

Clinical Scholarship and Evidence-Based Practice

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True scholarship consists in knowing not what things exist, but what they mean; it is not memory but judgment.

—James Russell Lowell

Any discussion of scholarship and evidence-based practice (EBP) and the doctor of nursing practice (DNP) role must first begin with some essential questions. These include questions as basic as the following: What is scholarship? Are EBP and clinical scholarship the same thing? How does clinical scholarship differ from the traditional definition of scholarship? Why do we need nursing scholars in practice settings? What is the role of the DNP in clinical scholarship? What are the knowledge resources, tools, and methods necessary to implement and support clinical scholarship and EBP?

These questions are important ones to consider as healthcare organizations and schools of nursing redefine and expand nurses' roles. If nursing is to maintain a full partnership with medicine in the delivery of health care, the education of nurse leaders and nurses in advanced practice roles must be at a comparable level with other doctorally prepared healthcare practitioners such as MDs, PharmDs, and PsyDs. The merging of nursing leadership skills, evidence-based decision making, and expert clinical care will ensure that nursing has a strong and credible presence in an ever-changing and complex healthcare system. In a presentation by former president Faye Raines to the American Association of Colleges of Nursing (AACN), the leader noted that "the DNP degree more accurately reflects current clinical competencies and includes preparation for the changing healthcare system" (Raines, 2010, p. 5).

The DNP degree is a terminal practice degree and is now considered by many healthcare organizations as the preferred degree for nursing leaders involved in the delivery and organization of clinical care and healthcare systems. The result has been a proliferation of DNP programs throughout the United States. Since the first edition of this book, the number of DNP programs and DNP graduates has increased exponentially. In a recent survey, the AACN reported that there are now 269 DNP programs in 48 states, with 59 more in the planning stages. Between 2012 and 2013, enrollment in DNP programs was 4,688 students, and there were 2,443 graduates during those same years. Currently, 18,000 students are enrolled in DNP programs nationwide—an increase of 26.2%, as noted in the fall 2014 survey of nursing programs (AACN, 2015). The DNP's academic preparation—with a strong curricular base in advanced practice principles, experiential learning, intra- and interprofessional collaboration, and application of the best clinical research evidence—can best fulfill nursing's goals for leadership in practice and clinical education. In addition, clinical scholarship, including critical inquiry, analysis, synthesis, creativity, and translational research, must be a distinguishing feature of the DNP's role and expertise.

The purpose of this chapter is to define and explore the meaning of clinical scholarship; to distinguish EBP from other forms of scholarly activity; to describe the unique role of the DNP in scholarship; and to provide an overview of the language, methodological tools, strategies, and thought processes that are necessary to ensure that nursing's scholarship is useful, significant, and of the highest quality. Entire books are dedicated to research processes, methodologies, and EBP. This is not the intent of this chapter; rather, it is to explore concepts, provide resources, and whet the reader's appetite for more in-depth information on the topic.

What Is Clinical Scholarship?

In Sigma Theta Tau International's (1999) *Clinical Scholarship Resource Paper*, Melanie Dreher, chair of the task force, wrote that “clinical scholarship is about inquiry and implies a willingness to scrutinize our practice” (Dreher, 1999, p. 26). In addition, “clinical scholarship is not clinical proficiency . . . unless we are questioning the reason for its use in the first place . . . ; and neither is it clinical research, although it is informed by and inspires research” (p. 26). Finally, she noted that “clinical scholarship is an intellectual process. . . . It includes challenging traditional nursing interventions, testing our ideas, predicting outcomes, and explaining both patterns and exceptions. In addition to observation, analysis, and synthesis, clinical scholarship includes [translation], application and

dissemination, all of which result in a new understanding of nursing phenomena and the development of new knowledge” (p. 26).

The AACN’s Position Statement on *Defining Scholarship for the Discipline of Nursing* (1999) defined scholarship as “those activities that systematically advance the teaching, research, and practice of nursing through rigorous inquiry that: 1) is significant to the profession, 2) is creative, 3) can be documented, 4) can be replicated or elaborated, and 5) can be peer-reviewed through various methods” (p. 1). According to the National Organization of Nurse Practitioner Faculties (NONPF), scholarly projects can be varied but should meet the needs of a group, community, or population versus an individual. Examples include, but are not limited to, translating research in practice, quality improvement, implementing and evaluating EBP guidelines, and collaborating on legislative change using evidence (NONPF, 2007).

