part I

An Introduction to Research

chapter 1

The Importance of Research as Evidence in Nursing

CHAPTER OBJECTIVES

The study of this chapter will help the learner to

- Define nursing research and discuss how research is used in nursing practice.
- Describe the evolution of nursing research.
- Investigate the roles that nurses play in research processes.
- Contrast research and other types of problem solving.
- Explore how research is used as evidence guiding the practice of nursing.
- Develop strategies for using research as evidence in nursing practice.
- Read research and appraise the credibility of the journal, authors, and publication process.

KEY TERMS

Blinded
Evidence-based practice
Evidence-based practice guideline
External validity
Journal club
Magnet status
National Institute of Nursing Research
Nursing process
Nursing research
Outcomes measurement
Peer review
Principal investigator
Quality improvement
Randomized controlled trial
Replication
Systematic review

Research as Evidence for Nursing Practice

The practice of nursing is deeply rooted in nursing knowledge, and nursing knowledge is generated and disseminated through reading, using, and creating nursing research.

Voices from the Field

I was working as the clinical nurse specialist of a busy surgical intensive care unit (ICU) when we received a critically ill patient. He was fresh from cardiac surgery and quite unstable; he needed multiple drugs and an intra-aortic balloon pump just to maintain his perfusion status. He was so sick that we were not able to place him on a special bed for pressure relief. For the first 24 hours, we were so busy trying to keep him alive that we did not even get a chance to turn him.

About 36 hours into his ICU admission, he was stable enough to place on a low-air-loss mattress for pressure-ulcer prevention. When we were finally able to turn him, we noted he had a small stage II pressure ulcer on his coccyx. Despite the treatments that we used, the pressure ulcer evolved into a full thickness wound. He recovered from his cardiac surgical procedure but, unfortunately, required surgeries and skin grafts to close the pressure ulcer wound.

The experience I had with this patient prompted me to review the evidence-based practice guidelines we had in place to prevent pressure ulcers in critically ill patients. I wanted to make sure we could prevent this happening again, but I had a lot of questions. Could we preventively place high-risk patients on low-air-loss mattresses while they were still in the perioperative service? Did we even know the patients who were at risk for pressure ulcers? What assessment tools did nurses use to assess the patient's risk? When a high-risk patient was identified, what interventions did the nurses use to prevent pressure ulcers? How were the ulcers treated once they appeared?

I was fortunate that my chief nursing officer (CNO) was a strong advocate for evidence-based practice (EBP), and she encouraged me to initiate an EBP review of pressure ulcer prevention and treatment. Specifically, I wanted to find out what nursing interventions were supported by research evidence when we were trying to prevent pressure ulcers in the surgical ICU. So I contacted other inpatient units at the hospital to determine what they were doing.

I discovered that the surgical ICU was not different from the other inpatient units. There was no standard, evidence-based nursing practice for pressure ulcer prevention. Units were not consistently using the same skin assessment tools, so it was hard to objectively communicate risk from one unit to another. The tools we were using were not necessarily based on research. It was clear that we needed to identify the best available evidence and devise a protocol.

We started by establishing an evidence-based skin care council for the hospital. The team consisted of bedside nurses from all inpatient units and the perioperative service. Initially the council reviewed current nursing skin assessment forms, and we conducted a review of the literature on pressure ulcer prevention and interventions. We discovered the Association for Healthcare Research and Quality (AHRQ) guidelines on pressure ulcer prevention and treatment, a key source of evidence for healthcare practices.

Over the course of the next year, we revised our nursing policy and procedure, incorporating the AHRQ evidence into a treatment guideline. The guideline included a procedure for skin assessment and nursing documentation, and pressure ulcer assessment and treatment decision algorithms. We reviewed skin-care products and narrowed down the products to those that were supported by evidence. One algorithm helped staff make selections between products that

maximized prevention and treatment. Another algorithm guided nurses in the use of therapeutic surfaces (e.g., low-air-loss mattresses) to prevent pressure ulcers. To monitor our progress, we began quarterly pressure ulcer prevalence studies. As part of the implementation, we scheduled a skin-care seminar featuring a national expert on skin care.

At the beginning of our EBP skin-care journey, our pressure ulcer prevalence was 9 percent. Since implementing our EBP skin-care initiatives our pressure ulcer prevalence has dropped by two thirds. The EBP skin-care council continues to be active in our hospital. We meet monthly to seek out the best evidence to guide skin- and wound-care product decisions, practice guidelines, protocols, and policies. My initial search for a solution—based on my experience with one patient—led to improvements in practice that have benefited many patients since then.

Mary Beth Flynn Makic, PhD, RN

Professional nurses rely on research findings to inform their practice decisions; they use critical thinking to apply research directly to specific patient care situations. The research process allows nurses to ask and answer questions systematically that will ensure that decisions are based on sound science and rigorous inquiry. Nursing research helps nurses in a variety of settings answer questions about patient care, education, and administration. Research ensures that practices are based on evidence, rather than eloquence or tradition.

What Is Nursing Research?

Nursing research is a systematic process of inquiry that uses rigorous guidelines to produce unbiased, trustworthy answers to questions about nursing practice. Research is used as evidence in the evaluation and determination of best nursing practices. The aim of original nursing research is to generate new knowledge to inform the practice of nursing. However, nurses may use research to

Nursing research: A systematic process of inquiry that uses rigorous guidelines to produce unbiased, trustworthy answers to questions about nursing practice.

- Synthesize the findings of others into a coherent guide for practice
- Explore and describe phenomena that affect health
- Find solutions to existing and emerging problems
- Test traditional approaches to patient care for continued relevance and effectiveness

A variety of methods is used to generate new knowledge or summarize existing study results. Nurse researchers may measure observable characteristics, solicit perceptions directly from clients, assess words and phrases for underlying meaning, or analyze a group of study findings in aggregate. Nurse researchers have virtually limitless options for research design and may assume roles ranging from primary investigator for a large, multisite trial to staff nurse in a bedside science project. The goal, however, is always the same: to generate new knowledge that can be applied to improve nursing practice.

Regardless of the design, research is a rigorous endeavor that is subject to peer review and replication. These two characteristics are essential to ensure that research is unbiased

and applicable to the real world. A study is subjected to **peer review** when experts in the field evaluate the quality of the research and determine whether it warrants presentation at a conference or publication in a professional journal. These reviews are generally **blinded**, meaning the reviewer is unaware of the researcher's identity. In blind peer review, a research report is subjected to appraisal by a neutral party who is unassociated with the research and unaware of the authorship. Reviewers determine whether the study process and outcome are of acceptable quality for communication to the broader professional community. **Replication** ensures that findings can be duplicated in different populations and at different times. This characteristic provides the nurse with confidence that the findings are not limited to a single sample, but that study outcomes will likely be similar in other patient populations.

Research: A Fundamental Nursing Skill

Although many students and practitioners of nursing consider research to be the purview of academics and graduate students, in reality, research is fundamental to professional nursing practice. There are many reasons why research is critical for the nurse in any role. Nursing is a profession, and along with advanced education and self-regulation, research is one of the central tenets that defines a profession. For nurses to function on the healthcare team as colleagues with therapists, physicians, and other caregivers, they must speak the language of science and use the best available research evidence as a basis for collaborating in planning patient care.

As professionals, nurses are accountable for the outcomes they achieve and the effectiveness of interventions that are applied and recommended to patients. Accountability is based on a solid understanding and evaluation of the best available evidence as a basis for decision making and patient counseling. In current healthcare practice, access, cost, and patient safety are all areas that clearly benefit from nursing research.

