
- B. Hypersomnolence
- C. Hyporeflexia
- D. Bradypnea

115. Which of the following symptoms is commonly reported in children with attention deficit hyperactive disorder?

- A. Difficulty sleeping at night
- B. Impulsivity
- C. Poor appetite
- D. Nonintentional tremor

116. Phototherapy is ordered for a newborn with physiologic jaundice. The nurse caring for the infant should:

- A. Offer the baby sterile water between feedings of formula.
- B. Apply an emollient to the baby's skin to prevent drying.
- C. Wear a gown, gloves, and a mask while caring for the infant.
- D. Place the baby on enteric isolation.

117. A veteran is admitted with a diagnosis of chronic post-traumatic stress disorder. After being placed in the treatment room, he begins to pace frantically and make references to “highway one.” As the nurse approaches him, he retreats to the corner and sits on the floor with his arms and legs pulled tight to his body. The client is experiencing a:

- A. Hallucination
- B. Phobic reaction
- C. Delusion
- D. Flashback

118. Which of the following behaviors is characteristic of the client with schizoid personality disorder?

- A. Excessive emotional outbursts
- B. Violation of the rights of others
- C. Social detachment
- D. Attention-seeking behaviors
119. The doctor has prescribed imipramine (Tofranil) for an elderly client with endogenous depression. The nurse should give priority to assessing the client's:
   ○ A. Fluid intake
   ○ B. Cardiac status
   ○ C. Respiratory effort
   ○ D. Urinary output

120. A teen hospitalized with anorexia nervosa is now permitted to leave her room and eat in the dining room. Which of the following nursing interventions should be included in the client's plan of care?
   ○ A. Weighing the client after she eats
   ○ B. Having a staff member remain with her for 1 hour after she eats
   ○ C. Placing high-protein foods in the center of the client's plate
   ○ D. Providing the client with child-sized utensils

121. A client receiving Eskalith (lithium carbonate) has a level of 4.5 mEq/L. The nurse should prepare the client for immediate:
   ○ A. Blood transfusion
   ○ B. Hemodialysis
   ○ C. Renal biopsy
   ○ D. Brain scan

122. A 15-year-old is admitted following a motor vehicle accident. Examination reveals that the client has a closed head injury, a linear fracture of the temporal bone, a fracture of the mandible, and multiple abrasions. Upon admission, he is very drowsy. Which of the following doctor’s orders should the nurse question?
   ○ A. Elevate the head 30°.
   ○ B. Apply Neosporin (neomycin) ointment to abrasions.
   ○ C. Polycillin (ampicillin) 500 mg IVPB q 6 hrs.
   ○ D. Demerol (meperidine) 75 mg q 3–4 hrs. PRN pain.

123. A client hospitalized with bipolar disorder, manic phase, begins to talk loudly, pace the floor, and shout commands to others in the day room as he quickly changes the TV channels. The nurse’s first action should include:
   ○ A. Checking the client’s medication order
   ○ B. Escorting the client from the day room
   ○ C. Placing the client in seclusion
   ○ D. Finding out whether the client’s behavior is upsetting others in the day room.
124. According to Erickson’s stage of growth and development, the developmental task
associated with middle childhood is:
   ○ A. Trust
   ○ B. Initiative
   ○ C. Independence
   ○ D. Industry

125. Procrastination, noncompliance, and intentional inefficiency are characteristics of the
client with:
   ○ A. Avoidant personality disorder
   ○ B. Antisocial personality disorder
   ○ C. Compulsive personality disorder
   ○ D. Passive aggressive personality disorder

126. A 5-year-old is admitted to the hospital with pneumonia. Her orders include chest
physiotherapy, mist tent, and inhalation with Mucomyst (acetylcysteine). Which of the
following measures should be included in her care?
   ○ A. Telling her to breathe in through her nose and breathe out through her
      mouth
   ○ B. Applying lotion to the exposed parts of her body
   ○ C. Checking her clothing and linen frequently for dampness
   ○ D. Obtaining a rectal temperature q 4 hours

127. The nurse should observe for side effects associated with the use of bronchodilators. A
common side effect of bronchodilators is:
   ○ A. Tinnitus
   ○ B. Tachycardia
   ○ C. Ataxia
   ○ D. Hypotension

128. The nurse is reviewing the chart of a 1-day-old infant. Which of the following data
requires further action?
   ○ A. Heart rate of 128
   ○ B. Respiratory rate of 72
   ○ C. Hematocrit of 50%
   ○ D. Blood glucose of 60 mg/100 ml
129. A primigravida, 26 years old and 33 weeks gestation, is admitted to the hospital with painless vaginal bleeding. She reports that the bleeding, which started 2 hours ago, has lessened in amount. Which of the following measures should be included in the client’s care?
   - A. Monitoring of cervical dilatation
   - B. Counting the number of pads used
   - C. Checking the pH of the vaginal fluid
   - D. Observing for Cullen’s sign

130. The 5-minute Apgar of a baby delivered by C-section is recorded as 9. The most likely reason for this score is:
   - A. The mottled appearance of the trunk.
   - B. The presence of conjunctival hemorrhages.
   - C. Cyanosis of the hands and feet.
   - D. Respiratory rate of 20–28/min.

131. A client with a history of repeated sinusitis and deviated septum has an order for a CAT scan. To prepare the client for the procedure, the nurse should:
   - A. Tell the client that she can have an analgesic for discomfort.
   - B. Tell the client that needles will be placed above and below her eyes during the procedure.
   - C. Tell the client that she will need to be still during the procedure.
   - D. Tell the client that she will have a radiopaque substance given by IV.

132. A 5-month-old infant is admitted to the ER with a temperature of 103.6° and irritability. The mother states that the child has been listless for the past several hours and that he had a seizure on the way to the hospital. A lumbar puncture confirms a diagnosis of bacterial meningitis. The nurse should assess the infant for:
   - A. Periorbital edema
   - B. Tenseness of the anterior fontanel
   - C. Positive Babinski reflex
   - D. Negative scarf sign
133. A client with a bowel resection and anastomosis returns to his room with an nasogastric tube attached to intermittent suction. Which of the following observations indicates that the nasogastric suction is working properly?

- **A.** The client's abdomen is soft.
- **B.** The client is able to swallow.
- **C.** The client has active bowel sounds.
- **D.** The client's abdominal dressing is dry and intact.

134. The nurse is teaching the client with insulin-dependent diabetes the signs of hypoglycemia. Which of the following signs is associated with hypoglycemia?

- **A.** Tremulousness
- **B.** Slow pulse
- **C.** Nausea
- **D.** Flushed skin

135. An adolescent client has been hospitalized for 2 months for an eating disorder. She asks the nurse what to tell her classmates about her long absence. The nurse can best help the client by:

- **A.** Having her practice changing the subject when asked personal questions
- **B.** Helping her invent a believable explanation for her absence
- **C.** Engaging her in role playing activities that are likely to occur
- **D.** Encouraging her to share her experiences with those who ask

136. Which of the following symptoms is associated with exacerbation of multiple sclerosis?

- **A.** Anorexia
- **B.** Seizures
- **C.** Diplopia
- **D.** Insomnia

137. A client with acquired immunodeficiency syndrome is admitted with a diagnosis of pneumocystis carinii pneumonia. Shortly after his admission, he becomes confused and disoriented. He attempts to pull out his IV and refuses to wear an O₂ mask. Based on his mental status, the priority nursing diagnosis is:

- **A.** Social isolation
- **B.** Risk for injury
- **C.** Ineffective coping
- **D.** Anxiety
138. Which of the following observations indicates the possibility of a birth injury related to forceps delivery?

- A. Asymmetry of the mouth
- B. Pectus excavatum
- C. Caput succedaneum
- D. Strabismus

139. The doctor has ordered Polycillin (ampicillin) Suspension 150 mg every 6 hours. The suggested dose for infants is 25–50 mg/kg/day in equally divided doses. The infant weighs 7 kg. The nurse should:

- A. Give the medication as ordered.
- B. Give half the amount ordered.
- C. Give the ordered amount every 12 hours.
- D. Check the order with the doctor.

140. A 31-year-old client is admitted to the psychiatric unit after cutting both wrists with a kitchen knife. The client has a diagnosis of borderline personality disorder. The most therapeutic approach by the nurse is one that is:

- A. Warm and nurturing
- B. Open and flexible
- C. Firm and consistent
- D. Nonintrusive and passive

141. Which of the following conditions is most likely related to the development of renal calculi?

- A. Gout
- B. Pancreatitis
- C. Fractured femur
- D. Disc disease

142. Which symptom is considered an adverse reaction to Kantrex (kanamycin)?

- A. Diminished hearing
- B. Hypotension
- C. Hepatomegaly
- D. Petechiae
143. Which of the following beverages is most appropriate for a client with renal failure?
   - A. Prune juice
   - B. Grape juice
   - C. Apple juice
   - D. Apricot juice

144. A client with acquired immunodeficiency syndrome is admitted for treatment of wasting syndrome. Which of the following dietary modifications can be used to compensate for the limited absorptive capability of the intestinal tract?
   - A. Thoroughly cooking all foods
   - B. Offering yogurt and buttermilk between meals
   - C. Forcing fluids
   - D. Providing small, frequent meals

145. The client has an IV in place when he returns for surgery. While examining the IV site, the licensed practical nurse notices pallor, coolness, and edema. The nurse is aware that these are signs of:
   - A. Infiltration
   - B. Infection
   - C. Thrombus formation
   - D. Sclerosing of the vein

146. Which of the following toys is the most appropriate for a 2-year-old with Tetralogy of Fallot?
   - A. A toy horn
   - B. A stethoscope
   - C. A push-pull toy
   - D. A shape sorter

147. While sitting in the cafeteria, a nurse overhears two students discussing a client admitted for chemical detoxification. The nurse should:
   - A. Report the incident to the teacher.
   - B. Report the incident to the nursing supervisor.
   - C. Confront the students with their behavior.
   - D. Ignore the students’ behavior.
148. The treatment protocol for a client with acute lymphatic leukemia includes Orasone (prednisone), Trexall (methotrexate), and Tagamet (cimetadine). The purpose of the cimetadine is to:
   ○ A. Decrease the secretion of pancreatic enzymes.
   ○ B. Enhance the effectiveness of the methotrexate.
   ○ C. Promote peristalsis.
   ○ D. Prevent a common side effect of prednisone.

149. A client has returned from having a transurethral prostatectomy. Which finding should be reported to the doctor immediately?
   ○ A. An hourly urinary output of 40–50 ml
   ○ B. Bright red urine with many clots
   ○ C. Dark red urine with few clots
   ○ D. Requests for pain med every 4 hours

150. A client has a repair of a hiatal hernia using a thoracic approach. During the immediate post-op period, the nurse should carefully assess the client for:
   ○ A. A change in appetite
   ○ B. Respiratory change
   ○ C. Anxiety
   ○ D. Activity intolerance

151. A client is admitted with a diagnosis of myxedema. An initial assessment of the client would reveal the symptoms of:
   ○ A. Slow pulse, weight loss, diarrhea, and cardiac failure
   ○ B. Weight gain, lethargy, slowed speech, and decreased respiratory rate
   ○ C. Rapid pulse, constipation, and bulging eyes
   ○ D. Decreased body temperature, weight loss, and increased respiratory rate

152. Which of the following should be included in the discharge teaching of a client with a unilateral adrenalectomy?
   ○ A. The client’s need to pay close attention to skin care
   ○ B. The client’s need to restrict dietary intake of sodium and protein
   ○ C. The client’s need to recognize signs of hypoglycemia
   ○ D. The client’s need for daily steroid medication
153. The doctor has ordered nasogastric feedings for an elderly client with dysphagia. Prior to administering a tube feeding, the nurse should:
   - A. Discard any aspirant and begin the tube feeding.
   - B. Check the pH of the aspirant.
   - C. Connect the tubing to suction.
   - D. Mix the feeding with 200 ml of water.

154. Which of the following meal choices is suitable for a 6-month-old infant?
   - A. Egg white, formula, and orange juice
   - B. Apple juice, carrots, and whole milk
   - C. Rice cereal, formula, and apple juice
   - D. Melba toast, egg yolk, and whole milk

155. A client has an order for D5NS 1000 ml to infuse over 8 hours. The IV set delivers 10 drops per ml. The nurse should maintain the infusion rate at:
   - A. 10 drops per minute
   - B. 15 drops per minute
   - C. 21 drops per minute
   - D. 32 drops per minute

156. A client with acute pancreatitis is started on solid food. Which of the following foods should be avoided?
   - A. Vanilla custard
   - B. Sponge cake
   - C. Sliced peaches
   - D. Cereal

157. The licensed practical nurse is preparing to administer an injection of vitamin K to a newborn. The nurse should administer the injection in the:
   - A. Rectus femoris muscle
   - B. Vastus lateralis muscle
   - C. Deltoid muscle
   - D. Dorsogluteal muscle
158. A client with insulin-dependent diabetes mellitus takes Lantus insulin. At what time of the day would the nurse administer the insulin?

- A. 0700
- B. 1200
- C. 1600
- D. 2100

159. Which snack is not appropriate for a 7-year-old with celiac disease?

- A. Rice Krispies bar
- B. Chocolate malted
- C. Popcorn
- D. Fruit sorbet

160. The physician has prescribed Immuran (cytoxan) for a client with nephrotic syndrome. The nurse should:

- A. Encourage the client to drink extra fluids.
- B. Request a low-protein diet for the client.
- C. Bathe the client using only mild soap and water.
- D. Provide additional warmth for swollen and inflamed joints.

161. A 6-year-old is diagnosed with scarlet fever. Which oral manifestation is associated with scarlet fever?

- A. White spots on the buccal mucosa
- B. Grayish membrane on the posterior pharynx
- C. Red or white strawberry tongue
- D. Black discoloration of the tongue

162. A 6-week-old infant is admitted with suspected pyloric stenosis. Which finding is characteristic of the infant with pyloric stenosis?

- A. Colicky abdominal pain
- B. A palpable, olive-shaped abdominal mass
- C. Currant jelly stools
- D. Intolerance to oats, barley, and rye
163. Prior to administering a tube feeding, the nurse obtains 50 ml of aspirant. The nurse should:
   ○ A. Discard the aspirant and begin the tube feeding.
   ○ B. Replace the aspirant and begin the tube feeding.
   ○ C. Discard the aspirant and hold the tube feeding.
   ○ D. Replace the aspirant and hold the tube feeding.

164. The nurse is caring for a client with detoxification from alcohol. Which medication is used in the treatment of alcohol withdrawal?
   ○ A. Antabuse (disulfiram)
   ○ B. Romazecon (flumazenil)
   ○ C. Dolophine (methadone)
   ○ D. Ativan (lorazepam)

165. A client with tuberculosis has an order for Rifadin (rifampin). What vitamin is usually given with rifampin?
   ○ A. Thiamine
   ○ B. Pyradoxine
   ○ C. Folic acid
   ○ D. Cyanocobalamine

166. Four clients have requested medication for pain. The licensed practical nurse should give priority to medicating:
   ○ A. The client with a fractured femur
   ○ B. The client with a closed head injury
   ○ C. The client with a laminectomy
   ○ D. The client with a posterior myocardial infarction

167. The nurse is preparing the room of a client returning from a subtotal thyroidectomy. Which item should be placed at the bedside of a client with a subtotal thyroidectomy?
   ○ A. An ambu bag
   ○ B. A tracheostomy set
   ○ C. An endotracheal tube
   ○ D. A ventilator
168. A client with insulin-dependent diabetes takes 20 units NPH insulin at 7 a.m. The nurse should observe the client for signs of hypoglycemia at:
   ○ A. 8 a.m.
   ○ B. 10 a.m.
   ○ C. 3 p.m.
   ○ D. 5 a.m.

169. A client hospitalized with mania is racing wildly about the unit trying to organize the other clients into a game of Ping Pong. The nurse should:
   ○ A. Send the client to the recreation room for art therapy.
   ○ B. Take the client outside for a walk.
   ○ C. Allow the client to continue because his activities are goal directed.
   ○ D. Suggest that the client do exercises to a video instead.

170. Following visitation, the nurse observes a client's wife sitting alone crying. When approached, the wife states, “I'm so worried about him.” The best response by the nurse is:
   ○ A. “Are you worried about him being in the hospital?”
   ○ B. “Tell me what is worrying you.”
   ○ C. “Would you like to talk with the social worker assigned to your husband?”
   ○ D. “Would you like to talk with your husband's doctor?”

171. The licensed practical nurse is assisting the charge nurse in planning care for a client with a detached retina. Which of the following nursing diagnoses should receive priority?
   ○ A. Alteration in comfort
   ○ B. Alteration in mobility
   ○ C. Alteration in skin integrity
   ○ D. Alteration in O₂ perfusion

172. When rendering aid to a victim who appears to be choking, the nurse's first action should be to:
   ○ A. Administer a blow to the back.
   ○ B. Ask the client whether she can speak.
   ○ C. Administer a chest thrust.
   ○ D. Establish an airway.
173. While reviewing the chart of an elderly client, the nurse notes that the last recorded temperature for the preceding shift was 104°. There is no documented intervention. The nurse should:

- A. Check the doctor's orders for an antipyretic.
- B. Ask the client whether he has received any medication for his fever.
- C. Call the nurse at home to validate whether the medication was given.
- D. Retake the client's temperature.

174. Which of the following infractions can result in the revocation of the nurse’s license?

- A. Failure to render care during a natural disaster
- B. Suspected negligence
- C. A felony conviction
- D. Failure to pay license renewal fees

175. Which statement by the parent of a child with sickle cell anemia indicates an understanding of the disease.

- A. “The pain he has is due to the presence of too many red blood cells.”
- B. “He will be able to go snow skiing with his friends as long as he stays warm.”
- C. “He will need extra fluids in the summer to prevent dehydration.”
- D. “There is very little chance that his brother will have sickle cell.”

176. The primary purpose for using a CPM machine for the client with a total knee repair is to help:

- A. Prevent contractures.
- B. Promote flexion of the artificial joint.
- C. Decrease the pain associated with early ambulation.
- D. Alleviate lactic acid production in the leg muscles.

177. Prior to suctioning a tracheotomy, the nurse should:

- A. Suction the oropharynx.
- B. Administer oxygen.
- C. Change the inner cannula.
- D. Raise the head of the bed.
178. Which of the following statements describes Piaget's stage of concrete operations?

- A. Reflex activity proceeds to imitative behavior.
- B. There is an increased ability to see another's point of view.
- C. Thought processes become more logical and coherent.
- D. The ability to think abstractly leads to logical conclusions.