These definitions and examples are congruent with the evolving definition of scholarship in academia since Boyer’s (1990, 1997) groundbreaking work, *Scholarship Reconsidered: Priorities of the Professoriate*. Ernest L. Boyer was an American educator, chancellor, and president of the Carnegie Foundation for the Advancement of Teaching (Carnegie Foundation for the Advancement of Teaching, 1996). Since the publication of *Scholarship Reconsidered* (1990), a new and expanded role for scholarship has emerged in academia that makes the previously mentioned definitions of scholarship more compatible with the goals and processes of practice disciplines. The traditional definition of scholarship in academia did not account for the nuances and rigors of clinical practice knowledge and its application for problem solving and interactive, human engagement (AACN, 2006). Boyer’s model (1990, 1997), however, is well suited to scholarship in nursing practice. In Boyer’s view, scholarship is not linear; rather, there is a constant, reciprocal, iterative relationship between each of its four aspects. It embraces the concepts of discovery (building new knowledge through research and careful inquiry to refine existing knowledge), integration (interpreting knowledge through dissemination in various forms), application (using knowledge for problem solving, service, and growth), and teaching (developing and testing instructional materials to advance learning, including the formation and sustaining of an engaging environment for learning between teacher and student) (Boyer, 1990, 1997; Stull & Lanz, 2005).

The AACN’s *The Essentials of Doctoral Education for Advanced Nursing Practice* (2006) embodies much of Boyer’s criteria in the specification of the eight core essentials and specialty-focused competencies as the basic underpinnings to be integrated into the DNP curriculum (AACN, 2006).

Essential 3 of the core elements is “clinical scholarship and analytic methods for evidence-based practice” (AACN, 2006). In this document, the authors stated that “scholarship and research are the hallmarks of doctoral education” (p. 11), and, further, that “research doctorates are designed to prepare graduates with the research skills necessary to discover new knowledge in the discipline. However, DNPs engaged in advanced nursing practice provide leadership for EBP. This requires competence in knowledge development activities such as the translation of research in practice, the evaluation of practice, activities aimed at improving the reliability of health care practice and outcomes, and participation in collaborative research” (DePalma & McGuire, as cited in AACN, 2006, p. 11). Therefore, DNP programs focus on the translation of new science, its application, and its evaluation. In addition, DNP graduates generate evidence to guide practice.

As DNP programs have proliferated, the curriculum has evolved to include more focus on research translation and EBP. An Internet review of the curricula from several national DNP programs indicates that most curricula include courses that provide graduates with the skills needed to participate in whatever level of research is appropriate to their setting and scholarship goals. Such courses include, for example, theory or scientific foundations for knowledge development, research and/or applied methods, statistics, and translating evidence into practice.

Evidence-Based Practice and Clinical Scholarship: Are They the Same?

Scholarship is an evolutionary process that raises the level of the profession through participation in the generation of new knowledge and through scientific and social exchange. “The difference between evidence based nursing practice and scholarship or applied nursing research is that evidence based practice is practice driven” (French, 1999, p. 77). Whereas scholarship was often viewed by many practicing professionals as an add-on, optional activity, EBP has become a necessity in our current information-based, technological age. Computers have given everyone access to both good and bad information. The defining feature of EBP is the linking of current research findings with patients’ conditions, values, and circumstances. In addition, it involves “the conscientious, explicit, and judicious use of current best evidence for making decisions about the care of individuals” (Sackett, Richardson, Rosenberg, & Haynes, 1997, p. 2). Nursing’s unique addition to this process must offer a more holistic approach that adds artful practice and ethical standards

to the empirics of evidence (Fawcett, Watson, Neuman, Hinton Walker, & Fitzpatrick, 2001).

The work of clinical scholars has increased during the past two decades. A review of published nursing articles from 1986 to 2015 in the Cumulative Index to Nursing and Allied Health Literature (CINAHL) database resulted in 153 published articles with clinical scholarship as the focus. When “evidence-based practice” was added to the search terms, an additional 20 articles were found. When “evidence-based practice” alone was used as the search term, the search returned 10,774 articles that were nursing focused.

