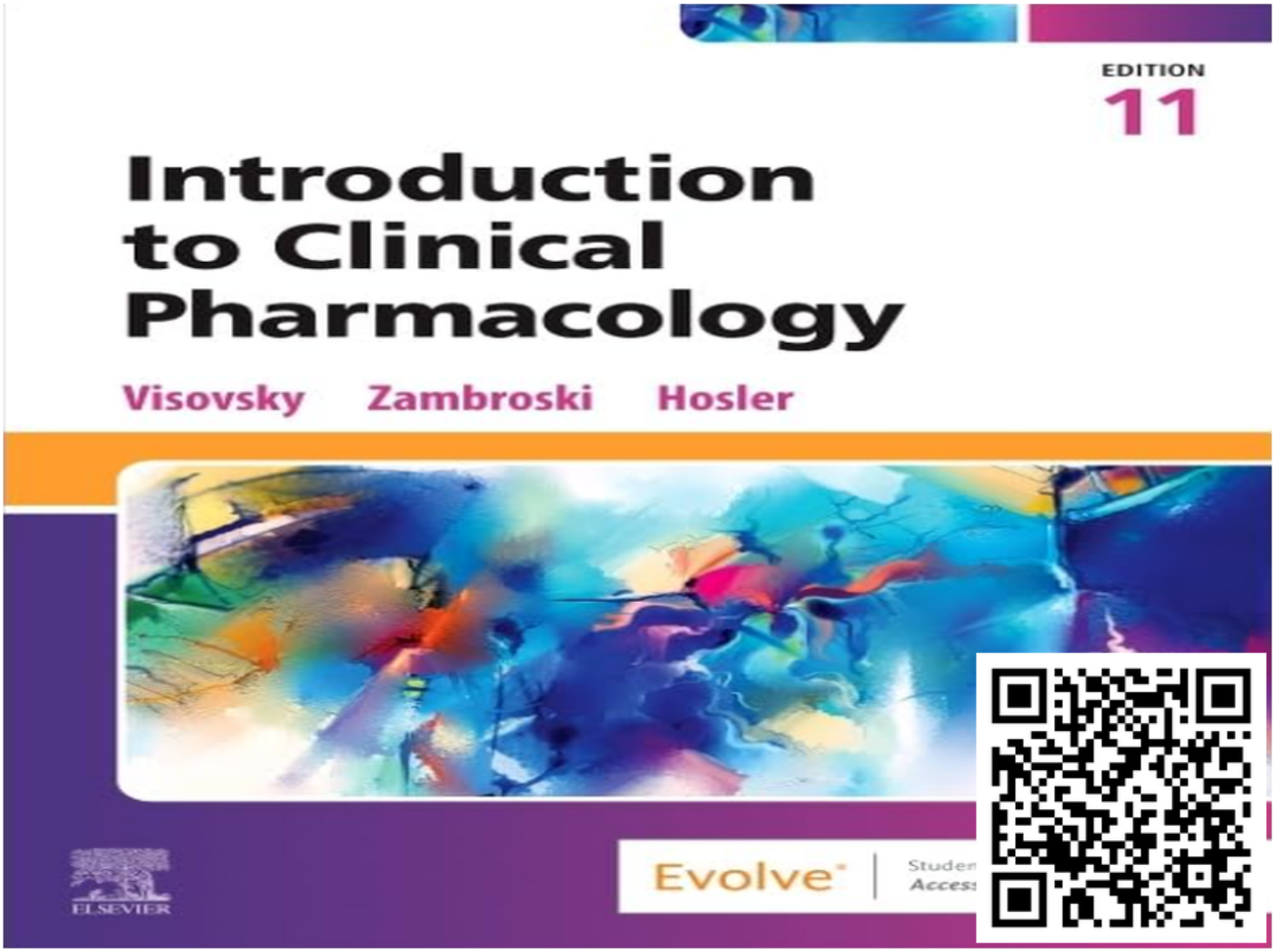

EDITION
11

Introduction to Clinical Pharmacology

Visovsky Zambroski Hosler

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EDITION
11

Introduction to Clinical Pharmacology

Constance G. Visovsky, PhD, RN, ACNP, FAAN
Professor and Lewis & Leona Hughes Endowed Chair in Nursing Science
College of Nursing
University of South Florida
Tampa, Florida

Cheryl H. Zambroski, PhD, RN
Associate Professor
College of Nursing
University of South Florida
Tampa, Florida

Shirley Meier Hosler, RN, BSN, MSN
Adjunct Faculty
Santa Fe Community College
Santa Fe, New Mexico

ELSEVIER

Elsevier
3251 Riverport Lane
St. Louis, Missouri 63043

INTRODUCTION TO CLINICAL PHARMACOLOGY, 11TH EDITION ISBN: 978-0-443-11336-9

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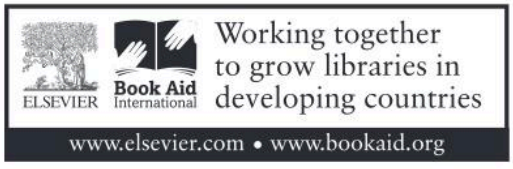
International Standard Book Number: 978-0-443-11336-9

Senior Content Strategist: Brandi Graham
Content Development Specialist: Andrew Schubert
Publishing Services Manager: Deepthi Unni
Project Manager: Nayagi Anandan
Design Direction: Renee Duenow

Printed in India

Last digit is the print number: 9 8 7 6 5 4 3 2 1



Contributor

M. Linda Workman, PhD, RN, FAAN
Visiting Professor
Case Western Reserve University
Cleveland, Ohio

Reviewers

Larissa Brown, MSN, RN
Educator
Three Rivers College
Poplar Bluff, Missouri

Tammy R. Dean, BSN, RN
Director
Prince William County School of Practical Nursing
Manassas, Virginia

Diane Duffy, RN, BSN, MEd
Practical Nursing Director
Chisholm Trail Technology Center
Omega, Oklahoma

James Graves, PharmD, MBA
University of Missouri Health Care
Columbia, Missouri

James D. Holland, PhD, RN, CNL, RRT, RCP
Associate Dean of Nursing and Allied Health
North Florida College
Madison, Florida

Denise King, MSN, RN
Practical Nursing Program Lead Instructor
Beaufort County Community College
Washington, North Carolina

Jill Kirk, RN, BSN
Director of Nursing
Tennessee College of Applied Technology
Paris, Tennessee

Leslie Merritts, RN, BSN
Director of Practical Nursing
Treasure Coast Technical College
Vero Beach, Florida

Tina Spagnola, MSN, RN, NPD-BC, NE-BC
Program Chair & Nursing Instructor
Pinellas Technical College
Clearwater, Florida

Preface

This 11th edition of *Introduction to Clinical Pharmacology* offers updated drug information from a team of committed authors who have years of experience in clinical care, in nursing education, and in teaching pharmacology content. Understanding and retaining knowledge of pharmacology are critical components of nursing care and patient safety. The author team strived to make the pharmacology learning experience one that combines updated information with drug safety cues and memory joggers to initiate information recall. In addition, features such as Lifespan Considerations link the information to care of the patient across all ages as appropriate. Each chapter contains a brief review of the body system and potential health problems. This format promotes high levels of content retention and also incorporates the newest NCLEX® testing blueprint format.

This textbook is written using the second person throughout to engage students and help them understand the nursing responsibilities required for use in the clinical setting. The textbook's new organization and style are intended to engage students and help them develop an in-depth understanding of the "need to know" content that is critical for safely administering medications in all environments in which licensed practical nurses/vocational nurses (LPNs/VNs) are employed. The components of the nursing process aligning with the LPN/LVN role are emphasized. All chapters, test questions, case studies, and illustrations have been greatly expanded to explain drug actions and techniques for administration. In addition, the 11th edition has an added chapter focused on drugs for anesthesia and analgesia and cancer therapeutics.

The textbook uses current terminology for education and healthcare practice. For example, more settings include nurse practitioners and physician assistants as legal prescribers in addition to the physician. To reflect this change, the term healthcare provider is used throughout. When discussing individuals receiving nursing care, the authors prefer the use of the term *patient* as opposed to the term *client*.

Learning Outcomes now replace Chapter Objectives. These outcomes concisely and clearly let the student know which content represents the *highest priority* for safe medication administration. All drugs and drug categories no longer in common usage, or those that do not apply to the LPN/VN role, have been eliminated. The textbook also helps students learn to make use of prevailing technology in drug delivery. Internet resources and references have been identified and highlighted within the Bookmark This feature.

Newly created drug tables are divided by drug category and organized to provide students with concise access to mechanisms, common adult drug dosages, and essential nursing implications for administration and patient teaching. Key terms critical for pharmacology are listed at the beginning of each chapter and include phonetic pronunciations, definitions, and page numbers where each term is first used. This textbook takes advantage of the use of medical and nonpharmacologic terminology, with short definitions placed alongside the terms and in the Glossary to aid student reading and retention.

Throughout this textbook, ensuring patient safety remains a major theme. The safety features are the Top Tip for Safety boxes that highlight very specific precautions, unusual drug dosages, or critical nursing interventions. This author team deeply believes that it is critical to provide patient safety information to reduce drug errors. In addition, patients and families who understand the why of directions are more likely to adhere to them. Toward this purpose, nursing actions are accompanied by the appropriate rationale. In the discussion of each drug category, the sections on patient and family teaching provide direct examples of exactly what to teach patients and families, as well as the rationales for why these actions or precautions are necessary. Specific content on Lifespan Considerations for drug administration related to older adults and pediatric patients and for pregnancy and lactation are appropriately placed for maximum retention.

Other user-friendly learning techniques provided in this streamlined and updated edition include features such as Memory Jogger and mnemonics. End-of-chapter review questions have been changed to reflect the latest NCLEX® format for developing clinical judgment, including multiple-choice, "select all that apply," and Next-Generation NCLEX–style questions. These formats help the student to think through responses rather than focus on rote memorization. All clinical chapters have newly developed case studies designed to help students learn to apply specific content.

The Student Study Guide has been revised. The instructor's TEACH resource is completely updated based on the revised Learning Outcomes for each chapter. The test bank has also been revised with newly formatted Next-Generation NCLEX® questions that

require the student to apply knowledge and prepare for the NCLEX® examination.

ORGANIZATION AND FEATURES

This textbook has been updated to include updated drugs, to remove drugs and terms that are no longer used in practice, and to add tables for each drug classification that list common drugs for each class and normal adult dosage ranges. Throughout this text, medications are referred to as drugs, and the drug prescriber is called the healthcare provider because this can be a physician, advanced practice nurse, certified registered nurse anesthetist, or physician's assistant. The text has been reorganized into three units totaling 23 chapters to streamline access to specific content areas. Chapter-ending Get Ready for Next-Generation NCLEX® Examination questions have been updated and revised throughout the text and use mostly application questions and Next-Generation NCLEX-style questions to provide students with practice in answering these types of examination questions.

UNIT I

The first unit provides an overview of general principles of pharmacology, including the nursing process as it relates to drug administration, and safe practices in drug administration that set the knowledge base for understanding specific drug categories. For example, this edition includes information on unique aspects of the contemporary LPN/LVN practice environment, including working in teams with medication assistants, the registered nurse, the healthcare provider, and other healthcare professionals.

Safe practice is accentuated throughout Chapter 1, with a guide to planning and giving drugs to patients. The updated *9 Rights of Drug Administration* is presented in detail and includes the right of the patient to refuse a drug. Although giving drugs properly is important, equally important are evaluating the expected drug response, understanding common side effects, and knowing how to handle adverse events from drugs.

In Chapter 2, the legal, regulatory, and ethical content related to giving drugs in the LPN/LVN role has been updated to include a thorough discussion of schedule drugs, drug diversion, and a distinction between addiction, drug abuse and misuse, and physical dependence. Technology-associated patient identification, drug orders, and the giving and recording of drugs in either a standard Kardex or electronic health record are covered. In Chapter 3, the student is acquainted with the Principles of Pharmacology, including drug absorption, distribution, metabolism and elimination to provide a basis for the drug knowledge in the following chapters.

UNIT II

Unit II is dedicated to the principles and calculations related to drug administration. The beginning of the unit focuses on drug calculation methods, such as fractions, ratio, and proportion, and dimensional analyses to give an in-depth review of drug calculation approaches used in different educational settings. Unit II is concerned with drug calculation, preparation, and administration. LPN/LVNs work in a variety of settings, including acute care, but are often employed in assisted nursing centers, nursing homes, and care centers in which high-tech drug administration systems may not be used. Thus they need to be able to give medications safely and accurately, relying on their own ability to calculate the drug dosages accurately. Chapter 4 includes the "need to know" content related to drug calculation and includes basic fractions, ratio and proportion, and dimensional analysis, a mathematical technique that is being adopted by many nursing programs for drug calculation. Intravenous drugs, oral drugs, parenteral drugs, and intravenous infusion calculation are presented in an organized, step-by-step manner. The application of topical, transdermal, mucous membrane, and eye and ear drugs is also presented with accompanying illustrations to help the student visualize the process while reading the material.

