

Clinical Nursing Skills & Techniques

8th
Edition

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8th Edition

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As always, this book is dedicated to my children. To be their mother brings more joy, honor, and sense of pride than I could ever imagine. They and their loved ones are truly my shining stars. As they grow, things change, and I now dedicate this book to:

My daughter, Rebecca Lacey Perry Bryan, her husband, Robert Donald Bryan, their three daughters Cora Elizabeth Bryan, Amalie Mary Bryan, and Noelle Anne Bryan, and their son Shepherd Charles Bryan; and to my son, Horace Mitchell “Mitch” Perry and his partner Samuel Jacob Cox.

Anne G. Perry

I wish to dedicate this new edition of our text to the incredible friends, work colleagues, and scholars I have been so fortunate to associate with throughout my career.

Patricia A. Potter

For my husband, who believes in me, even when I do not believe in myself.

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Preface to the Student

Numerous features are built into this text to help you identify key pieces of information and study more efficiently. Additional study tools and review questions may be found on the companion Evolve site: <http://evolve.elsevier.com/Perry/skills>

Evolve media resources are available for every chapter.

Key Terms call attention to critical terminology.

Objectives highlight key information to follow.

22

Parenteral Medications

SKILLS AND PROCEDURES

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- Procedural Guideline 22-1
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- Skill 22-3 Administering Intradermal Injections, p. 552
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MEDIA RESOURCES

- Evolve <http://evolve.elsevier.com/Perry/skills>
 - Review Questions
 - Video Clips
 - Audio Glossary
- NSO** Nursing Skills Online

KEY TERMS

Adverse reaction	Compatibility	Induration	Parenteral
Air embolus	Continuous subcutaneous infusion (CSOI or CSCI)	Infiltration	Phlebitis
Allergic reaction	Diluent	Infusion	Piggyback infusion
Ampule	Extravasation	Injection	Saline lock
Anaphylactic reaction	Hematemesis	Intradermal (ID) injection	Subcutaneous injection
Aqueous	Hematuria	Intramuscular (IM) injection	Vial
Aspirate	Hypodermoclysis	Intravenous (IV) injection	Volume-control administration set (Volutrol)
Blunt-tip vial access cannula	Incompatibility	Medication administration record (MAR)	Z-track method
Bolus			

OBJECTIVES

- Mastery of content in this chapter will enable the nurse to:
- Correctly prepare injectable medications from a vial and an ampule.
 - Identify advantages, disadvantages, and risks of administering medications by each injection route.
 - Evaluate the effectiveness and outcomes of administering medications by each injection route.
 - Explain the importance of selecting the proper-size syringe and needle for an injection.
 - Discuss factors to consider when selecting injection sites.
 - Discuss ways to promote patient comfort while administering an injection.
 - Correctly administer intradermal, subcutaneous, and intramuscular injections.
 - Compare the risks of three different intravenous routes.
 - Correctly administer an intravenous infusion by intravenous piggyback, intermittent infusion, or bolus through a hanging intravenous line or saline lock.
 - Initiate, maintain, and discontinue a continuous subcutaneous infusion.

554 CHAPTER 22 Parenteral Medications

STEP

- Inject medication slowly. Normally you feel resistance. If not, needle is too deep; remove and begin again.

Slow injection minimizes discomfort at site. Dermal layer is tight and does not expand easily when you inject solution.

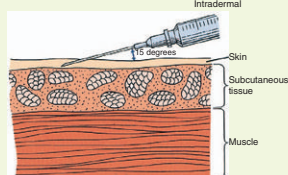
Clinical Decision Point It is not necessary to aspirate because dermis is relatively avascular.

- While injecting medication, note that small bleb (approximately 6 mm [$\frac{1}{4}$ inch]) resembling mosquito bite appears on skin surface (see illustration).
 - After withdrawing needle, apply alcohol swab or gauze gently over site.
- 15 Help patient to comfortable position.
- 16 Discard uncapped needle or needle enclosed in safety shield and attached syringe in puncture- and leak-proof receptacle.
- 17 Remove gloves and perform hand hygiene.
- 18 Stay with patient for several minutes and observe for any allergic reactions.

Bleb indicates that you deposited medication in dermis.

Do not massage site. Apply bandage if needed.

Gives patient sense of well-being. Prevents injury to patients and health care personnel. Recapping needles increases risk for a needlestick injury (OSHA, 2012). Reduces transmission of microorganisms. Dyspnea, wheezing, and circulatory collapse are signs of severe anaphylactic reaction.



STEP 14b Intradermal needle tip inserted into dermis.



STEP 14d Injection creates small bleb.



Clinical Decision Points highlight points to consider when performing skills to ensure effective outcomes and promote safety.

Extensive illustrations demonstrate step-by-step procedures for more thorough understanding.

Quick Response codes may be scanned to link to video clips directly from the text page.

EVALUATION

- Return to room in 15 to 30 minutes and ask if patient feels any acute pain, burning, numbness, or tingling at injection site.
- Ask patient to discuss implications of skin testing and signs of hypersensitivity.
- Inspect bleb. *Optional:* Use skin pencil and draw circle around perimeter of injection site. Read TB test site at 48 to 72 hours; look for induration (hard, dense, raised area) of skin around injection site of:
 - 15 mm or more in patients with no known risk factors for tuberculosis.
 - 10 mm or more in patients who are recent immigrants; injection drug users; residents and employees of high-risk settings; patients with certain chronic illnesses; children less than 4 years of age; and infants, children, and adolescents exposed to high-risk adults.

Continued discomfort could indicate injury to underlying tissues. Patient's ability to recognize signs of skin testing helps to ensure timely reporting of results. Determines if reaction to antigen occurs; indication positive for TB or tested allergens.

Degree of reaction varies based on patient condition. Site must be read at various intervals to determine test results. Pencil marks make site easy to find. You determine results of skin testing at various times, based on type of medication used or type of skin testing completed. Manufacturer directions determine when to read test results.

STEP	RATIONALE
8 Dispose of supplies in puncture- and leak-proof container.	Prevents accidental needlesticks (OSHA, 2012).
9 Remove gloves and perform hand hygiene.	Reduces transmission of microorganisms.
10 Stay with patient for several minutes and observe for any allergic reactions.	Dyspnea, wheezing, and circulatory collapse are signs of severe anaphylactic reaction.

EVALUATION

- 1 Observe patient for signs or symptoms of adverse reaction.
- 2 During infusion periodically check infusion rate and condition of IV site.
- 3 Ask patient to explain purpose and side effects of medication.

Unexpected Outcomes

- 1 Patient develops adverse or allergic reaction to medication.

- 2 Medication does not infuse over established time frame.

- 3 IV site shows signs of infiltration or phlebitis (see Chapter 28).

IV medications act rapidly. IV must remain patent for proper drug administration. Infiltration at IV site requires discontinuing infusion.

Evaluates patient's understanding of instruction.

Related Interventions

- Stop medication infusion immediately.
- Follow agency policy or guidelines for appropriate response to allergic reaction (e.g., administration of antihistamine such as diphenhydramine [Benadryl] or epinephrine) and reporting of adverse medication reactions.
- Notify patient's health care provider of adverse effects immediately.
- Add allergy information to patient record per agency policy.
- Determine reason (e.g., improper calculation of flow rate, poor positioning of IV needle at insertion site, infiltration).
- Take corrective action as indicated.
- Stop IV infusion and discontinue access device.
- Treat IV site as indicated by agency policy.
- Insert new IV catheter if therapy continues.
- For infiltration determine how harmful the medication is to subcutaneous tissue. Provide IV extravasation care (e.g., injecting phenolamine [Regi-time] around IV infiltration site) as indicated by agency policy or consult pharmacist to determine appropriate follow-up care.