179. A client recently diagnosed with bipolar disorder expresses concern over taking Eskalith (lithium carbonate) because "a lot of people have problems getting too much of it." The nurse should explain that lithium toxicity typically occurs when the client has an insufficient intake of:

- A. Carbohydrates for energy
- B. Protein for maintenance of cell integrity
- C. Potassium for muscle contractility
- D. Sodium and fluids for renal excretion

180. A client admitted to the psychiatric unit claims to be the "Son of God" and insists that he will not be confined by "mere mortals." The most likely explanation for the client's delusions is:

- A. A religious conversion
- B. A stressful event
- C. Low self-esteem
- D. Overwhelming anxiety

181. Which of the following statements reflects Kohlberg's theory of the moral development of the preschool-age child?

- A. Obeying adults is seen as correct behavior.
- B. Showing respect for parents is seen as important.
- C. Pleasing others is viewed as good behavior.
- D. Behavior is determined by consequences.

182. A diagnosis of pernicious anemia is made by:

- A. Bone marrow aspiration
- B. Quantitative assay
- C. Weber test
- D. Schilling test
183. A client is being treated for cancer with linear acceleration radiation. The physician has marked the radiation site with a blue marking pen. The nurse should:
   - A. Remove the unsightly markings with acetone or alcohol.
   - B. Cover the radiation site with loose gauze dressing.
   - C. Sprinkle baby powder over the radiated area.
   - D. Refrain from using soap or lotion on the marked area.

184. A toddler with otitis media has just completed antibiotic therapy. A recheck appointment should be made to:
   - A. Determine whether the ear infection has affected her hearing.
   - B. Determine whether she needs a typanoplasty.
   - C. Document that the infection has completely cleared.
   - D. Obtain a new prescription in case the infection recurs.

185. A 9-year-old is admitted with suspected rheumatic fever. Which finding is suggestive of Sydenham's chorea?
   - A. Irregular movements of the extremities and facial grimacing
   - B. Painless swellings over the extensor surfaces of the joints
   - C. Faint areas of red demarcation over the back and abdomen
   - D. Swelling, inflammation, and effusion of the joints

186. The licensed practical nurse is caring for a client with congestive heart failure. The nurse should immediately report the presence of:
   - A. Pink, frothy sputum
   - B. Pedal edema
   - C. Shortness of breath
   - D. Diminished peripheral pulses

187. The licensed practical nurse is making assignments for the nursing assistant. Which task can she safely assign to the nursing assistant?
   - A. Measuring the intake of a client with community-acquired pneumonia
   - B. Feeding the client with a peg tube
   - C. Ambulating the client with a chest drainage device
   - D. Caring for a client during electroconvulsive therapy
188. A client's vision is to be evaluated using the Ishihara exam. The nurse recognizes that the client will be checked for:
   - A. Macular degeneration
   - B. Astigmatism
   - C. Color blindness
   - D. Glaucoma

189. A factory worker is brought to the nurse's office after a metal fragment enters her right eye. The nurse should:
   - A. Cover the right eye with a sterile 4 ¥ 4.
   - B. Attempt to remove the metal with a cotton-tipped applicator.
   - C. Flush the eye for 10 minutes with running water.
   - D. Cover both eyes and transport the client to the ER.

190. The nurse has an order for 75 mg of Demerol (meperidine) and 50 mg of Phenergan (promethazine) to be given to a post-operative client. The nurse should:
   - A. Draw the medication up in one syringe and administer it in the dorsogluteal muscle.
   - B. Draw the medications up separately and administer them in two different sites.
   - C. Question the order because the medications have an antagonistic effect.
   - D. Draw the medication up in one syringe and administer it in the deltoid.

191. The doctor has ordered Nitrostat (nitroglycerine) sublingually for a client with angina. The client should be ordered to replenish his supply every:
   - A. 6 months
   - B. 3 months
   - C. 12 months
   - D. 18 months

192. The doctor has order 1 mg of Stadol (butorphanol) to be given IM. The medication is available in 4 mg per ml. The nurse should administer:
   - A. 0.5 ml
   - B. 0.25 ml
   - C. 0.75 ml
   - D. 1.0 ml
The doctor has ordered Lovenox (enoxaparin) 20 mg subcutaneously daily. The medication is available as 60 mg per ml. The nurse should administer:

- A. 0.50 ml
- B. 0.53 ml
- C. 0.33 ml
- D. 0.25 ml

The licensed practical nurse is assisting the registered nurse with the triage of four clients. Which client should be cared for first?

- A. The client with a laceration to the skull
- B. The client with burns to his back and legs
- C. The client with circumoral cyanosis and tachypnea
- D. The client with dilated, nonreactive pupils

A child with croup is placed in a cool, high-humidity tent connected to room air. The primary purpose of the tent is to:

- A. Prevent insensible water loss.
- B. Provide a moist environment with oxygen at 30%.
- C. Prevent dehydration and reduce fever.
- D. Liquefy secretions and relieve laryngeal spasm.

The nurse shows an understanding of the psychological needs of a client in isolation when he:

- A. Provides extra reading material.
- B. Alternates nursing staff.
- C. Allows phone calls from family and friends.
- D. Limits the use of a gown and gloves.

The nurse is suctioning the tracheostomy of an adult client. The recommended pressure setting is:

- A. 40–60 mm Hg
- B. 60–80 mm Hg
- C. 80–120 mm Hg
- D. 120–140 mm Hg
198. Which incidence should be documented on an unusual incident report?
   - A. The client leaves the hospital against the doctor’s advice.
   - B. The client develops a fever after receiving a blood transfusion.
   - C. The client reports an upset stomach after taking an antibiotic.
   - D. The client falls in her bathroom.

199. A client with cancer tells the nurse that he would like to make out a living will. The nurse knows that a living will provides documentation of:
   - A. The client’s desire to receive all means of assistance to sustain life.
   - B. The client’s desire to allow another to make decisions regarding his care.
   - C. The client’s wish to die without life-prolonging interventions.
   - D. The client’s desire to have his life terminated by active euthanasia.

200. A client who is 2 days post-operative from an appendectomy requests medication for pain. The client’s vital signs are as follows: pulse 96, respirations 30, BP 130/92. The nurse should:
   - A. Ask whether the client is anxious.
   - B. Give the pain medication.
   - C. Check the dressing for bleeding.
   - D. Recheck the client’s vital signs.
## Answers to Practice Exam 2

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80. B   107. B   134. A
83. A   110. A   137. B
84. A   111. A   138. A
85. C   112. B   139. D
86. B   113. A   140. C
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Answer Rationales

1. Answer C is correct. The child with autism engages in ritualistic behavior. Answer A is incorrect because the child does not talk to strangers. The child with autism prefers inanimate objects and likes music; therefore, answers B and D are incorrect.

2. Answer D is correct. The milkshake will provide needed calories and nutrients for a client with mania. Answers A and B are incorrect because they are high in sodium, which causes the client to excrete the lithium. Answer C has some nutrient value but not as much as the milkshake, so it is incorrect.

3. Answer D is correct. The client with a closed fracture poses little risk of infection for the post-operative client. Answer A is incorrect because the client would return from surgery with bleeding and nasal packing. Answer B is incorrect because the client will have a productive cough. Answer C is incorrect because the client has an ulceration of the skin.

4. Answer D is correct. The suicidal client has difficulty expressing anger toward others. The depressed suicidal client frequently expresses feelings of low self-worth, feelings of remorse and guilt, and a dependence on others; therefore, answers A, B, and C are incorrect.

5. Answer B is correct. A cast made from fiberglass dries in 15 minutes, and the client is able to bear weight within 30 minutes of application. Answer A is incorrect because the cast would not be dry enough to support weight bearing. Answer C is incorrect because the fiberglass cast can support weight bearing sooner than 3 hours. Answer D refers to a cast made of plaster of Paris; therefore, it is incorrect.

6. Answer B is correct. Pain following cataract surgery indicates a complication. Answer A is incorrect because the eye shield is worn while sleeping. Answer C is incorrect because the client should keep his head elevated 30°–45° post-operatively. Answer D is incorrect because sunglasses protect the client from the glare of lights or sunlight.

7. Answer D is correct. The maximal effects from tricyclic antidepressants might not be achieved for up to 6 months after the medication is started. Answers A and B are incorrect because the times for maximal effects are too brief. Answer C is incorrect because it refers to the time when initial symptomatic relief, rather than maximal effects, occurs.

8. Answer D is correct. Answers A, B, and C are incorrect because they contain lower amounts of potassium. (Note: The banana contains 450 mg K⁺; the orange contains 235 mg K⁺; the pear contains 208 mg K⁺; and the apple contains 165 mg K⁺.)

9. Answer B is correct. The spinach salad contains 150 mg of magnesium. Answer A is incorrect because fruit is low in magnesium. A baked potato with the skin is high in potassium not magnesium; therefore, answer C is incorrect. Answer D is high in calcium and protein not magnesium therefore it is incorrect.

10. Answer C is correct. Ataxia can be seen in clients with lithium levels of 2.0–2.5 mEq/L. Hyerreflexia would be seen in the client rather than hyporeflexia; therefore, answer A is incorrect. Akathesia is an extrapyramidal side effect from antipsychotic medication, so answer B is incorrect. Answer D is not specific to lithium use so it is incorrect.
11. Answer B is correct. The 2-year-old can walk up and down stairs, one foot at a time. Answers A and D are within the gross motor development of the 5-year-old, so they are incorrect. Answer C is within the gross motor development of the 3-year-old, so it is wrong.

12. Answer A is correct. Following a thyroidectomy, the client should be placed in semi-Fowler’s position to decrease swelling that would place pressure on the airway. Answers B, C, and D are incorrect because they would increase the chances of post-operative complications that include bleeding, swelling, and airway obstruction.

13. Answer D is correct. Placing the child in a knee position increases the blood flow back to the heart and lessens cerebral hypoxia. The same effect is achieved when the child squats during a hypoxic attack. Answers A and C provide comfort but do not increase blood flow back to the heart, so they are incorrect. Answer B is incorrect because it does not increase blood flow back to vital centers.

14. Answer B is correct. The dose of regular insulin is drawn into the syringe before the NPH insulin to prevent accidentally mixing rapid-acting insulin with time-released insulin. Answer A is incorrect because regular and NPH insulin can be given in one injection. Answers C and D contain inaccurate statements and are therefore incorrect.

15. Answer B is correct. Atropine is contraindicated for use by clients with glaucoma. Answers A, C, and D can be used by clients with glaucoma, so they are incorrect.

16. Answer D is correct. Luncheon meats contain preservatives such as nitrates that have been linked to gastric cancer. Answers A, B, and C have not been found to increase the risk of gastric cancer; therefore, they are incorrect.

17. Answer D is correct. The nurse should use an abduction pillow to maintain the client’s hip in an abducted position. Answers A, B, and C do not prevent dislocation of the hip prosthesis, so they are incorrect.

18. Answer D is correct. Pain 3 days after application of a cast is a symptom of compartment syndrome, which requires immediate attention to bivalve or remove the cast. Answer A will reduce swelling but will do little to relieve the pain associated with compartment syndrome, so it is incorrect. Answer B will not improve circulation to the extremity and will do little to lessen the pain of compartment syndrome, so it is incorrect. Pain beneath the cast after 3 days is not normal, so answer C is incorrect.

19. Answer C is correct. Taking the medication with a meal or snack will lessen gastric upset caused by NSAIDs. Answers A and D are inaccurate statements; therefore, they are incorrect. Answer B is incorrect because fluids are needed to help renal excretion.

20. Answer C is correct. A history of cruelty to people and animals, truancy, setting fires, and a lack of guilt or remorse are associated with a diagnosis of conduct disorder in children that becomes a diagnosis of antisocial personality disorder in adults. Answer A is incorrect because a client with antisocial personality disorder does not hold consistent employment. Answer B is incorrect because the IQ is usually higher than average. Answer D is incorrect because the client typically lacks guilt or remorse for wrongdoing.
21. Answer A is correct. Planning for travel with same-age peers is an example of ego integrity. Answers B, C, and D are examples of stagnation or ego despair; therefore, they are incorrect.

22. Answer A is correct. The nursing assistant should be assigned to care for the client with chronic health needs that mainly require assistance with the activities of daily living. Answers B, C, and D require skilled nursing care for acute health problems, so they are incorrect.

23. Answer B is correct. Spinach provides vitamins and minerals; dried beans provide fiber, protein, and iron; and tomatoes provide vitamin C. Answer A is incorrect because it is not a well-balanced meal and bacon is high in fat and sodium. Answer C is incorrect because it is high in sodium and contains foods that are difficult for the elderly client to digest. Answer D is incorrect because beef is high in fat and cheese and milk can create problems for a client who is lactose intolerance.

24. Answer C is correct. The licensed vocational nurse can not assume primary care of a client with a central venous access device. The licensed vocational nurse can care for a client in labor, a postoperative client, and a client with bipolar disorder, so answers A, B, and D are incorrect.

25. Answer B is correct. Clients with Cushing's syndrome have an increase in cortisol levels that predispose them to infections. Answers A and C are incorrect because the client would have hyperglycemia and hypervolemia. Answer D is not associated with Cushing's disease, so it is incorrect.

26. Answer A is correct. Pheochromocytoma is an adrenal tumor that causes malignant hypertension. Petechial rash across the chest and axilla are symptoms of pulmonary embolus; therefore, answer B is incorrect. White flecks in the iris, known as Brushfield's spots, are found in children with Down's syndrome, so answer C is incorrect. Answer D can be found in children who consume an abundance of yellow vegetables, so it is incorrect.

27. Answer A is correct. An 8-ounce glass of milk contains 290 mg of calcium. Answers B, C, and D contain lesser amounts; therefore, they are incorrect. (Note: An ounce of cheddar cheese contains 205 mg of calcium; half cup of raw broccoli contains 175 mg of calcium; and a 4-ounce salmon croquet contains 165 mg of calcium.)

28. Answer A is correct. Sulfamylon produces a painful sensation when applied to the burn wound, so the client should receive pain medication prior to dressing changes. Answers B, C, and D do not pertain to dressing changes for the client with burns, so they are incorrect.

29. Answer B is correct. Acyclovir is used for the client with acquired immune deficiency syndrome whose T cell counts are less than 200. Answers A and D are used in the treatment of the client with pneumocystis pneumonia with depressed T cell counts; therefore, they are incorrect. Answer C is used as a prophylaxis against pneumocystis; therefore, it is incorrect.

30. Answer B is correct. True contractions are regular and consistent. True contractions do not have to begin in the lower abdomen, so answer A is incorrect. Answer C is incorrect because true contractions do not lessen with activity. Answer D is incorrect because true contractions do not have a pattern of being strong and then weak—they are consistent.
31. Answer A is correct. Side effects of bronchodilators such as theophylline include irritability, rapid pulse, and palpitations. Answer B is incorrect because bronchodilators cause the pulse to be rapid. Answer C is incorrect because theophylline causes a decrease in blood pressure. Answer D is incorrect because bronchodilators cause increased wakefulness.

32. Answer A is correct. According to the Denver Developmental Screening Test, the child can pull a toy behind her by age 2 years. Answers B, C, and D are not accomplished until ages 4–5 years, so they are incorrect.

33. Answer D is correct. The client is unable to actively hallucinate while taking a walk or talking with the nurse. Answers A, B, and C do not involve the client in activity to minimize the hallucinations, so they are incorrect.

34. Answer C is correct. Bronze-like skin pigmentation is a symptom of Addison's disease. Answers A, B, and D are incorrect because they are symptoms of Cushing's disease.

35. Answer A is correct. The nurse should question the client regarding any changes in behavior to determine responses to treatment. Answer B is incorrect because it encourages the client's delusions. Answer C is incorrect because it will increase the client's anxiety level. Answer D is incorrect because it makes an assumption rather than looking at the meaning behind the client's behavior.

36. Answer A is correct. The client with a fractured mandible should keep a pair of wire cutters with him at all times to release the device in case of choking or aspiration. Answer B is incorrect because the wires would prevent insertion of an oral airway. Answer C is incorrect because it would be of no use in releasing the wires. Answer D is incorrect because it would be used only as a last resort in case of airway obstruction.

37. Answer C is correct. Disalignment and shortening of the affected limb are specific symptoms of a fractured hip. Pain, absence of pedal pulses, and diminished sensation are characteristics of all fractures; therefore, answers A, B, and D are incorrect.

38. Answer A is correct. Placing the nasogastric tube in ice water will make insertion easier. Answers B and C are incorrect because they call for the client's head to be flexed on the chest or hyperextended, which makes insertion more difficult. Answer D is incorrect because it makes the tube more flexible, which makes insertion more difficult.

39. Answer C is correct. An amniocentesis at 37 weeks gestation will determine the maturity of the fetal lungs. Answer A is incorrect because it does not determine the effect of diabetes on the fetus. A sonoogram, not an amniocentesis, determines the skeletal age of the fetus, so answer B is incorrect. Answer D involves an amniocentesis done in the first trimester, so it is incorrect.

40. Answer B is correct. The infant's apical heart rate is within the accepted range for administering the medication. Answers A, C, and D are incorrect because the apical heart rate is suitable for giving the medication.
41. Answer A is correct. Paresthesia and weakness of the lower extremities are symptoms of Guillain-Barré syndrome. Answer B is incorrect because the client would have hyporeactive reflexes. Answer C describes symptoms of the client with multiple sclerosis, so it is incorrect. Answer D describes symptoms of hepatic coma, so it is incorrect.

42. Answer D is correct. At 1 year of age, the infant should be able to sit without any support. Answers A, B, and C are expected findings in the child at 1 year of age; therefore, they are incorrect.

43. Answer A is correct. A client who is depressed and withdrawn will work best in a one-to-one relationship with the nursing staff. Answer B is incorrect because it does not convey a sense of caring to the depressed client. Answer C is incorrect because the depressed client needs to be involved in activities with others. Answer D is incorrect because the depressed client frequently exhibits anhedonia, or lack of enjoyment in anything.

44. Answer B is correct. Chelating agents are used to treat clients with poisonings from heavy metals such as lead and iron. Answers A and D are used to remove noncorrosive poisons; therefore, they are incorrect. Answer C prevents vomiting; therefore, it is an incorrect response.

45. Answer C is correct. A client with myxedema can be made more comfortable by providing an extra blanket. Answer A is incorrect because the client needs low-calorie snacks. Answer B is incorrect because it does not specifically relate to a client with myxedema. Answer D is incorrect because it pertains to a client with diabetes mellitus.

46. Answer B is correct. Steroid abuse causes aggression and uncontrolled rage in the user. Answers A, C, and D do not describe the behavior of one who abuses steroids, so they are incorrect.

47. Answer D is correct. The client should be escorted to her room to protect her and to allow her an opportunity to regain control of her behavior. Answers A and B do not focus on the needs of the client, so they are incorrect. Answer C should be done after the client is taken to her room, so it is incorrect.