UNIT III

Drug classification groups provide essential information for student retention on select drug categories. Unit III focuses on content that has application to treatment purpose (i.e., anti-infective drugs), and chapters are associated with body systems, such as renal, urinary, and cardiovascular systems. By grouping drugs using the drug classification system, students quickly learn about individual drugs by understanding their drug class. The narrative content in the text focuses on major drug groups, and coverage of specific drugs appears in reference tables. A brand-new chapter covering drugs for cancer treatment has been added. In addition, special attention has been placed on drugs for reproductive health, the treatment of thyroid and adrenal problems and osteoporosis. All chapters have been updated in this edition to represent the latest clinical drug treatment information. Each drug class is presented in a consistent format with a separate Patient and Family Teaching section. Even though additional drug references can be used by students, the author team believes it is critical that students have a base knowledge of the potential dosage ranges for adult drugs to promote safe, effective practice. Thus drug dosage ranges are included in tables with each chapter in Unit III.

Chapter-ending NCLEX® Examination questions and Case Studies require the student to apply information gained from each chapter to address patient scenarios. Suggested answers to the questions and Case Studies are provided online in the TEACH Instructor Resources on Evolve at http://evolve.elsevier.com/Visovsky/LPNpharmacology.

TEACHING AND LEARNING PACKAGE FOR THE INSTRUCTOR

TEACH INSTRUCTOR RESOURCES

TEACH Instructor Resources on Evolve, available at http://evolve.elsevier.com/Visovsky/LPNpharmacology, provide a wealth of material to help you make your pharmacology instruction a success.

In addition to all of the Student Resources, the following are provided for faculty:

- The Exam View Test Bank has been completely updated with approximately 480 questions that feature Next-Generation NCLEX–style questions. Each question is coded for the correct answer, rationale, page reference, and cognitive level.
- TEACH Lesson Plans, based on textbook chapter Learning Objectives, serve as ready-made, modifiable lesson plans and a complete roadmap to link all parts of the educational package. These concise and straightforward lesson plans can be modified or combined to meet your particular scheduling and teaching needs.
- PowerPoint Presentations provide approximately 450 text slides for classroom or online presentations.
- Open-Book Quizzes for each chapter in the textbook help to ensure that your students are reading and comprehending their textbook reading assignments.
- An Image Collection includes all the illustrations and photos from the textbook.
- Suggestions for Working with Students Who Speak English as a Second Language help you promote the success of ESL learners.
- Answer Keys to the Critical Thinking Questions, Case Studies, and Study Guide activities and exercises are available for your own use or for distribution to your students.

FOR THE STUDENT

Evolve Student Resources, available at http://evolve.elsevier.com/Visovsky/LPNpharmacology, include more than 400 interactive Review Questions for the NCLEX-PN® Examination, Video Clips, an Audio Glossary with pronunciations for more than 150 Key Terms, 12 Interactive Drug Dosage Calculators, newly proposed FDA Guidelines on Pregnancy and Lactation, and links to updated information on the Top 200 Prescription Drugs, a Bibliography, and a detailed Glossary.

A comprehensive Study Guide, available separately, includes Worksheets and Review Sheets with an enhanced focus on critical thinking, prioritizing, care of older adults, and cultural considerations. The exercises focus on promoting medication safety and prevention of drug errors.

In working with patients, the nursing student will quickly learn that giving medications is one of the most challenging parts of the nursing role. A nurse who develops the knowledge and skills needed to correctly give medications will be noticed and recognized with respect by both patients and colleagues in the healthcare system. Both the responsibilities and the personal rewards are great.

Constance G. Visovsky, PhD, RN, ACNP, FAAN
Cheryl H. Zambroski, PhD, RN
Shirley Meier Hosler, RN, BSN, MSN

Acknowledgments

The eleventh edition of *Introduction to Clinical Pharmacology* represents a collaboration among three experienced nurse educators and clinicians who have taught pharmacology to all levels of nursing students. The 11th edition brings these authors back together with updated information, new drugs, and what the LPN/LVN needs to know to administer medications safely and monitor the patient for both expected and adverse effects. I remain grateful to my colleagues, Dr. Zambroski and Ms. Hosler, for their excellence and dedication to this work and for providing a textbook and test bank that will prove to be critical resources for the LPN/LVN student and faculty.

The author team remains extremely grateful to Dr. M. Linda Workman, our dear friend and mentor, who continues to provide her support and guidance to this author team. Lifetime mentors are few and far between, so we acknowledge her commitment and support.

The author team is grateful for the Elsevier editorial, production, marketing, and design staff. Special thanks to Brandi Graham, Senior Content Strategist, for her guidance to this author team; and to Andrew Schubert, Content Development Specialist, for his editorial guidance and support to keep the text production on track.

On behalf of the author team, I would like to express our eternal gratitude to our families and friends, who supported our endeavors on this project and were our cheerleaders throughout the process. I would like to acknowledge the love and support of my husband, Bob Visovsky, who sustained me during this project. Thank you to my students, who inspire me every day to be a better teacher. Last, I would like to thank my God for presenting this opportunity to me and for providing the fortitude to take this textbook to completion.

Constance (Connie) G. Visovsky, PhD, RN, ACNP, FAAN

Thank you to my terrific colleagues, Dr. Visovsky, Ms. Hosler, and Dr. Passmore, as well as to our students, who challenge and cheer us as we continue to learn each day. A special thank you to my husband, James, for his ongoing love and support during this project.

Cheryl H. Zambroski, PhD, RN

Thanks to every student who has shared a path with me along the way: I could never have achieved the process of learning how to write if you hadn't first taught me how to teach. To my colleagues, Connie, Cheryl, and Denise, you are the best of the best!

Shirley Meier Hosler, RN, BSN, MSN

About the Authors

CONSTANCE G. VISOVSKY, PHD, RN, ACNP, FAAN

Constance (Connie) G. Visovsky received her BS and MS degrees in nursing from the University of Rochester, Rochester, New York, and her PhD from Case Western Reserve University, Cleveland, Ohio. She is an acute care nurse practitioner, specializing in the treatment of patients with cancer. She is considered an expert in the area of chemotherapy-induced peripheral neuropathy and has grants and publications on this topic to her credit. Dr. Visovsky is an experienced nurse educator and scientist. She is currently Professor and the Lewis & Leona Hughes Endowed Chair in Nursing Science at the University of South Florida, College of Nursing.

CHERYL H. ZAMBROSKI, PHD, RN

Cheryl H. Zambroski received her diploma in nursing from Rockford Memorial Hospital School of Nursing, her BS and MS in Nursing from the University of Illinois, and her PhD in Nursing from the University of Kentucky. Her clinical experiences focused on adult health in areas that include emergency nursing, critical care, and medical-surgical nursing. She also worked as a clinical nurse specialist in cardiovascular and thoracic nursing. Her teaching career began at Jefferson Community College in Louisville, Kentucky. She later taught a variety of courses in the undergraduate program and the clinical nurse specialist track at the University of Louisville. Currently, Dr. Zambroski teaches pharmacology, public health, and mental health nursing at the University of South Florida College of Nursing.

SHIRLEY MEIER HOSLER, RN, BSN, MSN

Shirley Meier Hosler received her AAS from Maria College in Albany, New York, later receiving her BSN from the University of New Mexico and MSN from the University of Illinois, Chicago. Shirley has more than 40 years of clinical, administrative, educational, and academic experience, having worked as a staff nurse, held numerous administrative nursing positions, and served on the faculty of colleges and universities. Her educational accomplishments include the development of online and classroom programs for nursing, emergency medical personnel, and paramedic professionals. Shirley has a broad base of expertise with specific concentration in the areas of prehospital medicine, adult medicine, and critical care. She has received numerous awards for her unique and innovative educational accomplishments.

To the Student

READING AND REVIEW TOOLS

- **Learning Outcomes** introduce the chapter topics.
- **Key Terms** are listed with page number references, and difficult medical, nursing, or scientific terms are accompanied by simple phonetic pronunciations. Key terms are considered essential to understanding the professional language and chapter content. Key terms are defined within the chapter, are in color the first time they appear in the narrative, and are briefly defined in the text, with complete definitions in the Glossary.
- Each chapter ends with a **Get Ready for the Next-Generation NCLEX® Examination!** section that might include (1) **Key Points** that reiterate the chapter outcomes and serve as a useful review of concepts, (2) an extensive set of **Review Questions for the NCLEX® Examination** with answers located on the Evolve site, (3) **Case Studies** with answers located on the Evolve site, and (4) **Drug Calculation Review Questions** with answers located on the Evolve site.
- A complete **Bibliography** section in the back of the text cites evidence-based information and provides resources for enhancing knowledge.

CHAPTER FEATURES

Procedures related to giving drugs are presented in a logical format with a defined purpose and relevant illustrations and are clearly defined and presented in a logical set of steps.

 **Memory Jogger** boxes restate key points from anatomy, physiology, or pharmacology that are important for students to remember and serve as foundational information for giving and monitoring drug therapy. Basic principles of drug calculation are presented in easy-to-follow steps to reinforce learning.

 **Top Tip for Safety** boxes identify the important knowledge that will aid students in giving particular drugs and will provide critical information and warnings of adverse effects of drugs that are important to patient safety.

 **Lifespan Considerations** boxes draw attention to information that is especially important to remember when giving a specific drug to older adults, children, or pregnant/lactating women.

 **Safety Alerts** indicate a particularly important factor to remember about a specific drug or drug class.

Canadian Drugs indicated within the tables point out brands available only in Canada.

 **Video Clips** located in the margins of the text indicate available relevant videos located on the Evolve site.

 **Bookmark This** boxes list useful websites that provide important resources for all nurses.

Contents

Pharmacology and the Nursing Process in LPN Practice

1

http://evolve.elsevier.com/Visovsky/LPNpharmacology

Learning Outcomes

1. Explain how licensed practical or vocational nurses (LPNs/VNs) use the clinical problem-solving process (nursing process) in practicing safe drug administration.
2. Discuss the differences between subjective and objective data related to drug administration.
3. Describe the specific actions involved in using the nursing process to safely give drugs.
4. List specific nursing activities related to assessing, planning, implementing, and evaluating the patient's response to drugs.
5. Compare the steps of the nursing process to the skills needed in applying the clinical judgment model.
6. Describe each of the *9 Rights of Drug Administration* as essential components of safe drug administration.

Key Terms

9 Rights of Drug Administration A series of nursing actions to protect the patient from drug error.

adverse effect A drug effect that is more severe than expected and has the potential to damage tissue or cause serious health problems. It may also be called *adverse effect, toxic effect*, or *toxicity* and usually requires an intervention by the prescriber.

assessment The first step of the nursing process; involves gathering information about the patient that will be used in planning care.

clinical judgment The observed outcome of critical thinking and decision making; an iterative process that uses nursing knowledge to observe and assess presenting situations, identify a prioritized client concern, and generate the best possible evidence-based solutions in order to deliver safe client care (National Council of State Boards of Nursing [NCSBN], 2019).

clinical problem-solving process (nursing process) A system to guide the nurse's work in a logical way; consists of five major steps: (1) assessment, (2) diagnosis, (3) planning, (4) implementation, and (5) evaluation.

contraindication Health-related reason for not giving a specific drug to a patient or a group of patients.

diagnosis A name (or label) for the patient's disease or condition.

evaluation The process of determining the right response by looking at what happens to the patient when the nursing care plan is put into action. It is an appraisal of the treatment effectiveness.

expected side effects Unintended but not unusual effects of a drug that occur in many people taking the drug; the effects are usually mild and do not require the drug to be stopped.

healthcare setting Any setting in which the LPN/VN practices nursing.

identifiers Information used to reliably prove that an individual is the person for whom the drug treatment is intended; may include the person's full name, medical record identification number, birthdate, or telephone number.

implementation The act of carrying out the planned interventions.

objective data Information that can be seen, heard, felt, or measured by someone other than the patient.

planning Using information about the patient gathered in the nursing assessment to set short-term and long-term goals.

precaution Health-related reason that a drug may be given that requires more monitoring to avoid adverse events (precautions).

subjective data Reports of what the patient says he or she is feeling or thinking.

therapeutic effect The intended action of the drug, also known as a drug's beneficial outcome.

THE LPN/VN'S ROLE AND THE NURSING PROCESS

Licensed practical or vocational nurses (LPNs/VNs) play a vitally important role in providing nursing care for patients and families across the lifespan. In fact, in December 2022 there were nearly 1,000,000 LPNs in the United States. The need for a well-educated LPN/

VN workforce is predicted to grow about 6% between 2021 and 2031, with projections of nearly 59,000 job openings annually over the decade. The factors that increase the demand for LPNs/VNs include an aging nursing workforce reaching retirement age, an aging population in general, and an increased number of people who are living with chronic and complex illnesses.