Recording and Reporting

- Immediately record medication, dose, route, infusion rate, and date and time administered on MAR or computer printout.
- Include initials or signature.
- Record volume of fluid in medication bag or Volurol on intake and output (I&O) form.
- Report any adverse reactions to patient's health care provider.

Special Considerations**Teaching**

- Review all IV medications with patient and significant others, including why patient is receiving the medication and potential adverse effects, including allergic responses.
- Teach patient and/or significant others not to alter the ordered rate of infusion without consulting the prescriber. IV medications need to be infused at a specified rate to achieve their desired effect and avoid adverse effects.
- Teach patient and/or significant others to report any adverse effects immediately.

Pediatric

- Infants and young children are more vulnerable to alterations in fluid balance and do not adjust quickly to changes in fluid

balance. Therefore, to assess fluid balance, monitor I&O carefully when infusing IV medications (Hockenberry and Wilson, 2011).

Gerontologic

- Altered pharmacokinetics of medications and the effects of polypharmacy place older adults at risk for medication toxicity. Carefully monitor the response of older adults to IV medications (Touhy and Jett, 2010).
- Older adults are at risk for developing fluid volume overload and require careful assessment for signs of overload and heart failure.

Home Care

- Patients or significant others who administer IV medications at home require education about the steps of medication administration. The patient or significant other needs to perform several return demonstrations of IV medication administration before performing this skill independently. In addition, patients and significant others need to know signs of IV medication administration complications such as phlebitis and infiltration and what to do for any problems.

Unexpected Outcomes/Related Interventions help you anticipate problems and respond appropriately.

Recording and Reporting guidelines for each skill detail what to document and report.

Special Considerations indicate special teaching considerations, as well as procedure modifications needed for pediatric, gerontologic, and home care populations.

NSO icon links to online course lessons.

Home Care

- Self-administration of an IM injection is difficult, especially in the vastus lateralis. Teach a significant other to identify and administer injections for the patient.
- Instruct adult patients who require frequent injections to apply EMLA cream to the injection site before administration.

- Patients need instruction in safe disposal of syringes and needles (see Skill 22-3, Home Care Considerations).
- See Skill 41-1 for information about modifying safety risks in the home.

SKILL 22-5 Administering Medications by Intravenous Bolus**NSO IV Medication Administration Module 1 Lesson 4**

In the past nurses often mixed medications into large volumes of intravenous (IV) fluids (500 to 1000 mL). However, today's safety standards and evidence-based practice no longer support this practice on a routine basis (Infusion Nurses Society [INS], 2011; ISMP, 2011; TJC, 2012). Many patient safety risks such as incorrect calculation, poor aseptic technique, incorrect labeling, pump programming errors, lack of medication knowledge, and mix-up with another medication occur when nurses have to prepare medications in IV containers on patient care units. There are a number of current best practices for preparation and administration of IV medication (Box 22-4).

An IV bolus is one method of medication administration currently practiced on patient care units. It introduces a concentrated dose of a medication directly into a vein by way of an existing IV access. An IV bolus or "push" usually requires small volumes of fluid, which is an advantage for patients who are at risk for fluid

overload. Administering medications by IV bolus is common in emergencies when you need to deliver a fast-acting medication quickly. Because these medications act quickly, it is essential that you monitor patients closely for adverse reactions. Agencies have policies and procedures that identify the medications that nurses are allowed to administer by IV push and other IV routes. These policies are based on the medication, compatibility and availability of staff, and type of monitoring equipment available. There are advantages and disadvantages to administering IV push medications (Box 22-5).

The IV bolus is a dangerous method to administer medications because it allows no time to correct errors. Administering an IV push medication too quickly can cause death. Therefore be very careful in calculating the correct amount of medication to give. In addition, a bolus may cause direct irritation to the lining of blood vessels; thus always confirm placement of the IV catheter or needle. Never give an IV bolus if the insertion site appears edematous or reddened or if the IV fluids do not flow at the ordered rate. Accidental injection of some medications into tissues surrounding a vein can cause pain, sloughing of tissues, and abscesses.

Verify the rate of administration of IV push medication using agency guidelines or a medication reference manual. The Institute for Safe Medication Practices (ISMP, 2011) has identified the

BOX 22-4 Best Practices for Administration of Intravenous Solutions and Medications

- Use standardized concentrations and dosages of medication.
- Use standardized procedures for ordering, preparing, and administering intravenous (IV) medications.
- Administer solutions and medications prepared and dispensed from the pharmacy or as commercially prepared when possible.
- Never prepare high-alert medications (e.g., heparin, dopamine, dobutamine, nitroglycerin, potassium, antibiotics, or magnesium) on a patient care unit.
- Use standardized infusion concentrations of "high-alert" medications.
- Standardize the storage of IV medications.
- Use the mnemonic CATS PRRR to help remember safety checks for administering IV medications: C, compatibilities; A, allergies; T, tubing correct; S, site checked; P, pump safety checked; R, right rate; R, release clamp; R, return and reassess the patient (Billings & Kowalski, 2006).
- Use standardized label practices. Bold patient name, generic drug name, and patient-specific dose.
- Correctly use technology such as intelligent-infusion devices, bar code-assisted medication administration, and electronic medication administration record.

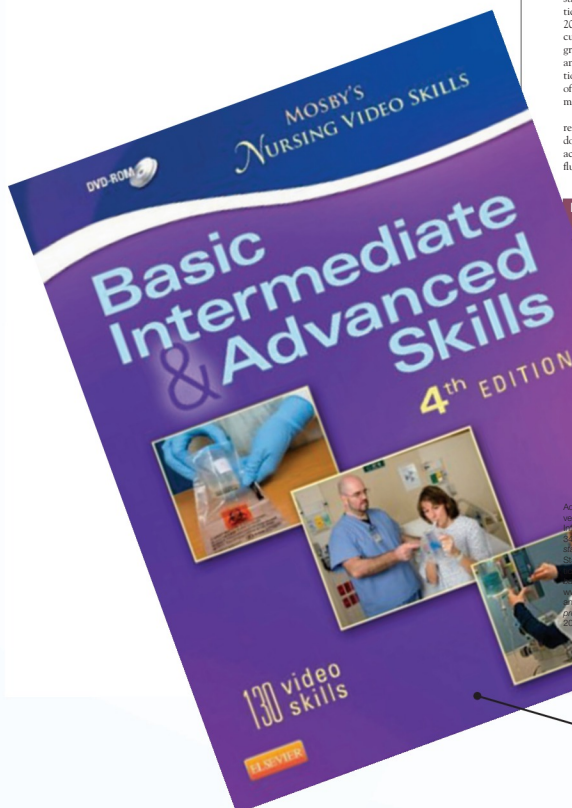
Adapted from American Society of Health-System Pharmacists (ASHP). Preventing medication error and death. *Am J Health-Syst Pharm*, 65:2367, 2008; Infusion Nurses Society. Infusion nursing standards of practice. *J Intraven Nurs Soc*, 2010; Institute for Safe Medication Practices (ISMP). Guidelines for safe medication practices, 2010, available at <http://www.ismp.org/tools/guidelines/>; Institute for Safe Medication Practices (ISMP). Guidelines for safe medication practices, 2011, available at <http://www.ismp.org/tools/guidelines/labelformats/VPB.asp>, accessed July 5, 2012; and The Joint Commission. 2010 National Patient Safety Goals hospital program, 2012, available at <http://www.jointcommission.org>, accessed July 2012.