Holleman, Eliens, van Vliet, and van Acterburg (2006) extensively reviewed six databases, including CINAHL, PubMed, Scirus, Invert, Google, and the Cochrane databases, focusing on the years between 1993 and 2004. In their meta-analysis of the literature on promotion of EBP and professional nursing associations, the authors found 179 articles that addressed EBP activities. Of the 179 articles, 47 dealt with EBP as structural measures (policy, role, quality indicators), 103 as competence- and attitude oriented (journals, conferences, workshops, research committees, etc.), and only 29 as behavior oriented (care models, guidelines).

Since the prior versions of this chapter, there has been progress in closing the gap between nursing science discovery and application or implementation in practice. Broome, Riner, and Allam (2013) specifically noted the increase of clinical investigations and practice/provider-based studies published by DNP-prepared authors from the years 2005–2012. A total of 300 articles in 59 journals were found. Of the 300 articles found, 175 met the study criteria. However, the authors recommended “greater integration of translational science models into DNP curricula to achieve the goal of publishing scholarly products that use evidence to improve practice or patient outcomes” (p. 429).

The principles of EBP were an outgrowth of the work of Dr. Archie Cochrane, a British epidemiologist who criticized the medical profession for not using evidence from randomized clinical trials as a basis for clinical care. He believed that the evidence from these trials should be systematically reviewed and constantly updated to afford patients the best quality care (Cochrane Collaboration, 2004). EBP includes an emphasis on the efficacy of treatments or interventions based on the results of experimental comparison between untreated control groups, treatments, or both. The core principles include: (1) formulating the clinical question; (2) identifying the most relevant articles, research, and other best evidence; (3) critically evaluating the evidence; (4) integrating and applying the evidence; and (5) reevaluating the application of evidence and making necessary changes. **Table 3-1** presents the hierarchy of evidence for practice.

Table 3-1 Hierarchy for Evaluating Evidence for Practice

Level 1 (strongest)	Systematic reviews/meta-analysis of all randomized controlled trials (RCTs); clinical practice guidelines based on RCT data
Level 2	Evidence from one or more RCTs
Level 3	Evidence from a controlled trial; no randomization
Level 4	Case control or cohort studies
Level 5	Systematic reviews of descriptive/qualitative studies
Level 6	Single descriptive or qualitative study
Level 7 (weakest)	Opinions of authorities/experts

Note: All levels assume a well-designed study.

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The definition of “evidence-based practice” has been adapted to include provisions for the provider’s experience and the patient’s values. It is through the incorporation of intuition, observation, theory, research, intelligent analysis, and judgment based on the data that nurses provide care that is truly individualized, reflective, and evidence based. With an increased knowledge of the theory and the tools necessary to critique and translate research into practice, the DNP is in a prime position to affect the delivery of care and to aggregate and translate evidence that can be disseminated to improve overall care and outcomes in myriad clinical areas. The translation and dissemination of clinical knowledge constitute the core of clinical scholarship.

What Is the Role of the Doctor of Nursing Practice in Clinical Scholarship?

In advanced practice, scholarship should be integrated with practice as a purposeful, systematic, and conscious endeavor. The emphasis is on inquiry, outcomes, and evidence to support practice (Sigma Theta Tau International Clinical Scholarship Task Force, 1999). Because of their education, advanced practice nurses (APNs), particularly DNPs, are expected to have mastery of essential information so that the teaching of staff, patients, and communities becomes a key function of the role. The dynamic nature of health care requires that DNPs be up to date on new information and that they be able to discern nuances in research findings so as to translate those findings in understandable ways that

improve care and practice. This requires constant critique, integration, and synthesis of new information from various sources into formats that can be disseminated to patients, colleagues, and others.

What distinguishes the role of the DNP from that of other advanced practice degree holders? The answer is not a simple one; the difference is, in fact, a combination of knowledge, expert skill, and the integration of *best* research to advance the practice and the profession. This skill comes from additional formal education, experience, and the translation, application, and evaluation of research in practice. Although most practicing nurses are exposed to “research” and “evidence” in practice, the DNP must not only embrace the process but also implement the findings in ways that ultimately change or improve practice and outcomes. Scholarship is the dissemination of those findings in publications, presentations, and Internet offerings that can be used by others. As envisioned in *The Essentials of Doctoral Education for Advanced Nursing Practice* (AACN, 2006), the DNP program prepares graduates to:

1. Use analytical methods to critically appraise existing literature and other evidence relevant to practice.
2. Design and implement processes to evaluate outcomes of practice, practice patterns, and systems of care within a practice setting, healthcare organization, or community against national benchmarks to determine variances in practice outcomes and population trends.
3. Design, direct, and evaluate quality improvement methodologies to promote safe, timely, effective, efficient, equitable, and patient-centered care.
4. Apply relevant findings to develop practice guidelines and improve practice and the practice environment.
5. Use information technology and research methods appropriately to:
 - Collect appropriate and accurate data to generate evidence for nursing practice.
 - Inform and guide the design of databases that generate meaningful evidence for nursing practice.
 - Analyze data from clinical practice.
 - Design evidence-based interventions.
 - Predict and analyze outcomes.
 - Examine patterns of behavior and outcomes.
 - Identify gaps in evidence for practice.
6. Function as a practice specialist/consultant in collaborative, knowledge-generating research.
7. Disseminate findings from evidence-based practice to improve healthcare outcomes. (p. 12)

These objectives encompass the essential skills, tools, and methods necessary to implement and support clinical scholarship and EBP. They can be distilled into six categories: (1) translating research in practice, (2) quality improvement and patient-centered care, (3) evaluation of practice, (4) research methods and technology, (5) participation in collaborative research, and (6) disseminating findings from EBP. Each of these areas is discussed in the following sections.

Translating Research in Practice

The use of evidence to support clinical practice is not a new phenomenon. Medical professionals have relied on data from science, empirical observation, case reviews, and other means for centuries (Monico, Moore, & Calise, 2005). However, as electronic access to sources of data has increased, the amount of evidence now available as a basis for clinical practice has become overwhelming. In addition, the use of translational science has increased and includes a number of processes, including knowledge translation, quality improvement, adoption of innovation, implementation science (applied research) for quality, and safety improvement (May, 2013; Newhouse, Bobay, Dykes, Stevens, & Titler, 2013).

The key to making best practice decisions is using the best quality evidence—evidence that is scientifically based and that has been replicated with success in repeated research and application. Unfortunately, although knowledge and availability of EBP have increased in the last decade, EBP remains underutilized as a tool to improve patient outcomes (Newhouse et al., 2013). Implementation science provides the tools—methods, interventions, and variables—that facilitate decision-making toward practice change (May, 2013; Newhouse et al., 2013).

Stevens (2011) specified three primary knowledge sources for EBP: valid research evidence, clinical expertise, and patient choice. Currently, evidence generated from large-scale randomized controlled trials is considered the gold standard for application in interventions (Fawcett & Garrity, 2009). Depending on the clinical situation and the patient's personal preference, other sources of evidence may be appropriate. These sources may include meta-analyses of all relevant randomized controlled trials; EBP guidelines from systematic reviews of randomized controlled trials, case control, or cohort studies; expert opinion; and nursing theory (Fawcett & Garrity, 2009; O'Mathuna, Fineout-Overholt, DiCenso, & Johnston, 2011).

To understand research evidence that may be used in practice, the following sections on qualitative and quantitative research offer a brief description of the processes and questions to be considered in

the evaluation of such research. Exhaustive coverage of every research method is beyond the scope of this chapter. However, the definitions, discussion, and examples are meant to illustrate how different types of research might be applied or used in practice and how their rigor and adequacy as evidence for practice should be evaluated.

Understanding, Distinguishing, and Evaluating Types of Research Evidence

Qualitative Research Evidence

Qualitative research is based on four levels of understanding:

1. What is the nature of reality? (Ontology)
2. What constitutes knowledge? (Epistemology)
3. How can we understand reality? (Methodology)
4. How can we collect the evidence? (Methods)

(Porter, 1996, as cited in Maggs-Rapport, 2001)

Types of Qualitative Research Studies Qualitative research is important in that it allows the nurse to consider the context of a situation while connecting with patients and noting individual differences. In addition, it permits nursing's unique perspective to be valued and considered critically when making clinical decisions. In her discussion of qualitative research and evidence-based nursing (EBN), Zuzelo (2007) proposed that "nursing needs to ensure that qualitative research is as much a part of the considered evidence as quantitative evidence is" (p. 484).