LPN/VN practice has shifted dramatically over the past decades, from the time when most graduates practiced in acute care settings (hospital-based care) until today, when graduates practice in a wide variety of long-term and community-based settings. LPNs/VNs practice in nursing homes, assisted living facilities, outpatient clinics, home health agencies, psychiatric/behavioral health facilities, hospices, rehabilitation centers, and other settings. No matter the setting, as an LPN/VN, you will share a responsibility with registered nurses (RNs) and other members of the healthcare team to provide safe, quality, and cost-effective care.

Wherever you choose to practice, it is likely that drug administration will be a significant part of your role. A survey of new LPNs/VNs revealed that over half of their work hours were involved in providing care related to giving drugs and to monitoring patients receiving drugs, including parenteral therapies. These new nurses rated knowledge of "client safety" and "medication" as the most important for safe and effective professional practice regardless of the setting.

Before we begin discussing specific drugs, we review the client clinical problem-solving process as it relates to drug administration. Although you may be familiar with the nursing process, we focus on how you will use it as you safely give drugs to patients in a variety of settings. To review, the **client problem-solving process (nursing process)** is a system that guides the nurse's work in a logical way (Fig. 1.1). The nursing process consists of five major steps: (1) assessment, (2) diagnosis, (3) planning, (4) implementation, and (5) evaluation.

ASSESSMENT

Assessment is the first step in the nursing process, and it involves collecting important information (also called *data*) about the patient that will be used in planning care. Depending on the clinical setting, an RN is assigned as the staff member who must perform the initial full assessment for each patient. However, as an LPN/VN, you will often make vital contributions to this assessment and may even be asked to provide full nursing assessment via protocols. This step of the nursing process is important because it provides initial information as you begin to make a record for developing the plan of care.

The first part of assessment related to drug administration involves gathering information about the patient and the patient's health condition before you give the drugs. When the patient is admitted to the **healthcare setting** (any setting in which LPNs/VNs practice nursing), you can obtain that information by talking to the patient (or to his or her caregiver if necessary), checking the patient closely for signs and symptoms of illness, viewing past medical records, and reviewing

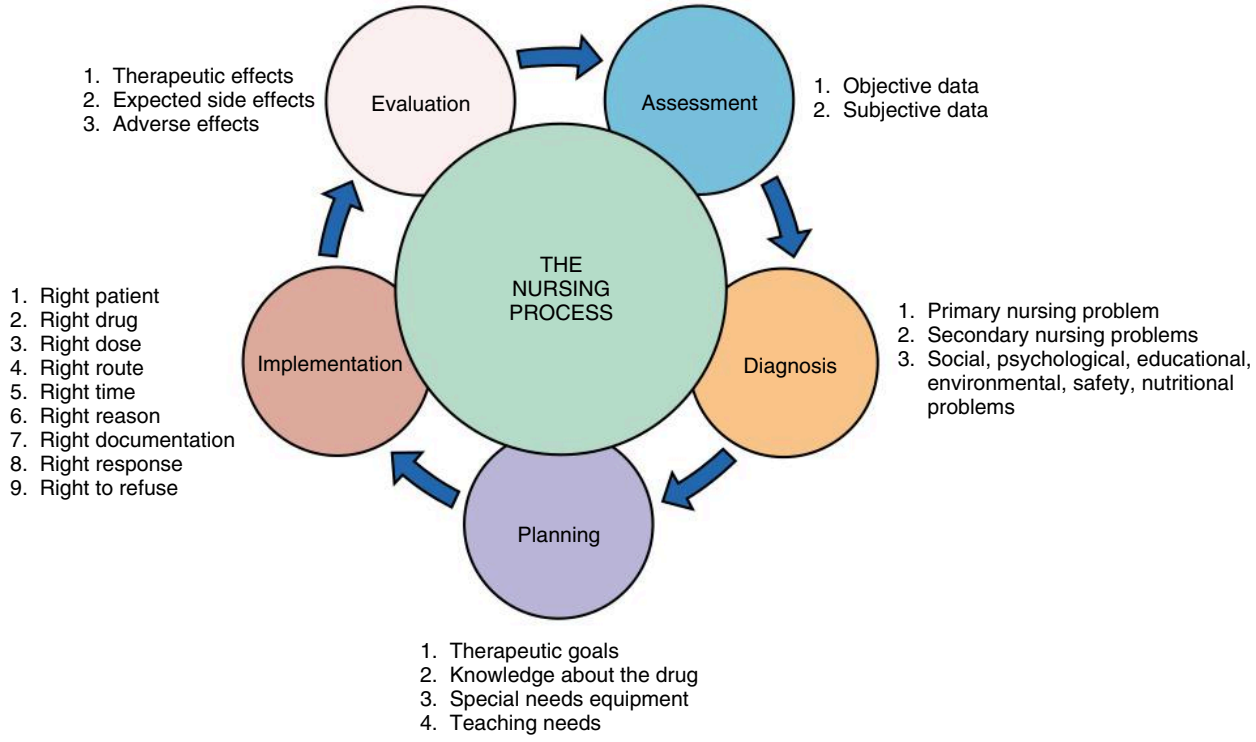


FIG. 1.1 The nursing process and examples of considerations associated with each step.

information the patient may have brought to the setting. Ask carefully about current health problems, a history of illnesses or surgeries, and drugs taken now and in the past (including over-the-counter [OTC] drugs and herbal or dietary supplements). This information is important for all team members and helps everyone to plan the patient's care. Information in the patient's history often directs the nurse and the physician to look for certain physical signs of illness that may be present.

Information you gather through assessment falls into two groups: subjective data and objective data. **Subjective data** are what the patient reports feeling and thinking. For example, if a patient reports feeling nauseated after taking a drug, you must accept the patient's word. You cannot see, hear, or feel the patient's nausea—that is why the data are subjective. A patient may report trouble breathing. Although you may observe rapid breathing, the degree of difficulty the patient feels cannot be measured. Information is subjective if you have to rely on the patient's words or if the symptoms cannot be felt by anyone other than the patient. In such cases you would report, "The patient states that. . . ." Other examples of subjective data that you may learn about from a patient interview include:

- The chief problem according to the patient (in the patient's own words)
- The patient's belief about what caused the problem
- The patient's description about what relieves the problem
- The patient's report of the severity of the problem

Objective data are data that can be seen, heard, felt, or measured by someone other than the patient. They include information obtained when the healthcare provider performs a physical examination or orders laboratory tests, x-rays, or other diagnostic tests. The RN or physician typically conducts a comprehensive physical assessment. As an LPN/VN, it is important for you to assess vital signs (respiratory rate, pulse, blood pressure, weight, height, temperature), physical findings based on careful observation, auscultation (listening with the stethoscope), and light palpation as appropriate for your clinical setting and your state's Nurse Practice Act. Other examples of objective data include:

- Presence of edema
- Quality of a cough
- Percentage of foods eaten at a meal
- Measures of intake and output

It is especially important to gather subjective and objective assessment data when the patient is first seen or on admission to the healthcare setting. This initial information can be used as a baseline for comparison as care progresses. In addition to the physical examination, it is important to gather a thorough patient history. Asking questions and listening carefully to the patient may be just as important as the physical examination or the results of laboratory tests. The LPN/VN is often with the patient, so he or she plays a very important role in continuing to listen to what the patient says and reporting new information to the other healthcare team members.

The nurse may not always be the one gathering the subjective and objective data; however, the nurse and everyone else on the healthcare team should learn whatever information they can from the chart, the physician, the family, and other team members and use that information to plan the patient's care. Understanding the difference between subjective and objective information can help you in reporting, or charting, the information. Based on our previous example and because you do not objectively *see* nausea, if the patient reports nausea (subjective information), your charting should specify "The patient reports nausea" rather than "The patient is nauseated." However, if the patient vomits (objective information), you will record the time, color, and amount.

Much of your role in assessment may be reporting data you collect to the RN or to other members of the healthcare team. The primary role you play in assessing the patient is defined by your state's Nurse Practice Act, which lists what actions LPNs/VNs may and may not perform. Your role also may vary according to your healthcare setting's policies and procedures.

Factors to Consider in Assessing the Patient

Certain information is very helpful in planning the care of the patient who is receiving drug therapy. The baseline nursing assessment is conducted at the time of the patient's admission to the healthcare setting. An important part of the assessment is the patient's drug history. The patient is typically the best source; however, you may also include reports from caregivers (e.g., spouse, close relatives, friends) and past medical records (often in the electronic medical record [EMR]).

When asking about the patient's drug history, you will want to collect data in the following areas:

1. Symptoms, signs, or diseases that explain the patient's need for a drug (such as high blood glucose levels, high blood pressure, or pain)
2. The names and, when possible, dosages of all the drugs the patient is taking, including:
   - Prescription drugs (in this category, patients often forget to mention birth control pills and implanted birth control measures)
   - OTC drugs such as aspirin, vitamins, laxatives, cold and sinus preparations, and antacids
   - Alcohol or street drugs used for recreational purposes (e.g., marijuana, cocaine)
   - Alternative therapies such as herbal agents or nutritional supplements
3. Any problems that the patient has had with drug therapy, for example:
   - Allergies (include the name of the drug and the symptoms the patient experienced)
   - Diseases that may prohibit or limit use of some drugs (e.g., sickle cell disease, glucose-6-phosphate dehydrogenase deficiency, drug addiction, immune deficiencies)

Data collection in all of these areas is important because this information can help prevent drug interactions or complications of drug therapy. You will also use this information as you monitor the patient's response and any changes in patient condition or status that may influence drug therapy during the time the patient is in the healthcare setting. This will help you determine whether the drug is helping the patient.

Memory Jogger

Nursing assessment is the use of your observational, questioning, and listening skills to learn information about the patient that can be used to ensure that you are giving drugs safely.

DIAGNOSIS

After all data have been collected, the nurse and other healthcare team members must identify the patient problems. This is determined through data **diagnosis**. The RN interprets the assessment data to identify the patient problem. The physician uses select data to make the medical diagnoses. As an LPN/VN, your knowledge about the patient allows you to make a significant contribution to the overall plan of care, including the plan of care around drug administration. The following are examples of follow-up questions you will need to ask related to giving drugs:

- What are the major health-related problems of this patient?
- What drugs is the patient likely to require?
- What special knowledge or equipment is required in giving these drugs?
- What special concerns or cultural beliefs does the patient have?
- How much does this patient understand about the prescribed treatment and drugs?
- What factors affect the patient's ability for self-care?

Answers to these questions (1) help you contribute to the goals of nursing care, (2) affect strategies you will use to care for the patient, and (3) tell you what type of patient teaching will be needed. Answering these questions may be more challenging with children, older adults, or people whose language or culture is different from yours. However, just as a physician must have the correct diagnosis to prescribe the right treatment, finding the correct answers to these questions helps you to plan the best care for the patient.

PLANNING

Based on the data you help collect, the medical and nursing diagnoses are made, goals are set, and nursing care plans are written. As a member of the healthcare team, the LPN/VN will be able to assist with the **planning** step. The nursing care plan involves collaboration with nurses and patients or caregivers to determine the expected patient outcomes. Using the information gathered in the assessment about the patient's history, medical and social problems, risk factors, and how ill the patient may be, goals are set on a short-term or a long-term basis. For example, the following short-term goal may be written: "The patient will describe pain at a level of 3 or below, on a scale of 0 to 10, 30 minutes after receiving a drug for pain." An example of a long-term goal is "The patient will demonstrate how to rotate injection sites for using his insulin pen by the time of discharge."

Memory Jogger

When collecting the drug history, be sure to include the patient's use of OTC drugs, such as herbal and dietary supplements, because they may interfere with prescription drugs.

Drug Orders and the Nursing Care Plan

Physicians, nurse practitioners, nurse midwives, nurse anesthetists, clinical nurse specialists, and physician assistants may write drug orders according to individual state laws. Large hospitals may have a staff *hospitalist*—a physician or nurse practitioner who practices in the hospital to oversee care for all patients. Teaching hospitals may employ resident doctors who are still in educational programs.

After a drug is ordered, the nurse must verify that the order is accurate. This is usually done by checking the drug administration record or EMR against the original order. You will need to learn and follow the procedures of the agency where you work when checking drugs and drug orders. In all care environments, you must carefully check each time you give a drug. This is essential to maintaining patient safety and minimizing the risk for errors or adverse effects.