Consumer demands require that nurses are accountable for their practice as well. Consumers and their families are often well informed about the evidence that reveals the effectiveness of care. The baby boom generation is entering the years that typically yield higher healthcare use, and this generation is better educated, is healthier, and has better access to information than any generation in history. The Internet has given consumers unprecedented access to health information—some of it questionable, but much of it of high quality—that enables them to evaluate the basis for their own healthcare decisions.

In recent years, external agencies and purchasers of healthcare services are requiring that organizations collect and report information about the quality of care that is delivered and the outcomes that are achieved. These external regulators frequently require that organizations report the evidence they use to make nursing practice decisions. Many nursing organizations are in the process of pursuing or maintaining **Magnet status**, which requires that staff nurses understand the research

Peer review: The process of subjecting research to the appraisal of a neutral third party. Common processes of peer review include selecting research for conferences and evaluating research manuscripts for publication.
Blinded: The peer reviewer is unaware of the author's identity, so personal influence is avoided.
Replication: Repeating a specific study in detail on a different sample. When a study has been replicated several times and similar results are found, the evidence can be used with more confidence.
Magnet status: A designation for organizations that have characteristics that make them attractive to nurses as workplaces.

process and use evidence as a basis for practice. To maintain *Magnet* status, hospitals must show improved outcomes and clinical practice based on current evidence (Wise, 2009).

gray matter

Research is critical in nursing because

- The use of research is inherent to the definition of a profession.
- Nurses are accountable for outcomes.
- Consumers are demanding evidence-based care.

The Evolution of Research in Nursing

Nursing is a relatively young field when compared to fields such as philosophy or physics that have hundreds of years of historical study. Nursing has not always relied on profession-specific research as a basis for practice. However, if one reads contemporary nursing literature, it is clear that research is taking on fundamental importance as a source of evidence for practice.

Florence Nightingale introduced the concept of scientific inquiry as a basis for practice. Nightingale's work focused on collecting information about factors that affected soldier mortality and morbidity during the Crimean War. With scientific data, she was able to create change in nursing practice. Indeed, her work was so impressive that she was inducted into the Statistical Society of London.

The years following Nightingale's era offered relatively little scientific work in nursing, likely because nursing education was accomplished through apprenticeship rather than scholarly work. As more nursing education moved into university settings in the 1950s, research took on more prominence as a key nursing activity. Journals were initiated both in the United States and internationally that focused exclusively on publishing nursing research. More outlets for the publication of nursing research were established in the 1970s and 1980s, leading to the communication of research findings to a broader audience. The creation of the National Center for Research for Nursing within the National Institutes of Health (NIH) in 1986 was a seminal step in recognizing the importance of nursing research. In 1993, the center was given full institute status as the **National Institute of Nursing Research (NINR)**. This move put nursing research on a par with medical research and the other health sciences, ensuring financial support and a national audience for disciplined inquiry in the field. The NINR and other national agencies guide the overarching research agenda that focuses nursing research on professional priorities. The mission of the NINR is to support clinical and basic research to establish a scientific basis for the care of individuals across the life span (NINR, 2010).

National Institute of Nursing Research (NNR): A federal agency responsible for the support of nursing research by establishing a national research agenda, funding grants and research awards, and providing training.

In the 1980s and 1990s, leaders in nursing research met periodically at a Conference on Research Priorities in Nursing Science (CORP) to identify research priorities for the nursing profession. These priorities were established as 5-year agendas. In the 1990s, advances in nursing research were coming so quickly that a more flexible approach was required. NINR research agenda planning now involves more frequent meetings of smaller groups that consist of nurse researchers, representa-

gray matter

Nurses may play a variety of roles in research, including the following:

- Informed consumer of research
- Participant in research-related activity, such as journal clubs
- Contributor to a systematic review process
- Data collector for a research project
- Principal investigator for a research study

tives of other NIH groups, and experts from the larger multidisciplinary community to identify pressing issues, research opportunities, and gaps in knowledge. This approach allows the NINR to set both long- and short-term goals for the national nursing research agenda. Some examples of recent NINR nursing research priorities appear in **Table 1.1**.

The 1990s and early twenty-first century saw a shift in emphasis on research as an academic activity to one that is a basis for nursing practice. The impetus for this shift was partially due to external influences that created demands for accountability, effectiveness, and efficiency. Internal influences in the profession also played a key role in this shift, as nursing professionals strive to create a norm of professional practice that is firmly grounded in best demonstrated practice.

Table 1.1

National Institute of Nursing Research Proposed Strategic Objectives for Nursing Research, 2011–2020

Objective	Examples
Advance health promotion and disease prevention	■ Study the behavior of systems that promote health, e.g., family units, populations, and organizations ■ Improve the understanding of health behavior patterns and incentives for behavior change ■ Determine the effects of models of preventive care ■ Create communication strategies that promote health and improve health literacy ■ Translate scientific research that will positively affect health behaviors ■ Incorporate interprofessional partnerships in the conduct of health behavior research
Improve quality of life by managing the symptoms of chronic illness	■ Improve knowledge of the biological basis for symptoms ■ Test interventions that reduce the development and/or impact of symptoms of chronic illness ■ Develop strategies that improve symptom management in chronic illness ■ Design strategies that help patients manage symptoms over the course of a disease
Improve end of life and palliative care	■ Enhance the scientific knowledge of issues and choices underlying end of life and palliative care ■ Develop and test interventions that provide palliative care across the lifespan ■ Develop strategies to minimize the burden of caregivers ■ Determine the impact of provider training on outcomes ■ Create communication strategies to promote end of life care
Enhance innovation in nursing research	■ Develop technologies and informatics-based solutions for health problems ■ Expand knowledge and application of telehealth interventions ■ Extend preventive interventions to underserved groups ■ Mobilize technology to form global partnerships to facilitate research and exchange of information

Source: National Institute of Nursing Research. Retrieved January 30, 2011, at http://www.ninr.nih.gov/NewsAndInformation/StrategicPlan2011.htm

Contemporary Nursing Research Roles

The nurse may be an effective team member on any number of research projects and may assume roles ranging from data collection to research design. The broad number of potential roles provides nurses with the chance to participate at an individual comfort level while learning increasingly complex research skills. The professional clinician has both opportunities and responsibilities to use research in a variety of ways to improve practice. **Table 1.2** contains the statement from the American Nurses Association that describes the expected roles of nurses in research processes.

Most nurses are first exposed to clinical research as informed consumers. The informed consumer of research is able to find appropriate research studies, read them critically, evaluate their findings for validity, and use the findings in practice. Nurses may also participate in research-related activities, including **journal clubs** or groups that meet periodically to critique one another's research studies. Attending research presentations and discussing posters at conferences also expose the nurse to a variety of research studies.

Journal club: A formally organized group that meets periodically to share and critique contemporary research in nursing, with a goal of both learning about the research process and finding evidence for practice.

Table 1.2

Research Roles for Nurses

Educational Level	Research Role
Baccalaureate	Have a basic understanding of the processes of research.
	Apply research findings from nursing and other disciplines to practice.
	Work with others to identify research problems.
	Collaborate on research teams.
Masters	Evaluate research findings to develop EBP guidelines.
	Form and lead teams focused on evidence-based practice.
	Identify practices and systems that require study.
	Collaborate with nurse scientists to initiate research.
Practice-based doctorates	Translate scientific knowledge into complex clinical interventions tailored to meet individual, family, and community health needs.
	Use advanced leadership knowledge and skills to translate research into practice.
	Collaborate with scientists on new health research opportunities.
Research-focused doctorates	Pursue intellectual inquiry and conduct independent research for the purpose of extending knowledge.
	Plan and carry out an independent program of research.
	Seek support for initial phases of a research program.
	Involve others in research projects and programs.