BOX 22-5 Advantages and Disadvantages of the Intravenous Push Method**Advantages**

- There is rapid onset of medication effects, which is useful in patients experiencing critical or emergent health problems.
- Medications can be prepared quickly and given over a shorter time than by intravenous (IV) piggyback.
- Doses of short-acting medications can be titrated based on a patient's needs and responses to the drug therapy. This is important for infants, children, and older patients.
- Method provides a more accurate dose of medication delivered because no medication is left in intravenously.

Disadvantages

- Not all medications can be delivered by IV push.
- There is higher risk for infusion reactions; some are mild to severe because the medication action peaks quickly.
- When giving medication quickly (e.g., less than 1 minute), there is very little opportunity to stop the injection if an adverse reaction occurs.
- Risk for infiltration and phlebitis is increased, especially if a highly concentrated medication, a small peripheral vein, or a short venous access device is used.
- Hypersensitivity reaction can cause an immediate or delayed systemic reaction to a medication, requiring supportive measures.



Mosby's Nursing Video Skills, Student Version, 4th edition contains 130 entirely new, high-definition video skills.

Preface to the Instructor

The evolution of technology and knowledge influences the way we teach clinical skills to nursing students and improves the quality of care possible for every patient. However, the foundation for success in performing nursing skills remains a competent, well-informed nurse who thinks critically and asks the right questions at the right time. That outcome is the driving factor behind this new edition.

In this eighth edition of *Clinical Nursing Skills & Techniques* we have adapted our headings to bring content relevant to the *Quality and Safety Education for Nurses* (QSEN) initiative to the forefront. You will now find sections on *Evidence-Based Practice*, *Patient-Centered Care*, *Safety*, and *Documentation and Collaboration*, making the related content even more visible. The opening chapter on *Using Evidence in Nursing Practice* prepares the student to understand and use the evidence-based practice information included in every chapter.

New content areas include **Communicating with a Cognitively Impaired Patient (Skill 3-5)**, **Adverse Event/Incident Reporting (Procedural Guideline 4-4)**, **Caring for Patients with Multidrug-Resistant Organisms (MDRO) and *Clostridium difficile* (Procedural Guideline 7-1)**, and **Wheelchair Transfer Techniques (Procedural Guideline 9-1)**. All other topics have been updated to the most recent standards in nursing practice.

Your students will find that *Clinical Nursing Skills & Techniques* provides a comprehensive resource that will serve them well through their nursing training and right into their clinical practice careers.

CLASSIC FEATURES

- **Over 200 basic, intermediate, and advanced nursing skills and procedures.**
- **Five-step nursing process** format provides a consistent presentation that helps students apply the process while learning each skill.
- **Skills and Procedures list, Objectives, and Key Terms** open each chapter.
- **Over 1200 full-color photos and drawings** help students master the material covered.
- **Evidence-Based Practice** in each chapter presents students with the newest scientific evidence for the procedures and protocols presented. Recent research findings are discussed, and their implications for patient care are explored.
- **Rationales** are given for steps within skills so students learn the *why* as well as the *how* of each skill. Rationales include citations from the current literature.
- **Clinical Decision Points** alert students to key steps that affect patient outcomes and help them modify care as needed to meet individual patient needs.

- **Recording and Reporting** sections follow the evaluation discussion and alert students to what information should be documented in each situation.
- **Delegation and Collaboration** defines communication within the patient care team and the nurse's responsibility when delegating to assistive personnel.
- **Unexpected Outcomes and Related Interventions** remind students to be alert for potential problems and help them determine appropriate nursing interventions.
- **Special Considerations** sections include additional considerations when performing the skill for specific populations of patients or in specific settings and may include:
 - **Teaching Considerations**
 - **Pediatric Considerations**
 - **Geriatric Considerations**
 - **Home Care Considerations**
- **Glossary** defines all key terms.

NEW TO THIS EDITION:

- **Quick Response codes** (scan with smartphone or tablet with camera to view video clips) on the text pages link video clips to the appropriate skill or procedure, allowing students to view the video immediately after reading the implementation section of the skill.
- **NSO icon** links text content with the new edition of *Nursing Skills Online*, which has been simultaneously revised with the textbook to provide completely coordinated information.
- **Patient-Centered Care** section in each chapter prepares nurses to recognize the importance of having patients partner in performing skills in a compassionate and coordinated way based on respect for patient's preferences, values, and needs (QSEN core competency).
- **Safety Guidelines** section in each chapter covers global recommendations on the safe execution of the particular skill set covered (QSEN core competency).
- **Expanded and improved end-of-chapter exercises** include a case study as well as review questions.
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Using Evidence in Nursing Practice

1

OUTLINE

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Steps of Evidence-Based Practice, p. 2

Impact of Evidence-Based Practice on Nursing, p. 9

MEDIA RESOURCES

-  <http://evolve.elsevier.com/Perry/skills>
 - Review Questions
 - Audio Glossary

KEY TERMS

Clinical guidelines	Peer reviewed
Evidence-based practice (EBP)	PICOT question
Hypothesis	Variable

OBJECTIVES

Mastery of content in this chapter will enable the nurse to:

- Define the key terms listed.
- Discuss how evidence improves the relevance and accuracy of nursing skills.
- Describe the six steps of evidence-based practice.
- Explain the components of a PICOT question.
- Discuss the process for evaluating evidence in the literature.
- Identify the elements to review when critiquing a scientific article.
- Discuss ways to apply evidence in nursing practice.
- Explain the importance of identifying outcomes in the evaluation of an evidence-based practice change.

Cathy works on a medical oncology unit where patients undergo chemotherapy and radiation for leukemia, lymphoma, and other forms of cancer. Because of their chemotherapy, many patients experience a drop in their platelet count and clotting factors, increasing their risk for bleeding. Cathy recently cared for a 42-year-old woman who fell while trying to get to the bathroom and hit her head against the bed frame, resulting in a serious intracranial bleed. Cathy discusses the situation with two nurse colleagues and asks, "How can we reduce the number of falls and injuries to our patients on the oncology unit?" The nurse specialist for the unit tells Cathy, "I heard about an approach to fall prevention on one of the surgical floors; it involves hourly rounding. Let's ask this question, *'In adult oncology patients, will the use of hourly rounding compared with the current fall prevention protocol affect the incidence of falls during hospitalization?'*" Feeling frustrated that their existing fall prevention protocol was not effective in reducing falls, the group agrees that the question is the right one to search in the literature.

This clinical case study highlights how professional nurses address problems in their practice. Evidence-based practice (EBP) is a process of making informed decisions about the way you care for patients. It all begins with asking clinical questions. Clinical questions lead nurses like Cathy and her colleagues to find evidence from the research literature, quality improvement data, risk management trends, and the opinions of nurse experts. Nurses then apply the evidence to make relevant and informed changes in practice such as fall prevention in the case study.

There are elements of all nursing procedures within this textbook that are evidence based. For example, the length of time necessary to wash hands, the technique for determining the position of a feeding tube in the stomach, and the technique for giving an intramuscular injection are based on evidence. Clinical research led to the answers for how these nursing procedures should be performed. The use of such evidence in practice enables clinicians like Cathy to provide the highest quality of care to their patients and families. EBP requires nurses to always think about their practice, raise pertinent clinical questions, search for the evidence that pertains to their questions, apply relevant evidence in practice changes, and evaluate the outcomes.

A CASE FOR EVIDENCE

One of the key messages in the 2010 report of the Institute of Medicine (IOM), *The Future of Nursing: Leading Change, Advancing Health*, is for nurses to be full partners with physicians and other health care professionals in redesigning health care in the United States (IOM, 2010). Nursing is well positioned to lead change and advance health through the use of EBP, a process that makes nurses more autonomous in changing health care practices. The IOM recommends that nurses be accountable for their own contributions to delivering high-quality care and work collaboratively with leaders from other health professions. The EBP process is a perfect vehicle to achieve that aim.