The nurse must also apply knowledge about the drug to the specific drug order to determine whether the drug and the dose ordered seem to be correct. No part of the order or the reason for giving the drug should be unclear. (Chapter 2 presents the information required for a clear and legal drug order.) Any questions about whether a drug is appropriate or safe for that patient must be answered before the drug is given. The EMR may alert the nurse if there is a problem with the order. However, good clinical judgment in carrying out the drug order is very important. If you determine that (1) any part of the order is incorrect or unclear, (2) the patient's condition would be made worse by the drug, (3) the person ordering the drug may not have had all the information needed about the patient when drug therapy was planned, or (4) there has been a change in the patient's condition and a question has arisen about whether the drug should be given, the drug should be *withheld* (i.e., not given) until the healthcare provider has been called and the question has been answered. If you think there is a problem with the drug order and the provider cannot be contacted or does not change the order under question, notify the charge nurse and the nursing supervisor as soon as possible. Most hospitals have clear policies about whom to contact, how to report this problem, and what to do next.

After you have the drug order and have decided to give the drug, include in your plan any patient problems that may increase the risk of issues related to the drug's side effects. For example, a patient who has poor vision may have a risk of falling in an unfamiliar hospital or nursing home setting. This is important if you are giving a diuretic and the patient needs to go to the bathroom frequently. You must plan ahead so that the patient can safely get to the bathroom. The importance of these problems may change over time as the patient's condition changes. Ongoing communication between nurses and the healthcare team is important to maintain safe, quality, and cost-effective patient care.

Factors to Consider in Planning to Give a Drug

Planning to give a drug involves four important steps:

1. Know the reason you are giving the patient the drug. In other words, what is this drug supposed to do for the patient?
2. Learn specific information about the drug, including:
   - The major action of the drug
   - Negative side effects that may develop
   - The usual dosage, route, and frequency
   - Situations in which the drug should not be given (**contraindications**)
   - Health-related reasons in which the drug should be given with greater consideration to avoid adverse events (**precautions**)
   - Main drug interactions (i.e., the possible influence of another drug given at the same time)
3. Plan for special storage requirements, procedures, techniques, or equipment needs, including:
   - Does the solution need to be shaken before it is given?
   - Should the drug be refrigerated?
   - Do you need a specific syringe (such as an insulin syringe)?
   - What special techniques are necessary for giving the drug, such as using an inhaler or not applying pressure to the site after giving certain injectable drugs?
4. Develop a teaching plan for the patient, including:
   - What the patient needs to know about the drug's action and side effects
   - What the patient needs to know to take the drug correctly
   - What the patient needs to report to the nurse or physician if there are any problems

As you develop your plan, be sure to use the data you gathered in the assessment and your knowledge about the drug. You will use this information as you prepare to implement your plan. Whether or not to give the drug will depend on your assessment, your knowledge, and your professional judgment.

Regarding drug orders, make certain that you understand each part of the drug order. Do not give the drug if you have a question about any part of the order.

Top Tip for Safety

CHECK THE EXPIRATION DATES INCLUDED ON THE DRUG LABELS: OUT WITH THE OLD!

Expired medications can be less effective and may adversely affect the patient's health.

The planning step of the nursing process is also the time to:

- Ensure that you have a place to gather the drugs that is quiet and free of interruption.
- Gather any special equipment you will need to give the drug (such as intravenous [IV] infusion pumps, alcohol wipes, or nebulizers).
- Review special procedures you will need to give the drug (such as the Z-track injection technique), to properly administer eye or ear drops, or to deliver a rectal suppository).

All of this information is documented in the nursing care plan in the paper chart or EMR so that other team members can see the plan.

IMPLEMENTATION

Implementation involves carrying out your plan of care as you safely give drugs to the patient. In planning the patient's care, you learned why each drug was ordered, the drug's actions, and how to safely give the drug. You will apply this knowledge during implementation of the plan. For example, if you are giving an angiotensin-converting enzyme inhibitor (see Chapter 9) to a patient with high blood pressure, you will need to check the patient's blood pressure before giving the drug. If you are planning to give the ordered penicillin antibiotic (see Chapter 5) and you notice that the patient has a red rash on his or her chest and arms, you would withhold the next dose of the drug until you have reported the rash to the healthcare provider, because it may indicate an allergic reaction. After you have carried out the plan, you will record in the patient's chart or EMR that you have given the drug.

The *9 Rights of Drug Administration*

A major strategy for giving drugs to patients is the **9 Rights of Drug Administration**. The nurse must always keep in mind these nine commonly recognized rights of drug administration (Box 1.1). Chapter 4 provides specific details about preparing and giving drugs.

You may have heard nurses in the clinical setting discuss the importance of the *five rights, six rights*, or *eight rights*. Over time, nursing has continued to emphasize those essential components of safe drug administration, and more rights have been added.

For our purposes, the nine rights ensure that you identify the *right patient* and give the *right drug* with the *right dose* using the *right route* at the *right time* for the *right reason*. Then you use the *right documentation* to record that the dose has been given. You then monitor the patient to assess the *right response*. The final right is that patients have the *right to refuse* the drug. You might

Box 1.1 The *9 Rights of Drug Administration*

- The right patient—Use at least two identifiers.
- The right drug—Check the drug label at least three times.
- The right dose—Make sure that you use the right amount of the drug; double-check the dose.
- The right route—Never change the route of administration without an order.
- The right time—Make sure that the drug has not been given recently or should be given at a different time of day.
- The right reason—Does this make sense for this patient? Know your patient and the drug.
- The right documentation—Document after you have given the drug, never before.
- The right response—How is the patient responding to the drug? Does it work?
- The right to refuse—Patients have the right to refuse; ask the patient to clarify his or her reason, provide good patient teaching, and document.

wonder how you can remember nine things. A runner who really enjoyed racing in 15K races (9.3 miles) said that he liked them the best because he could divide them into three 5Ks (3.1 miles each) so it seemed easier. You can do the same with the nine rights.

This section reviews each right and explains the reason each is essential for safe, quality, and cost-effective care.

Memory Jogger

THE *9 RIGHTS OF DRUG ADMINISTRATION* (THREE AT A TIME)

- Right patient, right drug, right dose
- Right route, right time, right reason
- Right documentation, right response, right to refuse

The Right Patient. Before you give any drug, make sure that you identify the right patient. The National Patient Safety Goals claim that the purpose of this approach is (1) to reliably identify the individual as the person for whom the treatment is intended and (2) to match the treatment to the person. To properly identify the patient, you use at least two identifiers. **Identifiers** are information that is used to reliably prove that an individual is the person for whom the drug treatment is intended. Identifiers may be the person's full name, medical record identification number, birthdate, or telephone number. These may be compared with the patient's identification bracelet (wristband) in appropriate situations. Healthcare agencies may specify the main identifiers to be used in the setting and/or use a barcode system to scan the drug to the wristband.

For patients who are alert and oriented, asking them their full name and birthdate and comparing the information with the medical record is a straightforward process. However, for those who are hard of hearing, confused, very young or very old, or critically ill, be sure to compare the name, birthdate, or medical record number against the patient's wristband (Fig. 1.2). Best practice is to directly instruct the patient: "Tell me your full name." This is much safer than asking "Are you Joe Jones?" A patient who is confused may not understand the question and may say yes or no regardless of whether that is the correct name.

FIG. 1.2 Nurse checking the patient's wristband for identification. (From Hoffmann Wold, G. (2012). *Basic geriatric nursing* (5th ed.). Mosby.)

In the hospital setting, never give a drug to a patient who is not wearing a wristband. Some long-term care settings use photographs of patients to assist the nurse in identifying patients who might be confused. Never identify the patient solely by the room or bed number.

The Right Drug. Each drug that is prescribed for the patient has a particular intended action. You will need to make sure that you give the right drug. Carefully compare the drug order with the drug label. Do not assume that the correct drug has been sent by the pharmacy.

Make sure that the drug is in the form prescribed because some drugs can come in multiple forms (e.g., tablets, capsules, syrup). Many drugs have names that look or sound almost the same as the names of other drugs; these are sometimes called *look-alike, sound-alike drugs*. The Institute for Safe Medication Practices (ISMP) has published a list of easily confused drug names (Table 1.1). The US Food and Drug Administration and ISMP also recommend the Tall Man lettering system to reduce confusion for look-alike drug names (Table 1.2). In this system, for example, Lamisil (brand name for an antifungal drug) is written as LamISIL. This helps highlight the "ISIL" part of the name so that the nurse does not confuse it with Lamictal (an antiseizure drug), written as LaMICtal. The Tall Man lettering system has been embraced by healthcare agencies as one more strategy to reduce drug errors.

Drugs may come individually wrapped in a unit-dose system package or as a prescription filled for one person; in rare cases, they may be taken from a unit's stock drugs. Sometimes the drug label includes a bar-code that is scanned by a computer. However it is packaged, you must read the drug label at least three times.

Top Tip for Safety

Read the drug label three times!

1. Before taking the drug from the unit-dose cart or storage area
2. Before preparing or measuring the prescribed dose of drug
3. At the bedside before you give it to the patient

- ***The Right Dose.*** As an LPN/VN, you will want to make sure you are giving the right dose. The amount of drug to be given is typically ordered by the healthcare provider as a dose for the "average" patient. A patient who is older, who has experienced severe weight loss as a result of illness, or who is small or very obese may require changes in the usual dosages. Pediatric patients often have doses ordered based on how much they weigh. Geriatric or older adult patients may be very sensitive to many drugs and may require a change in dosage. If the patient has poor liver or kidney function, changes in dosage may be necessary for the desired effect. The healthcare provider may order a specific dosage of the drug when treatment begins and may adjust the dose later based on changes in the patient's condition.

Giving the correct dose of a drug also requires that you use the proper equipment (e.g., insulin must be measured in an insulin syringe), the proper drug form (e.g., oral or rectal, water or oil based, scored tablets or coated capsules), and the proper concentration (e.g., 0.25% versus 0.5% solution for eye drops), and you must accurately calculate the right drug dose. For high-alert drugs (see Chapter 2), many healthcare settings have policies that require two nurses to check any drug dose that must be calculated—particularly for drugs such as narcotics, heparin, insulin, and IV drugs—to reduce the risk for error.

- ***The Right Route.*** Each drug must be given by the right route. The drug order must state how the drug is to be given (route of drug administration). The nurse must never change routes without obtaining a new order. Although many drugs may be given by different routes, the dose is often different for each route.

The oral route is the preferred route if the patient is oriented (i.e., awake and able to understand) and can swallow without choking. In some cases, faster delivery or a higher blood level of a drug is needed, and the drug may be given parenterally (e.g., subcutaneously or intravenously; see Chapter 4). Special precautions may be needed for drugs given through these routes (such as how fast they can be given or in what dosage). Review your drug references to ensure that you are giving the drug correctly.

For patients with breathing problems such as asthma, drugs that previously were given orally can now be given by an inhaler. This decreases the number of side effects by getting the drug directly to where it is needed: in the lungs. You will need to teach the patient techniques to achieve the greatest benefit from the inhaler. Other routes that you will see in practice are drugs given as eye drops, ear drops, topical agents,

Table 1.1 Examples from Institute for Safe Medication Practices Commonly Confused Drug Names

DRUG NAME[a]	CONFUSED DRUG NAME	DRUG NAME	CONFUSED DRUG NAME
Aciphex	Accupril	Diprivan	Ditropan
Adderall	Inderal	Flonase	Flovent
Allegra	Viagra	Lantus	Lente
Benadryl	benazepril	Lexapro	Loxitane
Bextra	Zetia	Microzide	Micronase
Captopril	carvedilol	Paxil	Plavix
Cozaar	Zocor	Pyridium	pyridoxine

[a]Brand name drugs always start with a capital letter. Generic drug names always start with a lowercase letter.

Table 1.2 Examples from Institute for Safe Medication Practices List of Drug Names with Tall Man Letters

DRUG NAME WITH TALL MAN LETTERS[a]	CONFUSED DRUG NAME	DRUG NAME WITH TALL MAN LETTERS	CONFUSED DRUG NAME
busPIRone	buPROPion	SOLU-Medrol	Solu-CORTEF
chlorproMAZINE	chlorproPAMIDE	SandIMMUNE	SandoSTATIN
Glipizide	glyBURIDE	SEROquel	SINEquan
NIFEdipine	niCARdipine	ZyPREXA	ZyrTEC
cefTRIAXone	ceFAZolin	FLUoxetine	PARoxetine
KlonoPIN	cloNIDine	HumaLOG	HumuLIN
PriLOSEC	PROzac	hydroOXYzine	hydrALAZINE

[a]Brand name drugs always start with a capital letter. Generic drugs typically start with lowercase letters. NOTE: Some generic drug names incorporate Tall Man letters. Generic drugs that start with Tall Man letters are identified with an asterisk.

or part of shampoos. The most important thing is that you give the right form of the drug for the right route.