There are several kinds of qualitative research studies, including critical social theory, ethnographic studies, grounded theory research, historical research, phenomenological studies, and philosophical inquiry. Each of these methods is discussed briefly to provide an overview of the scope and potential uses of qualitative evidence and to provide a basis for evaluating the use of qualitative studies as a basis for changes in practice.

Critical Social Theory *Critical social theory* uses multiple research methods as a basis for promoting change in areas where power imbalances exist (N. Burns & Grove, 2009). According to Horkheimer (1895–1973), Marcuse (1898–1979), Adorno (1903–1969), and Habermas (1929–), critical social theory is based on the belief that individuals should seek freedom from domination (Maggs-Rapport, 2001). Habermas in particular believed that people must understand the nature of "constraining circumstances" before they can be liberated from them (Maggs-Rapport, 2001). Another

critical social theorist, Giddens (as cited in Maggs-Rapport, 2001), believed that we can understand why people act in certain ways only if we can appreciate the meanings of their actions.

The DNP might use data from critical social theory to identify meaning or patterns of concern where certain societal cultural norms exist in the form of barriers that affect particularly vulnerable populations such as the elderly, the incarcerated, abused women, and the chronically ill. Analysis would necessarily include an examination of the underlying conditions, a critique of the social phenomena, and the discovery and revelation of the social and political injustices embedded in the experience of the population in question that could lead toward removal of barriers (Maggs-Rapport, 2001).

Ethnographic Research *Ethnographic research* is used to describe the nature or characteristics of a culture to gain insight into the lifeways or behaviors of a group. Distinguishing features are immersed in the participant's way of life (Polit & Hungler, 1997), and the information gathered speaks for itself rather than being interpreted or explored for additional meanings (Maggs-Rapport, 2001). Field notes based on researcher observations over time describe daily interactions with subjects.

In one ethnographic study, Kovarsky (2008) compared clients' and families' personal experiences of outcomes and interventions with written professional discourse, technical reports, and other conceptualizations of evidence in practice. Of note was "the dismissal of subjective, phenomenally oriented information that functioned to marginalize and silence voices . . . of clients when constituting proof of effectiveness" (Kovarsky, 2008, p. 47). Further, "the current version of EBP needs to be reformulated to include subjective voices from the life-worlds of clients as a form of evidence" (p. 47). As one example of an ethnographic approach, Kovarsky proposed the personal experience narrative as a measure of qualitative outcomes and intervention analysis (p. 48). Citing a study by Simmons-Mackie and Damico (2001), Kovarsky described an ethnographic interview with a patient experiencing poststroke aphasia. When asked to comment on life before her stroke, K. [the patient] said,

"Before teacher . . . now I don't know . . . what." and "uh . . . uh . . . -always, always . . . uh . . . busy, busy, busy, . . . teachin . . . teachin . . . always, I love it. . . it's me . . . But now . . . here (points to mouth) talk, not uh . . . teaching." When asked about a typical day, she shrugged and said "nothing . . . here (points to television)" and later added "eat . . . and (points to newspaper) and shows (points to television)." (Simmons-Mackie & Damico, 2001, as cited in Kovarsky, 2008, p. 51)

These statements illustrate an altered level of life activity that cannot be appreciated in objective technical descriptions of outcomes of disease processes and their sequelae.

The ethnographic narrative is a method of subjective evidence gathering that can enhance the specificity and richness of other research methodologies, including evidence gained from logical positivist approaches such as randomized controlled trials. In particular, DNPs in public health or community health could use this method in conjunction with other, more traditional forms of evidence to gain a better real-world understanding of the populations they serve.

Grounded Theory Research *Grounded theory research* is focused on the influence of interactional processes (identification, description, and explanation) between individuals, families, or groups within a social context (Strauss & Corbin, 1994). It is an observational method used to study problems in social settings that are “grounded” in the data obtained from those observations (Glaser & Strauss, 1967; Grove, Burns, & Gray, 2013). Grounded theory is an applicable framework for study of myriad contexts, situations, and settings because it bridges the gap between empirical observation and the generation of theory by providing a structured method of sampling procedures and coding observations for explaining social phenomena or generating new theory (Annells, 1996; Barnes, 1996; Glaser & Strauss, 1967; Hammersley, 1989).