48. Answer D is correct. Talking with the nursing assistant regarding her feelings about death shows the most concern for her. Answer A is incorrect because it does not help the nursing assistant deal with her feelings. Answer B is incorrect because it is a nonempathetic response to the nursing assistant. Answer C is incorrect because it does not prepare the nursing assistant for future situations.

49. Answer A is correct. The least restrictive restraint for an infant with cleft lip and cleft palate repair is elbow restraints. Answers B, C, and D are more restrictive and unnecessary, so they are incorrect.

50. Answer C is correct. Esophageal varices are varicosities of the esophagus that are the result of portal hypertension caused by chronic alcohol use. Answers A, B, and D are not causes for esophageal varices; therefore, they are incorrect.

51. Answer D is correct. Painless vaginal bleeding is associated with placenta previa. The nurse should give priority to determining the status of the fetus. Answers B and C would be assessed before contacting the doctor as indicated in answer A, so answers A, B, and C are incorrect.
52. Answer C is correct. Elevations in white cell count indicate the presence of infection, which requires treatment prior to surgery. Answers A, B, and D are within normal limits and require no intervention, so they are wrong.

53. Answer C is correct. Beta blockers such as timolol (Timoptic) can cause bronchospasms in the client with chronic obstructive lung disease. Timoptic is not contraindicated for use in a client with diabetes, gastric ulcers, or pancreatitis, therefore answers A, B, and D are incorrect.

54. Answer B is correct. Aged cheese, wine, and smoked or pickled meats should be avoided by the client taking an MAOI, not a phenothiazine. Answers A, C, and D are included in the discharge teaching of a client receiving Thorazine (chlorpromazine).

55. Answer D is correct. The client will need to hold the cane in her left hand because of right-sided hemiplegia. Answer A is incorrect because it states the client will hold the cane in her right hand, which is wrong. It will not be necessary for the client to advance the cane with the affected leg or to use a walker, so answers B and C are wrong.

56. Answer D is correct. Leaving a night light on during the evening and night shifts helps the client remain oriented to the environment and fosters independence. Answers A and B are wrong because they will not decrease the client's confusion. Answer C will increase the likelihood of confusion in an elderly client, so it is wrong.

57. Answer A is correct. A radium implant provides a source of internal radiation. The nurse should explain that the client's body acts as a shield so that a lead-lined apron is usually unnecessary, making answer C incorrect. Answers B and D do not educate the nursing assistant regarding the client's treatment, so they are wrong.

58. Answer B is correct. An increase in carbohydrates will provide energy needs and help decrease caloric expenditures following surgery. Answers A and C are incorrect statements and are therefore wrong. Answer D is incorrect because increased protein, not fat, is needed for healing.

59. Answer A is correct. Akathesia is an extrapyramidal side effect of many older antipsychotic medications such as haloperidol and chlorpromazine. Answers B, C, and D are not associated with the use of haloperidol.

60. Answer A is correct. The nurse should not allow the doctor to continue the dressing change without the use of sterile gloves. Answer B is incorrect because it implies that the doctor is negligent in his care. Answer C is incorrect because it places the client at risk for infection. Answer D is incorrect because infection could have been minimized or prevented by appropriate nursing care.

61. Answer B is correct. Pruritis is caused by the presence of uric acid crystals on the skin, which is common in clients with end-stage renal failure. Answers A, C, and D are wrong because they are not associated with end-stage renal failure.

62. Answer D is correct. The client undergoing an angiogram will experience a warm sensation as the dye is injected. Answers A, B, and C are wrong because they are not associated with an angiogram.
63. Answer B is correct. Semi-liquids are more easily swallowed by a client with dysphagia than either liquids or solids. Answer C is incorrect because the client should be given semi-liquids, not liquids. Answers A and D are useful for a client with dumping syndrome following a gastrectomy, not a client with dysphagia, so they are wrong.

64. Answer C is correct. There is no specified time or frequency for the ordered medication. Answers A, B, and D contain a specified time and frequency.

65. Answer A is correct. Falls constitute a major source of injury in toddlers. It will be important to provide safety measures such as stair guards. Answers B, C, and D are within the developmental norms for an 18-month-old; therefore, they are not a concern for the caregiver.

66. Answer A is correct. Placing the client in Trendelenburg position will engorge the vessels, make insertion of the catheter easier, and lessen the likelihood of air entering the central line. Answer B is incorrect because the client will not be more comfortable in Trendelenburg position. Answer C and D are not correct statements.

67. Answer B is correct. Taking deep breaths will decrease the discomfort experienced during removal of the drain. Answers A, C, and D are incorrect statements because they do not decrease the discomfort during removal of the drain.

68. Answer B is correct. A low-sodium diet is best for a client with Meniere's syndrome. Answers A, C, and D do not relate to the care of the client with Meniere's syndrome, so they are incorrect.

69. Answer B is correct. Anxiety, shortness of breath, and cloudy mentation are associated with impending respiratory failure. Answer A is wrong because it will worsen the client's condition by robbing him of his CO₂ drive to breathe. Answer C is incorrect because it will further deprive him of needed oxygen. Answer D is incorrect because it will further depress respiratory effort.

70. Answer B is correct. Increased voiding at night is a symptom of right-sided heart failure. Answers A and D are incorrect because they are symptoms of left-sided heart failure. Answer C does not relate to the client's diagnosis, so it is incorrect.

71. Answer B is correct. An MRI requires the client to be confined in a small enclosure for a period of time. The client's refusal to accept a corner bed could indicate claustrophobia, so the client needs further assessment. An MRI is not contraindicated for clients with diabetes or asthma, so answers A and D are incorrect. Answer C is incorrect because no contrast media is used in an MRI.

72. Answer B is correct. The CPM machine should not be set at 90° flexion until the fifth post-operative day. Answers A, C, and D are expected findings and do not require immediate nursing intervention, so they are incorrect.

73. Answer C is correct. The proper site for the administration of the Mantoux test is the left forearm. Answers A, B, and D are therefore incorrect.
74. Answer C is correct. Decreased urinary output is an early indication of renal transplant rejection. Answer A is an incorrect statement, so it is wrong. Answer B is incorrect because tenderness over the operative site is expected. Answer D is incorrect because it is not a sign of transplant rejection.

75. Answer B is correct. The nurse should number the vials and take them to the lab for examination of protein, glucose, and cell count. Answer A is incorrect because the vials are not placed on ice. Answer C is incorrect because the vials should not be rotated. Answer D is an incorrect statement, so it is wrong.

76. Answer D is correct. Multiparous clients have the greatest risk for postpartal hemorrhage; therefore, Answers A, B, and C are incorrect.

77. Answer D is correct. The pulse oximeter should be placed on the child’s finger or earlobe because blood flow to these areas is most accessible for measuring oxygen concentration. Answer A is incorrect because the probe cannot be secured to the abdomen. Answer B is incorrect because it should be recalibrated before application. Answer C is incorrect because a reading is obtained within seconds, not minutes.

78. Answer B is correct. A client withdrawing from barbiturates requires slow detoxification to prevent convulsions, delirium, tachycardia, and death. Answers A, C, and D are not associated with life-threatening symptoms during withdrawal; therefore, they are incorrect.

79. Answer B is correct. The overuse of nasal sprays containing oxymetazoline or phenylephrine can lead to rebound vasoconstriction and nasal congestion. Answer A is incorrect because it is a side effect of steroid nasal sprays. Answers C and D are incorrect because nasal polyps and tinnitus are not associated with the use of nasal sprays.

80. Answer B is correct. The medication should be administered using the calibrated dropper that comes with the medication. Answers A and C are incorrect because part or all of the medication could be lost during administration. Answer D is incorrect because part or all of the medication will be lost if the child does not finish the baby bottle.

81. Answer C is correct. The client should be encouraged to participate in quiet, nonchallenging activities with a few other clients. Answer A is incorrect because it will be overwhelming to the client. Answer B is incorrect at this time but will be appropriate as the client’s condition continues to improve. Answer D is incorrect because solitary activities increase social isolation.

82. Answer B is correct. Cardiac catheterization will allow the doctor to determine the exact size and location of the defect. Answers A and C are incorrect because they are not symptoms of a ventricular septal defect. Cardiac catheterization does not determine the presence of murmurs; therefore, answer D is incorrect.

83. Answer A is correct. The presence of a hydatidiform mole is diagnosed using an ultrasound. Answer B is incorrect because it is the diagnostic test for neural tube defects. Answer C is incorrect because it is the diagnostic test to confirm pregnancy. Answer D is incorrect because it is the diagnostic test for fetal lung maturity.
84. Answer A is correct. The client will receive medication that relaxes skeletal muscles and produces mild sedation. Answers B and D are incorrect because such statements increase the client’s anxiety level. Nausea and headache are not associated with ECT, so answer C is incorrect.

85. Answer C is correct. The client receiving chemotherapy for leukemia usually develops ulceration of the oral mucosa. Cool, soft foods such as ice cream and frozen yogurt are well tolerated. Answers A and B are incorrect because the child might not be able to eat a well-balanced diet of preferred foods because of the presence of mucosal ulceration. Answer D is incorrect because it does not take care of the client’s nutritional needs; however, it is important to document the client’s intake.

86. Answer B is correct. An induration of 10 mm or greater is considered to be a positive indication of exposure to the tubercle bacillus. Answers A, C, and D are incorrect statements, so they are wrong.

87. Answer A is correct. Lyme disease produces a characteristic annular or circular rash sometimes described as a “bull’s eye” rash. Answers B, C, and D are incorrect because they are not symptoms associated with Lyme disease.

88. Answer B is correct. Stimulation of the breasts and nipples can cause contractions that increase the likelihood of early termination of the pregnancy. Answer A is incorrect, although she should follow the doctor’s recommendations regarding sexual intercourse early in the pregnancy. Answer C is incorrect because there is no indication that her work is detrimental to the pregnancy. Answer D is incorrect because nausea and vomiting are common in early pregnancy.

89. Answer B is correct. Ischemia of the myocardium produces crushing substernal pain that typically radiates to the left jaw and arm. Answers A, C, and D do not relate to the pain of myocardial infarction, so they are incorrect.

90. Answer D is correct. The nurse should give priority to checking the pulses distal to the catheter insertion site as well as assessing the site for signs of bleeding. Answers A, B, and C are important but are not the main priority of care, so they are incorrect.

91. Answer B is correct. The most common complication following a myocardial infarction is cardiac dysrhythmia, which is sometimes fatal. Answers A and C are incorrect because they are not common complications of myocardial infarction. Answer D is incorrect because the client would experience cardiogenic shock, not hypovolemic shock.

92. Answer B is correct. The client with gluten-induced enteropathy experiences symptoms after ingesting foods containing wheat, oats, barley, or rye. Corn or millet are therefore substituted in the diet. Answers A, C, and D are incorrect because they contain foods that worsen the client’s condition.

93. Answer A is correct. Elevations in temperature increase the client’s oxygen requirements as well as the cardiac output; therefore, the doctor should be notified. Answer B is incorrect because the cardiac output will increase, not decrease. Answer C is incorrect because an elevated temperature is not associated with cardiac tamponade. Answer D is incorrect because the client is kept on a cooling blanket to maintain hypothermia.
94. Answer A is correct. Huntington’s disease is inherited as an autosomal dominant trait. There is a one in two, or 50%, chance that each child will be affected with the disease. Answer B is wrong because it’s an incorrect statement. Answer C is incorrect because it refers to sex-linked disorders such as hemophilia. Answer D is incorrect because it refers to autosomal recessive disorders such as sickle cell anemia.

95. Answer B is correct. A permanent set pacemaker will function at a continuous rate set by the physician. Answers A, C, and D are unnecessary; therefore, they are incorrect.

96. Answer B is correct. Neuroleptic malignant syndrome is an adverse reaction that is characterized by extreme elevations in temperature. Answers A and C are incorrect because they are expected side effects. Elevations in blood pressure are associated with reactions between foods containing tyramine and MAOI; therefore, D is incorrect.

97. Answer C is correct. Exposure to cold temperatures increases the peripheral vasospasms that characterize Raynaud’s disease. Answers A and D are incorrect because they do prevent the symptoms of Raynaud’s. Answer B will benefit the client with Buerger’s but will not prevent the symptoms of Raynaud’s, so it is wrong.

98. Answer B is correct. Hemodialysis is scheduled before transplantation to rid the body of wastes and regulate the fluid and electrolyte balance. Answers A, C, and D are not performed on a client awaiting renal transplant, so they are incorrect.

99. Answer A is correct. Decreased blood pressure, increased pulse rate, and abdominal distention are symptoms of altered bowel function and possible shock that require immediate intervention. Answer B is incorrect because it does not require immediate intervention. Answer C is incorrect because it suggests cystitis, which is treatable with antibiotics. Answer D is incorrect because there is no sign of illness that requires immediate intervention.

100. Answer C is correct. Gingival hyperplasia is a side effect of phenytoin. The client will therefore need more frequent dental visits. Answers A, B, and D do not apply to the medication, so they are incorrect.

101. Answer B is correct. Blowing cool air over the affected site will help provide some relief from the pain and itching. Corticosteroids are contraindicated in the treatment of herpes, so answer A is incorrect. Answer C is incorrect because warmth increases the itching and discomfort. Answer D is incorrect because herpes is caused by a virus, not a fungus.

102. Answer C is correct. Thiamine is administered to treat Wernicke’s encephalopathy, a neurological condition related to chronic alcohol use. The primary reason for giving the medication is not to increase appetite; therefore, answer A is incorrect. Thiamine will not reduce the craving for alcohol or prevent delirium tremens; therefore, answers B and D are incorrect.

103. Answer B is correct. Knee contracture is a complication associated with below-the-knee amputation. Answer A is incorrect because it refers to a complication of above-the-knee amputation. Answers C and D are incorrect because they do not relate to the question.
104. Answer B is correct. The client’s gag reflex is depressed prior to having an EGD. The nurse should give priority to checking for the return of the gag reflex before offering the client oral fluids. Answer A is incorrect because conscious sedation is used. Answers C and D are not affected by the procedure, so they are incorrect.

105. Answer A is correct. Pernicious anemia results from the loss of intrinsic factor, which is common after gastric resection. Answer B refers to aplastic anemia, so it is incorrect. Answer C is incorrect because it refers to Cooley’s anemia. Answer D does not apply to the question, so it is incorrect.

106. Answer B is correct. The eye shield should be worn at night or when napping to prevent accidental trauma to the operative eye. Prescription eye drops, not over-the-counter eye drops, are ordered for the client, so answer A is incorrect. The client might or might not require glasses following cataract surgery, so answer C is incorrect. Answer D is incorrect because cataract surgery is pain free.

107. Answer B is correct. Green, leafy vegetables are rich in vitamin K, which decreases the effectiveness of the client’s anticoagulant therapy. Answers A, C, and D are incorrect because they indicate that the client understands the nurse’s teaching regarding his medication.

108. Answer A is correct. Projectile vomiting is a symptom of increased intracranial pressure that results from shunt failure. Answers B, C, and D are wrong because they are not symptoms associated with the failure of a ventriculoperitoneal shunt.

109. Answer A is correct. The symptoms of Buerger’s disease are improved by doing Buerger Allen exercises to improve vascular return from the lower extremities. Answer B is incorrect because it refers to Raynaud’s disease. Answer C does not refer to Buerger’s disease; therefore, it is incorrect. Answer D is incorrect because it refers to osteoporosis.

110. Answer A is correct. Surgical manipulation of the pituitary can result in diabetes insipidus, which is characterized by polydipsia and polyuria. Answers B and C are symptoms of renal failure and are therefore incorrect. Answer D is a symptom of cystitis, so it is incorrect.

111. Answer A is correct. The adolescent primigravida is particularly at risk for the development of pregnancy-induced hypertension. Nutritional status of the mother, pre-pregnant weight, and history of hypertension are not significant factors in the development of PIH, so answers B, C, and D are incorrect.

112. Answer B is correct. The child’s symptoms are consistent with those of epiglottitis, an infection of the upper airway that can result in total airway obstruction. Symptoms of strep throat, laryngotracheobronchitis, and bronchiolitis are different from those presented by the client; therefore, answers A, C, and D are incorrect.

113. Answer A is correct. Persistent coughing is a sign of an allergic response to the medication. Answers B, C, and D are not associated with the use of captopril; therefore, they are incorrect.

114. Answer B is correct. Excessive sleeping is a common side effect of magnesium sulfate. Decreased urinary output, depressed reflexes, and slowed respirations are all signs of toxicity; therefore, answers A, C, and D are incorrect.
115. Answer B is correct. The triad of symptoms commonly found in children with ADHD are inattentiveness, impulsivity, and excessive motor activity. Answers A, C, and D describe adverse effects from stimulant medications used to treat ADHD, so they are incorrect.

116. Answer A is correct. Providing additional fluids will help the newborn eliminate excess bilirubin in his stool and urine. Answer B is incorrect because oils and lotions should not be used with phototherapy. Physiologic jaundice is not associated with infection, so answers C and D are incorrect.

117. Answer D is correct. The client's symptoms are consistent with a flashback due to post-traumatic stress disorder. Answers A and C are incorrect because they are associated with psychotic disorders such as schizophrenia. Phobic reactions do not involve flashback episodes, so answer B is incorrect.

118. Answer C is correct. Persons with schizoid personality disorder retreat are generally described as withdrawn, reclusive, and loners. Answers A and D are incorrect because they describe the behavior of a client with histrionic or borderline personality disorder. Answer B is incorrect because it describes the behavior of a client with antisocial personality disorder.

119. Answer B is correct. The elderly client is likely to have changes in cardiac function. Tricyclic antidepressants are contraindicated in a client with cardiac disease. Answers A, C, and D are important to assess but do not take priority over the client's cardiac status; therefore, they are incorrect.

120. Answer B is correct. Having a staff member remain with the client for 1 hour after meals will help prevent self-induced vomiting. Answer A is incorrect because the client will weigh more after meals, which can undermine treatment. Answer C is incorrect because the client will need a balanced diet and excess protein might not be well tolerated at first. Answer D is incorrect because it treats the client as a child rather than as an adult.

121. Answer B is correct. Lithium levels greater than 3.5 mEq/L are potentially fatal. At this level, the immediate use of dialysis is required to save the client's life. Answers A, C, and D do not relate to the client's care and are therefore incorrect.

122. Answer D is correct. Narcotics and sedatives are contraindicated in a client with a head injury. Answer A is incorrect because the client's head would need to be elevated. Answer B is incorrect because Neosporin or another topical antibiotic would need to be applied to the abrasions. Answer C is incorrect because the client would receive antibiotic therapy to prevent secondary infection.