Adapted from: American Association of Colleges of Nursing. (2006). *AACN position statement on nursing research.*

Systematic review: A highly structured process of identifying, appraising, and summarizing research studies into guidelines for practice, characterized by objectivity that avoids bias.
Evidence-based practice guideline: A guide for nursing practice that is the outcome of an unbiased, exhaustive review of the research literature, combined with clinical expert opinion and evaluation of patient preferences. It is generally developed by a team of experts.
Principal investigator: The individual who is primarily responsible for a research study. The principal investigator is responsible for all elements of the study and is the first author listed on publications or presentations.

As the nurse becomes more proficient in the research process, involvement in a **systematic review** is a logical next step. Conducting a systematic review resulting in an **evidence-based practice guideline** requires the ability to develop research questions methodically, write inclusion criteria, conduct in-depth literature searches, and review the results of many studies critically. This participation also leads to facilitating changes in clinical practice on a larger scale and requires the nurse to use leadership and communication skills.

Involvement in actual research studies does not require complete control or in-depth design abilities. Assisting with data collection can take the form of helping measure outcomes on subjects or personally participating as a subject. Clinicians are frequently recruited to participate in studies or collect data directly from patients or their records. Collecting data for the studies of other researchers can give the nurse valuable insight into the methods used to maximize reliability and validity, which helps later if the nurse chooses to design an experiment.

Most nurses do not immediately start with an individual research study, but serve on a research team. As part of a team, the nurse can learn the skills needed to conduct research while relying on the time and expertise of a group of individuals. Serving on a team gives the nurse the opportunity to participate in research in a collegial way, collaborating with others to achieve a mutual goal.

The most advanced nurses are **principal investigators**, or producers of research, designing and conducting their own research projects. It is rare that individuals are able to accomplish research projects on their own, so it is more likely that the nurse will lead a research team. This requires not only research and analytical skill, but also skill in leading groups, managing projects, and soliciting organizational commitment.

Research Versus Problem Solving

Quality improvement: The systematic, data-based monitoring and evaluation of organizational processes with the end goal of continuous improvement. The goal is internal application rather than external generalization.
Outcomes measurement: Measurement of the end results of nursing care or other interventions; stated in terms of effects on patients' physiological condition, satisfaction, or psychosocial health.

Research is distinct from other problem-solving processes. Many processes involve inquiry. In an organizational setting, **quality improvement**, performance improvement, and **outcomes measurement** all involve systematic processes and an emphasis on data as a basis for decisions. For an individual nurse, the **nursing process** requires that the nurse gather evidence before planning an intervention and subsequently guides the nurse to evaluate the effectiveness of care objectively. Although both organizational and individual problem-solving processes may be systematic and objective, these are not synonymous with research in intent, risks, or outcome (Newhouse et al., 2006).

The intent of quality improvement is to improve processes for the benefit of patients or customers within an organizational context. It is basically a management tool that is used to ensure continuous improvement and a focus on quality. Research, on the other hand, has a broader intent. The goal of research is to benefit the profession of nursing and to make a contribution to the knowledge base for practice. Research is more beneficial because it becomes more broadly applied; quality improvement is beneficial specifically because of its specificity to a single organization.

The risk for a subject in a quality improvement study is not much more than the risk associated with clinical care. These studies are frequently descriptive or measure relationships that are evidenced by existing data. Often, patients who are the subjects of study for a quality improvement project are unaware they are even in a study. In a research project, however, subjects are clearly informed at the beginning of the project of the risks and benefits associated with participating in the study, and they are allowed to withdraw their information at any time. Upfront and informed consent is central to the research process.

Nursing process: A systematic process used by nurses to identify and address patient problems. Includes the stages of assessment, planning, intervention, and evaluation.

Finally, the outcomes of a quality improvement study are intended to benefit a specific clinical group and so are reviewed by formal committees and communicated internally to organizational audiences. Research findings are subjected to rigorous peer review by neutral, external reviewers, and findings are expected to stand up to replication. When quality improvement projects are planned with an expectation of publication, the distinction becomes less clear. Is the goal of publication to share perspective on a process or to generalize the results to a broader group of patients? If the latter is the goal, then quality improvement projects should be subjected to the same rigorous review and control as a research project.

The intent when an individual nurse applies the nursing process for problem solving is even more specific. The nursing process requires an individual nurse to gather data about a patient, draw conclusions about patient needs, and implement measures to address those needs. Data collected from the patient are used to evaluate the effectiveness of care and make modifications to the plan. These steps mirror the research process, but at an individual level. Research is useful within the nursing process as a source of knowledge about assessment procedures, problem identification, and effective therapeutics, but simply using the nursing process does not constitute research.

Research as Evidence in Nursing Practice

It would seem a foregone conclusion that effective nursing practice is based on the best possible, rigorously tested evidence. Yet it is only in the past two decades that an emphasis on evidence as a basis for practice has reached the forefront of professional nursing. Although it may be surprising that the scientific basis for nursing practice has been this long in coming, there are many reasons why evidence-based nursing practice is a relatively recent effort. The past decade has seen unprecedented advances in information technology, making research and other types of evidence widely available to healthcare practitioners. Whereas a nurse practicing in the 1980s may have read one or two professional journals a month and attended perhaps one clinical conference in a year, contemporary nursing professionals have access to a virtually unlimited bank of professional journal articles and other sources of research evidence via the Internet. Technology has supported the communication of best practices and afforded consumers open access to healthcare information

gray matter

The research process is distinct from other problem-solving processes in that

- Research contributes to the profession of nursing, not just a single organization or patient.
- Research involves an explicit process of informed consent for subjects.
- Research is subjected to external peer review and replication.

as well. As a result, evidence-based practice is quickly becoming the norm for effective nursing practice.

Evidence-Based Practice

Evidence-based practice: The use of the best scientific evidence, integrated with clinical experience and incorporating patient values and preferences in the practice of professional nursing care.

What Evidence-Based Practice IS

Evidence-based practice is the use of the best scientific evidence, integrated with clinical experience and incorporating patient values and preferences in the practice of professional nursing care. All three elements are important. As illustrated in **FIGURE 1.1**, the triad of rigorous evidence, clinical experience, and patient preferences must be balanced to achieve clinical practices that are both scientifically sound and acceptable to the individuals applying and benefiting from them.