◆ ***The Right Time.*** The drug order should say when and how often the drug is to be given. In many situations you will work with the RN (and/or pharmacist) to determine the right time. Most healthcare agencies have guidelines that specify what time drugs will be given when they are ordered (e.g., drugs given once a day are given at 9:00 a.m.). You must be familiar with your agency guidelines for general times of administration. Nevertheless, it will be important for you to report if the information suggests timing that conflicts with the usual guideline. For example, some statin drugs (given once a day) should be given before bedtime for best effect rather than in the morning. If you have any questions, make sure to notify the RN or the healthcare provider. It is always better to ask the question than to risk a mistake.

To be effective, many drugs must be given exactly on schedule, day and night, to keep the level of drug constant in the body. For example, if a patient is taking warfarin (an anticoagulant) to decrease the risk for blood clots, the drug must be given at the same time every day. Patients with infections should follow a very regular schedule to maintain a consistent level of antibiotics and decrease the risk for antibiotic resistance.

You may need to plan around other patient activities when you give drugs. A patient with a newly diagnosed infection may need to have a blood culture drawn *before* starting antibiotic therapy. If the patient is scheduled for an ultrasound, you may want to *hold* giving a diuretic in the early morning (i.e., wait until later) so that the patient does not experience urinary urgency while having the procedure. As you go through each chapter on drugs, you will learn more on this topic.

Drugs are usually given when there is the best chance for the body to absorb them and the least risk of side effects. Some drugs should be given when the patient's stomach is empty, and others should be given with food to prevent gastrointestinal side effects. Some drugs require that the patient not eat certain foods. Others do not mix well with alcohol. Antacids interfere with the absorption of a number of drugs and therefore need to be given 2 hours before or 2 hours after taking those drugs. When a patient is taking several drugs, check to ensure that the drugs do not interfere or interact with each other. (For example, some antibiotics can interfere with the action of birth control pills, and a sexually active woman taking both could become pregnant if she does not use another form of contraception.) Whenever you are giving a new drug or one you have never seen before, use your drug references to ensure that the timing is correct.

It is especially important to confirm the timing of one-time-only, as needed, and emergency drugs. *The nurse must be certain that no one else has already given the drug and that it is the appropriate time to give the drug.* Narcotics (opioids) are often ordered as "stat" (to be given within a few minutes of the order) or "PRN" (as needed). Note on the patient's record as soon as possible that you have given a narcotic so that it is clear the patient has been given the drug. (For more information, see Chapter 2.) Box 1.2 lists the main factors to remember in giving a drug at the right time.

Box 1.2 Factors to Consider in Giving a Drug at the Right Time

- Always confirm the last time the drug was given to avoid giving too much in too short a time period.
- Understand and follow the rules of your hospital regarding the times to give scheduled drugs.
- Check drug references for the best times to achieve the best drug absorption and to limit risks for interactions with other drugs.
- Give drugs at times ordered to help keep blood levels of the drug constant.
- Plan drug therapy while keeping in mind other diagnostic and laboratory testing that your patient may be experiencing.

Even though it may be tempting if you are on a busy unit, never leave a drug at the bedside for the patient to take later. If the patient cannot take the drug when you bring it, you should return later with the drug. As a nurse, you must document the time the patient actually takes the drug. If you are not present when the patient takes the drug, you cannot document it.

Top Tip for Safety

MAKE CERTAIN THE PATIENT TAKES THE DRUG

Never leave a drug at the bedside for the patient to take later.

The Right Reason. All medications are prescribed for a clear purpose. As a LPN, you should have a good understanding of your patient's health problems. The prescribed drugs should make sense to you, even if you may not fully understand the specific disease pathophysiology. As you learn pharmacology, you will learn the basic uses of the specific drugs and this will help you apply what you have learned to your patients. For example, you may have a patient with a diagnosis of high blood pressure, you would expect the patient to have an antihypertensive drug in their plan of care. If you have a patient with decreased mobility, you would understand that a stool softener would be helpful in decreasing the risk of constipation. On the other hand, if you have a patient with a viral infection, and the patient is prescribed an antibiotic typically prescribed for a bacterial infection (for example ampicillin or doxycycline), you would double check with the charge nurse or other healthcare provider for the reason the patient is receiving this drug. If you have a patient who is having severe diarrhea, you would question why the patient is scheduled to receive a laxative (and you would hold the medication until you have talked to the

healthcare provider). Never be afraid to ask the charge nurse or healthcare provider to better understand why the patient is receiving the drug.

The Right Documentation. Increasingly, electronic health record and charting systems are being used in healthcare settings. Whether the nurse records giving the drug in a paper chart or uses an electronic chart, the basics are the same: You need to make the right documentation. Record the time, route, and site of administration (if parenteral) after you have given the drug. It is very important to record this right away; do not delay or wait until later. As a tool of communication, failure to record means that you did not give the drug. In an emergency or when a drug is used only once or twice, such a failure is very important.

The documentation must always list the drug given, the dose, and the time it was actually given, not the time it was supposed to be given. In some offices or clinics where immunizations are given, the policy may require that the lot number listed on the bottle be recorded in the patient's chart. Most charting systems include a place to record the patient's response to the drug. Any patient reports of problems or adverse effects must be noted in the chart and reported immediately to the head nurse and the physician.

It is vitally important that you *never record drugs that were not given or record them before they are given*. If a patient does not receive the drug for any reason, notify the nurse in charge or the healthcare provider according to the policies of your healthcare setting.

Following the rules of your healthcare setting and carefully following the rights of drug administration can reduce the risk for drug error. If an error is made, talking about it honestly and taking quick action to correct any damage are vitally important to protect the patient from harm. Acknowledging error is an essential, and ethical, part of nursing practice.

The Right Response. As every drug is prescribed for a right reason, you will want to determine if the patient is having the expected response. Your evaluation of the response, whether expected or unexpected, guides your next actions. For example, if a patient is prescribed an antihypertensive for a patient with high blood pressure, you will monitor the blood pressure to determine if the drugs have achieved the desired result. If, on the other hand, the patient experiences severe side effects from the drug, you will report to healthcare provider. Knowing the basic actions of the drug and the overall plan of care will help you to determine your actions.

The Right to Refuse. Patients do have the right to refuse drugs based on the principle of autonomy (right to self-determination). Although we recognize that patients can refuse (with rare exception; see the following paragraph), it is important to talk with patients regarding their reasons for refusal. In many cases, refusals are based on a lack of understanding about the purposes of the drug, and talking about it gives you the opportunity to teach or clarify information about the drug. Another example is a patient who refuses a laxative because he or she has diarrhea—clearly a good reason! Whatever the reason, if the patient refuses after you have answered all of his or her questions, make sure to document the refusal in the medical record.

In some clinical areas (e.g., psychiatric units), patients may be a danger to themselves or to others. In those situations, know your state laws that allow emergency treatment orders. If there is any question, make sure to check with the RN or the healthcare provider.

EVALUATION

Evaluation is the process of determining the right response and looking at what happens to the patient when the nursing care plan is put into action. It is the appraisal of the treatment's effectiveness. Evaluation requires the nurse to watch for the patient's response to a drug, noting both expected and unexpected findings. For example, when antipyretics (i.e., drugs that reduce fever) are given, you will take the patient's temperature to determine whether the drug lowered the fever. When drugs are given to reduce blood pressure, you will do regular blood pressure checks. For drugs used to reduce pain, you will evaluate whether the drug reduced the patient's pain according to your agency's pain scale.

Evaluation of what happens when you give a drug helps the healthcare team decide whether to continue the same drug or make a change. Gathering such information is also a part of the continuing assessment of a patient during care that the nurse will record in the patient's chart. The nursing process may be seen as a circle (see Fig. 1.1). For example, the patient's temperature can be part of the evaluation step of the nursing process, but it may also be part of the assessment step when you notice that the patient's temperature remains elevated, indicating that the patient needs a different dose of the drug, a different drug altogether, or some additional treatment measures.

Top Tip for Safety

EVALUATE RESPONSE TO DRUG

It is important to watch the patient and look for any signs of improvement as well as any side effects, adverse effects, or allergic responses.

Factors to Consider in Evaluating Response to Drug

The nurse checks for three types of responses to drug therapy: therapeutic effects, expected side effects, and adverse effects.

Therapeutic effects are seen when the drug does what it was supposed to do. If you understand why the drug is being given (i.e., the therapeutic goal of the drug), you will be able to decide whether that goal is being met. For example, if the patient's blood glucose level is high and regular insulin is given, you should

see a lower blood glucose level when it is next checked. If the patient is constipated and takes a laxative, the patient should have a bowel movement.

Expected side effects are unintended but not unusual effects that occur in many people taking the drug; they are usually mild and do not require the drug to be stopped. One example of an expected side effect is the sleepiness that most patients feel when taking an opioid (narcotic) for pain. All drugs have side effects, but not all patients have every side effect listed for a single drug. Always document side effects. Side effects such as nausea or vomiting sometimes can be stopped by decreasing the dosage or by giving the drug with food. Telling the healthcare provider about the side effects helps him or her decide whether the patient should keep taking the drug or it should be stopped.

Adverse effects are seen when patients do not respond to their drugs in the way they should or develop new signs or symptoms. For example, a patient with pneumonia may be given penicillin. Although this antibiotic may be working to control the infection, the patient may develop shortness of breath, which could be an allergic reaction to the drug; in that case, the penicillin must be stopped. A patient taking an anticoagulant to prevent blood clots must be closely watched for signs of bleeding or bruising that would indicate the patient has taken too large a dose or has had a larger-than-expected response to the drug. *If you suspect a patient is having an adverse effect, report it to the RN or the healthcare provider immediately.* When serious adverse effects occur in response to a drug, the healthcare provider usually discontinues (stops) the drug.

The nurse is the healthcare worker who is most often with the patient and is therefore in an important position to notice the patient's response to drug therapy. Carefully and repeatedly evaluating the patient and documenting your findings in the patient's medical record is vitally important in the delivery of safe, quality, and cost-effective care.

Top Tip for Safety

Use the *9 Rights of Drug Administration* each and every time you give a drug to a patient!

USING THE CLINICAL JUDGMENT MODEL

In 2023, the National Council of State Boards of Nursing (NCSBN) altered the format of the National Council Licensure Exam (NCLEX®) to include questions evaluating the new LPN/VN's ability in clinical decision making, also called **clinical judgment**. This requires you to be able to translate your nursing knowledge into clinical practice. The NCSBN definition of *clinical judgment* is "the observed outcome of critical thinking and decision making. This iterative process uses nursing knowledge to observe and assess presenting situations, identify a prioritized client concern, and generate the best possible evidence-based solutions to deliver safe client care" (NCSBN, 2019, p. 1). This definition builds on and expands the nursing process and indicates that clinical judgment skills are not linear steps that are followed in a particular sequence.

After developing the definition of clinical judgment, the NCSBN developed a Clinical Judgment Measurement and Action Model. Six cognitive (thinking) skills—called *cognitive processes*—were identified as essential for nurses to make appropriate clinical judgment. These skills help nurses identify changes in a patient's clinical condition and know what actions to take and why. The six essential cognitive skills of clinical judgment are Recognize Cues, Analyze Cues, Prioritize Hypotheses, Generate Solutions, Take Action, and Evaluate Outcomes (NCSBN, 2019):

- **Recognize Cues**

  Cues are elements of assessment data that provide important information for the nurse as a basis for making client decisions. In a clinical situation, the nurse determines which data are *relevant* (directly related to client outcomes or the priority of care) and of immediate concern to the nurse, or *irrelevant* (unrelated to client outcomes or priority of care). *For example, you recognize the specific lab values that are critical to whether or not you administer a certain medication. Of the patient's available lab work, you determine which values are relevant to the medication you are giving.*

- **Analyze Cues**

  When using this skill, the nurse considers the context of the client's history and situation and interprets how the identified relevant cues relate to the client's condition. Data that support or contradict a particular cue in the client situation are determined, and potential complications are identified. *For example, once you are aware that a patient has a potassium level of 3.5 mEq/L, consider the effect of giving or withholding a furosemide diuretic for this patient.*

- **Prioritize Hypotheses**

  For this skill, the nurse needs to examine all possibilities about what is occurring in the client situation. The urgency and risk for the client are considered for each possible health condition. The nurse determines which client conditions are the *most likely* and *most serious*, and why. *For your patient with the potassium level of 3.5 mEq/L, there is a risk of heart rhythm disturbances if the furosemide diuretic is given and the potassium drops too low. Although the patient may need diuretics for the heart failure, it is a priority to make sure that it can be given safely.*

- **Generate Solutions**

  To generate solutions, the nurse first identifies expected client outcomes. Using the prioritized hypotheses, the nurse then plans specific actions that may achieve the desirable outcomes. Actual or potential evidence-based actions that should be *avoided* or are *contraindicated* are also considered because some actions could be harmful for the client in the given situation. *For the considered patient, holding the furosemide until plans are made to supplement oral potassium can prevent hypokalemia and allow administration of the diuretic.*

- **Take Action**

Using this skill, the nurse decides which nursing actions will address the highest priorities of care and determines in what priority these actions will be implemented. Actions can include, but are not limited to, additional assessment, health teaching, documentation, requested primary healthcare provider orders, performance of nursing skills, and consultation with healthcare team members. *Recognizing the problem, you contact the healthcare provider with the information and receive an order for 20 mEq KCl orally to be given with the furosemide.*

- **Evaluate Outcomes**

After implementing the best evidence-based nursing action, the nurse evaluates the actual client outcomes in the situation and compares them to expected outcomes. The nurse then decides if the selected nursing actions were effective, ineffective, or made no difference in how the client is progressing. *The patient avoids irregular heart rate, lung sounds are clear, and the patient has no peripheral edema.*

As mentioned, the six clinical judgment skills build on and expand the nursing process. The following table shows a comparison of the steps of the nursing process and the essential cognitive skills needed for sound clinical judgment.