123. Answer B is correct. Escorting the client from the day room allows him time to regain control of his behavior. Answers A and C are incorrect because these interventions would be done after the client has been removed from the day room. Answer D is incorrect because it has no bearing on appropriate care of the client.

124. Answer D is correct. According to Erikson's Psychosocial Developmental Theory, the developmental task of middle childhood is industry versus inferiority. Answer A is incorrect because it is the developmental task of infancy. Answer B is incorrect because it is the developmental task of the school-aged child. Answer C is incorrect because it is not one of Erikson's developmental stages.
125. Answer D is correct. Persons with passive aggressive personality disorder display hostility through procrastination, noncompliance, and intentional inefficiency. Answer A is incorrect because associated behaviors of avoidant personality disorder include shyness, aloofness, and social withdrawal. Answer B is incorrect because associated behaviors of antisocial personality disorder include violation of the rights of others, lack of guilt or remorse, and failure to learn from mistakes. Answer C is incorrect because associated behaviors of compulsive personality disorder include rigid perfectionism, lack of spontaneity, and over seriousness.

126. Answer C is correct. The nurse should check the client's clothing and linen for wetness to prevent chilling. Answer A is incorrect because it is unnecessary for the client to exhale through her mouth. Answer B is incorrect because there is no indication that the client's skin needs lotion. Answer D is incorrect because a tympanic temperature, not a rectal temperature, would be obtained.

127. Answer B is correct. A side effect of bronchodilators is tachycardia. Answers A and C are not associated with bronchodilators, so they are incorrect. Answer D is incorrect because hypotension is a sign of toxicity, not a side effect.

128. Answer B is correct. The respiratory rate of 72 is too rapid. Answers A, C, and D are incorrect because they are within the normal range for the newborn.

129. Answer B is correct. The client's symptoms suggest placenta previa. Counting the number of pads and recording the amount of bleeding will best monitor the client's blood loss. Answer A is incorrect because vaginal exam is contraindicated. Answer C is incorrect because the pH of the vaginal fluid will be influenced by the presence of bleeding. Answer D is incorrect because Cullen's sign indicates intra-abdominal bleeding.

130. Answer C is correct. Although cyanosis of the hands and feet is common in the newborn, it accounts for an Apgar score of less than 10. Answer A suggests cooling, which is not scored by the Apgar. Answer B is incorrect because conjunctival hemorrhages are not associated with the Apgar. Answer D is incorrect because it is within normal range as measured by the Apgar.

131. Answer C is correct. The client having a CAT scan of the sinuses will have to lie still in the prone position. Answer A is incorrect because there is no discomfort associated with a CAT scan. Answers B and D are inaccurate statements, so they are incorrect.

132. Answer B is correct. Tenseness of the anterior fontanel indicates an increase in intracranial pressure. Answer A is incorrect because periorbital edema is not associated with meningitis. Answer C is incorrect because a positive Babinski reflex is normal in the infant. Answer D is incorrect because it relates to the preterm infant, not the infant with meningitis.

133. Answer A is correct. Nasogastric suction decompresses the stomach and leaves the abdomen soft and nondistended. Answer B is incorrect because it does not relate to the effectiveness of the NG suction. Answer C is incorrect because it relates to peristalsis, not the effectiveness of the NG suction. Answer D is incorrect because it relates to wound healing, not the effectiveness of the NG suction.
134. Answer A is correct. Tremulousness is an early sign of hypoglycemia. Answers B, C, and D are incorrect because they are symptoms of hyperglycemia.

135. Answer C is correct. Allowing the client to practice role playing situations she might later encounter will best prepare her for her return to school. Answers A, B, and D do not prepare the client as well as simulated role play; therefore, they are incorrect.

136. Answer C is correct. The most common sign associated with exacerbation of multiple sclerosis is double vision. Answers A, B, and D are not associated with a diagnosis of multiple sclerosis; therefore, they are incorrect.

137. Answer B is correct. The client's priority nursing diagnosis is based on his risk for self injury. Answers A, C, and D focus on the client's psychosocial needs, which do not take priority over physiological needs; therefore, they are incorrect.

138. Answer A is correct. Damage to the facial nerve and asymmetry of the mouth are associated with forceps delivery. Answer B is a chest deformity unrelated to forceps delivery, so it is incorrect. Answer C is incorrect because it occurs as a result of prolonged labor and is unrelated to forceps delivery. Answer D is a normal occurrence in the newborn and is unrelated to forceps delivery, so it is incorrect.

139. Answer D is correct. The recommended dose ranges from 175 mg to 350 mg per day. The order as written calls for 600 mg per day, so the nurse should check the order with the doctor before giving the medication. Answer A is incorrect because the dosage exceeds the recommended amount. Answers B and C are incorrect because they involve changing the order, which requires a doctor's order.

140. Answer C is correct. The nurse should be firm and consistent when working with a client with borderline personality disorder. Answers A, B, and D are incorrect because they do not provide boundaries for the client.

141. Answer A is correct. Gout and renal calculi are the result of increased amounts of uric acid. Answer B is incorrect because it does not contribute to renal calculi. Answers C and D can result from decreased calcium levels. Renal calculi are the result of excess calcium, so answers C and D are incorrect.

142. Answer A is correct. Diminished hearing and deafness are adverse reactions to aminoglycoside antibiotics. Answers B, C, and D are incorrect because they are not associated with aminoglycosides.

143. Answer D is correct. A client with renal failure needs beverages that are low in potassium. A glass of apricot juice contains just 286 mg of potassium. Answers A, B, and C contain more potassium; therefore, they are incorrect. (Note: Prune juice contains 700 mg; grape juice contains 335 mg; and apple juice contains 296 mg.)

144. Answer D is correct. Providing small, frequent meals will improve the client's appetite and help reduce nausea. Answer A is incorrect because it does not compensate for limited absorption. Foods and beverages containing live cultures are discouraged for an immune-compromised client; therefore, answer B is incorrect. Answer C is incorrect because forcing fluids will not compensate for limited absorption of the gut.
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145. Answer A is correct. Pallor, coolness, and edema at the IV site are signs of infiltration. Signs of infection, thrombus formation, and sclerosing of the vein include redness, warmth, and swelling, so answers B, C, and D are incorrect.

146. Answer D is correct. A shape sorter is developmentally appropriate for the toddler, and it allows for quiet play. Answers A and C are incorrect because they require too much activity for a child with chronic hypoxia. Answer B is incorrect because it is too developmentally advanced for a toddler.

147. Answer C is correct. The students are violating confidentiality by discussing the client outside the area of care. The nurse should confront them with their behavior. Answers A and B are incorrect because their behavior should be confronted immediately rather than waiting for the teacher or the nursing supervisor. Answer D is incorrect because it does not protect the client's right to confidential treatment.

148. Answer D is correct. A common side effect of prednisone is gastric ulcers. Cimetadine is given to help prevent the development of ulcers. Answers A, B, and C do not relate to the use of cimetadine, so they are incorrect.

149. Answer B is correct. Bright red bleeding with many clots indicates arterial bleeding that requires surgical intervention. Answer A is within normal limits, so it is incorrect. Answer C indicates venous bleeding, which can be managed by nursing intervention, so it is incorrect. Answer D does not indicate excessive need for pain management that requires the doctor's attention; therefore, it is incorrect.

150. Answer B is correct. Repair of a hiatal hernia using a thoracic approach can cause the client to take shallow breaths, which can alter oxygen exchange. Answers A, C, and D do not relate specifically to the repair of a hiatal hernia, nor do they take priority over effective breathing; therefore, they are incorrect.

151. Answer B is correct. Myxedema symptoms include weight gain, lethargy, slowed speech, and decreased respiratory rate. Answers A, C, and D do not describe the symptoms of the client with myxedema; therefore, they are incorrect.

152. Answer D is correct. The client with an adrenalectomy will need daily steroid medication. Answers A, B, and C do not relate to the question; therefore, they are incorrect.

153. Answer B is correct. The nurse should check the pH of the aspirant prior to administering each feeding. Answer A is incorrect because it removes needed electrolytes with each feeding. Answer C is incorrect because suction is unnecessary. Answer D is incorrect because water is provided after the feeding.

154. Answer C is correct. Rice cereal, apple juice, and formula are suitable foods for the 6-month-old infant. Orange juice, whole milk, and eggs are not suitable for the young infant, so answers A, B, and D are incorrect.

155. Answer C is correct. The IV rate should be maintained at 21 drops per minute. Answers A, B, and D have infusion rates that are incorrect.

156. Answer A is correct. The client with acute pancreatitis needs a diet that is low in fat and protein, and custard is high in fat. Answers B, C, and D are low in fat and protein so they would be well tolerated by the client with pancreatitis; therefore, they are incorrect.
157. Answer B is correct. The nurse should administer the injection in the vastus lateralis muscle. Answers A and C are not as well developed in the newborn, so they are incorrect. Answer D is incorrect because the dorsogluteal muscle is not used for IM injections until the child is 1–2 years of age.

158. Answer D is correct. Lantus insulin is a long-acting insulin that is administered at bedtime. Answers A, B, and C are incorrect because the times of administration are incorrect.

159. Answer B is correct. Malt is made from barley, a substance that is eliminated from the diet of a client with celiac disease. Answers A, C, and D are all allowable on the client's diet, so they are incorrect.

160. Answer A is correct. The client taking cytoxan should increase his fluid intake to prevent hemorrhagic cystitis. Answers B, C, and D do not relate to the question, so they are incorrect.

161. Answer C is correct. Scarlet fever is characterized by a red or white strawberry tongue. Answers A, B, and D are not associated with the oral manifestations of scarlet fever, so they are incorrect.

162. Answer B is correct. Projectile vomiting and the presence of a palpable, olive-shaped mass in the right upper quadrant of the abdomen are signs of pyloric stenosis. Answers A and C are associated with intussusception; therefore, they are incorrect. Answer D is a characteristic of celiac disease; therefore, it is incorrect.

163. Answer B is correct. The nurse should replace the aspirant and begin the tube feeding. Answer A is incorrect because it removes electrolytes. Answer C is incorrect because it removes electrolytes and deprives the client of needed nourishment. Answer D is incorrect because there is no indication to hold the feeding.

164. Answer D is correct. Benzodiazepines are ordered for clients in alcohol withdrawal to prevent delirium tremens. Answer A is incorrect because it is a medication used in aversive therapy to maintain sobriety. Answer B is incorrect because it is used for the treatment of benzodiazepine overdose. Answer C is incorrect because it is the treatment for opiate withdrawal.

165. Answer B is correct. Pyridoxine (also known as pyridoxal phosphate), B6, is commonly given with rifampin to prevent peripheral neuropathies. Answer A is given to treat Wernicke's encephalopathy in clients with chronic alcoholism; therefore, it is incorrect. Answer C is incorrect because it is given to prevent neural tube defects. Answer D is incorrect because it is given for pernicious anemia.

166. Answer D is correct. The nurse should give priority to giving pain medication to the client who has had a myocardial infarction because pain further compromises blood flow to the myocardium. Answers A and C are incorrect because they do not have life-threatening conditions. Answer B is incorrect because pain medications are withheld from clients with head injuries to prevent CNS depression.

167. Answer A is correct. The nurse should keep an ambu bag beside the bed of a client with a subtotal thyroidectomy. Answers B and D would be used only after answer A, so they are incorrect. Answer C would not be appropriate for a client with a subtotal thyroidectomy, so it is incorrect.

168. Answer C is correct. The client taking NPH insulin should have a snack at midafternoon to prevent hypoglycemia. Answers A and B are incorrect because the times are too early for symptoms of hypoglycemia. Answer D is incorrect because the time is too late and the client would be in severe hypoglycemia.
169. Answer B is correct. Taking the client outside for a walk will provide the client a therapeutic outlet and will decrease the chance of his upsetting the other clients. Answer A does not provide the supervision that the client needs, so it is incorrect. Answers C and D allow his manic behavior to continue; therefore, they are incorrect.

170. Answer B is correct. The most therapeutic response is an open-ended one that allows the wife an opportunity to discuss her concerns about her husband's condition and care. Answers A, C, and D are incorrect because they are direct questions that do not encourage the wife to express her feelings.

171. Answer B is correct. The client with a detached retina will have limitations in mobility before and after surgery. Answer A is incorrect because detached retina produces no pain or discomfort. Answers C and D do not apply to the client with a detached retina, so they are incorrect.

172. Answer B is correct. If the client can speak, the airway is not obstructed. Answers A, C, and D are not the first actions the nurse should take, so they are incorrect.

173. Answer D is correct. The nurse should retake the client's temperature to determine accuracy because no intervention was done. Answers A, B, and C depend on the client's present temperature reading, so they are incorrect.

174. Answer C is correct. Torts such as negligence, malpractice, and assault and battery, if proven, can result in revocation of the nurse's license. Answer A is incorrect because it is not punishable by law. Answer B is incorrect because wrongdoing is only suspected and has not been proven. Failure to pay license renewal fees results in an inability to continue to practice, not a revocation of the license, so answer D is incorrect.

175. Answer C is correct. The child will need additional fluids in summer to prevent dehydration that could lead to a sickle cell crisis. Answer A is not a true statement; therefore, it is incorrect. Answer B is incorrect because the activity will create a greater oxygen demand and precipitate sickle cell crisis. Answer D is not a true statement; therefore, it is incorrect.

176. Answer B is correct. The primary purpose for the continuous passive motion machine is to promote flexion of the artificial joint. The device should be placed at the foot of the client's bed. Answers A, C, and D do not describe the purpose of the CPM machine; therefore, they are incorrect.

177. Answer B is correct. Prior to suctioning, the client with a tracheostomy should be oxygenated at 100% via ambu or ventilator to prevent hypoxia. Answer A should be done last, so it is incorrect. Answers C and D are not necessary before suctioning the tracheostomy therefore they are incorrect.

178. Answer C is correct. During concrete operations, the child's thought processes become more logical and coherent. Answer A is incorrect because it describes the sensorimotor stage of development. Answer B is incorrect because it describes the intuitive stage of development. Answer D is incorrect because it describes the formal operational stage of development.

179. Answer D is correct. The client needs adequate amounts of sodium and fluids to prevent lithium toxicity. Answers A, B, and C are not specific to the client taking lithium; therefore, they are incorrect.
180. Answer C is correct. Delusions of grandeur are associated with low self-esteem. Answer A is incorrect because conversion is expressed as sensory or motor deficits. Answers B and D can cause an increase in the client's delusions but do not explain their purpose, so they are incorrect.

181. Answer D is correct. According to Kohlberg, in the preconventional stage of development, the behavior of the preschool child is determined by the consequences of the behavior. Answers A, B, and C describe other stages of moral development, so they are incorrect.

182. Answer D is correct. The Schilling test is the diagnostic test for pernicious anemia. Answer A is incorrect because it is the diagnostic test for leukemia. Answer B does not apply to pernicious anemia, so it is incorrect. Answer C refers to a hearing test for bone conduction; therefore, it is incorrect.

183. Answer D is correct. The blue markings designate the area that is to receive radiation therapy. The nurse should not use soap or lotion on the area. Answers A, B, and C should not be used with the client receiving linear acceleration radiation; therefore, they are incorrect.

184. Answer D is correct. The blue markings designate the area that is to receive radiation therapy. The nurse should not use soap or lotion on the area. Answers A, B, and C should not be used with the client receiving linear acceleration radiation; therefore, they are incorrect.

185. Answer A is correct. A child with Sydenham's chorea exhibits irregular movements of the extremities, facial grimacing, and labile moods. Answer B is incorrect because it describes subcutaneous nodules. Answer C is incorrect because it describes erythema marginatum. Answer D is incorrect because it describes polymigratory arthritis.

186. Answer A is correct. The appearance of pink, frothy sputum should be reported immediately because it is a sign of pulmonary edema caused by left-sided heart failure. The client's condition is worsening. Answer B is incorrect because it is a sign of right-sided heart failure. Answer C is a symptom of congestive heart failure but is not as ominous as the appearance of pink, frothy sputum, so it is incorrect. Answer D is incorrect because it is not specific to the question.

187. Answer A is correct. The nursing assistant can be assigned to measure the intake of a client with community-acquired pneumonia. Answer B is incorrect because the nursing assistant cannot administer tube feedings. Answer C is incorrect because the nursing assistant has not been taught what to do if the chest tube becomes disconnected. Answer D is incorrect because it requires management of the client with a grand mal seizure.

188. Answer C is correct. The Ishihara Polychromatic chart is used to examine the client's color vision. Macular degeneration is checked using the Amsler grid, so answer A is incorrect. The Snellen chart is used to determine visual acuity and the presence of astigmatism; therefore, answer B is incorrect. The presence of glaucoma is checked by tonometry; therefore, answer D is incorrect.
189. Answer D is correct. The nurse should cover both of the client's eyes and transport her immediately to the ER or doctor's office. Answers A, B, and C are incorrect because they increase the risk of further damage to the eye.

190. Answer A is correct. The medication should be drawn up in one syringe and administered in a large muscle such as the dorsogluteal. Answer B is incorrect because the medications can be given together in one injection. Answer C is incorrect because the medications have a synergistic effect, not an antagonistic one. Answer D is incorrect because the muscle is too small for the amount of medication.

191. Answer A is correct. The client should replenish his supply of nitroglycerin tablets every 6 months. Answers B, C, and D are incorrect because the recommended times for replacement are incorrect.

192. Answer B is correct. The nurse should administer 0.25 ml of Stadol intramuscularly. Answers A, C, and D are for lesser or greater amounts, so they are incorrect.

193. Answer C is correct. The nurse should administer 0.33 ml of enoxaparin subcutaneously. Answers A, B, and D are for lesser or greater amounts, so they are incorrect.

194. Answer C is correct. The nurse should give priority to caring for the client with circumoral cyanosis and tachypnea, which suggest problems with oxygenation. Answers A and B are incorrect because they are lesser injuries. Answer D is incorrect because the client is dead.

195. Answer D is correct. The primary reason for placing a child with croup under a mist tent is to liquefy secretions and relieve laryngeal spasms. Answer A is incorrect because it does not prevent insensible water loss. Answer B is incorrect because the oxygen concentration is too high. Answer C is incorrect because the mist tent does not prevent dehydration or reduce fever.

196. Answer C is correct. Allowing phone calls from family and friends provides psychological support for the client in isolation. Answer A will provide diversional activity but will not lessen the client's loneliness, so it is incorrect. Answer B is incorrect because it does not provide a consistent caregiver who is familiar with the client. Answer D is incorrect because it places the nurse and the client at greater risk for the transmission of pathogens.

197. Answer C is correct. The recommended setting for performing tracheal suction is 80–120 mm Hg. Answers A and B are incorrect because the amounts of suction are too low. Answer D is incorrect because the amount of suction is excessive.