Although healthcare practitioners have long used research as a basis for practice, a systematic approach to the translation of research into practice has been introduced in relatively recent times. The impetus for evidence-based practice was a 1990 comment by a Canadian physician on the need to "bring critical appraisal to the bedside." The first documented use of the term *evidence-based practice* appeared less than two decades ago when a clinical epidemiology text (Sackett et al., 1991) used the term to describe the way students in medical school were taught to develop an attitude of "enlightened skepticism" toward the routine application of diagnostic technologies and clinical interventions in their daily practice. The authors described how effective practitioners rigorously review published studies to inform clinical decisions. The goal stated in this publication was an

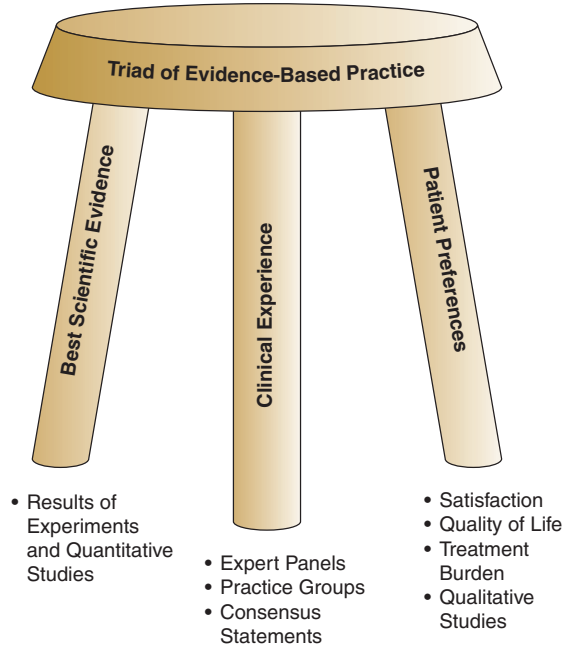

FIGURE 1.1 The Triad of Evidence-Based Practice

awareness of the evidence on which professional practice is based and a critical assessment of the soundness of that evidence.

The term entered the U.S. literature in 1993 when an article in the *Journal of the American Medical Association* described the need for an established scientific basis for healthcare decisions (Oxman, Sackett, & Guyatt, 1993). The authors of the article noted that the goal of evidence-based practice is to help practitioners translate the results of research into clinical practice, and they recognized that the scientific practice of health care required sifting through and appraising evidence to make appropriate decisions.

Even with the relatively recent birth of the term, evidence-based practice has rapidly become an international standard for all healthcare practitioners. Using the best scientific evidence as a basis for practice makes intuitive sense and places nursing in the company of the other science-based health professions in using evidence as a foundation for clinical decision making.

What Evidence-Based Practice Is NOT

A wide range of activities contribute to evidence-based practice. Many of these activities—reviewing research, consulting expert colleagues, considering patient preferences—are common in nursing practice. However, many such activities are not considered evidence-based practice, but rather other forms of decision making used to solve problems.

Evidence-Based Practice Is Not Clinical Problem Solving

Although evidence-based practice is a mechanism for solving clinical problems and making decisions about interventions, it is distinct from traditional problem-solving approaches in health care. Conventional decision making about clinical practices relied on expert opinion—sometimes achieved by consensus, but rarely through experimentation—combined with standard practice. Evidence-based practice is a systematic process of critically reviewing the best available research evidence and then incorporating clinical experience and patient preferences into the mix.

Evidence-Based Practice Is Not Solely Randomized Controlled Trials

Evidence-based practice does not mean choosing only those interventions supported by **randomized controlled trials**—although these studies are clearly important in providing guidance for effective practices. A somewhat tongue-in-cheek article by Smith and Pell (2006) suggested that we did not need a randomized trial to inform practitioners of the importance of a parachute as a measure of preventing death when jumping from an airplane (and, in fact, noted the difficulty in recruiting a control group for such a trial!). Evidence-based practice does not rely solely on one type of evidence, but rather is founded on a hierarchy of evidence, with individual studies rated from "strongest" to "weakest" based on the type of design and quality of execution. Evidence can come from many different types of studies in addition to randomized trials.

Randomized controlled trial: A typical experiment in which subjects are randomly assigned to groups, one of which gets an experimental treatment while another is a control group. The experiment has high internal validity so the researcher can draw conclusions regarding the effects of treatments.

Evidence-Based Practice Is Not "Cookbook Medicine"

Guidelines based on the best available evidence do not mean the practitioner has an edict to practice in a single way. In fact, evidence alone is never sufficient to make a specific

clinical decision about a specific patient. The nurse needs evidence plus good judgment, clinical skill, and knowledge of the patient's unique needs to apply evidence to a specific patient care situation. The definition of evidence-based practice, in fact, holds evidence as only one element of the triad of decision making. Clinical judgment and patient values must be considered when applying the evidence to a particular situation.

Evidence Is Not the Same as Theory

Theoretical effects must be tested and retested to be determined effective. As late as the early twentieth century, physicians still believed that bloodletting was an effective treatment for a host of disorders. This belief was based on the empirical observation that a patient's pulse rate slowed when he or she was bled and the theory that a slower pulse reduced irritation and inflammation. Although the empirical observations were accurate—the patient's pulse would slow, indeed, but due to ensuing hypovolemic shock—the theoretical relationship to a therapeutic response was ill founded. Many contemporary healthcare interventions are, unfortunately, based on similar theoretical relationships that have been untested for years. Recent research has refuted many of these theoretical assumptions, including the protective value of hormone-replacement therapy, the use of rubbing alcohol to prevent infection in a neonate's umbilical cord, and the relative harmlessness of margarine, among many others.

Evidence-Based Nursing Is Not Evidence-Based Medicine

The nature and processes of research are likely to be unique for any given profession. Medicine and nursing have different philosophical roots and approaches to patient care. Medicine relies on an extensive scientific basis that is primarily concerned with the cause of disease and effects of treatment. The evidence for medical care, by necessity, focuses on scientific studies that quantify these effects. Medical evidence has been criticized, however, for its sometimes artificial nature. It is a research paradox that the more an experiment is controlled, the less applicability the results will have in the real world. Randomized controlled trials, then, may provide the most rigorous scientific evidence, but that evidence may not apply well to individual patients with a broad range of physical, psychological, and behavioral conditions.

Nursing, on the other hand, requires a holistic approach to the care of individuals with physical, psychosocial, and/or spiritual needs. This care is founded on the nurse–patient relationship and the nurse's appreciation for the patient's unique needs. The evidence for nursing care, then, will require a broad range of methodologies as a basis for care. This is not to imply that these sources of evidence are not subjected to healthy skepticism and systematic inquiry, but rather that a broader range of evidence is considered as a basis for practice.

The Importance of Evidence-Based Practice in Nursing

Evidence-based practice is important to the nurse for many reasons. At the top of this list is the contribution of evidence to the effective care of patients. Studies have supported that patient outcomes are substantially improved when health care is based on

evidence from well-designed studies versus tradition or clinical expertise alone. Leufer and Cleary-Holdforth (2009) aggregated outcomes studies related to evidence-based practice changes. A wide range of effects were found in multiple specialties including orthopedic, cardiovascular, respiratory, and obstetrical outcomes. Evidence-based practices in obstetrics and neonatal care reduced morbidity and mortality, sometimes dramatically. The use of corticosteroids in premature labor, for example, reduced the risk of premature infant death by 20 percent. A seminal meta-analysis by Heater, Becker, and Olson (1988) demonstrated the impact of evidence-based practices on a range of behavioral, physiological, and psychosocial aspects of patient well-being. The linkage between evidence-based interventions and outcomes is an important one, and determining the scientific support for a practice prior to its implementation makes intuitive sense.

Although quantitative studies of cause and effect are limited, there are indications that evidence as a basis for process improvement and leadership practices may benefit the organization as well as its patients (Stetler & Caramanica, 2007). Changes in attitudes, knowledge, and skills related to evidence-based practices have been demonstrated through testing educational interventions (Varnell et al., 2008). Evidence-based practice may soon become the norm for both the way care is delivered and the way organizations operate.

Healthcare providers operate in an era of accountability, in which quality issues, patient safety, and cost concerns are primary drivers of patient care processes. Using evidence to guide practice streamlines patient care (Newhouse, 2007). Practices that are unnecessary are eliminated; ineffective practices are replaced with practices that result in desired outcomes.