STEPS OF THE NURSING PROCESS	COGNITIVE SKILLS FOR CLINICAL JUDGMENT
Assessment	Recognize Cues
Diagnosis	Analyze Cues
Diagnosis	Prioritize Hypotheses
Planning	Generate Solutions
Implementation	Take Action
Evaluation	Evaluate Outcomes

Get Ready for the Next-Generation NCLEX® Examination!

Key Points

- Use the *9 Rights* each and every time you give a drug to a patient.
- Nursing assessment is using your observational, questioning, and listening skills to learn information about the patient that can be used to ensure that you are safely giving drugs.
- When assessing a patient, always ask carefully about current health problems, history of illnesses, history of surgeries, and drugs taken (including OTC and herbal drugs), both now and in the past.
- Always know why you are giving the patient the drug.
- Check the label of each drug you are giving three times to ensure that it is the right drug.
- Do not give a drug that was made for one route by any other route.
- When giving a one-time-only drug, take extra precautions to make certain that it has not already been given by someone else.
- Never record drugs that were not given or record them before they are given.
- Always use two unique patient identifiers when giving a patient a drug.
- If a patient refuses to take a drug, clarify the patient's reason and make sure to document the refusal.
- All drugs have side effects, but not all patients have every side effect listed for any single drug.
- Any questions about whether a drug is appropriate or safe for that patient *must* be answered before the drug is given.
- If you suspect a patient is having an adverse effect, report it immediately to the RN or the healthcare provider.
- Never leave a drug at the bedside for the patient to take later.
- In the hospital, never give a drug to a patient who is not wearing an identification band.

Clinical Judgment and Next-Generation NCLEX® Examination-Style Questions

1. **Which of the following is considered a therapeutic effect?**
   1. Tachypnea
   2. Decreased nausea
   3. Edema of left foot
   4. Irregular heart rate

2. **Which of the following examples would be considered objective data? Select all or any that apply.**
   1. "I have pain in my chest."
   2. Blood pressure is 140/70.
   3. Skin is warm and dry.
   4. "I had an appointment last week with my doctor."
   5. Child's mother states, "His temperature was 102 degrees before we came to the hospital."
   6. Weight gain of 3 pounds in 4 days.
   7. Patient states she has trouble breathing or "catching" her breath.

3. **Which of the following would be considered examples of the *9 Rights*? Select all or any that apply.**
   1. Right patient
   2. Right time
   3. Right room number
   4. Right to refuse
   5. Right documentation
   6. Right reason

4. **Which of the following examples would be considered a contraindication?**
   1. Giving a drug for pain to a patient who has a fractured left ankle
   2. Giving a drug that causes birth defects to a patient who is 8 weeks pregnant
   3. Giving a drug that may cause dizziness to a patient with high blood pressure
   4. Giving a drug that may cause an increase in heart rate to a patient who has asthma

5. **The LPN/VN is giving a patient her morning drugs due at 9:00 a.m. After you have already prepared the drug, the patient states, "No, I don't want that pill today." What is your best first action?**
   1. Tell the patient she has to take the drug because it was ordered by the doctor.
   2. Ask the patient to tell you her reason for not taking the drug.
   3. Teach the patient why she needs it and give the drug.
   4. Ask the patient if she has any questions about the drug.

6. **A patient recently began taking an antibiotic for a wound infection and presents for a follow-up appointment. The office nurse reviews the patient's temperature and checks for wound drainage. Which stage of the nursing process corresponds to this review?**
   1. Assessment
   2. Diagnosis
   3. Planning
   4. Intervention
   5. Evaluation

7. **For which patient should the LPN/VN contact the healthcare provider to obtain a new order for an alternative route of drug administration?**
   1. The patient who is a newly diagnosed diabetic
   2. The patient who must take the drug with food
   3. The patient who is experiencing nausea and vomiting
   4. The patient who is receiving a drug for pain after surgery

8. **Based on the following data, the risk for a drug error to be made is highest in which patient?**
   1. An 87-year-old patient who is drowsy after receiving pain medication
   2. A 14-year-old patient who is in traction after experiencing a broken leg
   3. A 65-year-old patient who has just undergone a knee replacement
   4. A 24-year-old pregnant patient who speaks both Spanish and English fluently

9. **What is the best way to check that you are giving the drug to the right patient?**
   1. Ask the patient's name.
   2. Compare the patient with the room number.
   3. Check the patient's wristband.
   4. Check two unique patient identifiers.

10. The LPN is caring for a patient transferred from the acute care setting to a skilled nursing facility for rehabilitation following diagnosis of post-COVID syndrome. The patient describes generalized weakness, fatigue, difficulty sleeping, anxiety, and shortness of breath with minor activity. While in the hospital, the patient had intermittent episodes of confusion but was oriented to person, place, and time at admission. Admission vital signs were BP 160/70, HR 78, RR 18. The patient is to receive an oral blood pressure tablet.

    For each potential step to give the drug, place an X in the box to indicate whether the action would be *Essential* (appropriate or necessary), *Non-Essential* (makes no difference or not necessary), or *Contraindicated* (could be harmful).

NURSING ACTIONS FOR DRUG ADMINISTRATION	ESSENTIAL	NON-ESSENTIAL	CONTRA-INDICATED
Assess the patient's mental status.			
Use two patient identifiers before giving the drug.			
Check the patient's blood sugar.			
Lay the patient flat in bed.			
Check the patient's blood pressure before administration of the drug.			
Document that the drug has been given following administration.			
Teach the patient that drugs for blood pressure may cause dizziness.			
Get the patient up in the chair before giving her the medication.			

Legal, Regulatory, and Ethical Aspects of Drug Administration

2

http://evolve.elsevier.com/Visovsky/LPNpharmacology/

Learning Outcomes

1. Describe the legal, regulatory, and ethical responsibilities of a nurse for drug administration.
2. Explain the meaning of controlled substances (scheduled drugs) and why drugs are placed in this category.
3. Describe the legal responsibilities for managing controlled substances.
4. List the information required for a legal drug order or prescription.
5. Describe the four different types of drug orders.
6. List what you need to do if you make a drug error.

Key Terms

as needed or PRN drug order An order for a drug to be given as needed based on a nurse's judgment about safety and patient need.

black box warning A special designation from the FDA indicating that the drug has a higher-than-normal risk for causing serious or life-threatening problems in addition to its positive benefits for some people.

controlled substances Drugs that are highly regulated because they are commonly abused; also known as *scheduled drugs*.

emergency or stat drug order A one-time drug order to be given immediately.

high-alert drugs Drugs that have the potential to cause significant harm to patients.

legal responsibility The nurse's authority as defined by the Nurse Practice Act in each state. It involves the nurse's judgment and actions while performing professional duties. All nurses must know what is legal in regard to drugs in the state in which they practice.

Nurse Practice Act The state law that licenses LPNs/VNs, registered nurses, nurse anesthetists, nurse practitioners, and nurse midwives. It describes the minimal educational preparation and professional requirements needed to perform specific functions, including drug administration, to protect the public safety.

over-the-counter (OTC) drugs Category of drugs identified by federal legislation that pose a low risk to patients; they may be purchased without a prescription, have a low risk for abuse, and are safe when directions are followed.

physical dependence The physical symptoms that occur with drug withdrawal (e.g., shaking, increased heart rate, pain, confusion, seizures).

prescription drugs Category of drugs regulated by federal legislation because they are dangerous, and their use must be controlled; they may be purchased only when prescribed. Examples are antibiotics and oral birth control pills.

prescriptive authority The authority designated by an individual state that determines who is legally permitted to write an order or prescription for drugs.

professional responsibility The obligation of nurses to act appropriately, ethically, and to the best of their ability as healthcare providers.

psychological dependence Feeling of anxiety, stress, or tension when a patient does not have access to a medication.

single drug order A one-time order to be given at a specified time.

standing drug order A drug order that indicates the drug is to be given until discontinued or for a certain number of doses.

INTRODUCTION

As a nurse you must understand the legal, ethical, and professional responsibilities associated with drug administration, as your decisions can result in consequences for the patient. The nurse's responsibilities include a thorough understanding of the drugs to be given, drug delivery systems, the accurate interpretation of drug orders, safe medication administration practices, and the nursing process as it relates to drug therapy. Failure of the nurse to carry out these responsibilities can result in serious drug errors and patient harm. There are also ethical issues that may occur while giving drugs to patients. For example, in assisted living or nursing home facilities, it is a common practice to mix drugs with food or drink, mainly to help patients swallow their prescribed drugs more

easily. Before you decide to give drugs mixed in food or drink, you should consider several things: You have an ethical responsibility to inform the patient's care provider, the patient, and the family that you will be giving the drugs in this manner. Failure to inform the provider, patient, or family of this practice is considered *covert drug administration*, which, although not illegal, is not considered a best practice in drug administration. The mixing of drugs with food or drink must be documented in the patient's care plan and on the drug administration chart to address the legal aspects of this practice. Additionally, certain foods or drinks, such as grapefruit juice, should not be taken with certain drugs because this practice may influence the effect of that drug. It is important to check your drug handbook before mixing drugs with food or drink.

It also is important to know which types of drugs cannot be crushed or have the capsule opened. For example, a 325-mg, enteric-coated aspirin pill may be difficult for some patients to swallow, but crushing the drug affects the speed at which it is absorbed and increases the chance that the patient will develop a stomach ulcer. Some drugs have a coating that slows the release of the drug. Crushing capsules and tablets releases all of the drug at once, instead of slowly over time, and can result in accidental overdose. The Institute for Safe Medication Practices (ISMP) has published a "do not crush" list that can be used for reference: http://www.ismp.org/tools/donotcrush.pdf.

Another important legal and ethical issue facing nurses is known as *drug diversion*. Drug diversion is defined as the illegal transfer of regulated drugs (e.g., narcotics) from the patient for whom they were prescribed to another person (e.g., a nurse), for use by themselves or others. When a nurse diverts a prescribed drug, it can result in significant threats to patient safety and is a liability for the healthcare organization that employs the nurse. The American Nurses Association (ANA) has defined an *impaired nurse* as one who cannot meet the professional code of ethics because of excessive use of alcohol or drugs. When drug diversion is suspected, the organization is required to launch a full-scale investigation. The nurse involved will most likely face disciplinary charges that will include treatment resources for the nurse with drug or alcohol addiction and may include suspension or permanent loss of the nurse's license.

Nurse leaders have a legal and ethical obligation to protect patients and the profession from impaired nurses. Some behaviors that may signal a drug or alcohol dependency problem in a nurse include increased absences, lateness to work, unexplained disappearance from the assigned unit, and decreased alertness. Drug diversion should also be suspected if patients continually report pain despite appropriate drug treatment and if inaccurate counts are noted.

REGULATION OF DRUG ADMINISTRATION

Nurses who give drugs are required to follow three levels of rules:

1. Federal laws, which describe rules that control how certain drugs may be given
2. State laws and regulations, or rules, which specify who may prescribe, dispense (give a supply), or give drugs and the process to be used
3. Individual hospital or agency rules, which may specify other guidelines or policies regarding how and when drugs are given and the records that must be kept recording drug treatment

FEDERAL LAWS

Congress is responsible for passing laws that make drugs as safe as possible for patients to take and to create measures that ensure that drugs do what they claim to do (effectiveness). Congress created the US Food and Drug Administration (FDA) to monitor or watch over the testing, approval, and marketing of new drugs. These regulations are very strict, and US drugs are some of the purest and most protected drugs in the world. Many laws have been passed to control drugs that might easily be abused and are dangerous. These laws define the three drug categories in the United States:

1. **Controlled substances**, which include opioids (narcotics) and some sedatives or tranquilizers
2. **Prescription drugs** such as antibiotics and oral contraceptives
3. **Over-the-counter (OTC) drugs** that are available without a prescription

Substance Abuse and Misuse

It is important for nurses to understand and be able to distinguish the differences between substance (drug) abuse and misuse. Substance abuse or *drug abuse* is *defined* as harmful or hazardous use of psychoactive substances, including alcohol and illicit drugs. The danger of psychoactive substances is that they pose a significant risk for addiction. However, *drug misuse* is defined as the use of illegal drugs and the inappropriate use of legal substances, such as alcohol and tobacco. It is important to note that *drug misuse* also applies to prescription medications and over-the-counter medications. In essence, drug misuse means the patient is using the drug in a way other than what was intended. Substance use disorders occur when the chronic use of alcohol and/or drugs causes significant health problems, disability, and failure to meet major responsibilities at work, school, or home.