198. Answer D is correct. Unusual incidents such as falls are documented on the unusual incident report. Answers A, B and C are incorrect because they would be documented in the client's chart.

199. Answer C is correct. The living will documents a client's desire to die without prolonged or extensive intervention. Answers A and D do not pertain to the living will, so they are incorrect. Answer B refers to a durable power of attorney; therefore, it is incorrect.

200. Answer B is correct. The client's request for pain medication and the reported vital signs indicate the client is in pain. The nurse should administer the pain medication. Answer A is incorrect because the client in pain is anxious. Answer C does not relate to the question, so it is incorrect. There is nothing to suggest that the client's vital signs were not accurate, so answer D is incorrect.
Through this book, we have tried to help you simplify preparation for the NCLEX® exam. This appendix includes information you have learned during nursing school but might have forgotten.

**Therapeutic Drug Levels**

Here are some of the therapeutic blood levels that are important for the nurse to be aware of when taking the NCLEX® exam:

- Digoxin: 0.5–2.0 ng/ml
- Lithium: 0.6–1.5 meq/L
- Dilantin: 10–20 mcg/dl
- Theophylline: 10–20 mcg/dl

**NOTE**

Lab values vary by age and some books might have different reference values.

**Vital Signs**

Here are some of the normal ranges for vital signs:

- Heart rate: 80–100 beats per minute
- Newborn heart rate: 100–180 beats per minute
- Respiratory rate: 12–20 respirations per minute
- Blood pressure: systolic = 110–120 mm Hg; diastolic = 60–90 mm Hg
- Newborn blood pressure: systolic = 65 mm Hg; diastolic = 41 mm Hg
- Temperature: 98.6 ±


Anticoagulant Therapy

These are the tests to be done for the client taking anticoagulants and their control levels. Remember that the therapeutic range is 1.5–2 times the control:

- Coumadin (sodium warfarin) PT/Protime: 12–20 seconds.
- International normalizing ratio (INR): 2–3.
- The antidote for sodium warfarin is vitamin K.

**NOTE**

Lab values vary by age and some books might have different reference values.

- Heparin and heparin derivatives partial thromboplastin time (PTT): 30–60 seconds.
- The antidote for heparin is protamine sulfate.

Intrapartal Normal Values

Here are some of the normal ranges to remember when caring for the client during the intrapartal period:

- Fetal heart rate: 120–160 beats per minute
- Variability: 6–10 beats per minute
- Contractions:
  - Frequency of contractions: every 2–5 minutes
  - Duration of contractions: less than 90 seconds
  - Intensity of contractions: less than 100 mmHg
- Amniotic fluid amount: 500–1200 ml

Standard Precautions

Standard precautions are a set of guidelines for the nurse to take when caring for the client. These precautions protect the nurse from transmitting the disease to another client or to herself:
Gloves should be worn when there is a chance of contact with blood and body fluids, when handling other potentially infected material, and when performing vascular access procedures.

Gloves should be changed after each client contact and between contact procedures with the same client.

Masks and protective eyewear should be worn when there is a likelihood of splashes or when body fluids might become airborne.

Gloves and aprons should be worn during procedures in which there is a likelihood of splashes of blood or body fluids.

Hand washing should be done immediately after contact with body fluids or other potentially infected material and as soon as gloves are removed.

Needles and sharps should be disposed of in sharps containers. No recapping, bending, or breaking of needles should occur.

Mouth-to-mouth resuscitation should be performed using a mouthpiece or other ventilation device.

**CAUTION**

Body fluids likely to transmit blood-borne disease include blood, semen, vaginal/cervical secretions, tissues, cerebral spinal fluid, amniotic fluid, synovial fluid, pleural fluid, peritoneal fluid, and breast milk. Body fluids not likely to transmit blood-borne disease unless blood is visible include feces, nasal secretions, sputum, vomitus, sweat, tears, urine, and saliva (the exception is during oral surgery or dentistry).

**Airborne Precautions**

Examples of infections caused by organisms suspended in the air for prolonged periods of time are tuberculosis, measles (rubella), and chickenpox. Place these clients in a private room. Healthcare workers should wear a HEPA mask or N-95 mask when dealing with such clients. These mask contain fine fibers and filter out particles, preventing them from passing through to the healthcare worker.

**Droplet Precautions**

Infections caused by organisms suspended in droplets that can travel 3 feet, but are not suspended in the air for long periods of time are influenza, mumps, pertussis, rubella (German measles), diphtheria, pneumonia, scarlet fever, streptococcal pharyngitis, and meningitis. Place the client in a private room or in a room with a client who has the same illness. The clients should be no closer than 3 feet away from one another. Caregivers should wear a mask, and the door can remain open.
Contact Precautions

Infections caused by organisms spread by direct contact include RSV, scabies, colonization with MRSA, and VRE. Place the client in a private room or with a client with the same condition. Caregivers should wear gloves when entering the room and wear gowns to prevent contact with the client. Hands should be washed with an antimicrobial soap before leaving the client’s room. Equipment used by the client should remain in the room and should be disinfected before being used by anyone else. The client should be transported only for essential procedures; during transport, precautions should be taken to prevent disease transmission.

Chemoprophylaxis After Occupational Exposure to HIV

Should the nurse be exposed to HIV, several interventions should be taken immediately. These interventions involve the use of several antiviral medications (see Table A.1).

**TABLE A.1 Interventions in the Event of HIV Exposure**

<table>
<thead>
<tr>
<th>Types of Exposure</th>
<th>Material Source</th>
<th>Antiviral Drug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percutaneous</td>
<td>Blood presents a high or increased risk for contamination (large volume of blood and blood with a high titer of HIV and stages of AIDS present extreme risk of contamination).</td>
<td>Zidovudine (ZDV); Lamivudine (3TC); Indinivir (IDV)</td>
</tr>
<tr>
<td>Mucous membrane</td>
<td>Fluid containing visible blood, other potentially infectious fluids, tissue, and urine present a high risk of contamination.</td>
<td>Zidovudine (ZDV); Lamivudine (3TC); Indinivir (IDV); Zidovudine (ZDV); DTC</td>
</tr>
<tr>
<td>Skin</td>
<td>Fluid containing visible blood or other potentially infectious fluids or tissue present a high risk of contamination.</td>
<td>Zidovudine (ZDV); Lamivudine (3TC); Indinivir (IDV); Same as above</td>
</tr>
</tbody>
</table>

Adapted from the USPHS Guidelines Exposure to HIV 2001.
Revised Life Support Guidelines (American Heart Association)

Frequently the American Heart Association releases guidelines for the care of the client experiencing dysrhythrias. Refer to http://www.aafp.org/afp/2006050/practice.html for these guidelines.

Defense Mechanisms Often Used by Clients During Stressful Situations

Here is a quick reference to some of the defense mechanisms used by the client to help him cope with stressors:

- **Compensation**—The development of attributes that take the place of more desirable ones.
- **Conversion reaction**—The development of physical symptoms in response to emotional distress.
- **Denial**—The failure to regard an event or feeling.
- **Displacement**—The transference of emotions to another other than the intended.
- **Projection**—The transferring of unacceptable feelings to another person.
- **Rationalization**—The dismissal of one’s responsibility by placing fault on another.
- **Reaction formation**—The expression of feelings opposite to one’s true feelings.
- **Regression**—The returning to a previous state of development in which one felt secure.
- **Repression**—The unconscious forgetting of unpleasant memories.
- **Sublimation**—The channeling of unacceptable behaviors into behaviors that are socially acceptable.
- **Suppression**—The conscious forgetting of an undesirable memory.

Nutrition Notes

It is important for the nurse to be aware of different diets used in the disease processes we have discussed. Table A.2 is a quick reference to help you remember the diets.
### TABLE A.2 Dietary and Nutrition Notes to Remember

<table>
<thead>
<tr>
<th>Diseases Being Treated</th>
<th>Foods to Include</th>
<th>Foods to Avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone marrow transplant clients</td>
<td>Cook or peel and wash all foods.</td>
<td>Avoid foods from salad bars, foods grown on or in the ground, and foods that are cultured.</td>
</tr>
<tr>
<td>Celiac/gluten-induced diarrhea</td>
<td>Milk, buttermilk, lean meats, eggs, cheese, fish, creamy peanut butter, cooked or canned juice, corn, bread stuffing from corn, cornstarch, rice, soybeans, potatoes, bouillon, and broth.</td>
<td>Malted milk, fat meats, luncheon meats, wheat, salmon, prunes, plums, rye, oats, barley, and soups thickened with gluten containing grains.</td>
</tr>
<tr>
<td>Congestive heart failure, hypertension</td>
<td>Meats low in cholesterol and fats, breads, starches, fruits, sweets, vegetables, dairy products.</td>
<td>Foods high in salts, canned products, frozen meats, cheeses, eggs, organ meats, fried foods, and alcohol.</td>
</tr>
<tr>
<td>Crohn's/ulcerative colitis</td>
<td>Meats, breads, and starches, fruits, vegetables, dairy products.</td>
<td>Whole grains, legumes, nuts, vegetables with skins, prune juice, and gristly meats.</td>
</tr>
<tr>
<td>Full liquid diets for clients who require a decrease in gastric motility</td>
<td>Milk, ice cream, soups, puddings, custards, plain yogurt, strained meats, strained fruits and vegetables, fruit and vegetable juices, cereal gruel, butter, margarine, and any component or combination of clear liquids.</td>
<td>All solid foods.</td>
</tr>
<tr>
<td>Lacto-vegetarian</td>
<td>Primary sources of protein, dairy products, peanut butter, legumes, soy analogs.</td>
<td>All meat products.</td>
</tr>
<tr>
<td>Peptic ulcer/hiatal hernia</td>
<td>Meats, breads, starches, fruits, vegetables, and dairy products.</td>
<td>Alcohol, coffee, chocolate, black or red pepper, chili powder, carminatives such as oil of peppermint and spearmint, garlic, onions, and cinnamon.</td>
</tr>
<tr>
<td>Radium implant clients</td>
<td>Same as for Crohn's and ulcerative colitis.</td>
<td>Same as for Crohn's and ulcerative colitis.</td>
</tr>
<tr>
<td>Renal transplant clients</td>
<td>Meats, dairy products, breads and starches, vegetables, and sweets.</td>
<td>Eggs, organ meats, fried or fatty food, foods containing salt, dried foods, salt substitutes, and fruits.</td>
</tr>
</tbody>
</table>
Immunization Schedule

It is important for the nurse to be aware of the recommended immunization schedule for various age groups. Figure A.1 is a recommended schedule for childhood and adolescent immunizations and Figure A.2 is a recommended schedule for adult immunizations.

**FIGURE A.1**
Recommended childhood and adolescent immunization schedule.

**FIGURE A.2**
Recommended adult immunization schedule.
APPENDIX B

Need to Know More?

The National Council Exam for Licensed Practical Nurses
http://www.ncsbn.org—The website for the National Council of State Boards of Nursing

Pharmacology
http://www.druginfonet.com
http://www.fda.gov/search/databases.html
http://www.globalrph.com
http://www.mosbysdrugconsult.com
http://www.needymeds.com
http://www.nlm.nih.gov/medlineplus
http://www.nursespdr.com

Care of the Client with Respiratory Disorders
http://www.aaaai.org—The website for the American Academy of Allergy, Asthma, and Immunology
http://www.cdc.gov—The website for the Centers for Disease Control and Prevention
http://www.lungusa.org—The website for the American Lung Association
Appendix B: Need to Know More?


### Care of the Client with Genitourinary Disorders

http://www.kidney.org—The website for the National Kidney Foundation

http://www.pkd.cure.org—The website for the Polycystic Kidney Disease Foundation


### Care of the Client with Hematological Disorders

http://www.americanhs.org—The website for the American Hemochromatosis Society

http://www.aplastic.org—The website for the Aplastic Anemia and MDS International Foundation

http://www.emedicine.com/med/topic3387.htm

http://www.hemophilia.org—The website for the National Hemophilia Foundation

http://www.marrow.org

http://www.nci.nih.gov—The website for the National Cancer Institute Information Center

http://www.ons.org—The website for the Oncology Nursing Society

http://www.sicklecelldisease.org—The website for the Sickle Cell Disease Association of America, Inc.


### Fluid and Electrolytes and Acid/Base Balance

http://www.enursescribe.com

http://www.umed.utah.edu/ms2/renal


**Care of the Client with Burns**


**Care of the Client with Sensory Disorders**

http://www.afb.org—The website for the American Foundation for the Blind

http://www.loc.gov.nis—The website for the National Library Services for the Blind and Physically Handicapped


**Care of the Client with Neoplastic Disorders**

http://www.abta.org—The website for the American Brain Tumor Association

http://www.cancer.gov—The website for the National Cancer Institute

http://www.komen.org—The website for the Susan G. Komen Breast Cancer Foundation

http://www.leukemia.org

http://www.leukemia-research.org

http://www.ons.org—The website for the Oncology Nursing Society

http://www.skincancer.org—The website for the Skin Cancer Foundation


Appendix B: Need to Know More?

Care of the Client with Gastrointestinal Disorders
http://www.asge.org—The website for the American Society for Gastrointestinal Endoscopy
http://www.ccfa.org—The website for the Crohn’s and Colitis Foundation
http://www.cdc.gov—The website for the Centers for Disease Control and Prevention
http://www.uoaa.org—The website for the United Ostomy Association


Care of the Client with Musculoskeletal and Connective Tissue Disorder
http://www.amputee-coalition.org—The website for the Amputee Coalition of America
http://www.niams.nih.gov—The website for the National Institute of Arthritis and Musculoskeletal and Skin Diseases
http://www.nof.org—The website for the National Osteoporosis Foundation
http://www.orthonurse.org—The website for the National Association of Orthopaedic Nurses


Care of the Client with Endocrine Disorders
http://www.cdc.gov/diabetes—The website for the Centers for Disease Control and Prevention
http://www.diabetes.org—The website for the American Diabetes Association
http://www.diabetesnet.com—The website for the American Association of Diabetes Educators
http://www.eatright.org—The website for the American Dietetic Association
http://www.endo-society.org—The website for the National Endocrine Society
http://www.medhelp.org/nadf—The website for the National Adrenal Disease Foundation
http://www.niddk.nih.gov—The website for the National Diabetes Clearing House
http://www.pancreasfoundation.org—The website for the National Pancreas Foundation
http://www.thyroid.org—The website for the American Thyroid Association


### Care of the Client with Cardiac Disorders

http://www.americanheart.org—The website for the American Heart Association

http://www.nursebeat.com—The website for Nurse Beat: Cardiac Nursing Electronic Journal


### Care of the Client with Neurological Disorders

http://www.apdaparkinson.com—The website for the American Parkinson’s Disease Association

http://www.biausa.org—The website for the Brain Injury Association

http://www.epilepsyfoundation.org—The website for the Epilepsy Foundation

http://www.guillain-barre.com/—The website for the Guillain–Barré Syndrome Foundation

http://www.nmss.org—The website for the National Multiple Sclerosis Society

http://www.parkinson.org—The website for the National Parkinson’s Foundation

http://www.stroke.org—The website for the American Stroke Association


Appendix B: Need to Know More?

**Care of the Client with Psychiatric Disorders**

http://www.nami.org—The website for the National Alliance on Mental Illness


**Maternal-Newborn Care**


**Care of the Pediatric Client**


**Cultural Practices Influencing Nursing Care**


**Legal Issues in Nursing Practice**

Alphabetical Listing of Nursing Boards in the United States and Protectorates

This appendix contains contact information for nursing boards found throughout the United States. The information found here is current as of this writing, but be aware that names, phone numbers, and websites do change. If the information found here is not completely current, most likely some of the information will be useful enough for you to still make contact with the organization. If all the information is incorrect, a helpful hint is to use an Internet search engine, such as Yahoo! or Google, and enter the name of the nursing board you are trying to contact. Most likely, you'll find some contact information. Also, if you don't have access to the Internet, contact your state government because it should be able to help you find the information you need.

Alabama Board of Nursing
770 Washington Avenue
RSA Plaza, Suite 250
Montgomery, AL 36130-3900
Phone: 334-242-4060
Fax: 334-242-4360
Contact person: N. Genell Lee, MSN, JD, RN, Executive Officer
Website: http://www.abn.state.al.us/

Alaska Board of Nursing
550 West Seventh Avenue, Suite 1500
Anchorage, AK 99501-3567
Phone: 907-269-8161
Fax: 907-269-8196
Contact person: Dorothy Fulton, MA, RN, Executive Director
Website: http://www.deed.state.ak.us/occ/pnur.htm
Appendix C: Alphabetical Listing of Nursing Boards in the United States and Protectorates

American Samoa Health Services
Regulatory Board
LBJ Tropical Medical Center
Pago Pago, AS 96799
Phone: 684-633-1222
Fax: 684-633-1869
Contact person: Etenauga Lutu, RN, Executive Secretary

Arizona State Board of Nursing
1651 E. Morten Avenue, Suite 210
Phoenix, AZ 85020
Phone: 602-889-5150
Fax: 602-889-5155
Contact person: Joey Ridenour, MN, RN, Executive Director
Website: http://www.azboardofnursing.org/

Arkansas State Board of Nursing
University Tower Building
1123 S. University, Suite 800
Little Rock, AR 72204-1619
Phone: 501-686-2700
Fax: 501-686-2714
Contact person: Faith Fields, MSN, RN, Executive Director
Website: http://www.state.ar.us/nurse

California Board of Registered Nursing
400 R Street, Suite 4030 Sacramento, CA 95814-6239
Phone: 916-322-3350
Fax: 916-327-4402
Contact person: Ruth Ann Terry, MPH, RN, Executive Officer
Website: http://www.rn.ca.gov/

California Board of Vocational Nurses and Psychiatric Technicians
2535 Capitol Oaks Drive, Suite 205
Sacramento, CA 95833
Phone: 916-263-7800
Fax: 916-263-7859
Contact person: Teresa Bello-Jones, JD, MSN, RN, Executive Officer
Website: http://www.bvnpt.ca.gov/
Alphabetical Listing of Nursing Boards in the United States and Protectorates

Colorado Board of Nursing
1560 Broadway, Suite 880
Denver, CO 80202
Phone: 303-894-2430
Fax: 303-894-2821
Contact person: Nancy L. Smith, PhD, RN, BC, FAANP, Program Director and Education Consultant
Website: http://www.dora.state.co.us/nursing/

Connecticut Board of Examiners for Nursing
Dept. of Public Health
410 Capitol Avenue, MS# 13PHO
P.O. Box 340308
Hartford, CT 06134-0328
Phone: 860-509-7624
Fax: 860-509-7553
Contact person: Jan Wojick, Board Liaison; Nancy L. Bafundo, BSN, MS, RN, Board President
Website: http://www.state.ct.us/dph/