EBP is a guide for making accurate, timely, and appropriate clinical decisions. It is an interdisciplinary process that results in applying the newest knowledge available in health care sciences to the bedside. It is important to translate best evidence into best practices at a patient's bedside. For example, using a sliding board to transfer a patient from bed to stretcher instead of lifting and using the research-based Braden scale to routinely assess a patient's risk for skin breakdown are examples of using evidence at the bedside. Evidence-based practice is a problem-solving approach to the delivery of health care that integrates the best evidence from scientific studies and patient care data along with clinicians' expertise and patient preferences and values (Melnyk et al., 2009). In this textbook you learn that use of evidence in nursing procedures or skills provides scientific guidelines for how to perform skills more effectively and improve patient outcomes.

As a professional nurse you need to stay informed and aware of the most current evidence. Typically new students diligently read their textbooks and assigned scientific articles. A good textbook incorporates current evidence into the practice guidelines and nursing skills at the time it is published. However, because a textbook relies on the scientific literature, a portion of the book can become outdated by the time it is published. Articles from nursing and the health care literature are available on almost any topic involving nursing practice. New research is reported every day. Although the scientific basis of nursing practice has grown, some practices are still not "research based" (based on findings from well-designed research studies) because findings are inconclusive or researchers have not yet studied the practices. For example, in the past nurses changed intravenous (IV) site dressings daily and applied antibiotic ointment to reduce the incidence of infection at a site. However, there was no evidence at the time to support this practice. IV care was based on tradition. Recent research has shown that topical antibiotics offer no benefit and daily dressing changes are not beneficial unless a dressing becomes soiled or compromised. In addition, a current standard of care is to cleanse an adult's IV site with chlorhexidine antiseptic solution, not antibiotic ointment (Infusion Nurses Society [INS], 2011). The challenge is to obtain the very best, most current information at the right time, when you need it for patient care.

The best evidence comes from well-designed, systematically conducted research studies found in scientific journals. Unfortunately much of that evidence does not reach the bedside. Many health care settings do not have a process to help staff adopt new evidence in practice. Nurses in practice settings, unlike educational settings, may not have easy access to databases for scientific literature. Instead they often care for patients on the basis of tradition, preferences, or convenience. Because there are often obstacles to research-based practice in clinical settings, it is important for administrators to provide a supportive environment and adequate facilitation of change. Researchers have found that

implementation of EBP is enhanced when organization leaders commit to improving practices and there are links to management structures and processes to support change (VanDeusen et al., 2010).

Research evidence alone is often not enough to justify a change in practice (Melnyk et al., 2010). You must also use sources of evidence that include quality improvement and risk management data, infection control data, retrospective or concurrent chart review, and clinicians' expertise. Nonresearch-based evidence is very valuable to fully inform you of practice issues in your setting. But remember, it is important that you not rely on nonresearch-based evidence alone. Research-based evidence is more likely to be timely, accurate, and relevant. When you face a clinical problem, seek out all sources of evidence to find the best solution in caring for patients.

Even when you use the best evidence available, application and outcomes will differ based on your patients' values, preferences, concerns, and/or expectations. As a nurse you develop critical thinking skills to determine whether evidence is relevant and appropriate to your patients and to a clinical situation. For example, some research suggests that therapeutic massage is effective in promoting sleep and reducing fatigue in patients who undergo coronary artery bypass surgery (Nerbass et al., 2010). However, if you care for a patient from a culture in which touch is a taboo, the use of massage is inappropriate. Using your clinical expertise and considering patients' cultures, values, and preferences ensure that you apply new evidence in practice both ethically and appropriately. EBP requires good nursing judgment; it is not finding research evidence and applying it blindly.

STEPS OF EVIDENCE-BASED PRACTICE

The multistep EBP process requires a spirit of inquiry (i.e., an ongoing curiosity about the best evidence to make clinical decisions) (Melnyk et al., 2009). Using a step-by-step approach ensures that you will obtain the strongest available evidence to apply in patient care. With a spirit of inquiry in place, there are six steps of EBP (Melnyk and Fineout-Overholt, 2010):

- 1 Ask a clinical question.
- 2 Search for the most relevant and best evidence that applies to the question.
- 3 Critically appraise the evidence you gather.
- 4 Apply or integrate evidence along with your clinical expertise, patient preferences, and values in making a practice decision or change.
- 5 Evaluate the practice decision or change.
- 6 Communicate your results.

Ask the Clinical Question

Every day nurses perform interventions (e.g., changing dressings, giving medications, providing comfort measures) that stimulate questions such as, "Why do we use this approach?" or "Is there a better way?" Always think about your practice when caring for patients. Question what does not make sense to you and what you think needs clarification. It is also important to include colleagues from all disciplines to give their perception of the clinical problem or issue. As shown in the previous case study, think about a patient care problem or an area of interest that is time consuming, costly, or not logical. Often The Joint Commission (TJC) standards (e.g., the annual patient safety goals) spark questions for you to pose about your patients. Clinical questions often arise as a result of either a problem- or a knowledge-focus trigger. A problem-focused trigger develops as you care for a patient or notice a trend on a

nursing unit. For example, a problem-focused trigger might arise while caring for an unconscious patient: “Which is the best anti-infective solution to use when giving oral care to unconscious patients?” Examples of problem-focused trends include the increase in number of pressure ulcers or incidence of urinary tract infections on a nursing unit. A knowledge-focused trigger arises when you ask a question regarding new information about a topic. For example, “What is the current evidence to reduce bloodstream infection in central venous catheters?” Important knowledge sources often include standards and practice guidelines available from national agencies such as the Agency for Healthcare Research and Quality (AHRQ), the Infusion Nurses Society (INS), and the American Association of Critical Care Nurses (AACN).

There are two types of clinical questions: background and foreground (Stillwell et al., 2010a; Nollan et al., 2010; Straus, 2011). A background question is broad and general. For example, “Which interventions are effective in reducing falls in oncology patients?” The answer to the question provides general knowledge about the problem or topic of interest. A background question has the advantage of allowing you to explore a vast array of options for your area of interest. In contrast, a foreground question is specific and relevant to a practice issue (Stillwell et al., 2010a). It is a question that must be asked to decide which of two interventions is likely the more effective in addressing a practice issue. For example, “In adult oncology patients, will the use of hourly rounding compared with a standard fall prevention protocol affect the incidence of falls?” When you ask a question and search the scientific literature, you do not want to read 100 articles to find the handful that are most helpful. This happens if you ask a background question. If you ask a foreground question, you are able to identify a few select articles that specifically address your practice question.

A foreground question is clearly worded when you use a PICOT format (Melnyk and Fineout-Overholt, 2010). Box 1-1 summarizes the five elements of a PICOT question. The key words of a PICOT question make it easier to search for evidence in the scientific literature. Examples of PICOT questions follow: *In abdominal surgery patients (P), does epidural analgesia (I) compared with patient-controlled analgesia (C) affect pain severity (O) in the first 48 hours after surgery? In oncology patients (P) does the use of a case management model (I) compared with a telephone call-back system (C) improve patient adherence to chemotherapy (O) during the first 3 months (T)?*

BOX 1-1 Developing a PICOT Question

- P** = Patient population of interest
Identify your patients by age, gender, ethnicity, disease, or health problem.
- I** = Intervention or issue of interest
Which intervention do you think is worthwhile to use in practice (e.g., a treatment, diagnostic test, prognostic factor)?
- C** = Comparison intervention or issue of interest
Which standard of care or current intervention do you usually use now in practice?
- O** = Outcome
Which result do you wish to achieve or observe as a result of an intervention (e.g., change in patient's behavior, physical finding, change in patient's perception)?
- T** = Time
How long does it take for an intervention to achieve the outcome?