For example, a study of the implementation of EBN in Iran (Adib-Hajbaghery, 2007) sought to distinguish factors influencing the implementation of EBP in Eastern countries (versus Western countries), particularly Iran. A brief description of this study using the grounded theory approach is presented here. Data collection consisted of purposive sampling of 21 nurses (nine staff and six head nurses in differing clinical settings) with experience in nursing greater than 5 years. An interview questionnaire consisted of open-ended questions, such as “What is the basis of care you give your patients?” (p. 568), “In your opinion, what is the basis of evidence based nursing?” (p. 568), and “Can you describe some instances in which you used scientific evidence in nursing?” (p. 568). “Issues were clarified and interviews were audiotaped, transcribed verbatim and analyzed consecutively” (Adib-Hajbaghery, 2007, p. 568). A total of 36 hours of observations and interviews were carried out concurrently and involved observations of those interviewed and others working on the units.

According to the procedure identified by Strauss and Corbin (1998), each interview was analyzed before the subsequent interview took place,

and the results were coded in three ways: open coding (breaking down, examining, comparing, conceptualizing, and categorizing), axial coding (putting data back together in new ways by linking codes to contexts, consequences, and patterns of interactions), and selective coding (identifying core categories and systematically relating and validating relationships) (Adib-Hajbaghery, 2007). To confirm the credibility of the data, participants were given a full transcript of their responses and a list of codes and themes to determine whether the codes and themes matched their responses.

To establish validity, two peer researchers also checked codes and themes using the same procedure as the researcher. The results were that two main categories emerged from the research: (1) the meaning of EBN; and (2) factors in implementation of EBN, including the themes of possessing professional knowledge and experience, having opportunity and time, becoming accustomed, self-confidence, the process of nursing education, and the work environment and its expectations (Adib-Hajbaghery, 2007).

The process and results of grounded theory research and analysis provide rich data for application in practice when paired with evidence from other sources. This is especially true when there is little clinical trial evidence to support the affective dimension of care or practice.

Historical Research *Historical research* is a description or analysis of events that have shaped a discipline. Although historical research may not be used directly in practice, it provides the foundation for examination of the discipline and for providing future directions (Fitzpatrick & Munhall, 2001; Grove et al., 2013). Often history is handed down in written documents. The Library of Congress's (n.d.) American Memory Collection has original writings, newspaper clippings, photos, and other documents that provide a realistic account of the influence and actions of famous women in history, including nursing leaders. Pictures and other documents showcase the original work of early nurse leaders such as Lavinia Dock (1858–1956), Margaret Sanger (1879–1966), Clara Barton (1821–1912), and Mary Breckinridge (1881–1965), which provides a basis for advanced nursing practice and can be used by DNP in education to provide a historical perspective for practice.

Another source of historical research is oral history. Using both written documents and oral history, Libster and McNeil (2009) traced the history and meaning of a religious tradition of care of the sick and poor by the Sisters of Charity. Wall, Edwards, and Porter (2007) used oral history and a method of textual analysis to determine how retired nurses

made sense of their educational experiences. Decker and Iphofen (2005) described a method of oral history research to discover knowledge about, and change within, a profession, particularly as it relates to EBP. Tropello (2000) used oral history technique in her dissertation, “Origins of the Nurse Practitioner Movement: An Oral History.” The purpose was to gain a better understanding of current advanced nursing practice roles through an exploration of the original movement. Eight participants in the original movement were the primary sources, and the information obtained and transcribed from taped interviews was enhanced by supportive papers, correspondence, and other documents, including secondary sources. One conclusion of the study was that the politics of the 1960s, which emphasized greater freedoms for women and a focus on social programs, helped alleviate healthcare manpower shortages (Tropello, 2000). This movement has paved the way for additional professionalization in nursing, including the evolution of the DNP curriculum. Started as a research project, it became part of the core curriculum under the continuing education division of the School of Nursing at the University of Colorado. The program used a nursing–physician team approach to aid families with limited access to primary providers (Tropello, 2000).

For DNPs to prescribe their future, they must have a clear understanding of and appreciation for their history so that they can build on and shape EBP in ways that preserve the essence of nursing. The National League for Nursing and Sigma Theta Tau International have excellent historical resources. Several of the audiotapes, videotapes, and other historical resources produced by these and other nurse theorists whose original work and theory development continue to provide frameworks for advancing nursing practice were referenced by Allen (1996) in a special report, “Celebrating Nursing History: What to Keep.”