Delaware Board of Nursing
861 Silver Lake Boulevard
Cannon Building, Suite 203
Dover, DE 19904
Phone: 302-739-4522
Fax: 302-739-2711
Contact person: Iva Boardman, MSN, RN, Executive Director
Website: http://www.professionallicensing.state.de.us/boards/nursing/index.shtml

District of Columbia Board of Nursing
Department of Health
825 N. Capitol Street, N.E., 2nd Floor
Room 2224
Washington, DC 20002
Phone: 202-442-4778
Fax: 202-442-9431
Contact person: Karen Scipio-Skinner, MSN, RNC, Executive Director
Website: http://www.dchealth.dc.gov/
Appendix C: Alphabetical Listing of Nursing Boards in the United States and Protectorates

Florida Board of Nursing
Mailing address:
4052 Bald Cypress Way, BIN C02
Tallahassee, FL 32399-3252
Street address:
4042 Bald Cypress Way, Room 120
Tallahassee, FL 32399
Phone: 850-245-4125
Fax: 850-245-4172
Contact person: Dan Coble, RN, PhD, Executive Director
Website: http://www.doh.state.fl.us/mqa/

Georgia Board of Nursing
237 Coliseum Drive
Macon, GA 31217-3858
Phone: 478-207-1640
Fax: 478-207-1660
Contact person: Sylvia Bond, RN, MSN, MBA, Executive Director
Website: http://www.sos.state.ga.us/plb/rn

Georgia State Board of Licensed Practical Nurses
237 Coliseum Drive
Macon, GA 31217-3858
Phone: 478-207-1300
Fax: 478-207-1633
Contact person: Jacqueline Hightower, JD, Executive Director
Website: http://www.sos.state.ga.us/plb/lpn

Guam Board of Nurse Examiners
Regular mailing address:
P.O. Box 2816
Hagatna, Guam 96932
Street address for FedEx and UPS:
651 Legacy Square Commercial Complex
South Route 10, Suite 9
Mangilao, Guam 96913
Phone: 671-735-7406 or 671-725-7411
Fax: 671-735-7413
Contact person: Lillian Perez-Posadas, Interim Executive Officer
Hawaii Board of Nursing
King Kalakaua Building
335 Merchant Street, 3rd Floor
Honolulu, HI 96813
Phone: 808-586-3000
Fax: 808-586-2689
Contact person: Kathleen Yokouchi, MBA, BBA, BA, Executive Officer
Website: http://www.state.hi.us/dcca/pvl/areas_nurse.html

Idaho Board of Nursing
280 N. 8th Street, Suite 210
P.O. Box 83720
Boise, ID 83720
Phone: 208-334-3110
Fax: 208-334-3262
Contact person: Sandra Evans, MA.Ed, RN, Executive Director
Website: http://www.state.id.us/ibn/ibnhome.htm

Illinois Department of Professional Regulation
James R. Thompson Center
100 West Randolph, Suite 9-300
Chicago, IL 60601
Phone: 312-814-2715
Fax: 312-814-3145
Contact person: Mary Ann Alexander, PhD, Nursing Act Coordinator
Website: http://www.dpr.state.il.us/

Indiana State Board of Nursing
Health Professions Bureau
402 W. Washington Street, Room W066
Indianapolis, IN 46204
Phone: 317-234-2043
Fax: 317-233-4236
Contact person: Kristen Kelley, Director of Nursing
Website: http://www.state.in.us/hpb/boards/isbn/
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Iowa Board of Nursing
RiverPoint Business Park
400 S.W. 8th Street, Suite B
Des Moines, IA 50309-4685
Phone: 515-281-3255
Fax: 515-281-4825
Contact person: Lorinda Inman, MSN, RN, Executive Director
Website: http://www.state.ia.us/government/nursing/

Kansas State Board of Nursing
Landon State Office Building
900 S.W. Jackson, Suite 1051
Topeka, KS 66612
Phone: 785-296-4929
Fax: 785-296-3929
Contact person: Mary Blubaugh, MSN, RN, Executive Administrator
Website: http://www.ksbn.org/

Kentucky Board of Nursing
312 Whittington Parkway, Suite 300
Louisville, KY 40222
Phone: 502-329-7000
Fax: 502-329-7011
Contact person: Sharon Weisenbeck, MS, RN, Executive Director
Website: http://www.kbn.ky.gov/

Louisiana State Board of Nursing
3510 N. Causeway Boulevard, Suite 501
Metairie, LA 70002
Phone: 504-838-5332
Fax: 504-838-5349
Contact person: Barbara Morvant, MN, RN, Executive Director
Website: http://www.lsbn.state.la.us/
Alphabetical Listing of Nursing Boards in the United States and Protectorates

Louisiana State Board of Practical Nurse Examiners
3421 N. Causeway Boulevard, Suite 505
Metairie, LA 70002
Phone: 504-838-5791
Fax: 504-838-5279
Contact person: Claire Glaviano, BSN, MN, RN, Executive Director
Website: http://www.lsbpne.com/

Maine State Board of Nursing
158 State House Station
Augusta, ME 04333
Phone: 207-287-1133
Fax: 207-287-1149
Contact person: Myra Broadway, JD, MS, RN, Executive Director
Website: http://www.maine.gov/boardofnursing/

Maryland Board of Nursing
4140 Patterson Avenue
Baltimore, MD 21215
Phone: 410-585-1900
Fax: 410-358-3530
Contact person: Donna Dorsey, MS, RN, Executive Director
Website: http://www.mbon.org/

Massachusetts Board of Registration in Nursing
Commonwealth of Massachusetts
239 Causeway Street, Suite 500
Boston, MA 02114
Phone: 617-727-9961
Fax: 617-727-1630
Contact person: Rula Faris Harb, MS, RN, Acting Executive Director
Website: http://www.state.ma.us/reg/boards/rn/
Appendix C: Alphabetical Listing of Nursing Boards in the United States and Protectorates

Michigan/DCH/Bureau of Health Professions  
Ottawa Towers North  
611 W. Ottawa, 1st Floor  
Lansing, MI 48933  
Phone: 517-335-0918  
Fax: 517-373-2179  
Contact person: Diane Lewis, MBA, BA, Policy Manager for Licensing Division  
Website: http://www.michigan.gov/healthlicense

Minnesota Board of Nursing  
2829 University Avenue SE  
Minneapolis, MN 55414  
Phone: 612-617-2270  
Fax: 612-617-2190  
Contact person: Shirley Brekken, MS, RN, Executive Director  
Website: http://www.nursingboard.state.mn.us/

Mississippi Board of Nursing  
1935 Lakeland Drive, Suite B  
Jackson, MS 39216-5014  
Phone: 601-987-4188  
Fax: 601-364-2352  
Contact person: Delia Owens, RN, JD, Executive Director  
Website: http://www.msbn.state.ms.us/

Missouri State Board of Nursing  
3605 Missouri Boulevard  
P.O. Box 656  
Jefferson City, MO 65102-0656  
Phone: 573-751-0681  
Fax: 573-751-0075  
Contact person: Lori Scheidt, BS, Executive Director  
Website: http://pr.mo.gov/nursing.asp
Montana State Board of Nursing
301 South Park
P.O. Box 200513
Helena, MT 59620-0513
Phone: 406-841-2340
Fax: 406-841-2343
Contact person: Vacant, Executive Director
Website: http://www.discoveringmontana.com/dli/bsd/license/bsd_boards/
nur_board/board_page.htm

Nebraska Department of Health and Human Services Regulation and Licensure
Nursing and Nursing Support
301 Centennial Mall South
Lincoln, NE 68509-4986
Phone: 402-471-4376
Fax: 402-471-1066
Contact person: Charlene Kelly, PhD, RN, Executive Director
Nursing and Nursing Support
Website: http://www.hhs.state.ne.us/crl/nursing/nursingindex.htm

Nevada State Board of Nursing
Administration, Discipline & Investigations
5011 Meadowood Mall #201
Reno, NV 89502-6547
Phone: 775-688-2620
Fax: 775-688-2628
Contact person: Debra Scott, MS, RN, Executive Director
Website: http://www.nursingboard.state.nv.us/

New Hampshire Board of Nursing
21 South Fruit Street, Suite 16
Concord, NH 03301-2341
Phone: 603-271-2323
Fax: 603-271-6605
Contact person: Margaret Walker, MBA, BSN, RN, Executive Director
Website: http://www.state.nh.us/nursing/
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New Jersey Board of Nursing  
P.O. Box 45010  
124 Halsey Street, 6th Floor  
Newark, NJ 07101  
Phone: 973-504-6586  
Fax: 973-648-3481  
Contact person: George Hebert, Executive Director  
Website: http://www.state.nj.us/lps/ca/medical.htm

New Mexico Board of Nursing  
6301 Indian School Road, NE  
Suite 710  
Albuquerque, NM 87110  
Phone: 505-841-8340  
Fax: 505-841-8347  
Contact person: Allison Kozeliski, RN, Executive Director  
Website: http://www.state.nm.us/clients/nursing

New York State Board of Nursing  
Education Bldg.  
89 Washington Avenue  
2nd Floor West Wing  
Albany, NY 12234  
Phone: 518-474-3817, extension 280  
Fax: 518-474-3706  
Contact person: Barbara Zittel, PhD, RN, Executive Secretary  
Website: http://www.nysed.gov/prof/nurse.htm

North Carolina Board of Nursing  
3724 National Drive, Suite 201  
Raleigh, NC 27602  
Phone: 919-782-3211  
Fax: 919-781-9461  
Contact person: Polly Johnson, MSN, RN, Executive Director  
Website: http://www.ncbon.com/
North Dakota Board of Nursing
919 South 7th Street, Suite 504
Bismarck, ND 58504
Phone: 701-328-9777
Fax: 701-328-9785
Contact person: Constance Kalanek, PhD, RN, Executive Director
Website: http://www.ndbon.org/

Northern Mariana Islands
Commonwealth Board of Nurse Examiners
P.O. Box 501458
Saipan, MP 96950
Phone: 670-664-4812
Fax: 670-664-4813
Contact person: Rosa M. Tuleda, Associate Director of Public Health & Nursing

Ohio Board of Nursing
17 South High Street, Suite 400
Columbus, OH 43215-3413
Phone: 614-466-3947
Fax: 614-466-0388
Contact person: John Brion, RN, MS, Executive Director
Website: http://www.nursing.ohio.gov/

Oklahoma Board of Nursing
2915 N. Classen Boulevard, Suite 524
Oklahoma City, OK 73106
Phone: 405-962-1800
Fax: 405-962-1821
Contact person: Kimberly Glazier, M.Ed., RN, Executive Director
Website: http://www.youroklahoma.com/nursing

Oregon State Board of Nursing
800 NE Oregon Street, Box 25
Suite 465
Portland, OR 97232
Phone: 503-731-4745
Fax: 503-731-4755
Contact person: Joan Bouchard, MN, RN, Executive Director
Website: http://www.osbn.state.or.us/
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Pennsylvania State Board of Nursing
P.O. Box 2649
Harrisburg, PA 17105-2649
Phone: 717-783-7142
Fax: 717-783-0822
Contact person: Laurette D. Keiser, RN, MSN, Executive Secretary/Section Chief
Website: http://www.dos.state.pa.us/bpoa

Commonwealth of Puerto Rico Board of Nurse Examiners
800 Roberto H. Todd Avenue
Room 202, Stop 18
San Juan, PR 00908
Phone: 787-725-7506
Fax: 787-725-7903
Contact person: Roberto Figueroa, RN, MSN, Executive Director of the Office of Regulations and Certifications of Health Care Professions

Rhode Island Board of Nurse Registration and Nursing Education
105 Cannon Building
Three Capitol Hill
Providence, RI 02908
Phone: 401-222-5700
Fax: 401-222-3352
Contact person: Jean Marie Rocha, MPH, RN, Executive Officer
Website: http://www.healthri.org/hsr/professions/nurses.htm

South Carolina State Board of Nursing
110 Centerview Drive, Suite 202
Columbia, SC 29210
Phone: 803-896-4550
Fax: 803-896-4525
Contact person: Martha Bursinger, RN, MSN, Executive Director
Website: http://www.llr.state.sc.us/pol/nursing
South Dakota Board of Nursing
4305 South Louise Avenue, Suite 201
Sioux Falls, SD 57106-3115
Phone: 605-362-2760
Fax: 605-362-2768
Contact person: Gloria Damgaard, RN, MS, Executive Secretary
Website: http://www.state.sd.us/doh/nursing/

Tennessee State Board of Nursing
425 Fifth Avenue North
1st Floor—Cordell Hull Building
Nashville, TN 37247
Phone: 615-532-5166
Fax: 615-741-7899
Contact person: Elizabeth Lund, MSN, RN, Executive Director
Website: http://www.tennessee.gov/health

Texas Board of Nurse Examiners
333 Guadalupe, Suite 3-460
Austin, TX 78701
Phone: 512-305-7400
Fax: 512-305-7401
Contact person: Katherine Thomas, MN, RN, Executive Director
Website: http://www.bne.state.tx.us/

Utah State Board of Nursing
Heber M. Wells Bldg., 4th Floor
160 East 300 South
Salt Lake City, UT 84111
Phone: 801-530-6628
Fax: 801-530-6511
Contact person: Laura Poe, MS, RN, Executive Administrator
Website: http://www.commerce.state.ut.us/
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Vermont State Board of Nursing
81 River Street
Heritage Building
Montpelier, VT 05609-1106
Phone: 802-828-2396
Fax: 802-828-2484
Contact person: Anita Ristau, MS, RN, Executive Director
Website: http://www.vtprofessionals.org/opr1/nurses/

Virgin Islands Board of Nurse Licensure
Veterans Drive Station
St. Thomas, VI 00803
Phone: 340-776-7397
Fax: 340-777-4003
Contact person: Winifred Garfield, CRNA, RN, Executive Secretary

Virginia Board of Nursing
6603 West Broad Street
5th Floor
Richmond, VA 23230-1712
Phone: 804-662-9909
Fax: 804-662-9512
Contact person: Jay Douglas, RN, MSM, CSAC, Executive Director
Website: http://www.dhp.state.va.us/

Washington State Nursing Care Quality Assurance Commission
Department of Health
HPQA #6
310 Israel Road SE
Tumwater, WA 98501-7864
Phone: 360-236-4700
Fax: 360-236-4738
Contact person: Paula Meyer, MSN, RN, Executive Director
Website: https://fortress.wa.gov/doh/hpqa-licensing/HPS6/Nursing/default.htm
West Virginia Board of Examiners for Registered Professional Nurses
101 Dee Drive
Charleston, WV 25311
Phone: 304-558-3596
Fax: 304-558-3666
Contact person: Laura Rhodes, MSN, RN, Executive Director
Website: http://www.wvrnboard.com/

West Virginia State Board of Examiners for Licensed Practical Nurses
101 Dee Drive
Charleston, WV 25311
Phone: 304-558-3572
Fax: 304-558-4367
Contact person: Lanette Anderson, RN, BSN, JD, Executive Director
Website: http://www.lpnboard.state.wv.us/

Wisconsin Department of Regulation and Licensing
1400 E. Washington Avenue, Room 173
Madison, WI 53708
Phone: 608-266-0145
Fax: 608-261-7083
Contact person: Kimberly Nania, PhD, MA, BS, Director, Bureau of Health Service Professions
Website: http://www.drl.state.wi.us/

Wyoming State Board of Nursing
2020 Carey Avenue, Suite 110
Cheyenne, WY 82002
Phone: 307-777-7601
Fax: 307-777-3519
Contact person: Cheryl Lynn Koski, MN, RN, CS, Executive Director
Website: http://nursing.state.wy.us/
APPENDIX D

What’s on the CD-ROM?

The CD features a state-of-the-art exam preparation engine from ExamForce. This uniquely powerful program will identify gaps in your knowledge and help you turn them into strengths. In addition to the ExamForce software, the CD includes an electronic version of this book in Portable Document Format (PDF) format and the Adobe Acrobat Reader used to display these files.

The CramMaster Engine

This innovative exam engine systematically prepares you for a successful test. Working your way through CramMaster is the fastest, surest route to a successful exam. The presentation of questions is weighted according to your unique requirements. Your answer history determines which questions you’ll see next. It determines what you don’t know and forces you to overcome those shortcomings. You won’t waste time answering easy questions about things you already know.

Multiple Test Modes

ExamForce’s CramMaster test engine has three unique testing modes to systematically prepare you for a successful exam.

Pretest Mode

Pretest mode is used to establish your baseline skill set. Train CramMaster by taking two or three pretests. There is no review or feedback on answers in this mode. View your topic-by-topic skill levels from the History menu on the main screen. Then, effective exam preparation begins by attacking your weakest topics first in Adaptive Drill mode.
Adaptive Drill Mode

Adaptive Drill mode enables you to focus on specific exam objectives. CramMaster learns the questions you find difficult and drills you until you master them. As you gain proficiency in one area, it seeks out the next with which to challenge you. Even the most complex concepts of the exam are mastered in this mode.

Simulated Exam Mode

Simulated Exam mode approximates the real NCLEX-RN® CAT exam. By the time you reach this level, you’ve already mastered the exam material. This is your opportunity to exercise those skills while building your mental and physical stamina.

Installing CramMaster for the NCLEX-RN® Exam

The following are the minimum system requirements for installation:

- Windows 98, Me, NT 4, 2000, or XP
- 128MB of RAM
- 38MB of disk space

To install the CramMaster product from the CD-ROM, follow these instructions:

1. Close all applications before beginning this installation.
2. Insert the CD into your CD-ROM drive. If the setup starts automatically, go to step 6. If the setup does not start automatically, continue with step 3.
3. From the Start menu, select Run.
4. Click Browse to locate the CramMaster CD. From the Look in drop-down list in the Browse dialog box, select the CD-ROM drive.
5. In the Browse dialog box, double-click on the fscommand directory and then double-click Setup.exe. In the Run dialog box, click OK to begin the installation.

If you need technical support, please contact ExamForce at 1-800-845-8569 or email support@examforce.com. Additional product support can be found at www.examforce.com.
6. On the Welcome screen, click Next.

7. Select I Agree to the End User License Agreement (EULA), and then click Next.

8. On the Choose Destination Location screen, click Next to install the software to C:\Program Files\CramMaster.

9. On the Select Program Manager Group screen, verify that the Program Manager group is set to CramMaster, and click Next.


12. For your convenience, a shortcut to CramMaster is created automatically on your desktop.

Using CramMaster for the NCLEX-RN® Exam

An introductory slideshow starts when CramMaster first launches. It teaches you how to get the most out of this uniquely powerful program. Uncheck the Show on Startup box to suppress the Introduction from showing each time the application is launched. You can review it at any time from the Help menu on the main screen. Tips on using other CramMaster features can be found there, as well.