A well-designed PICOT question does not have to include all five elements. For example, a comparison intervention is not pertinent when a PICOT question is about meaning such as, “Do family caregivers (P) of hospice patients feel anxiety (O) when providing hands-on care? A time element is also not always required (Stillwell et al., 2010a). However, the elements of Population, an Intervention or issue of interest, and Outcome are essential for a well-designed PICOT question.

A clearly stated PICOT question helps to identify knowledge gaps for a specific clinical problem or situation. When you form well-thought-out questions, the type of evidence you lack for clinical practice becomes clearer when you search the literature. Examples of different knowledge gaps include the following:

- **Diagnosis:** Questions about the selection and interpretation of diagnostic tests. *Example:* Does the use of a disposable oral thermometer compared with an electronic oral thermometer measure body temperature accurately in a patient with an endotracheal tube?
- **Prognosis:** Questions about a patient's likely clinical outcome. *Example:* Is there a difference in the incidence of deep vein thrombosis in surgical patients wearing sequential compression stockings compared to those who wear elastic stockings?
- **Therapy:** Questions about the selection of the most beneficial treatments. *Example:* Which bowel regimen is most effective in relieving constipation caused by the administration of opioid therapy in oncology patients with chronic pain?
- **Prevention:** Questions about screening and prevention methods to reduce the risk of disease. *Example:* Does performance of a prostate-specific antigen (PSA) test in an older adult who is asymptomatic of prostate disease decrease his risk for mortality from prostate cancer?
- **Education:** Questions about best teaching strategies for colleagues, patients, or family members. *Example:* Is the use of visual aids compared with low-literacy teaching booklets more effective to educate low-literacy adults about therapeutic diets?
- **Meaning:** Questions that seek understanding of a phenomenon. *Example:* How do patients with cervical cancer perceive their quality of life?

Search for the Best Evidence

In the case study the nurse specialist conducts a literature search on the basis of the PICOT question. Key words from the question direct the search, including “falls,” “cancer,” “injury,” “rounding,” and “adult.” The literature search results in four articles pertaining to risk factors for falls and outcomes from hourly rounding.

Once you have a clear and concise PICOT question, you are ready to search for evidence. Evidence exists in quality or performance improvement data, existing clinical practice guidelines, or computerized bibliographical databases. Do not hesitate to ask for help from faculty or expert nurses to find appropriate evidence. When you are assigned to a health care setting, consider using advanced practice nurses, staff educators, risk managers, and infection control nurses as resources.

When searching the scientific literature for evidence, seek the assistance of a medical librarian who knows the relevant databases (Box 1-2). A database is an electronic library of published scientific studies, including peer-reviewed research. A peer-reviewed article is one that has been evaluated by a panel of experts familiar with the topic or subject matter of the article. The librarian translates the elements of your PICOT question into the language or key

BOX 1-2 Searchable Scientific Literature Databases and Sources

CINAHL	Cumulative Index of Nursing and Allied Health Literature. Includes studies in nursing, allied health, and biomedicine http://www.cinahl.com
MEDLINE	Includes studies in medicine, nursing, dentistry, psychiatry, veterinary medicine, and allied health http://www.ncbi.nlm.nih.gov
EMBASE	Biomedical and pharmaceutical studies http://www.embase.com
PsycINFO	Psychology and related health care disciplines http://www.apa.org/psycinfo
Cochrane Database of Systematic Reviews	Full text of regularly updated systematic reviews prepared by the Cochrane Collaboration; includes completed reviews and protocols http://www.cochrane.org/reviews
National Guidelines Clearinghouse	Repository for structured abstracts (summaries) about clinical guidelines and their development; also includes condensed version of guideline for viewing http://www.guideline.gov
PubMed	Health science library at the National Library of Medicine; offers free access to journal articles http://www.nlm.nih.gov

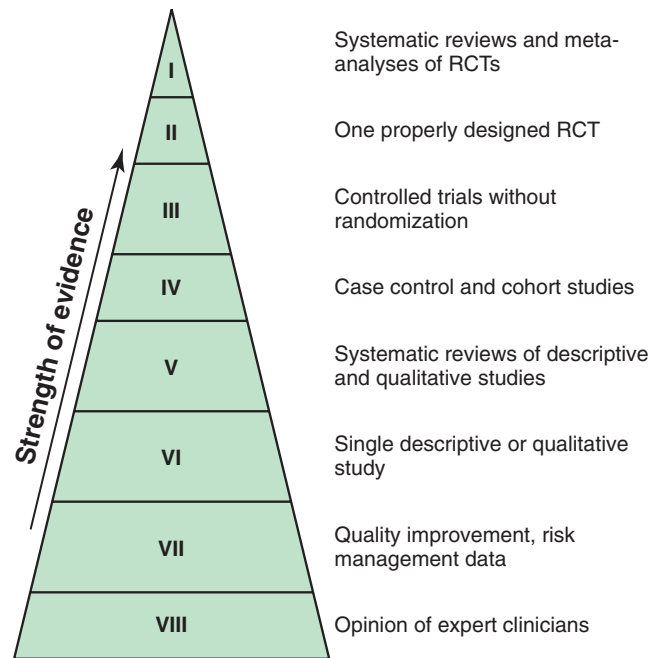


FIG 1-1 The evidence pyramid. RCT, Randomized controlled trial.

words that yield the best evidence search. For example, consider this PICOT question: “Does the use of computerized home instruction compared with a group class improve oncology patients’ adherence to oral chemotherapy 3 months following treatment?” The key words include *oncology patient*, *computerized instruction*, *adherence*, and *chemotherapy*. A good librarian recommends using the indexing language or controlled vocabulary of the database that you are searching. This means that, by using the words that the database contains, you will likely have a more inclusive search (Stillwell et al., 2010b). In the previous example the word *oncology* might be entered instead as “cancer” to fit the database language. When conducting a search, you enter and manipulate the different key words until you get the combination that gives you the articles about your question that you want to read. When you enter a key word to search a database, be prepared for some confusion in the evidence that you obtain. The vocabulary within published articles is often vague. The word that you select sometimes has one meaning to one author and a very different meaning to another. Each key word generates a set of articles. For example, in the PubMed database *oncology patient* generates 122,000 articles, *adherence* generates 64,878 articles, and *chemotherapy* generates over 2 million articles. That’s a lot of reading. In addition, you want to read only articles that address all three of the topics. If you combine the key terms of a search using the Boolean connector *and*, the combination of “oncology patient *and* chemotherapy *and* adherence” generates 274 articles. A librarian can also show you how to limit a search by categories such as the time frame during which the article was

written, types of studies, or age of patients. This reduces the number of articles further to give you a more manageable number to review for your PICOT question (Stillwell et al., 2010b).

CINAHL, PubMed (which includes MEDLINE), and the Cochrane Database of Systematic Reviews are among the most comprehensive databases and represent the scientific knowledge base of health care (Melnyk and Fineout-Overholt, 2010). Some databases are available through vendors at a cost, some are free of charge, and some offer both options. Nursing students and nurses who work in academic medical centers usually have access to an institutional subscription through a vendor. One of the common vendors is OVID, which offers several different databases. Some databases such as PubMed are available free on the Internet. The Cochrane Database of Systematic Reviews is a valuable source of synthesized evidence (i.e., preappraised evidence). It includes the full text of regularly updated systematic reviews and protocols for reviews that are currently in progress. The National Guidelines Clearinghouse (NGC) is a database supported by the AHRQ. It contains clinical guidelines (i.e., systematically developed statements about a plan of care for a specific set of clinical circumstances involving a specific patient population). The NGC is a valuable source when you want to develop a plan of care for a patient.