Controlled Substances

Regulations are written for controlled substances because they are most often abused by patients and the general public. The Controlled Substances Act of 1970 classified such drugs into five schedules, and they became known as *scheduled drugs*. Each schedule rates

the likelihood that the drugs in that category will be abused, causing dependency or addiction.

For example, Schedule I drugs, such as heroin, have no medical use and are considered highly addictive. At the other end of the schedules are Schedule V drugs, such as cough medicine with low-dose codeine, which have a low potential for abuse. The degree of control, the recordkeeping required, the order forms, and other regulations are different for each of these five classes. Table 2.1 describes the five drug schedules, with examples of drugs in each category. Drugs are sometimes moved from one class to another if it becomes clear they are being abused by the public. Many states have approved the medical use of marijuana for the treatment of certain conditions, mostly in cases of terminal illness.

Memory Jogger

- **Physical dependence** refers to the *physical symptoms* occurring during drug withdrawal. Symptoms such as shaking, increased heart rate, pain, confusion, seizures, and other troubling symptoms can occur.
- **Psychological dependence**, or addiction, is a *mental desire* associated with taking certain substances, such as cocaine or alcohol. Symptoms of mental dependence such as anxiety, anger, or depression can occur with psychological dependence.

Federal and state laws make it a crime for anyone to have controlled substances without a prescription. Each state has a practice act that lists which healthcare providers may dispense or write prescriptions for controlled substances. Almost all states have programs for prescription monitoring of controlled substances received by patients from several different providers to prevent prescription drug abuse. Physicians, dentists, nurse practitioners, physician assistants, and sometimes nurse midwives may write prescriptions for controlled substances. Pharmacists dispense the drugs according to the provider's orders. Licensed practical nurses (LPNs) or licensed vocational nurses (LVNs) may give controlled substances to a patient only if the state board of nursing permits it in its scope of practice, and they must be under the direction of a healthcare provider who is licensed to prescribe these drugs.

Legal Responsibilities in Drug Administration

LPNs/VNs work in many different settings. Some settings may have high levels of technology for securing controlled substances, and others may use a double-lock system. Each state and healthcare agency has laws and policies that cover ordering, receiving, storing, and recordkeeping of controlled substances.

Table 2.1 Classification of Controlled Substances in the United States

SCHEDULE	DESCRIPTION	EXAMPLES
I	High potential for abuse No accepted medical use in treatment Lack of accepted safety for use of the drug or other substance under medical supervision	More than 80 drugs or substances, of which the following are best known: alpha-acetylmethadol, gamma-hydroxybutyric acid (GHB), heroin, lysergic acid diethylamide (LSD), marijuana, mescaline, peyote, methaqualone (Quaalude)
II	High potential for abuse Currently accepted use for treatment Abuse may lead to severe psychological dependence or physical dependence	More than 30 drugs or substances, of which the following are best known: amphetamines, cocaine, codeine, fentanyl, hydromorphone (Dilaudid), meperidine (Demerol), methadone, methylphenidate (Ritalin), morphine, oxycodone (Percodan), pentobarbital, secobarbital
III	Potential for abuse less than the drugs or substances in Schedules I and II Currently accepted medical use for treatment Abuse may lead to moderate or low physical dependence or high psychological dependence	Most drugs are compounds containing some small amounts of the drugs from Schedule II along with acetaminophen or aspirin, such as acetaminophen with codeine (Tylenol #3 or #4) and aspirin/butalbital/caffeine (Fiorinal) Other drugs include anabolic steroids such as testosterone preparations and sodium oxybate (Xyrem), a drug that contains GHB for use with the sleep disorder narcolepsy
IV	Low potential for abuse relative to the drugs or substances in Schedule III Currently accepted medical use for treatment Abuse may lead to limited physical dependence or psychological dependence relative to the drugs or substances in Schedule III	Includes diet drugs containing propionic acid Other well-known drugs include benzodiazepines such as lorazepam (Ativan), flurazepam (Dalmane), diazepam (Valium), midazolam (Versed), and alprazolam (Xanax) and the following: chloral hydrate, paraldehyde, pentazocine (Talwin), phenobarbital
V	Low potential for abuse relative to the drugs or substances in Schedule IV Currently accepted medical use Abuse may lead to limited physical dependence or psychological dependence relative to the drugs or substances in Schedule IV	Includes cough preparations containing small amounts of codeine and drugs for diarrhea that also contain small amounts of opioids, such as diphenoxylate with atropine (Lomotil)

From U.S. Drug Enforcement Administration (DEA), Title 21 U.S.C. Section 812.

Opioids (narcotics) are scheduled drugs, and all of them must be counted during every shift. Records must be kept for every dose given. Agency policy determines which nurses will be held responsible for handing over the control of controlled substances from one shift to the next and for counting and securing controlled substances. All controlled substances that are ordered for a patient but not used during the hospital stay are sent back to the pharmacy when the patient is discharged.

Nurses may never borrow a drug ordered for one patient to use for another patient, and they may never use these drugs for themselves. In a time when drug abuse is so common, the nurse who has responsibility for the controlled substances must remain alert. With about 8% to 15% of healthcare professionals having a history of substance abuse, there is a risk for drug diversion. Some potential clues for identifying drug diversion include a pattern of drugs frequently being "dropped" or "spilled" or unrelieved pain in patients who received large or more frequent doses of drugs. As a nurse, you must know the federal, state, and agency rules about giving any type of drug, including controlled substances. The rules that govern controlled substances are very clear and very strict. If you violate the controlled substance laws, you may be punished by a fine, a prison sentence, or both. Nurses with drug abuse problems can temporarily or permanently lose their license to practice. Nurses have an ethical and a **legal responsibility** to report suspected drug diversion. In most states, the state board of nursing has a program to help nurses with substance abuse that affects their ability to carry out their nursing duties.

Distribution of Controlled Substances and Drugs. Federal and state laws and institutional policies are clear about how controlled substances are handled in hospitals and other agencies. The goal of all regulations and policies is to verify and account for all controlled substances. In some cases, a paper-based system may be used. When controlled substances, particularly opioids (narcotics), are ordered from the pharmacy, they come in single-dose units or prefilled syringes and are attached to a special inventory count sheet. The nurse receiving the order from the pharmacy must inspect the drug and return to the pharmacy a signed record stating that all of the drug ordered was received and correct as verified by two nurses. As each drug is used, it must be accounted for on the inventory sheet by the nurse giving the drug. The use of opioids (narcotics) is carefully monitored on the unit. Controlled substances are stored in a special double-locked cabinet. The keys to this cabinet are kept in a locked box with code access or carried by the charge nurse or a nurse responsible for accounting for opioids (narcotics) on the unit. The nurses who are responsible for the narcotics key has the legal responsibility for overseeing the use and recording of all opioids during a shift, regardless of whether he or she personally gives the drugs to the patients.

There are also automated drug dispensing systems such as the Pyxis. These systems may include dispensing of opioids, routinely stocked drugs, and drugs specifically prescribed for individual patients. Nurses withdraw drugs by giving a password or fingerprint instead of using a key to open a locked cabinet. One issue to note is that drug orders can be overridden in the Pyxis under specific circumstances, such as when an emergency verbal order is received from the provider. A record is kept of what is ordered and used for patients in these circumstances, but overriding drug orders can result in critical drug errors if not done carefully.

When controlled substances are ordered for a patient, the nurse who will give the drug first checks the order, dosage, and last time the drug was given before obtaining the controlled substance. All nurses giving controlled substances must officially sign out all the controlled drugs given during the shift. The agency's inventory report is completed before the drug is removed from the cabinet or Pyxis. This report may be in the form of a written document, or a patient's barcode may be used instead. The report form should include the patient's name, date, drug, dosage, and signature of the nurse giving the drug. A follow-up note about the patient's response to the drug may also be required. If a dose is ordered that is smaller than that provided (so that some of the drug must be discarded) or the drug is accidentally dropped, contaminated, spilled, or otherwise made unusable and unreturnable, *two nurses* must sign the inventory report and describe the situation. Institutional policy may require additional actions.

If a key or keys are used to access controlled substances in a cabinet, at the end of each shift the responsibility for the keys is transferred to another authorized nurse from the new shift. Keys or electronic access to controlled substances are never given to physicians or any other unauthorized healthcare worker. The contents of the locked cabinet are counted together by one nurse from each shift. The numbers of each ampule, tablet, and prefilled syringe in the cabinet must match the numbers listed on the inventory report form. Sealed packages are kept sealed. Opened drug packages must each be inspected and counted. Prefilled syringes must be examined to make sure they all have the same color, the same fluid levels, and the same amounts of air within them. Both nurses must sign the inventory report, officially stating that the records and inventory are accurate at that time.

Occasionally, the inventory and the written report do not agree. Any disagreement between the number of remaining doses and the number listed in the inventory report must be explained. All nurses who have access to the cabinet keys or the locked Pyxis must be asked about the controlled substances they have given.

Steps must be retraced to see if someone forgot to record any drug. Patient charts can also be checked to see if a controlled substance was given that was not signed for on the inventory report. If errors in the report cannot be found, both the pharmacy and the nursing service office must be notified, and an investigation is opened to determine if drug diversion has occurred. Depending on the type and magnitude of the issue, the institution or agency administrator and security police also may be contacted.

Top Tip for Safety

CONTROLLED SUBSTANCES

Verify all orders for controlled substances. Only authorized nurses can be responsible for access to and delivery of controlled substances, and for the LPN/LVN, this authority may differ between states and provinces. Follow all regulatory policies and procedures for safety and security of controlled substances. Report any suspicious findings that may point to possible drug diversion.

Prescription Drugs

In the United States, the safety and effectiveness of prescription drugs are regulated by the Federal Prescription Drug Marketing Act (1987), and it is the responsibility of the Food and Drug Administration (FDA) to decide which drugs will require a prescription to be obtained. This regulation is in place to prevent prescription drug misuse and abuse. The ability to write prescriptions is provided to only a few healthcare professionals (e.g., physicians, dentists, nurse practitioners, physician assistants).

Misuse or abuse of prescription drugs can lead to adverse drug events, including those caused by dangerous drug interactions. The most commonly abused prescription drugs include narcotics (opioids) and drugs given for sleep or anxiety disorders.

The Omnibus Budget Reconciliation Acts of 1989, 1990, and 1991 placed further controls on drugs for Medicare or older adult patients. According to one study, as many as 15% of older adults are at risk for potentially major drug–drug interactions. Older patients are at high risk for problems with prescription drugs. They may not take the drug properly because of poor eyesight, memory, or coordination; they may take many drugs that interact with each other; or they may have chronic diseases that interfere with how the drug works.

Medicare Plan D provides coverage of some types of drugs for those who pay for this insurance option. More and more, insurance and government groups that pay for drugs limit the types and numbers of drugs that may be ordered to those on a "preferred" drug list. The preferred drug list may require the use of cheaper generic drugs to control costs because new or brand-name drugs usually are more expensive. Many drugs are not FDA approved as safe and effective for children or pregnant women. Prescription drugs make up most of the drugs given to patients in assisted living centers, nursing homes, or hospitals. Prescription drugs are carefully tested for safety and effectiveness before they are put on the market. However, even though much may be known about a particular drug, each patient can have different reactions to it. You must know the expected and adverse effects of drugs given to your patients and watch for signs that the drug is working the way it should. Any adverse reactions that may develop must be reported to the ordering provider. Patients often take several drugs at the same time, and the interaction among the drugs may make it hard to tell how each drug affects the patient, making your nursing knowledge of these drugs a critical part of safe nursing practice.

Over-the-Counter Drugs

The FDA has also found that many drugs are safe enough not to need a prescription. These drugs are known as over-the-counter (OTC) drugs. OTC drugs are used to treat many common minor problems, such as colds, allergies, headaches, minor burns, constipation, or upset stomach. These drugs may be purchased easily at a drugstore or pharmacy. They are often the first thing patients try before they go to the doctor. Although OTC drugs are widely available, they are not without some risk. Like all drugs, some OTC drugs may produce adverse effects in some patients. There is also the possibility of adverse drug or food interactions or harm caused by excessive doses. Patients should be taught to read the drug facts label that is included with all OTC products and to consult with their pharmacist or other healthcare provider if they have additional questions concerning OTC drug use.