Customer Support

If you encounter problems installing or using CramMaster for the NCLEX-RN® exam, please contact ExamForce at 1-800-845-8569 or email support@examforce.com. Support hours are from 8:30 a.m. to 5:30 p.m. EST Monday through Friday. Additional product support can be found at www.examforce.com.

If you would like to purchase additional ExamForce products, call 1-800-845-8569 or visit www.examforce.com.
Glossary

A

abandonment Abandonment is the act of leaving after the nurse has taken report and assumed care of the client.

abortion An abortion is the termination of a pregnancy prior to the point of viability.

acidosis Acidosis is the condition whereby the acidity of the blood is increased due to accumulation of acids or excessive loss of bicarbonate.

acromegaly Acromegaly is an increase in growth hormone in the adult, causing elongation and enlargement of the bones of the extremities and certain bones of the face and jaws.

active transport Active transport is the process by which a cell membrane moves molecules against a concentration or electrochemical gradient. An example of this is the movement of potassium, sodium, calcium, chloride, and hydrogen.

acute respiratory failure Acute respiratory failure is the inability of the lungs to meet the body’s oxygen requirements.

Addison’s disease Addison’s disease is a disease caused by a decreased function of the adrenal cortex. This causes a decrease in cortisol levels, leading to hypotension, decreased fluid volume, decreased sodium, and decreased blood glucose.
adverse reaction  An adverse reaction to a drug is a reaction that causes harm to the client.

aganglionic  Aganglionic means lacking nerve stimulation.

agonist  An agonist is a group of drugs that mimic the body’s own regulatory function. An example of an agonist is a drug that binds to the receptor and stimulates the receptor's function.

alkalosis  Alkalosis is a condition whereby the alkalinity of the blood is increased due to an accumulation of alkaline or a loss of acids.

allergic response  An allergic response is an abnormal immune response.

allograft  An allograft is a skin graft obtained from the same species.

alpha-fetoprotein  Alpha-fetoprotein is an antigen present in the human fetus. Maternal serum can be evaluated at 16–18 weeks of pregnancy. Elevated levels can indicate neural-tube defects. Low levels can indicate Down’s syndrome.

amenorrhea  Amenorrhea is the absence of menses.

anastomosis  Anastomosis is a surgical connection of two tubular structures.

aneurysm  An aneurysm is a ballooning of a blood vessel. Usually the artery is affected. There are three types: fusiform, dissecting, and sacular.

angina pectoris  Angina pectoris is severe pain around the heart caused by a relative deficiency of oxygen supply to the heart muscle. It occurs most often after increased activity.

angioplasty  Angioplasty is a procedure that uses a balloon to press atherosclerotic plaque or a clot into the wall of the vessel.

anorexia nervosa  Anorexia nervosa is an eating disorder characterized by a refusal to eat that results in extreme emaciation, amenorrhea, lanugo, muscle wasting, and loss of bone mass.

anovulation  Anovulation is a failure to ovulate.

antagonist  An antagonist is a drug that works against or prevents a response.

anuria  Anuria is the absence of urinary output.

apnea  Apnea is the absence of respirations.

aqueous humor  Aqueous humor is the watery fluid in the anterior and posterior chambers of the eye.

areflexia  Areflexia refers to the absence of reflexes.

arteriovenous graft  Arteriovenous graft is a surgical connection between an artery and a vein used for hemodialysis.

ascites  Ascites is a serous fluid that has accumulated in the peritoneal cavity.

assault  Assault is stating of intent to unlawfully touch another with the intent to cause harm.

asthma  Asthma is a disease characterized by wheezing and shortness of breath.

astigmatism  Astigmatism is a visual disorder in which the light rays are spread over a diffuse area rather than being focused on the retina.
atelectasis  Atelectasis is a collapse or incomplete expansion of the lung.
atherosclerosis  Atherosclerosis is an accumulation of cholesterol-lipid-calcium deposits in the walls of the vessels.
atresia  Atresia is the absence or closure of a normal body opening.
attention deficit hyperactive disorder  ADHD is a disorder of childhood characterized by overactivity, impulsivity, and inattention.
aura  Aura is a sensation that precedes or signals the onset of a seizure or a migraine headache. It can involve olfactory, visual, or auditory sensations.
autograft  Autograft is a skin graft obtained from an individual's own body.
automatacism  Automatacism is the performance of automatic actions or behaviors without conscious knowledge or awareness.
autosomal recessive disorder  Autosomal recessive disorder is an inherited disorder carried on any chromosome other than the sex chromosome.
battery  Battery is the unlawful touching of another without consent. An example of this would be performing surgery without proper consent.
biosynthetic graft  A biosynthetic graft is a graft or dressing made from synthetic material or animal collagen.
bipolar disorder  Bipolar disorder is a mood disorder characterized by periods of mania with or without depression.
blood pressure  The blood pressure is the tension exerted by the blood against the arterial walls.
bone density  Bone density is the degree of thickness in a bone. Loss of bone density is associated with osteoporosis.
bradycardia  Bradycardia is a heart rate of less than 60 beats per minute.
Braxton-Hicks contractions  Braxton-Hicks contractions are false labor contractions.
bronchitis  Bronchitis is the inflammation of the bronchi.
buccal  Buccal administration of a drug is administration into the cheek.
Buerger's disease  Buerger's disease is a chronic, recurring, inflammatory, vascular occlusive disease, chiefly of the peripheral arteries and veins of the extremities.
bulimia nervosa  Bulimia nervosa is an eating disorder characterized by binge eating followed by purging.
burn shock  Burn shock is hypovolemia that occurs within the first 24 hours following a major burn injury.
burr holes  Circular holes made in the skull with a drill. The procedure can be done to decrease intracranial pressure or for the purpose of exploration and diagnosis.
calcitonin Calcitonin is a hormone produced by the human thyroid gland that is important for maintaining a dense, strong bone matrix and regulating the blood calcium level. It also can be given as a medication to increase bone density.

Canal of Schlemm Canal of Schlemm is a venous sinus found at the junction of the cornea and sclera.

caput succedaneum Caput succedaneum is edema of the fetal scalp that crosses the suture lines. The swelling reabsorbs within 1–3 days.

cardiac catheterization A cardiac catheterization is a procedure that is used to diagnose blockages in the coronary arteries. A catheter is threaded into the coronary arteries, and a dye is injected into the myocardial vessels.

cardiac tamponade Cardiac tamponade is the accumulation of excess fluid in the pericardial sac of the heart.

cardiopulmonary resuscitation CPR is a method of externally providing oxygen and heart pumping if the client is in cardiopulmonary arrest.

cataract Cataract is an opacity in the crystalline lens of the eye.

cervix The cervix is the neck of the uterus.

Cesarean section A Cesarean section is the delivery of the baby by means of an incision into the uterus.

Chadwick’s sign Chadwick’s sign is a purplish color affecting the cervix and vagina due to vascular engorgement. Chadwick’s sign is a presumptive sign of pregnancy occurring at about 4 weeks gestation.

chemical agents Chemical agents are gases or liquids that are capable of producing disability or death.

Cheyne Stokes Cheyne Stokes respirations refers to a type of breathing pattern recognized by periods of apnea lasting 10–60 seconds followed by a gradual increase in the depth and frequency of breaths.

chloasma Chloasma is the mask of pregnancy and is a brownish pigmentation of the face. It also can be present in clients with oral contraceptive therapy or hormone replacement.

cholesterol Cholesterol is a substance made up of C_{27}H_{45}OH, a monohydric alcohol widely distributed in animal tissue and occurring in foods such as egg yolks, oils, liver, kidneys, and adrenal glands.

Chvostek’s sign Chvostek’s sign is a spasm of the facial muscles and nerve found in hypocalcemia.

civil laws Civil laws refers to laws pertaining to interpersonal suits. It can involve torts, libel, negligence, and malpractice.

clonic movements Clonic movements refer to movements that alternate between the contraction and relaxation of a muscle.

clostridium Clostridium is a group of bacteria belonging to the Bacillaceae family. *Clostridium perfringens* is the primary cause of gangrene.

colostrum Colostrum is the first liquid expressed from the breast after delivery. Colostrum contains proteins, antibodies, and calories.
common laws  Common law is a law designed to provide compensation for a tort or other civil act.

conduct disorder  Conduct disorder is a disorder of childhood characterized by the violation of the rights of others with a lack of guilt or remorse for wrongdoing.

conduction system of the heart  The conduction system of the heart is composed of the nervous tissue in the heart that conducts electrical impulses throughout the heart. It consists of the SA node, AV node, Bundle of His, the right and left bundle branches, and the Purkinje fibers.

conductive hearing loss  Conductive hearing loss is caused by a failure of excitation or movement of the stapes.

condylomata acuminata  Condylomata acuminata is a wart appearing on the genital area. It is caused by various types of human papilloma virus.

congenital anomaly  Congenital anomaly is a deformity that is present at birth; it's also called a birth defect.

congestive heart failure  Congestive heart failure is caused by an accumulation of fluid in the circulatory system related to the heart's inability to pump blood through the body. In pulmonary edema, or left-sided congestive heart failure, fluid accumulates in the lungs. In right-sided congestive heart failure, the fluid accumulates in the peripheral circulation.

consensus formula  Consensus formula is a method for determining fluid replacement for those with a major burn injury.

consent  Consent is voluntarily giving permission to allow someone else to do something.

continuous positive airway pressure  CPAP is the application of positive airway pressure used throughout the respiratory cycle for a client with spontaneous respirations.

contraception  Contraception is the prevention of conception.

contracture  Contracture is a fibrosis of connective tissue that prevents normal movement.

contraindication  Contraindication is a reason that a drug should not be given to a client.

conversion  Conversion is a physical expression of an emotional conflict.

cor pulmonale  Cor pulmonale is right-sided heart failure.

cornea  The cornea is the transparent anterior portion of the outer layer of the eyeball.

coronary artery bypass graft  A coronary artery bypass graft is a surgical procedure that uses a donor vessel to bypass a blockage in the coronary arteries.

corticosteroids  Corticosteroid is a group of hormones secreted by the adrenal cortex.

craniofacial  Craniofacial pertains to the face and head.

craniotomy  A surgical incision through the cranium that allows access to the brain.

crepitation  The clicking or grating sound heard on movement of broken bones or movement of joints.
cretinism  Cretinism is hypothyroidism found in the neonate.

criminal laws  Criminal laws are laws governing criminal acts. If found guilty of a crime, the offender is usually sentenced to jail time.

culture  Culture is defined as the sum of beliefs that are passed on from generation to generation by a particular group.

Cushing's syndrome  Cushing syndrome is an increase in cortisol production by the adrenal cortex causing alkalosis, increased sodium, increased fluid levels, and hyperglycemia.

cutaneous ureterostomy  Cutaneous ureterostomy is the surgical implantation of the ureter to the surface of the skin.

cyanosis  Cyanosis is the blue, gray, or purple discoloration of the skin and mucus membranes caused by low oxygen levels or reduced hemoglobin.

cyclothymia  Cyclothymia is a chronic mood disturbance of at least 2 years duration involving numerous episodes of hypomania and depression.

cystectomy  Cystectomy is the surgical removal of the urinary bladder.

cystitis  Cystitis is the inflammation of the urinary bladder.

d  Debridement  Debridement is the removal of eschar from the surface of a burn.

decelerations  Decelerations are drops in the fetal heart rate from normal range.

There are three types of decelerations. Early decelerations are caused by head compression; variable decelerations are caused by cord compression; and late decelerations are caused by utero-placental insufficiency.

decerebrate posture  This refers to the rigid body position assumed by a client with a loss of cerebral control of spinal reflexes. It is characterized by arms that are stiff and extended and forearms that are pronated.

decibel  Decibel is the degree of intensity or loudness.

decorticate posture  Decorticate posture refers to the posture of a client with a deficit above the level of the brain stem. It is characterized by rigidity of the body with arms flexed, fists clenched, and legs extended.

defamation of character  Defamation of character means talking about another person with the intent to slander his character.

defibrillator  A defibrillator is a device used to correct ventricular fibrillation. The electrical device shocks the client to restore the normal rhythm of the heart.

delusion  Delusion is a firm, fixed belief not based in reality.

demineralize  Demineralize refers to the loss of mineral salts from bone. Demineralization is often associated with rheumatoid arthritis.

diabetes insipidus  Diabetes insipidus is a disease caused by a lack of antidiuretic hormone. This lack of antidiuretic hormone results in polyuria, hypotension, and shock.

dialysis  Dialysis is the passage of blood through a semipermeable membrane to remove waste products.
diastole  Diastole is the relaxation phase of the ventricle. Diastolic blood pressure is normally 60–85 mm Hg.

diffusion  Diffusion is the process whereby molecules move from an area of higher concentration to an area of lower concentration.

disseminated intravascular coagulation  DIC is a pathological form of coagulation resulting in platelet aggregation.

doll's eye phenomenon  Doll's eye phenomenon is a test used for a comatose client to test the oculocephalic reflex for brain stem dysfunction. The examiner holds the client's eyes open and rotates his head quickly from side to side. The normal response is for both eyes to deviate to the side opposite the direction of the head rotation.

donor site  Donor site is the area from which a graft is taken.

dowager's hump  Dowager's hump is an abnormal cervical convexity of the anterior lumbar spine accompanied by dorsal kyphosis. Dowager's hump is due to loss of bone and is frequently seen in clients with osteoporosis.


dwarfism  Dwarfism is a lack of growth hormones causing short bones and small stature. It can be a result of endocrine dysfunction, genetics, or renal disease.

dysmenorrhea  Dysmenorrhea is defined as difficult or painful menses.

dysphagia  Dysphagia is difficulty swallowing.

dysplasia  Dysplasia is abnormal tissue development.

dyspnea  Dyspnea means labored respirations.

dysthymic disorder  Dysthymic disorder is a chronic depressed mood with a duration of more than 2 years.

dystocia  Dystocia is defined as difficult or painful labor.

dysuria  Dysuria is painful urination.

**E**

ectopic pregnancy  Ectopic pregnancy is any pregnancy occurring outside the uterus.

electrocardiogram  An electrocardiogram is a record of the electrical activity of the heart.

electroconvulsive therapy  Electroconvulsive therapy is somatic therapy using electrically induced seizures to relieve severe depression.

electrolytes  Electrolytes are substances that, in solution, conduct electricity (cations are positively charged and anions are negatively charged). Acids, bases, and salts are common electrolytes. Salts include sodium, potassium, and chloride.

emaciated  Emaciated refers to excessive thinness of the body or a condition of wasting away.

**emergent**  Emergent is a category of triage requiring immediate care for life-threatening conditions.
emergent phase of burn injury  Emergent phase of burn injury refers to the first 24 hours following a major burn injury.

emphysema  Emphysema is a chronic respiratory disease characterized by overdistention and destruction of the alveolar walls.

empyema  Empyema is a collection of infected fluid in a body cavity, particularly in the pleura.

end-stage renal failure  End-stage renal failure is the chronic loss of kidney function that requires dialysis or renal transplant.

endocrine  The ductal system of the body. The endocrine system produces hormones used for bodily functions.

endometriosis  Endometriosis is the implantation of endometrial tissue outside the uterus.

enteric coating  Enteric coating is a coating on a tablet or capsule that does not dissolve until it is exposed to acids in the small intestines.

enteropathy  Enteropathy is a pathological condition of the intestine.

epidural anesthesia  Epidural anesthesia is anesthetic administered into the dura outside the spinal cord into the epidural space. It provides pain relief during labor, delivery, and surgery.

eschar  Eschar is the black, leathery slough that covers a burn wound.

estriol  Estriol is a steroid found in large quantities in the urine of the pregnant client.

ethics  Ethics is the study of the rightness of conduct.

ethnicity  Ethnicity is a culture group's sense of identification associated with the group's common good.

euthanasia  Euthanasia is a word meaning painless and easy death. It is also the deliberate ending of life in individuals with an incurable disease.

exophthalmoses  Exophthalmoses is bulging eyes related to thyroid disorders, orbital tumors, leukemia, and aneurysms.

extrapyramidal side effect  An extrapyramidal side effect is one from antipsychotic medication with symptoms of tremors, muscle rigidity, bradykinesia, and difficulty in ambulation.

extravasation  Extravasation is the escape of intravenous fluid into the surrounding tissue.

F

fasciotomy  Fasciotomy is the surgical incision into the membrane that supports, covers, and separates muscle.

fatigue  Fatigue is a regular sense of exhaustion making an individual have a decreased capacity to perform physical and mental work.

Federal Drug Administration  The FDA is an organization responsible for assuring the public that drugs are safe and effective for public use.

felony  A felony is a crime that is usually punishable by imprisonment.
fetal monitoring  Fetal monitoring is a method of evaluating the fetus during labor. Fetal monitoring can be done either externally with a toco monitor or internally using scalp electrodes. Monitoring of both fetal heart tones and uterine contraction can be accomplished.

filtration  Filtration is the process whereby particles are removed from a solution by allowing the liquid portion to pass through a semipermeable membrane.

fistula  Fistula is a blind pouch between two adjacent structures or an abnormal tube-like connection between a body cavity and the skin or another body cavity.

fundus  The fundus is the top portion of the uterus.

gastrinoma  Gastrinoma is a tumor that secretes gastrin.

glaucoma  Glaucoma is a group of eye diseases characterized by an increase in pressure within the eye.

glomerulonephritis  Glomerulonephritis is an inflammation of the kidney caused by an antigen antibody reaction.

glucocorticoid  Glucocorticoid is a classification of adrenal cortical hormones that are active in protecting against stress and affecting protein and carbohydrate metabolism.

goiter  A goiter is a benign hyperplasia of the thyroid.

Gravidity  Gravidity is the number of pregnancies.

Hallucination  Hallucination is a false sensory perception experienced during psychosis.

Hashimoto’s thyroiditis  Hashimoto’s thyroiditis is an inflammation of the thyroid gland resulting in antibody production against thyroid hormone. The result will be hypothyroidism.

Heart block  Heart block is a condition in which the conduction system of the heart—the sinoatrial node and atrioventricular node, Bundle of His, purkinje fibers—fail to conduct impulses normally. Heart block is caused by structural changes, toxic drug effects, or nutrition or endocrine disorders.
Hegar’s sign  Hegar’s sign is easy flexion of the lower uterine segment during bimanual exam. It occurs in about the second or third month.

Heimlich maneuver  The Heimlich maneuver is a technique of removing a foreign object from the airway.