Existing practices may even be unintentionally harming patients (as was found in the hormone-replacement studies), so it is ethically unjustified to continue using untested interventions. Evidence can help healthcare professionals avoid making errors in decision making relative to patient care. Using research decreases the need for trial and error, which is time-consuming and may be counterproductive. In any case, time is not wasted on practices that may be ineffective or unnecessarily time-intensive.

gray matter

Evidence-based practice is important in nursing practice because research has shown that

- Patient outcomes are better when evidence is used as a basis for practice.
- Nursing care is more efficient as ineffective processes are replaced.
- Errors in decision making become less frequent.
- Consumers want evidence-based information to make decisions.

Consumers are well-informed about their options for personal health care and often resist the traditional, paternalistic approach to health interventions. The public expects that care is based on scientific evidence and believes that care processes should routinely lead to high quality outcomes that are physically and mentally desirable (Aarons et al., 2009). Healthcare professionals must be able to respond to their patients' questions about the scientific merit of interventions and about the relative benefit of treatment options.

Evidence might come in the form of journal articles, policies, guidelines, professional consensus statements, and standards of practice as well as formalized research. Although evidence-based practice implies scientific evidence, the words *relevant* and *rigorous* might be better adjectives to describe the kind of evidence needed by healthcare

professionals. Critical skills include the ability to judge both the *type of evidence* that is needed and the *value of that evidence*.

Healthcare practitioners do not practice in professional isolation, but rather explore what works and does not work using empirical methods. An increased emphasis on evidence-based practice can be viewed as a response to these broader forces in the context of healthcare delivery and a logical progression toward the utilization of research as a basis for patient care decisions.

How Can Evidence Be Used in Health Care?

At its best, evidence provides the basis for effective, efficient patient care practices. At a minimum, an evidence-based approach can enhance practice by encouraging reflection on what we know about virtually every aspect of daily patient care. The evidence-based practice (EBP) process need not be onerous, and basically entails five elements: (1) formulating an appropriate question, (2) performing an efficient literature search, (3) critically appraising the best available evidence, (4) applying the best evidence to clinical practice, and (5) assessing outcomes of care (Noteboom et al., 2008). The original question can come from a variety of sources in a healthcare setting and, likewise, there is a wide range of organizational processes for which evidence can improve outcomes.

Evidence as a Basis for Healthcare Processes

Evidence can be incorporated into virtually every phase of the healthcare process. Evidence exists for best practices in

- Assessment of patient conditions
- Diagnosis of patient problems
- Planning of patient care
- Interventions to improve the patient's function or condition, or to prevent complications
- Evaluation of patient responses to intervention

Evidence as a Basis for Policies and Procedures

Although healthcare professionals from different educational programs, backgrounds, and experience may have different ways of delivering patient care, few can argue with the need for best practices. Evidence-based practice provides the foundation for policies and procedures that are tested and found effective, as opposed to "the way we've always done it."

Evidence as a Basis for Patient Care Management Tools

The evidence that is revealed through systematic review of research and other sources provides an excellent basis for patient care management tools such as care maps, critical paths, protocols, and standard order sets. One of the benefits of patient care management

tools is the reduction of variability in practices, and evidence serves as a rational basis for standardized practices.

Evidence as a Basis for Care of the Individual

The complexity of patients that need care in the healthcare system can make the clinician wonder if evidence can ever be applied to an individual patient. It is easy to consider the question, "Is my patient so different from those in the research that results will not help me make a treatment decision?" This question, more than any other, may stand in the way of applying evidence to individual patient care situations. In fact, one study found that the more familiar a patient was to a practitioner, the *less likely* the clinician was to use evidence as a basis for that person's care (Summerskill & Pope, 2002).

As practitioners, though, we must ask whether these assumptions about the uniqueness of patients are in their best interests when it comes to clinical care. Uncertainty is inherent in the healthcare process; evidence helps to quantify that uncertainty. Concern for the uniqueness of the individual patient is not a reason to ignore the evidence, but rather to learn to critically apply it appropriately. Evidence is not intended to be rigid, but rather—as our definition makes explicit—to be *integrated* with clinical experience and a patient's unique values to arrive at optimal outcomes.

Evidence in clinical practice is not solely limited to patient care, however. Healthcare professionals might be interested in evidence as it relates to team functioning, the best way to communicate change, organizational models for research utilization, or even the effects of insurance on healthcare usage. Evidence in health care abounds on a variety of topics, and research utilization can improve patient care in a multitude of ways.

gray matter

Evidence can be used in nursing practice as a basis for

- Nursing care processes such as assessment, diagnosis, treatment, and evaluation
- Policies and procedures that guide nursing practice within an organization
- Patient care management tools such as care maps, standard order sets, and critical paths
- Care decisions regarding individual patient needs

Strategies for Implementing Evidence-Based Practice

Considering the benefits of basing clinical nursing practice on evidence, it would make sense for evidence-based nursing practice to be the norm. Unfortunately, this is not the case. There are many reasons why evidence-based practices are the exception rather than the rule, including limitations created by evidence-based practice systems themselves. Some barriers are related to human factors, and still others are related to the organizations within which nursing care is delivered. **Table 1.3** lists some of the common barriers to using evidence as a basis for practice.

Organizations do not commonly have systems in place to support clinicians in the development of evidence-based practice tools. Although there has been a surge in the resources available for practitioners who want to participate in the development of practice guidelines, there has been little in the way of operational models to guide healthcare organizations that want to implement pervasive evidence-based practice (Salbach et al., 2007).

Table 1.3

Barriers to Using Evidence in Clinical Practice

Limitations in evidence-based practice systems	■ Overwhelming amount of information in the literature ■ Sometimes contradictory findings in the research
Human factors that create barriers	■ Lack of knowledge about evidence-based practice ■ Lack of skill in finding and/or appraising research studies ■ Negative attitudes about research and evidence-based care ■ Perception that research is "cookbook medicine" ■ Perception that research is for medicine, not nursing ■ Patient expectations (e.g., demanding antibiotics)
Organizational factors that create barriers	■ Lack of authority for clinicians to make changes in practice ■ Peers emphasize status quo practice because "we've always done it this way" ■ Demanding workloads with no time for research activities ■ Conflict in priorities between unit work and research ■ Lack of administrative support or incentives

The complexities of changing practice based on evidence are daunting indeed. Pagoto et al. (2007) studied the barriers and facilitators of evidence-based practice as perceived by healthcare professionals. Seven themes were used to describe both barriers and facilitators:

- Training and educational support
- Attitudes toward EBP and research
- Consumer demand for evidence-based care
- Logistical and organizational considerations
- Institutional and leadership support
- Policies and procedures
- Access to appropriate evidence

Strategies for Overcoming Barriers

Although little can be done to reduce the complexity of contemporary clinical care, there are some strategies that can help improve the rate at which healthcare professionals utilize research as a basis for their practice.

Begin the process by specifically *identifying the facilitators of and barriers to EBP practices*. Use of a self-assessment such as that tested by Gale and Schaffer (2009) can help identify organizational strengths and limitations in preparation for an EBP effort.

Education and training can improve knowledge and strengthen practitioners' beliefs about the benefits of EBP (Varnell et al., 2008). Clinicians may fear they will appear to lack competence, and knowledge will give them confidence in determining an evidence base for their practice.

One of the most helpful—and difficult—strategies is to *create an environment that encourages an inquisitive approach* about clinical care. The first step in identifying opportunities for best practices is questioning current practice. This can be accomplished by creating a culture in which EBP is valued, supported, and expected.