The pyramid in Fig. 1-1 represents a hierarchy for rating available scientific evidence. It is important to learn about the types of studies to help you know which ones have the best scientific evidence. The strongest evidence is at the top of the pyramid; the weakest is at the bottom. You can use the rating scale of I to VIII when you later critique each article that you obtain in your search of the literature. Table 1-1 describes types of studies in the evidence hierarchy, beginning with the study at the top of the hierarchy, a systematic review.

If your PICOT question leads you to a systematic review, celebrate! A systematic review is the perfect answer to a PICOT question. Basically a researcher has asked the same PICOT question you have asked and then examined all of the well-designed relevant randomized controlled trials (RCTs) that ask the same question. A systematic review explains if the evidence for which you are searching exists and whether there is good cause to change

TABLE 1-1 Types of Studies in the Evidence Hierarchy

Study Type	Description	Example
Systematic review or meta-analysis	An author or panel of experts reviews the evidence from randomized controlled trials about a specific clinical question and summarizes the state of the science. In a meta-analysis, there is the addition of a statistical analysis that combines data from all studies.	35 studies were examined to evaluate the outcomes of case-managed, integrated home and community care services for older persons, including those with dementia. Evidence from RCTs showed that case management improves function and appropriate use of medications, increases use of community services, and reduces nursing home admission (Low, Yap, and Brodaty, 2011).
Randomized controlled trial (RCT)	A researcher tests an intervention against the usual standard of care. Participants are randomly assigned to either a control group (receives standard care) or a treatment group (receives the experimental intervention), with both measured on the same outcomes to see if there is a difference.	Researchers conducted an RCT among 125 critically ill patients receiving tube feedings. The study determined the effect of returning (treatment) or discarding gastric residual volume (GRV) on gastric emptying delays and feeding, electrolyte, and comfort outcomes. Findings showed a lower incidence and severity of delayed gastric emptying when GRV was returned. No significant differences were found for feeding delays, electrolyte imbalance, or changes in vital signs. The study findings support that the return of gastric content aspirated improved GRV management without increasing the risk for potential complications (Juvé-Udina et al., 2009).
Case control study	Researchers study one group of subjects with a certain condition (e.g., obesity) at the same time as another group of subjects who do not have the condition to determine if there is an association between the condition and predictor variables (e.g., exercise pattern, family history, history of depression).	In a historical case control, researchers studied a group of 19,951 children who had been admitted to an emergency department for asthma attacks. The researchers compared the effectiveness of the use of inhaled beta-agonists given via a metered-dose inhaler (MDI) with spacers versus the use of nebulizers. This was part of an evidence-based asthma pathway. The use of an MDI with spacer was effective in the management of acute asthma (Goh et al., 2010).
Descriptive study	Study describes the concepts under study. It sometimes examines the prevalence, magnitude, and/or characteristics of a concept.	A convenience sample of 100 patients and 100 unrelated family caregivers were surveyed to examine their perceptions of the caregiving skills they perform, the difficulty they experience in performing certain skills, and their associated learning needs (Potter et al., 2010).
Qualitative study	Study examines individuals' experiences with health problems or life experiences and the contexts in which the experiences occur.	Researchers asked 392 nurses to discuss a care episode from their practice. Cases describing patients with cancer involved nurses' use of powerful emotive language. The influence of patients' cancer experience affects nurses personally and professionally (Kendall, 2007).
Quality improvement data, risk management information	Data collected within a health care agency offer important trending information about clinical conditions and problems. Staff in the agency review the data periodically to identify problem areas and seek solutions.	Article reviews the results of a 2-year quality improvement campaign involving physicians and nurses at a teaching hospital to improve the identification and accurate documentation of pressure ulcers (Dahlstrom et al., 2011).
Clinical experts	Accessing clinical experts on a nursing unit is an excellent way to learn about current evidence. Clinical experts often write clinical articles on topics that require application of evidence in the literature.	Clinical article describes an evidence-based practice project. The practice change involved interventions, including a campaign to raise geriatric awareness, the creation of "falls tool boxes," education of staff and family, and implementation of a structured hourly patient rounds schedule (Murphy et al., 2008).

practice. In the Cochrane Library all entries include information on systematic reviews.

Individual RCTs have been the gold standard for research (Padian et al., 2010; Titler et al., 2001). An RCT is a formal experiment for testing therapies and establishing cause and effect. Historically few RCTs have been conducted in nursing, but this is changing. The nature of nursing causes researchers to ask questions that are not always answered best by an RCT. Nurses care for patients' responses to disease or health problems. For example, they assist patients with problems such as knowledge deficit, symptom management, and coping with psychological distress and with the problems in these areas that often occur simultaneously. An RCT cannot easily be designed to learn how patients handle such complex health problems.

More often you find articles in the nursing literature that involve controlled trials without randomization (i.e., descriptive studies). Even though these types of studies represent a lower level of evidence, if a study results in relevant findings, it helps you decide if your PICOT question can be answered.

The use of clinical experts is at the bottom of the evidence pyramid, but do not consider clinical experts a poor source of evidence. Expert clinicians frequently use evidence as they build their own practice, and they are rich sources of information for clinical problems.

Critique the Evidence

In the case study the nurses on the oncology unit conduct their unit-based practice committee (UPC) meeting. During

the meeting Cathy and her colleagues decide that it is important to include key members of their interdisciplinary team (pharmacy and physical therapy). The UPC then reviews the articles carefully, using a rapid-appraisal checklist. After the group evaluates the articles for the strength of evidence and synthesizes the findings, they decide that there is evidence for implementing hourly rounding with focused patient assessment to prevent falls. The staff notes that one of the articles recommends hourly rounding during daytime hours and rounding every 2 hours during evening and night hours. Another article summarizes fall risks for patients in an acute care hospital and highlights factors to include in a nursing assessment such as medications (e.g., antihistamines, sedatives, analgesics, and antiemetics).

Once you have found research articles that address your PICOT question, the next step is to review the articles critically to determine if there is evidence that answers your question. It is important to use an approach that does not bog you down by reviewing every single element of each article. Melnyk et al. (2010) recommend the use of a rapid critical appraisal (RCA) that answers three important questions:

- What are the results of the study, and are they important?
- Are they valid?
- Will the results help you care for your patients?

Many organizations use an RCA checklist (Fig. 1-2) for recording article reviews. You begin an article review by determining if the research study was valid or conducted in a well-designed way. This

Example of a Rapid Critical Appraisal Form

- Why was the study done? (Is there a clear explanation of the study purpose?)
- Are the study findings valid?
 - How were study participants chosen? How many were chosen?
 - Are the study instruments valid and reliable?
 - Does the research approach fit the purpose of the study?
 - How were accuracy and completeness of data ensured?
 - Do the study findings fit the data that were generated?
- What are the results of the study, and are they important?
 - Yes
 - No
 - Unknown
- Is the finding from the study clearly identified?
- Are the results logical, consistent, and easy to follow?
- Are the results plausible and believable?
- How do the results fit with previous research in the area?
- Will the results help me in caring for my patients?
- Do the results apply to my patients?
- How would I use the findings in my practice?
- How would patient and family values be considered in applying these results?
- Do we have the resources to apply this in our practice setting?