Accidental overdoses of common cold drugs in children have occurred because of confusion by parents about the correct dosage to give, and these drugs are no longer recommended for use in pediatric patients. Studies have shown that 40% of parents give their children incorrect dosages of liquid drugs. Cold and allergy products that contain pseudoephedrine and can be used to make illegal drugs are now stored behind the pharmacy counter and are sold in limited quantities. OTC drugs that are given in assisted living centers, nursing homes, and hospitals require a legal prescriber's order before they are given. Without an order in these settings, patients cannot take even the OTC drugs they brought with them.

CANADIAN DRUG LEGISLATION

The Health Products and Food Branch of Canada's Department of National Health and Welfare is like the FDA of the US Department of Health and Human Services. This branch is responsible for the administration and enforcement of federal laws such as the Food and Drugs Act, the Proprietary or Patent Medicine

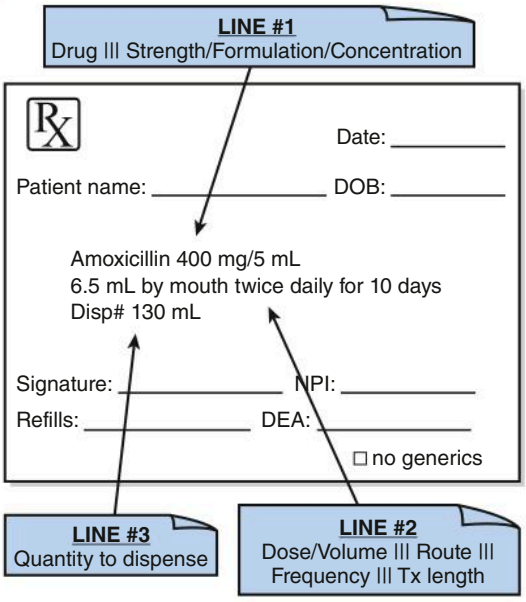


Fig. 2.1 Example of a valid prescription.

Act, and the Controlled Drugs and Substances Act. These acts, together with provincial acts and regulations that cover the sale of drugs and those that cover the healthcare professions, are designed to protect the Canadian consumer from health hazards; misleading ads about drugs, cosmetics, and devices; and impure food and drugs. The Canadian Food and Drugs Act divides drugs into various categories. Regulations covering the various categories or schedules of drugs differ from those in the United States. There are three major classes of drugs under the Food and Drugs Act: nonprescription drugs, prescription drugs, and restricted drugs.

The Proprietary or Patent Medicine Act provides for a class of products that may be sold to the general public by anyone. The drug formula is proprietary (a trade secret); it is not found in the official drug manuals or printed on the label. The formulas for all such proprietary nonpharmacologic drugs must be registered, and a license must be issued under the Proprietary or Patent Medicine Act. The nurse needs to be aware of patients taking such drugs in the case of possible drug interactions.

The Canadian Controlled Drugs and Substances Act covers the possession, sale, manufacture, production, and distribution of opioids (narcotics) in Canada. Only authorized people may have opioids in their possession. All people authorized to be in possession of an opioid must keep a record of the names and quantities of all opioids dispensed, and they must ensure their safekeeping. Nurses are in violation of this act if they are guilty of illegal possession of opioids.

OTC drugs are regulated in Canada by the Canadian Food and Drugs Act. These drugs can be purchased without a prescription, but there are rules about packaging, labeling, and dispensing of the drugs. Nurses must be aware of the risks these drugs have and watch for possible adverse effects and interactions with other drugs. OTC drugs available in Canada differ from those available in the United States.

THE DRUG ORDER

LEGAL PRESCRIPTIONS

Both state law and agency policy require that all drugs given in hospitals and long-term care facilities must be ordered by licensed healthcare providers acting within their scope of practice. This generally restricts **prescriptive authority** (the authority to write an order or prescription for drugs) to licensed physicians, dentists, nurse practitioners, nurse midwives, nurse anesthetists, and physician assistants. Providers who write the prescriptions are also called *prescribers*. Prescriptions for a hospitalized patient are written in the specified area of a patient's chart or recorded in the electronic record, and the pharmacy is notified. In some agencies, the order must be transcribed or rewritten by an authorized individual onto a special pharmacy order form, which is then sent to the pharmacy. Assisted living facilities and long-term care facilities may have providers who evaluate the patients and order or issue recurring orders for patient drugs. Every time a patient has a prescription filled, the pharmacy is required to give information about the drug and how it is to be given.

A legal prescription order must contain:

- Patient's full name
- Date
- Name of drug
- Route of administration
- Dose
- Frequency
- Duration
- Signature of prescriber

Additional details about how to give the drug may also be written—for example, "Take with meals," "Avoid milk products with this drug," "(number of) refills available," "May cause drowsiness," or "Please label." Pharmacies also require the patient's age and address on the prescription. This information may help the pharmacist ensure the right drug dosage for the patient (e.g., child, older adult) and verify the patient's identity (Fig. 2.1).

In emergencies or if the provider is not available on site, a *verbal order*, usually over the telephone, may be given. All agencies that employ nurses have policies about verbal orders. The agency decides who is authorized to take, transcribe, and implement verbal orders. The nurse taking the order is responsible for writing the order on the order form in the medical record, including the name of the nurse and the name of the prescriber. Many institutions also require that a note be written to indicate that the order was read back to the prescriber for validation. The prescriber must

then cosign the order, usually within 24 hours, for it to be valid. The receiving and transcribing of verbal telephone orders may be the responsibility of the registered nurse (RN). *It is your responsibility as an LPN/VN to be very familiar with the verbal order policy of the institution where you are practicing.*

TYPES OF DRUG ORDERS

Drug orders are classified into one of four types: the standing order, the emergency or stat order, the single order, and the as needed or PRN order.

A **standing drug order** indicates that the drug is to be given until discontinued or for a certain number of doses. Hospital or institutional policy usually dictates that most standing orders expire after a certain number of days. A renewal order, such as the following, must then be written by the prescriber before the drug may be continued:

- amoxicillin 500 mg orally every 8 hours for 10 days
- ibuprofen 600 mg orally every 6 hours prn

An **emergency or stat drug order** is a one-time order to be given immediately, such as the following:

- diphenhydramine 50 mg IV stat

A **single drug order** is a one-time order, such as the following, to be given at a specified time:

- cefazolin 1 g IV at 10:00 a.m. before surgery

An **as needed or PRN drug order** is an order for a drug to be given as needed based on a nurse's judgment of safety and patient need, such as the following:

- docusate 100 mg orally at bedtime as needed for constipation

STATE LAW AND HEALTHCARE AGENCY POLICIES

Although many regulations about giving drugs come from federal laws, details about who may prescribe and who may give drugs are set by each individual state. This authority is spelled out for nurses in the **Nurse Practice Act** of each state and can be found at the National Council of State Boards of Nursing Web site.

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https://www.ncsbn.org/npa.htm

Differences in practice from state to state make it essential that nurses learn what is legal regarding drug administration and that they make sure they abide by the rules and regulations. Because nurses may move from state to state, they must know exactly what is in the Nurse Practice Act of each state where they are licensed to work. Nurses often move between jobs, and some states recognize the nursing license of another state through an agreement called the *Nurse Licensure Compact*. There is a growing list of states that participate in the compact (available at https://www.ncsbn.org).

State rules about nursing practice often list the basic or minimum standards of practice. Agency or institutional policies and guidelines may be more specific or more restrictive than state Nurse Practice Acts. Agencies that employ nurses must provide written policy statements about the educational preparation for nurses permitted to give drugs and an orientation to particular policies, procedures, and recordkeeping rules of the agency. When you accept a nursing job, it is implied that you are willing to obey the policies or procedures of that institution. It may be an agency's policy to require employment for a certain period, completion of special orientation and training sessions, and passage of a probation period before a nurse is permitted to give drugs. Even when you have the legal authority to give drugs, a valid drug order signed by an authorized prescriber is needed.

Giving drugs is a responsibility reserved for nurses who are named by law to give drugs and who can document the appropriate educational preparation to do so. Nurses who give drugs to patients accept **professional responsibility** for giving drugs correctly, ethically, and legally. This means nurses must accept *ethical and legal* responsibility for good judgment and actions in drug administration and monitoring the effects of drugs given. Agencies expect nurses to carry out the steps of the nursing process, and you are responsible for good assessment, planning, implementation, and evaluation of the patient when drugs are given. You will be held responsible for failure to perform any of these steps well.

Medication Technician or Aides

More than half the states have recognized the role of medication technician or aide in the giving of drugs to patients under the supervision of a licensed nurse. Medication technicians or aides are unlicensed assistive personnel who may obtain certification by taking the Medication Aide Certification Exam. As unlicensed assistive personnel, the medication technician or aide must hold the Certified Nurse Assistant/Aide (CNA) credential, complete a state-approved Medication Assistant program, and meet all other state requirements to become registered, which includes a written competency examination and may, in some instances, include a clinical competency evaluation. The responsibilities of a medication technician or aide include the preparation, distribution, and monitoring of the effects of a patient's prescribed drugs. A national survey of 3,455 medication aides (Budden, 2012) found that medication technicians or aides were asked to perform duties for which they were not trained, such as calling physicians to change medication orders, giving controlled drugs, and making decisions about giving or not giving insulin. These activities are all beyond the scope of an aide because they require assessment skills and nursing judgment. As an LPN/LVN, you are responsible for the supervision of medication technicians

or aides as they carry out their duties regarding administering drugs to patients under your care.

The *9 Rights of Drug Administration*

The nursing process is a helpful system to be used when giving drugs. There is a professional requirement and an implied ethical and legal requirement that nurses use this process. You must learn information about the patient's medical diagnosis, medical history, current symptoms, allergies, and current drugs taken. You are responsible for learning about all your patients' prescribed drugs, including the dosage, route of administration, expected response, adverse reactions, and the monitoring needed to ensure that the drug is working as it should and to observe for drug interactions. You are also responsible for following all laws and agency policies that are related to giving drugs, including the *9 Rights of Drug Administration* (Table 2.2). You also are responsible for teaching the patient and the family what they need to know for continued and safe administration of this drug.

DRUG ADMINISTRATION SYSTEMS

One critical nursing responsibility is to check that the drug orders for your patient are correct. You may need to confirm the order you have (using a drug Kardex or other paper drug system or using the electronic medical record [EMR] in a computerized system) against the original order by the provider. Every agency has its own drug order, distribution, and recording system for the patient's health record. Agency policy will tell you what information is to be placed in each section. After you give the drug or drugs ordered, you must record all required drug administration information.

An EMR system is a software platform that allows the electronic entry, storage, and maintenance of digital medical data. Integrated within an EMR, many facilities now use a barcoded drug administration system to allow drug orders to be sent to the pharmacy when they are written; the drugs are sent to the patient's room or floor, and the drug is then taken to the patient's bedside. The patient's barcoded wristband and the barcode on each drug are scanned by the nurse using a handheld device (Fig. 2.2). This ensures that the right patient is getting the right drug as noted in the drug order. As the patient is observed taking the drug, the nurse notes that the drug has been given and the chart is electronically updated with this information.

An EMR and an integrated barcoded drug system have several advantages. The use of a computer to create the record prevents illegible clinician handwriting, a common cause of drug errors. These systems also avoid having orders transcribed several times as they are sent to the pharmacy, given to the nurse, and so on; this results in fewer errors. Many systems are designed to indicate whether the dose ordered by the clinician is out of the acceptable dosage range or would interact with another ordered drug, whether there are other dosing errors, or if the patient has a recorded allergy to a prescribed drug.

Table 2.2 The *9 Rights of Drug Administration*

RIGHT PATIENT	CHECK THE PATIENT'S NAME USING TWO METHODS TO IDENTIFY THE PATIENT.
Right drug	Check drug order. Check drug label.
Right dose	Check drug order. Confirm drug dose is appropriate.
Right route	Confirm the drug can be given by the route ordered. Confirm the patient can take or receive the drug by the route ordered.
Right time	Confirm the times the drug is ordered are correct. Check for correct time before giving the drug. Check the last time the drug was given.
Right reason	Confirm the reason or need for the drug.
Right documentation	Document drug administration after the drug is given. Chart the time, route, and any other specific information as necessary.
Right response	Confirm the drug has had the desired effect. Document any monitoring needed or adverse effects as needed.
Right to refuse	The patient has a right to refuse any prescribed drug.

Fig. 2.2 Electronic scan of wristband. (From deWit, S. C., & ONeill, P. (2014). *Fundamental concepts and skills for nursing* (4th ed.). Saunders.)

KARDEX AND ELECTRONIC DRUG SYSTEMS

The Kardex is a pen-and-paper, flip-file card system that has been used for many years. It contains