Despite the barriers inherent in implementing evidence-based practice in clinical practice, it is imperative to create structures and processes that reduce these obstacles. Regardless of the system within which the clinician practices, there is a systematic approach to finding and documenting the best possible evidence for practice. The process involves defining a clinical question, identifying and appraising the best possible evidence, and drawing conclusions about best practice.

Reading Research for Evidence-Based Practice

Reading research as evidence requires that the professional nurse have a basic understanding of research processes and can apply that understanding to the critical appraisal of individual studies. This is a systematic process of assessing the reliability, validity, and trustworthiness of studies, which will be explored in detail throughout this text. The appraisal process begins by determining if the journal, authors, and publication process are credible.

Consider the following key issues when assessing credibility:

- Does the author have the appropriate clinical and educational credentials for the research study? If not, have team members been recruited who have the requisite knowledge and skill? Teams give strength to a research project by providing diversity of perspectives and enlarging the expertise that is accessible to the team members.
- Is there evidence of a conflict of interest that may introduce bias into the study? For example, does the financial sponsor of the study have something to gain by positive or negative results? Sponsors may unintentionally impose expectations on a study and a researcher that may introduce bias into the study. Do the authors have an association with any of the entities in the study? If the authors are employed by an agency being tested in the study, then researcher bias may be a potential influence on the interpretation of data or the selective reporting of findings.
- Is the journal unbiased? In other words, does the publication have anything to gain by publishing positive or negative results? The publication should be one that has an external editorial board and a cadre of reviewers who are not associated financially with the publication. The names and credentials of the editorial board should be accessible in the publication.

Where to Look

It is sometimes difficult to determine whether a journal is peer reviewed. It may be explicitly stated in the front of the journal, but the absence of this description does not mean the journal is not a scholarly one. The reader may have to scrutinize the front matter of a journal (the masthead and publication information) or a journal web page to determine the nature of the publication.

The front matter should also include the names of the external editorial board. An external editorial board means there is objective oversight of the content and quality of material published in the journal. It is uncommon that the names of actual reviewers are published; the peer review process is a blinded one, meaning that article authors do not know the identity of the manuscript reviewer, and the reviewer does not know the identity of the authors.

If it is not clear whether the journal is peer reviewed, or if an article has been retrieved electronically so front matter is not available, some hints may indicate a journal is a scholarly one. Characteristically, peer-reviewed journal issues are identified by volume and number, and the pages are numbered sequentially through the entire year instead of starting over with each issue. An article published in October, therefore, would likely have page numbers in the hundreds. The first page may also specify the date on which a manuscript was received, reviewed, and subsequently published. This would confirm that a journal article has been peer reviewed.

The first page of the article should describe the author's credentials and place of employment, along with contact information. Any potential conflicts of interest should be identified here. Funding sources for research studies may appear in the credentials section or at the end of the article. Ideally, the journal will also publish any potential conflicts of interest—such as companies owned by the journal's parent company—that may introduce bias into the publication's selection process.

- Has the research study undergone blinded peer review? Blind peer review enables a critical appraisal of the research study by a neutral party who is not influenced by the stature (or lack of it) of the authors.
- Has the study been published within a reasonable time frame? Health care has a rapidly changing clinical environment, and studies that are delayed in getting to publication may be outdated before they reach print. Many journals note the date on which a manuscript was received and the length of time until it was reviewed and accepted. This enables the reader to determine if the information in the study is contemporary or subject to historical effects.

Reading research, much like any nursing skill, becomes easier with practice. As a practicing nurse reads, studies, and engages in research projects, the process becomes more efficient and informative. Evaluation that may initially require a great deal of focus and effort eventually becomes second nature. As the appraisal of research becomes part of the nurse's routine, the ability to select studies for application to practice allows the nurse to ensure that his or her practice is based on sound evidence.

Using Research in Evidence-Based Practice

Research is a key element in evidence-based practice. Scientific, rigorous, peer-reviewed studies are the foundation of evidence for professional nursing practice. Selecting,

reviewing, and incorporating research findings into practice are at the heart of professional nursing care delivery; however, evidence-based practice does not eliminate the need for professional clinical judgment. The application of a specific evidence-based practice guideline to a specific patient situation is based on the nurse's assessment of the situation and an appraisal of the interventions that are most likely to be successful. The responsibility remains with the clinician to combine evidence with clinical expertise and patient values in managing individual patients and achieving optimal outcomes.

Where to Begin?

The process begins by identifying a problem that will be best addressed by a review of the evidence. The choice of a subject to study may be driven by a variety of factors. Newell-Stokes (2004) classifies three general categories that may uncover the need for evidence-based practice.

The first category includes problem-focused factors. These are generally clinical problems that are identified through quality improvement processes, benchmarking studies, regulatory agency feedback, practicing clinicians, or administrative data. For example, a hospital may identify a problem with skin breakdown through nurse observation, quality data indicating an increase in pressure ulcer rates, analysis indicating pressure ulcer rates are higher than comparable hospital units, or data that demonstrate higher costs for patients with skin breakdown.

A second category includes factors related to nursing knowledge. A knowledge deficit may be evident, or new knowledge may emerge through research studies. A new professional association or new national guideline presents opportunities for incorporating evidence-based changes into practice. A practice change often has a better chance of implementation if users perceive a solid base of evidence for the practice change. For example, a nurse who attends a national conference may find that hydrotherapy is an evidence-based treatment for pressure ulcers and use the information to motivate a change in nursing practice.

Checklist for Evaluating the Credibility of a Research Article

- ✔ The authors have the appropriate clinical and educational credentials for this research study.
- ✔ There is no evidence of any conflict of interest for the authors that might introduce bias into the way the study is designed or the way the results are viewed.
- ✔ There is evidence that this journal is peer reviewed (at least one of these):
  - Pages are sequentially numbered for the entire year.
  - Issues are identified by volume and number.
  - The journal has an external editorial board.
  - The article indicates a review date.
- ✔ The publication has no financial connection to positive or negative results from the study.
- ✔ The study has been published in a reasonable time frame from date of study to date of publication.

The third category includes factors such as new equipment, technology, or products that become available to the nurse. All of these present opportunities to use evidence in practice to improve outcomes.

Once the need is identified for a change in practice, the way the research is gathered and used may take a variety of forms.

Processes for Linking Evidence to Practice

Evidence can be used as a basis for practice through several processes. An individual nurse may appraise research studies and share findings with colleagues. A specific question may be answered by reviewing the literature or attending research presentations at conferences.

Although reviewing research studies is a good beginning for establishing evidence for nursing practice, it is possible to introduce bias into the selection of the articles to review. Nurses may consciously or unconsciously select only those articles that support their point of view while ignoring studies that do not. A systematic review process controls the potential for this bias. A systematic review process is a structured approach to a comprehensive research review. A systematic review begins by establishing objective criteria for finding and selecting research articles, combined with documentation of the rationale for eliminating any study from the review.

Research studies that are selected for inclusion in the review are subjected to careful and thorough appraisal of study quality and validity. Studies are graded based on the strength of evidence they provide as well as design and quality criteria. There is some variability in the rating scales that are commonly used to evaluate a research study's strength as evidence. It is important to understand that one rating system is not necessarily better than another. Individual values, the nature of the practice question, and the kind of knowledge needed drive the choice of a rating system. Most grading systems have between four and six levels. **Table 1.4** depicts a rating system for levels of evidence that is a composite of the works of Armola et al. (2009), Ahrens (2005), and Rice (2008).