HELLP  HELLP stands for hemolysis, elevated liver enzymes, low platelets. Found in pregnancy, this disorder results in a bleeding and clotting process and possible liver failure.

hemarthrosis  Hemarthrosis means bleeding within the joint.

hematuria  Hematuria is the presence of blood in the urine.

hemolysis  Hemolysis is the destruction of red blood cells.

hemoptysis  Hemoptysis is the expectoration of blood.

hepatomegaly  Hepatomegaly is an enlargement of the liver.

heritage  Heritage is the belief regarding self that is passed on through the generations.

herpes  Herpes virus is a virus resulting in vesicular lesions. There are several types, including herpes simplex, herpes zoster, genital herpes, and varicella.

heterograft  Heterograft is a skin graft obtained from another species.

histoplasmosis  Histoplasmosis is a systematic fungal infection commonly found in the lungs. It’s found in bird droppings.

homograft  Homograft is a skin graft obtained from the same species; also called an allograft.

hormones  Hormones are substances, originating in an organ, a gland, or a body part, which are conveyed through the blood to another body part. This substance stimulates that body part to increase or decrease functional activity or to secrete another hormone.

human papilloma virus  Human papilloma virus is a human virus resulting in wart-like lesions. HPV on the genital area predisposes the client to vaginal and cervical cancer.

hydatidiform mole  A hydatidiform mole is a pregnancy that results from a blighted ovum. This causes rapid growth of a cyst inside the uterus.

hyperopia  Hyperopia is an error in refraction caused by light waves focusing behind the retina; it’s also called farsightedness.

hyperpnea  Hyperpnea is an increased rate and depth of respirations.

hyperpyrexia  Hyperpyrexia is a marked increase in body temperature.

hypertension  Hypertension is a disorder characterized by an elevated blood pressure above 140/90 on three occasions.

hypertensive crisis  Hypertensive crisis refers to severe elevations in blood pressure with diastolic readings greater than 130 mm Hg.

hyperthermia  Hyperthermia refers to a body temperature above 98.6° F.

hypocapnia  Hypocapnia means decreased carbon dioxide in the blood.
hypochondriasis  Hypochondriasis is a condition of extreme preoccupation or fear of disease.

hypoxemia  Hypoxemia means decreased oxygen tension in the blood.

hypoxia  Hypoxia means decreased concentration of oxygen in inspired air.

I

ileal conduit  Ileal conduit is a urinary diversion created by transplanting the ureters into a prepared and isolated segment of the ileum.

ileal reservoir  Ileal reservoir is a urinary diversion created by transplanting the ureters into a surgically created cavity made from a prepared segment of the ileum.

implantable cardioverter  An implantable cardioverter is a device that monitors the rhythm of the heart and delivers cardioversion or defibrillates to the client if a life-threatening arrhythmia is recorded.

incident report  An incident report is a report that is filed when an error has occurred. An example of this is a medication error.

informed consent  Informed consent is consent given by a client who understands the reason for a treatment or procedure.

intentional torts  An intentional tort is a wrongful act by a person who means to cause harm.

intermediate phase of burn injury  Intermediate phase of burn injury is the period of 48–72 hours following a major burn injury.

intradermal  Intradermal administration of a drug is administration of the drug directly under the derma or into the intracutaneous space.

intramuscular  Intramuscular administration of a drug is the injection of the drug into the muscle.

intraocular pressure  Intraocular pressure is tension within the eyeball.

invasion of privacy  Invasion of privacy is invasion of another’s person or space without consent.

isoimmunization  Isoimmunization causes antibodies to be formed against certain properties of incompatible blood. It’s found especially in Rh negative mothers who have been exposed to an Rh positive baby.

isometric exercise  Isometric exercise involves keeping a body part still while alternating contraction and relaxation of the muscle.

J

jaundice  Jaundice is a yellowish discoloration to the skin due to elevated bilirubin levels in the blood.

jobst garment  A jobst garment is a pressure garment worn to decrease the formation of scar tissue.

K

kyphosis  Kyphosis is an abnormal posterior curvature of the spine.
labor  Labor is the work process used to expel the baby from the uterus.

legally blind  Legally blind means a vision of 20/200.

lens  Lens is the transparent biconvex structure of the eye that focuses light waves.

Leopold’s maneuvers  Leopold’s maneuvers are maneuvers used to palpate the abdomen of a pregnant client to determine presentation and position.

leukopenia  Leukopenia is a decrease in the white blood cell count below the normal level.

liable  Liable means legally responsible. A healthcare worker is liable for actions that fail to meet the standard of care.

licensure  Licensure in nursing pertains to giving permission to practice nursing. It is an official release issued by the state.

lightning  Lightning is the descent of the fetus into the true pelvis.

linea nigra  Linea nigra is the dark line up the abdomen caused by hormonal changes in pregnancy or with birth control pills.

living will  A living will is an advanced directive prepared by a client when he is alive, competent, and able to make decisions regarding refusal of future healthcare.

lordosis  Lordosis refers to an anterior convex curve of the lumbar spine.

Lund and Browder method  The Lund and Browder method is a means of determining TBSA for burns using special charts that allow for changes with growth.

macular degeneration  Macular degeneration is the degeneration of the macular area of the retina that is important in visualization of fine details.

malaise  Malaise is a reported sense of discomfort, weakness, or feeling “run down.”

malice  Malice means intent to commit an unlawful act or cause harm to another without legal justification or excuse.

malpractice  Malpractice is the failure to perform a duty or performing a duty incorrectly and harm results to the client.

malpractice insurance  Malpractice insurance protects the healthcare worker from monetary loss in the case of a lawsuit involving nursing practice.

McDonald’s sign  McDonald’s sign refers to a sign or rule to determine the expected fundal height during the second and third trimester.

meconium ileus  Meconium ileus is a bowel obstruction caused by an impacted meconium.

melena  Melena refers to black, tarry stools. The condition is due to the presence of blood in the gastrointestinal tract.

Meniere’s disease  Meniere’s disease is a disease of the inner ear with symptoms of tinnitus, vertigo, a sensation of fullness in the ears, and progressive hearing loss.

miotic  Miotic is a medication that causes the pupil to constrict.
misdemeanor  A misdemeanor is a crime of a lesser nature usually punishable by a fine or a sentence in a local prison for less than 1 year.

multigravid  A multigravid woman is a woman who has experienced more than one pregnancy.

mydriatic  Mydriatic is a medication that causes the pupil to dilate.

myocardial infarction  A myocardial infarction is a condition caused by the blockage of one or more coronary arteries.

myopia  Myopia is an error in refraction caused by light waves focusing in front of the retina; it’s also called nearsightedness.

myxedema  Myxedema is hypothyroidism in the adult client.

neuroleptic malignant syndrome  Neuroleptic malignant syndrome is the extreme elevation in temperature occurring as a side effect from antipsychotic medication.

neurosis  Neurosis is a disorder involving extreme anxiety.

neurotransmitter  Neurotransmitter is a chemical found in the nervous system that facilitates the transmission of nerve impulses across the synaptic gap.

nonurgent  Nonurgent is a category of triage involving episodic illness that can be cared for within 24 hours.

nulliparity  Nulliparity refers to a female who has not given birth to a child.

Nurse Practice Act  Nurse Practice Act is the legal act passed by Congress that spells out the rights and responsibilities of the nurse in practice.

nursing implication  Nursing implications are the results of drug therapy. The nurse is concerned with the nursing implications because they indicate whether the plan of care is working.

oligohydramnios  Oligohydramnios is a condition in which too little amniotic fluid is present due to a loss of amniotic fluid or due to a lack of production of amniotic fluid. The amount of amniotic fluid can be estimated by ultrasound.

oliguria  Oliguria is decreased urinary output.
oral  Oral administration is administering a drug by swallowing.

otitis media  Otitis media is an inflammation of the middle ear.

otosclerosis  Otosclerosis is a hardening of the stapes.

ototoxic  Ototoxic means medications that damage the acoustic nerve.

ovulation  Ovulation is the process of releasing an ovum from the ovaries. Ovulation occurs approximately 16 days from the first day of the last menstrual period.

oxytocin  Oxytocin is a pituitary hormone that causes the uterus to contract.

P

pacemaker  A pacemaker is a specialized cell or group of cells that can spread to other regions of the heart. An artificial cardiac pacemaker is an electrical device that can substitute for a defective natural pacemaker and control the beating of the heart.

pain disorder  Pain disorder is a somatiform disorder characterized by severe pain in one or more areas that interfere with normal bodily functions.

palliative  Palliative refers to symptomatic relief.

pallor  Pallor refers to skin that is without color.

palm method  Palm method is a way of determining TBSA for scattered burns using the client's palm, which represents 1% of TBSA.

Papanicolaou smear  Papanicolaou smear is a test commonly called a Pap smear. A Pap smear is done to determine early cervical cancer. It is done by scraping the cervix and applying cells to a glass plate for examination.

para  Para is the number of pregnancies that survive past viability.

paresis  Paresis refers to partial paralysis.

paresthesia  Paresthesia is a sensation of numbness and tingling.

Parkland formula  The Parkland formula is a method of determining fluid replacement for those with a major burn injury.

pathological fracture  Pathological fracture is a fracture caused by a disease.

Patient's Bill of Rights  The Patient's Bill of Rights is a bill that was passed to ensure that the client receives equal and unbiased treatment. Some of the examples of clauses found in the Patient's Bill of Rights are the client's right to refuse treatment and to be informed of treatment.

peak  Peak is the highest serum blood drug level.

personality disorder  Personality disorder refers to rigid, maladaptive patterns of behavior.

pH  pH is the degree of acidity or alkalinity of a substance. A determination of 7.40 is neither alkaline nor acid. The normal range of pH is 7.35–7.45. Below 7.40 is acidic; above 7.40 is alkaline.

pharmacodynamics  Pharmacodynamics is the study of drugs' effects on the body.
**pharmacokinetics** Pharmacokinetics is the study of the metabolism and action of drugs with particular emphasis on the absorption, duration, and distribution in the body and the method of excretion.

**pharmacotherapeutics** Pharmacotherapeutics is the study of drugs’ effects on disease.

**pica** Pica is eating any form of non-nutrient material such as clay, corn starch, paper, or lead paint.

**piloerection** Piloerection is the appearance of gooseflesh or goose bumps.

**pleural effusion** Pleural effusion is a collection of fluid in the serous membrane that lines the lungs.

**pleurisy** Pleurisy is the inflammation of the pleural sac.

**pneumonia** Pneumonia is the inflammation of the lungs.

**polyarteritis nodosa** Polyarteritis nodosa is a disease of the small or medium arteries characterized by inflammation and necrosis that results in diminished blood flow to areas supplied by the affected vessels.

**polycythemia** Polycythemia refers to elevations in the number of red blood cells.

**polyhydramnios** Polyhydramnios is an accumulation of too much amniotic fluid. Polyhydramnios can be detected by ultrasound examination.

**postcoital** Postcoital refers to the time after sexual intercourse.

**postictal** Postictal refers to the time after a seizure.

**postpartum** The postpartum period is the time period immediately after delivery of the fetus and placenta.

**preeclampsia** Preeclampsia is a disorder characterized by elevated blood pressure, proteinuria, and edema.

**premature rupture of the membranes** Premature rupture of the membranes is a rupture of the membranes more than 24 hours prior to the onset of true labor.

**presbycusis** Presbycusis is the progressive hearing loss associated with aging.

**presbyopia** Presbyopia is a visual change associated with aging in which the crystalline lens loses the ability to accommodate to near vision.

**preterm labor** Preterm labor is labor that occurs earlier than 37 weeks gestation.

**proliferation** Proliferation refers to rapid reproduction.

**prostaglandin gel** Prostaglandin gel is a gel that is used to ripen the cervix.

**pruritis** Pruritis refers to itching of the skin.

**psychosis** Psychosis is a disorder characterized by thinking that is not based in reality.

**pulmonary embolus** Pulmonary embolus is a particulate matter that enters the systemic circulation and lodges in the pulmonary vessels.

**pulmonary surfactant** Pulmonary surfactant is a surface factor agent that decreases the surface tension.
pulse pressure  Pulse pressure is the difference between the diastolic and systolic pressures.

purine  Purine is the end product of nucleoprotein digestion.

Raynaud's phenomenon  Raynaud's is a vasospastic disease of the small arteries and arterioles. Patients have intermittent vasospastic attacks of varying severity and frequency caused by exposure to cold.

regulatory laws  Regulatory laws are laws that spell out the rules and regulations of the practice of nursing.

rehabilitative phase of burn injury  Rehabilitative phase of burn injury refers to the last stage of a burn injury.

religion  Religion is the belief and practices having to do with a higher being.

respiratory syncytial virus  Respiratory syncytial virus is an organism responsible for causing bronchiolitis.

restraints  Restraints are methods used to prevent movement of a client. There are two types of restraints: mental or physical.

retinal detachment  Retinal detachment is the separation of the inner sensory layers of the retina from the outer pigmented epithelium.

Rinne's test  Rinne's test is used to compare bone conduction with air conduction. The examiner places and maintains a vibrating tuning fork on the mastoid process of the client’s ear until the client can no longer hear it. The tuning fork is then placed at the outer ear. A normal finding is for the client to continue to hear the vibrations when the tuning fork is placed at the outer ear. This indicates that air conduction exceeds bone conduction.

rubella  Rubella is German measles.

Rule of Nines  Rule of nines is a method of determining TBSA using percentages of nine for major body areas.

schizophrenia  Schizophrenia is a psychotic disorder characterized by hallucinations and delusions due to alterations in neurotransmitters such as serotonin and dopamine.

scleroderma  Scleroderma is a progressive hardening of the skin.

Sensorineural hearing loss  Sensorineural hearing loss is caused by damage to the auditory nerve.

rubella  Rubella is German measles.

Seattle

rubella  Rubella is German measles.

Rule of Nines  Rule of nines is a method of determining TBSA using percentages of nine for major body areas.

somatization disorder  Somatization disorder is a conversion of mental experiences into bodily symptoms.
spleenectomy  Spleenectomy is the surgical removal of the spleen.

spleenomegaly  Spleenomegaly refers to the enlargement of the spleen.

steatorrhea  Steatorrhea is a fat, frothy stool common in those with cystic fibrosis and celiac disease.

stenosis  Stenosis is a narrowing or closure of a passageway.

sexually transmitted infections  Sexually transmitted infections (STIs) are infections transmitted by blood and other body fluids. Some common examples of these are gonorrhea, syphilis, chlamydia, and genital herpes.

stridor  Stridor refers to crowing respirations due to obstructed airway.

subcutaneous  Subcutaneous administration of a drug is the injection of the drug into the subcutaneous tissue.

syndrome of inappropriate antidiuretic hormone  SIADH is a collection of symptoms characterized by an abnormal production or sustained secretion of antidiuretic hormone. The result of SIADH is altered urinary output. Frequently, SIADH is characterized by polyuria with a very low specific gravity (diabetes insipidus).

synergistic  Synergistic is a term used to describe a drug that works to enhance the action of another.

systemic lupus erythematosus  Systemic lupus erythematosus is an autoimmune disorder that involves multiple organ systems.

systole  Systole is the contraction phase of the ventricle. Systolic pressure is normally 90–135 mm Hg.

tachypnea  Tachypnea means rapid respirations.

tension pneumothorax  Tension pneumothorax is a type of pneumothorax in which air enters the chest cavity but cannot escape.

tetany  Tetany is a neurological disorder characterized by intermittent tonic spasms that usually involve the extremities.

thrombocytopenia  Thrombocytopenia is a decrease in platelet count below the normal level.

thrombophlebitis  Thrombophlebitis is an inflammation of a vein with a clot.

thyroid-stimulating hormone  TSH is a hormone secreted by the anterior portion of the pituitary gland that stimulates the thyroid gland to secrete thyroxine and triiodothyronine.

thyroid storm  A thyroid storm is an abrupt onset of fever, sweating, congestive heart failure, tachycardia, and cardiac collapse. A thyroid storm is caused by a sudden release of thyroid hormone.

time orientation  Time orientation is the view of time in the present, past, or future.

tinnitus  Tinnitus is a reported sensation of ringing in the ears.

tonic movements  Tonic movements refers to contractions in movement.

TORCH  TORCH stands for a combination of teratogenic illnesses: toxoplasmosis, rubella, cytomegalovirus, and herpes. TORCHS includes syphilis.
tort  A tort is a wrongful act committed on a person or his property.

total body surface area  TBSA is the cumulative percent of body areas affected by burns.

Toxic Shock Syndrome  Toxic Shock Syndrome is a potentially life-threatening streptococcal or staphylococcal infection.

toxicity  Toxicity is the degree of being poisonous.

toxoplasmosis  Toxoplasmosis is a protozoan found in many mammals and birds.

tradition  A tradition is a practice passed on from generation to generation, usually by the elders in the community.

transcutaneous electrical nerve stimulation unit  A TENS unit is a battery-operated unit with electrodes applied to the skin. The TENS unit produces a tingling, vibrating, or buzzing sensation at a pain site. It works by stimulating nonpain receptors in the same areas that transmit the pain.

transphenoidal hypophysectomy  A transphenoidal hypophysectomy is the surgical removal of the stem of the pituitary gland using an anterior approach through the sphenoid sinuses.

trichomonas  Trichomonas is a flagella organism that causes a vaginal discharge. Flagel is the treatment of choice.

trough  Trough is the lowest drug level.

Trousseau's sign  Trousseau's sign is a method used to detect hypocalcemia. Trousseau's sign can be elicited by placing the blood pressure cuff on the lower arm and looking for a carpopedal spasm.

ultrasonography  Ultrasonography is a method of examining the uterine content. An ultrasound uses ultrasound waves to visualize internal organs and the fetus. It can also be used to visualize tumors and other abnormalities.

umbilical cord  The umbilical cord is the lifeline from the mother to the baby. It contains two arteries and one vein.

Uniform Determination of Death Act  The Uniform Determination of Death Act was written by the National Conference of Commissioners on Uniform State Laws to be used as a model for the purpose of providing a standard or uniform code for determining death among the individual states.

upper respiratory infection  An upper respiratory infection is a general term used for any infectious process of the nasal passages, pharynx, or bronchi.

urgent  Urgent is a category of triage requiring care for serious but not life-threatening illness.

valsalva maneuver  The valsalva maneuver is the attempt to forcibly exhale against a closed glottis, nose, and mouth.

value  A value is a standard that people use to assess themselves. It is a belief about what is worthwhile.
varicose veins  Varicose veins are distended, dilated superficial veins. This condition can occur in almost any part of the body but is most common in the lower extremities.

ventricular tachycardia  Ventricular tachycardia is an extremely rapid rhythm of the ventricle. It is a lethal arrhythmia that leads to ventricular fibrillation and standstill.

W

Webber test  Webber is a test for one-sided deafness. The examiner places a vibrating tuning fork in the middle of the client’s head. If the client has an alteration in hearing, she will perceive the sound more on the diseased side.

Wharton’s jelly  Wharton’s jelly is the covering of the umbilical cord.
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