FIG 1-2 Example of a rapid critical appraisal form. (Adapted from Melnyk B, Fineout-Overholt E: Evidence-based practice in nursing and health care: a guide to best practice, Philadelphia, 2010, Lippincott Williams & Wilkin; Fineout-Overholt E et al: Evidence-based practice step by step: critical appraisal of the evidence, Part 1, AJN 110(7):47, 2010.)

requires knowing the type of study using the evidence pyramid. For example, if you have an RCT to review, were subjects randomized? Does the sample of subjects appear to be large enough to test the intervention effectively? Were all subjects measured for the same outcomes? In contrast, if you read a qualitative study, did the researcher study a sufficient representation of subjects, and did the approach allow for a thorough and objective review of findings? As you read each article, you ask the second question: What are the results and were they important? If you have an RCT, you want to know if an intervention worked or not. If you have a descriptive study, is the information relevant to your PICOT question?

You might also choose to review a clinical article that explains a clinical practice topic relevant to your PICOT question. A clinical article is not rated for its level of evidence; but it can offer useful information, especially if you decide to implement a change related to the practice topic. To learn how to read research and clinical articles, know each of the common elements. This will help you decide if an article is complete and well explained. Articles should include the following elements:

- **Abstract:** A brief summary of the article that tells you if the article is research or clinically based. An abstract summarizes the purpose of the study or clinical topic, the major themes or findings, and the implications for nursing practice.
- **Introduction:** Contains information about the purpose of the article and the importance of the topic for the audience who reads it. The introduction usually contains brief supporting evidence as to why the topic is important from the author's point of view.

After reading the abstract and introduction, you will decide if you want to continue to read the entire article. You will know if the topic of the article is similar to your PICOT question or related closely enough to provide you useful information. Remember that the research question does not need to be the same as yours but close enough to offer useful information. If this is the case, continue to read the next elements of the article:

- **Literature review or background:** A good author offers a detailed background of the level of scientific or clinical information that exists about the topic of the article. The review offers an explanation about what led the author to conduct a study or report on a clinical topic. Perhaps the article itself does not address your PICOT question the way you desire but possibly leads you to other more useful articles. The literature review gives you a good idea of how past research led to the researcher's question.
- **Article narrative:** The "middle section" or narrative of an article differs according to the type of evidence-based article, either clinical or research (Melnyk and Fineout-Overholt, 2010). A clinical article describes a clinical topic, which often includes a description of a patient population, the nature of a certain disease or health problem, how it affects patients, and the appropriate nursing therapies. Clinical articles often describe how to use a therapy or new technology. A research article describes the conduct of a research study, including its purpose; how the study was designed; and the results. A narrative of a research article contains several standard subsections:
 - **Purpose statement:** Explains the focus or intent of a study. It identifies which concepts will be researched.
 - **Methods or design:** Explains how a research study is organized and conducted to answer the research question(s). This is where you learn the type of study (i.e., RCT, case control, or qualitative). You also learn how many subjects or persons are in a study. In health care studies subjects

BOX 1-3 Common Statistical Terms

Sample Size: Number (n) of individuals in a study.

Significance: A measure that gives the likelihood that a finding or a result is caused by the intervention being tested and not by chance. Most researchers set the level of significance at a p value of 0.05 or 0.01. For example, if the effects of an intervention are significant at $p < 0.05$, it means that the likelihood of the effect occurring by chance is less than 5%; thus it is more likely that the intervention made a true difference.

Confidence interval (CI): The range (e.g., range of a mean score) in which clinicians can expect to get results if they present an intervention as it was in a study (Fineout-Overholt et al., 2010). The CI tells you the precision of a study. A 95% CI means that clinicians can be 95% confident that their findings will be within the range given in the study.

Effect size: When the effect of an intervention is statistically significant, it does not necessarily mean that it is big, important, or helpful in decision making. It simply means that you can be confident that there is a difference. An effect size greater than 0.05 is considered a large effect.

sometimes include patients, family members, or health care staff. The language in the methods section is sometimes confusing if it explains details about how the researcher designs the study to minimize bias so as to obtain the most accurate results possible. Use your faculty member as a resource to help interpret this section.

- **Results or conclusions:** Clinical and research articles have a summary section. In a clinical article the author explains the clinical implications for the topic. In a research article the author explains the results and whether a research question is answered. For example, in a qualitative study there is a thorough summary of the descriptive themes and ideas that arise from the researcher's analysis of data. A quantitative study includes a full description of the study subjects and a statistical analysis of findings. It is important to learn some of the common statistical terms (Box 1-3). A good author discusses limitations to a study in the results section. The information on limitations helps you decide if you want to use the evidence with your patients.
- **Clinical implications:** A research article includes a section that explains if the findings from the study have clinical implications. The researcher explains how to apply findings in a practice setting for the type of subjects studied.

As you critique each article, complete your RCA checklist. You may choose to rate each article by its level and strength of evidence, using the scale of I to VIII from the evidence pyramid (see Fig. 1-1). It also helps to review multiple articles with a group of colleagues involved in the EBP process. Each person can review a single article; then you can come together as a group to review your total findings. At that time you discuss the third important question: Will the results help you care for your patients?

Use critical thinking to consider the scientific rigor of the evidence and how well it answers your area of interest. Scientific rigor is the extent to which the findings of a study are valid, reliable, and relevant to a patient population of interest. Consider the evidence in light of your patients' concerns and preferences. Your review of articles offers a snapshot conclusion based on combined evidence about one focused topical area. As a clinician judge whether to use the evidence for a particular patient or group of

patients who usually have complex medical histories and patterns of responses (Melnyk and Fineout-Overholt, 2010). Ethically always consider evidence that will benefit patients and do no harm. Decide if the evidence is relevant, is easily applicable in your setting of practice, and has the potential for improving patient outcomes.

Apply the Evidence

Based on their experience and a review of their unit fall index reports, the staff on the oncology unit know that patients on the unit fall during all hours of the day and night. The unit practice committee recommends starting a new hourly rounds program using a focused fall screening tool and nursing assessments for key fall risk factors. Registered nurses (RNs) will round on patients on all even hours and conduct focused assessments of fall risk factors such as weakness, pain, or the need to go to the bathroom. If a patient is found to be at high fall risk, the physical therapists will be asked to consult and assess patients' lower-extremity strength and overall balance. Pharmacy will place alerts on medication administration records so nurses can monitor patients receiving antihistamines before blood transfusions. Nursing assistive personnel (NAP) will round on odd hours and do follow-up observations to be sure that patients have their toileting needs met, are comfortable, and have no further needs. Each hour the nursing staff will inform patients that someone from the nursing team will return in an hour for another check. The unit practice committee plans to have a staff orientation and set a date for the start of the hourly rounding protocol.

After reviewing all of the evidence, you decide if it answers your PICOT question. If so, your next step is to implement a plan to apply evidence into practice. One important step for an individual or an interdisciplinary EBP committee to address is the resources needed for a practice change project. Are added costs or new equipment involved with a practice change? Do you have adequate staff to make the practice change work as planned? Do management and medical staff support you in the change? If the barriers to practice change are excessive, adopting a practice change can be difficult, if not impossible.

In the case study the oncology UPC involves other disciplines and their managers in planning their project. The committee forms a plan for implementing their hourly rounding protocol. There are key steps for applying evidence into practice:

- 1 Plan how to collect baseline data on the outcomes that will evaluate the effect of your practice change (e.g., the oncology nurses will be able to refer to fall index data collected during the 6 months before implementation of the protocol). The nurses will continue to collect the fall index and the fall-related injury rate once the new protocol begins.
 - a Know which outcomes to measure and how to collect them (e.g., to measure pain acuity use a self-report pain scale; to measure ambulation determine the distance a patient walks each time).
 - b Be sure that the outcomes are measurable. Use scales (e.g., Pain and Braden scales), physiologic measures (e.g., temperature, blood pressure, pulse oximetry), or survey tools.
 - c Choose outcomes that are not costly to collect. Use existing equipment if you can.
 - d Who will collect the data? It is usually best to limit the number of staff who collect data to ensure better accuracy

and consistency in measurement. Be sure that each person collects data the same way and accurately.