Using this scale, for example, a randomized trial of the use of aromatherapy in a postanesthesia care unit to reduce nausea would be the strongest level of evidence if it were from a large study with definitive results or if it were successfully replicated several times at several sites. The same study conducted in a single setting with a small sample of convenience would provide evidence that was less authoritative. Weaker still would be the evidence that was generated through observation or expert opinions.

It must be noted that these rating scales apply primarily to the evaluation of treatments, interventions, or the effectiveness of therapies. Recall the definition of evidence-based practice: practice based on the best demonstrated evidence combined with clinical experience and patient preferences. The hierarchy of evidence may look quite different depending on the nature of the practice under study.

Review and rating of the evidence should result in recommendations for practice. The strength of these recommendations is commensurate with the level of evidence and the quality of the study. The link between the strength of the evidence and the strength of the

Table 1.4

Rating Systems for Grading Levels of Evidence

Level of Rating	Type of Study
Level I	■ Multiple randomized controlled trials (RCTs) reported as meta-analysis, systematic review, or meta-synthesis, with results that consistently support a specific intervention or treatment
	■ Randomized trials with large sample sizes and large effect sizes
Level II	■ Evidence from well-designed controlled studies, either randomized or nonrandomized, with results that consistently support a specific intervention or treatment
Level III	■ Evidence from studies of intact groups
	■ Ex-post-facto and causal-comparative studies
	■ Case–control or cohort studies
	■ Evidence obtained from time series with and without an intervention
	■ Single experimental or quasi-experimental studies with dramatic effect sizes
Level IV	■ Evidence from integrative reviews
	■ Systematic reviews of qualitative or descriptive studies
	■ Theory-based evidence and expert opinion
	■ Peer-reviewed professional organization standards with supporting clinical studies

resulting recommendation is the way in which varying levels of evidence are incorporated into a single practice guideline. **Table 1.5** depicts the way that the American Academy of Pediatrics (2004) recommends that evidence be linked to a subsequent system of recommendations. Based on the strength of the evidence and the preponderance of benefit or harm, recommendations are generated that are classified as strongly recommended, optional, or recommended. Some evidence results in no recommendation because a conclusion cannot be definitively drawn. Some evidence that shows harm to the patient may result in not recommended status.

The systematic review process is an involved and time-consuming one and should be undertaken only when no existing evidence-based practice guidelines exist. The effort is warranted, though, when no clear guidance exists for specific practices, or when the development of a guideline is likely to be affected by practitioner bias.

Creating Evidence for Practice

Nurses are commonly the primary investigators for studies that focus on the needs of patients and the effectiveness of nursing interventions. When a nurse conceives of, designs, and implements a research project, he or she is designated as a primary

Table 1.5

The Link Between Evidence and Recommendations for Practice

Type of Evidence	Clear Evidence of Benefit or Harm	Benefit and Harm Are Balanced
Well-designed, randomized controlled trials (RCTs) or reports of multiple RCTs	Strong recommendation for or against the intervention.	Action is optional.
RCTs with limitations of quasi-experimental studies	Recommendation for or against the intervention.	Action is optional.
Observational and descriptive studies, case controls, and cohort designs	Recommendation for or against the intervention.	Action is optional.
Expert opinion, case studies	Action is optional.	No recommendation for or against the intervention.

Source: Levin, R. F., & Feldman, H. R. (2006). *Teaching evidence-based nursing*. New York: Springer.

investigator. The primary investigator is responsible for all aspects of a research study's conduct and outcome, even if a team is involved. The primary investigator also has the right to be the first author noted on a research publication.

The design of a research study is an advanced and complex skill that requires experience in the clinical processes under study as well as an understanding of the complexity of research design and analysis. That is not to say that the professional nurse cannot gain the skill and experience needed to be a primary investigator, only that becoming a nurse researcher is an evolutionary process that occurs over time. It is the rare nurse who is able to design and conduct a study on the first attempt. More commonly, a nurse learns the process by being involved in the research of others in some way—either in data collection, team participation, or even as a subject. Only gradually does he or she gain the ability to conceive of and lead a research project.

Creating nursing research is a systematic, rigorous process. The remainder of this text will guide the nurse as he or she gains the foundation needed to read, use, and create evidence.

Future Directions for Nursing Research

It is clear that nursing research will continue to assume a prominent role in supporting the professional practice of nursing. The future of nursing research is exciting and requires that all nurses accept responsibility for seeking and using evidence as a basis for practice. It can be expected that research as part of nursing's future includes focusing on

For More Depth and Detail

For a more in-depth look at the concepts in this chapter, try these references:

Bauer-Wu, S., Epshtein, A., & Reid Ponte, P. (2006). Promoting excellence in nursing research and scholarship in the clinical setting. *Journal of Nursing Administration, 36*(5), 224–227.

Kenny, D., Richard, M., Ceniceros, X., & Blaize, K. (2010). Collaborating across services to advance evidence-based nursing practice. *Nursing Research, 59*(1 Suppl), S11–S21.

Malloch, K., & Porter-O'Grady, T. (2006). *Introduction to evidence-based practice in nursing and health care*. Sudbury, MA: Jones and Bartlett.

Melnyk, B., Fineout-Overholt, E., Stillwell, S., & Williamson, K. (2010). Evidence-based practice step by step: The seven steps of evidence-based practice. *American Journal of Nursing, 110*(1), 51–53.

Scott, K., & McSherry, R. (2009). Evidence-based nursing: Clarifying the concepts for nurses in practice. *Journal of Clinical Nursing, 18*(8), 1085–1095.

Shirey, M. (2006). Evidence-based practice: How nurse leaders can facilitate innovation. *Nursing Administration Quarterly, 30*(3), 252–265.

Strout, T., Lancaster, K., & Schultz, A. (2010). Development and implementation of an inductive model for evidence-based practice: A grassroots approach for building evidence-based practice capacity in staff nurses. *Nursing Clinics of North America, 44*(1), 93–102.

Tagney, J., & Haines, C. (2009). Using evidence-based practice to address gaps in nursing knowledge. *British Journal of Nursing, 18*(8), 484–489.

Thiel, L., & Ghosh, Y. (2010). Determining registered nurses' readiness for evidence-based practice. *Worldviews on Evidence Based Nursing, 5*(4), 182–192.

research as a routine and integral part of a professional nursing practice environment. This requires the engagement of nurses in disciplined inquiry on some level, whether as informed consumers or primary investigators and team leaders. Nurses must be involved in the promotion of research in support of nursing practices. As such, nurses must become adept at planning and implementing change in nursing practices. An open mind and adaptability are key characteristics for ensuring adoption of evidence-based practices.

Collaboration with physicians and members of other disciplines in the design and implementation of patient-centered research will continue to elevate nurses to the level expected of all of the health science professions. Participation on a research team encourages other professions to treat nurses as respected colleagues and valued members of the healthcare team.

The future of nursing requires an emphasis on increasing the contribution of research to the knowledge of nursing based on a strategic research agenda. This includes a broadening of the opportunities for dissemination of nursing research findings through research conferences, clinical groups, electronic formats, and publication.

Summary of Key Concepts

- The practice of nursing is founded on nursing knowledge, and nursing knowledge is generated and disseminated through reading, using, and creating nursing research.
- Nursing research is a systematic process of inquiry that uses rigorous, systematic approaches to produce answers to questions and solutions to problems in nursing practice. Research is designed so that it is free of bias and results are trustworthy. The hallmarks of research are peer review and replication.
- Nurses may use research to synthesize the findings of others, explore and describe phenomena, find solutions to problems, or test traditional approaches for efficacy.
- Research is fundamental to nursing practice because it is characteristic of a profession, and nurses are accountable for the care they deliver. Consumers and external agencies are demanding that healthcare professionals provide evidence for the effectiveness of interventions.
- Nursing is a relatively young profession, but there is still a history of disciplined inquiry by its practitioners. The National Institute of Nursing Research gives nursing research national stature and financial support, and also establishes a national agenda of priorities for nursing research.