- e Establish a way to record all data.
- 2 Test your practice change in a pilot project. This means that you implement the change in practice for a set period of time (e.g., 3 to 6 months). Consider how long it will take to show that your practice change made a difference (Poe and White, 2010). Apply evidence in a manner that integrates well with existing practice for all affected disciplines. Consider how you can introduce your practice change into existing policies, standards of care, and assessment or clinical protocols.
- 3 Involve all staff in the patient care area or unit where you work. An interdisciplinary approach brings together ideas from different perspectives. This is very important for creating a climate of EBP.
- 4 Be sure to educate all nurses or other staff who will be involved in the project before you begin implementation. Also keep them informed of the progress of the change.

The goal of any EBP change is to ensure the highest quality of care by using evidence that promotes the best outcomes (Poe and White, 2010). Proper planning is essential before implementing your practice change. Once you implement your intervention, monitor the project closely and consider how staff and patients are responding.

Evaluate the Practice Decision or Change

On the oncology unit the UPC made sure that outcome measures were in place when the protocol began. A fall index rate was collected monthly. The staff decided to add a monthly report of injuries from falls to the outcome data. Three months after implementing the protocol the medical oncology unit was cautiously optimistic. The average fall index for the unit dropped from 5.1 to 3.7, and the injury rate also dropped. The nurses observed a decline in patients' use of call lights, which was attributed to their knowing that nurses and assistive personnel would visit frequently. The UPC members surveyed nursing and physical therapy staff about the change and found that the majority were enthused and agreed that hourly rounding needed to be a routine part of their unit practice. The nursing staff is able to see that use of the protocol improves patient outcomes and gives them more time to coordinate care because of fewer distractions from patient calls.

After implementing a practice change, your next step is to evaluate the effect. You do this by analyzing the outcome data that you collect during the pilot project. Outcome evaluation tells you if your practice change improved conditions, created no change, or worsened conditions. For examples, after using a new, transparent IV dressing, the staff analyzed their audits, which included the incidence of dislodged IVs and the incidence and rating of phlebitis. Their findings showed reduction in the number of catheters that became dislodged and in onset and severity of phlebitis. After using a new approach to educating clinic patients about medications and administration schedules, follow-up phone calls to patients found an improved understanding of doses and times to administer. However, patients were not able to explain which side effects to expect. Once an evaluation is complete, you must decide to continue the EBP, make a revision, or discontinue the practice change. Analysis of an EBP change may require assistance from statisticians if you or your team members collect extensive data. Be sure to use reliable resources and be thorough in examining all data.

Communicating a Practice Change

Six months after starting the new fall prevention protocol, the fall index of the oncology unit continues to remain low. An added outcome is an improvement in patient satisfaction scores. Cathy submits the protocol for an abstract in the hospital publication, *Nursing Research Day*. Her abstract, "Using Evidence To Prevent Falls," is well accepted by her peers and becomes a standard for other nursing units in the hospital.

After applying evidence, it is important to communicate the change in practice and the results to nursing and other health care colleagues. This is true whether the results are successful or unsuccessful. There are many ways to communicate the outcomes of EBP: talking with a colleague, sharing results in staff meetings, presenting in workshops or seminars, submitting an abstract for a poster presentation, and publishing an article. As a professional you are responsible for communicating important information about nursing practice. Sharing evidence and the effects of any

practice change motivates others within a health care setting and makes them excited about potential practice improvements on their work units. When you successfully adopt an EBP way of thinking, it becomes very natural to talk about available evidence and continue seeking solutions for problems in patient care.

IMPACT OF EVIDENCE-BASED PRACTICE ON NURSING

This chapter provides a brief introduction to EBP. Of all of the initiatives introduced in health care, EBP may be the most important. With the rapid, ongoing expansion of research knowledge in health care, it is essential to remain accountable by applying evidence in patient care. When evidence exists about ways to improve patient outcomes, it becomes important for that evidence to reach the bedside. Your patients expect nursing professionals to be informed and to use the safest and most appropriate interventions. Use of evidence enhances nursing, improving patients' perceptions of excellent nursing care.



Critical Thinking Exercises

Maria Gonzalez is a 45-year-old Hispanic woman who is admitted to the hospital with inflammatory bowel disease, which she has had for 2 years. The disease is an inflammation of the intestines. As a result, Maria has a recurrence of bloody diarrhea, abdominal cramping, and a fever. During her hospital stay Maria receives IV fluids, corticosteroids, and anti-infective drugs. Jeanne is the nurse assigned to coordinate Maria's discharge home. Jeanne is concerned about Maria's diet at home and wonders how it might affect her disease, particularly the frequency of diarrhea. She learns that Maria eats three large meals a day with a diet high in carbohydrates. In consultation with her instructor, Jeanne asks if a low-carbohydrate diet might be best for Maria. The instructor suggests that Jeanne conduct a literature search to see what the most current evidence suggests.

- 1 Given this clinical case study, write the PICOT question that is the basis of Jeanne's inquiry.
- 2 The librarian helps Jeanne conduct a literature search. Among the articles located in the search is a systematic review. Explain why a systematic review is the best source of evidence.
- 3 One of the articles found by the librarian describes a study in which a researcher studied 45 patients with inflammatory bowel disease and 52 patients with normal intestinal function to determine if there is an association between frequency of diarrhea and ingestion of high-carbohydrate intake. Which type of study did this researcher conduct?



REVIEW QUESTIONS

- 1 Place the steps of evidence-based practice in the correct order:
 - 1 _____ Search the literature for evidence.
 - 2 _____ Evaluate outcomes of the practice change.
 - 3 _____ Communicate the findings.
 - 4 _____ Apply evidence in making a practice change.
 - 5 _____ Ask a PICOT question.
 - 6 _____ Critique the available evidence.

- 2 A nurse is talking with colleagues and shares what she learned at a recent conference on wound care. She suggests that the group discuss which is the best anti-infective solution to use to clean infected incisions? Which type of trigger for a clinical question is this?
 - 1 Problem-focused
 - 2 Knowledge-focused
 - 3 Peer-focused
 - 4 PICOT-focused
- 3 Which question contains the primary components of a PICOT question?
 - 1 Are oral steroids effective for female adults with adult-onset asthma?
 - 2 Which steroid preparations are best for male teenagers with activity-induced asthma who play sports?
 - 3 Does the use of inhalers improve bronchial air flow?
 - 4 Does the use of medication via an inhaler versus a nebulizer affect oxygen saturation in asthmatic children?
- 4 A group of nurses on an obstetric unit are discussing the results of their patient satisfaction scores. They've noticed the scores dropping over the last 3 months. Their manager has expressed concern as to why the female patients do not think that nurses are responsive to their needs. The nurses decide to address the issue in their EBP committee where they will form a PICOT question. This scenario is an example of which type of trigger for an EBP question?
 - 1 Administrative-focused
 - 2 Knowledge-focused
 - 3 Problem-focused
 - 4 Time-focused
- 5 The nurses on the obstetric unit have identified a PICOT question to address the patient satisfaction problem, "Does hourly rounding improve female obstetric patients' perceptions of satisfaction with nursing care?" Place each element of the PICOT question in the correct category.
 - 1 P _____
 - 2 I _____
 - 3 C _____
 - 4 O _____
 - 5 T _____