CRITICAL APPRAISAL **EXERCISE**

Retrieve the following full text article from the Cumulative Index to Nursing and Allied Health Literature, or a similar search database:

Ortiz, J., McGilligan, K., & Kelly, P. (2004). Duration of breast milk expression among working mothers enrolled in an employer-sponsored lactation program. *Pediatric Nursing, 30*(2), 111–118.

Review the article, including information about the authors and sponsors of the study. Consider the following appraisal questions in your critical review of this research article:

1. Do the authors have the appropriate clinical and educational credentials for this research study? What are the strengths and weaknesses of this research team?
2. Is there evidence of any conflict of interest that might introduce bias into the way the study is designed or the way the results are viewed? Do the authors have any potential financial gain from the results of this study?
3. What is the evidence that this journal is peer-reviewed? Find the home page of this journal on the web. Does the journal have an editorial board?
4. Does the journal have anything to gain by publishing positive or negative results from this study?
5. Has the study been published in a reasonable time frame? Were the data that were used for the study based on a relatively recent sampling time frame?
6. Is there evidence of bias in the way the study was designed or implemented? If so, how does it affect the nurses' use of these data in the practice setting?

- Nurses may fulfill a variety of roles in contemporary nursing research practice, ranging from informed consumers to data collectors to primary investigators. As nurses become more proficient in nursing research, their roles may broaden and involve projects of increasing complexity.
- Research is not synonymous with problem solving; it is intended to benefit the profession as a whole. A systematic approach and upfront, informed consent of subjects are hallmarks of a research process.
- The benefit of research to nurses is its use as evidence for practice. Evidence-based practice is the use of the best scientific evidence integrated with clinical experience, and incorporating patient values and preferences in the practice of professional nursing care. A variety of types of research is required to accomplish this goal.
- Evidence-based practice is important in nursing because outcomes are improved, care is more efficient and effective, and errors are reduced when practitioners use evidence as a standard of care. Consumers are asking for evidence to help them make decisions about their treatment options, and nurses are in a unique position to provide them with appropriate evidence.
- Evidence can be used as a basis for nursing practice in assessment of the patient's condition, diagnosis of patient problems, planning patient care, evaluating interventions, and evaluating patient responses.
- Barriers to using evidence as a basis for nursing practice may be related to the nature of evidence in practice, individual issues, or organizational constraints. Nurses must identify barriers to the use of evidence in practice and implement strategies to overcome them.
- Translation of research into practice is based on a careful evaluation of the characteristics of a patient population, matched with an assessment of the credibility and **external validity** of studies relative to patient needs.
- Future directions in nursing research include focusing on research as an integral part of nursing practice in a collaborative environment. Collaboration with other healthcare team members in research enhances the value of the profession and garners respect for its practitioners.

External validity: A study that can be confidently generalized to people, places, or situations other than those in the experiment.

References

Aarons, G., Wells, R., Zagursky, K., Fettes, D., & Palinkas, L. (2009). Implementing evidence-based practice in community mental health agencies: A multiple stakeholder analysis. *American Journal of Public Health, 99*(11), 2087–2095.

Ahrens, T. (2005). Evidence-based practice: Priorities and implementation strategies. *AACN Clinical Issues, 16*(1), 36–42.

American Academy of Pediatrics. (2004). Policy statement: Classifying recommendations for clinical practice guidelines. *Pediatrics, 114*(3), 874–877.

American Association of Colleges of Nursing. (2006). AACN Position Statement on Nursing Research. Retrieved January 31, 2001, from www.aacn.nche.edu

Armola, R., Bourgault, A., Halm, M., Board, R., Bucher, L., et al. (2008). AACN's levels of evidence: What's new? *Critical Care Nurse, 29*(4), 70–73.

Gale, B., & Schaffer, M. (2009). Organizational readiness for evidence-based practice. *Journal of Nursing Administration, 39*(2), 91–97.

Heater, B., Becker, A., & Olson, R. (1988). Nursing interventions and patient outcomes: A meta-analysis of studies. *Nursing Research, 37*(5), 303–307.

Leufer, T., & Cleary-Holdforth, J. (2009). Evidence-based practice: Improving patient outcomes. *Nursing Standard, 23*(32), 35–39.

National Institute of Nursing Research. (2010, January). About NINR: Mission statement. Retrieved January 31, 2010, from http://www.ninr.nih.gov/AboutNINR/NINRMissionandStrategicPlan/

Newell-Stokes, G. (2004). Applying evidence-based practice: A place to start. *Journal of Infusion Nursing, 27*(6), 381–385.

Newhouse, R. (2007). Creating infrastructure supportive of evidence-based nursing practice: Leadership strategies. *Worldviews on Evidence-Based Nursing, 4*(1), 21–29.

Newhouse, R., Pettit, J., Poe, S., & Rocco, L. (2006). The slippery slope: Differentiating between quality improvement and research. *Journal of Nursing Administration, 36*(4), 211–219.

Noteboom, J., Allison, S., Cleland, J., & Whitman. J. (2008). A primer on selected aspects of evidence-based practice to questions of treatment. Part 2: Interpreting results, application to clinical practice, and self-evaluation. *Journal of Orthopaedic and Sports Physical Therapy, 28*(8), 485–501.

Oxman, A., Sackett, D., & Guyatt, G. (1993). Users' guides to the medical literature: I. How to get started. *Journal of the American Medical Association, 270*, 2093–2095.

Pagoto, S., Spring, B., Coups, E., Mulvaney, S., Coutu, M., et al. (2007). Barriers and facilitators of evidence-based practice perceived by behavioral science health professionals. *Journal of Clinical Psychology, 63*(7), 695–705.

Rice, M. (2008) Evidence-based practice in psychiatric care: Defining levels of evidence. *Journal of the American Psychiatric Nurses Association, 14*(3), 181–187.

Sackett, D., Haynes, R., Guyatt, G., & Tugwell, P. (1991). *Clinical epidemiology: A basic science for clinical medicine* (2nd ed.). Boston: Little, Brown.

Salbach, N., Jaglal, S., Korner-Bitensky, N., Rappolt, S., & Davis, D. (2007). Practitioner and organizational barriers to evidence-based practice of physical therapists for people with stroke. *Physical Therapy, 87*(10), 1284–1305.

Smith, G., & Pell, J. (2006). Parachute use to prevent death and major trauma related to gravitational challenge: Systematic review of randomized controlled trials. *International Journal of Prosthodontics, 19*(2), 126–128.

Stetler, C., & Caramanica, L. (2007). Evaluation of an evidence-based practice initiative: Outcomes, strengths, and limitations of a retrospective, conceptually-based approach. *Worldviews on Evidence-Based Nursing, 4*(4), 187–199.

Summerskill, W., & Pope, C. (2002). An exploratory qualitative study of the barriers to secondary prevention in the management of coronary heart disease. *Family Practitioner, 19*, 605–610.

Varnell, G., Haas, B., Duke, G., & Hudson, K. (2008). Effect of an educational intervention on attitudes toward an implementation of evidence-based practice. *Worldviews on Evidence-Based Nursing, 5*(4), 172–181.

Wise, N. (2009). Maintaining Magnet status: Establishing an EBP committee. *AORN Journal, 90*(2), 205–213.