Phenomenological Research The aim of a *phenomenological (hermeneutic) study* is to understand a phenomenon through the recognition of the meaning of an experience or occurrence. Phenomenology focuses on discerning the real truth of a phenomenon rather than arguing a point or developing abstract theory (Hallett, 1995). Researchers explore an experience as it is lived by the participants in the study. The phenomenon of interest may include any number of experiences, such as death, divorce, pain, or cancer. The researcher collects data and interprets the experiences as they are lived (Grove et al., 2013). One example of a phenomenological study by Marineau (2005) involved perceptions of telehealth support by an APN for patients discharged from the hospital with acute infections.

Empirical data were insufficient in patients who had previously been enrolled in a quantitative pilot study of telehealth. Therefore, eidetic phenomenology, which compares variations in imagination after an event to capture patients' lived experiences after discharge, was used. Theme categories were: initial response, engaging in care, and experiencing the downside. Of the 10 participants in the trial, only one had a negative experience. The study was seen as useful in adding to the understanding of the transitional process of care (Marineau, 2005).

In another phenomenological approach, Maggs-Rapport (2001) used van Manen's (1990) social scientific approach to look at women's immediate response to the phenomenon of egg sharing (donation of one woman's eggs to another woman) after consultation with a clinician, and their lived experiences of egg sharing in return for free fertility treatment. The in-depth open-ended interviews of this technique established a conversational relationship about the meaning of the experience and produced a narrative that "enriches the understanding of the phenomena" (Maggs-Rapport, 2001, p. 374). Before each description can be transformed into phenomenological language, meaning units must be made of each description (Giorgi, 2000). However, only a small number of descriptions are necessary for the nature of the phenomenon to become apparent (Giorgi, 2000; van Manen, 1990).

Phenomenological techniques with a strong nursing orientation include those of Crotty (1996) and Munhall (1994, 2007). Other studies that utilized the phenomenological approach in advanced practice include those about the analysis of patient experiences of low back pain (Volker & Limerick, 2007); advanced nursing practice in rural areas (Conger & Plager, 2008); the meaning of U.S. childbirth for Mexican immigrant women (Imberg, 2008); the lived experience of the APN's transition to nurse educator (Bailey, 2012); how family practice physicians, nurse practitioners (NPs), and physicians assistants (PAs) incorporate spiritual care into practice (Tanyi, McKenzie, & Chapek, 2009); the leadership and management role of the DNP in the care of older persons in the United States (Stoekel, 2010); sociophenomenology and conversation analysis, and interpreting video lifeworld healthcare interactions (Bickerton, Procter, Johnson, & Medina, 2011); and hospital nurses' lived experience of power (Fackler, Chambers, & Bourbonniere, 2015). Phenomenological studies contribute to the evidence base by enhancing our understanding of the true meaning of patients' experiences and the broader dimensions of a problem, thus aiding in a more holistic perspective in practice.

Philosophical Inquiry *Philosophical inquiry* is used to explore the nature of knowledge, values, meaning, and ethical factors related to a question of interest. Although philosophical inquiry is related to theory, it is not the same as theory, which is more specific and concrete (Pesut & Johnson, 2007). Citing Edwards (2001), Pesut and Johnson (2007) described three “strands” that compose philosophical inquiry: (1) philosophical presupposition, which involves identifying and analyzing presuppositions in nursing (an example might be a concept analysis of nursing practice or advanced practice); (2) philosophical problems, such as what constitutes knowing in a particular situation, or ethical analyses, such as the ethics of caring in situations in which nurses’ and patients’ values conflict; and (3) scholarship, in which nurse theorists’ works are examined from a philosophical perspective. In this case, as noted by N. Burns and Grove (2009), the researcher would “conduct an extensive search of the literature, examine conceptual meaning, pose questions and propose answers including the implications for those answers” (p. 26).

In a practical application of philosophical inquiry, Dorn (2004) described a model, caring-healing inquiry for holistic nursing practice, to guide nursing research and quality improvement in a tertiary hospital. The model, which integrated the values of the hospital, provided the basis for nurses (mostly APNs) to describe their contributions to care through research and practice improvement in a partnership between a hospital and university nursing program. Facilitated by a nurse-researcher faculty member, the group served as an advisory group for program planning, development and clinical innovation.

In a more recent example, Alimohammadi, Taleghani, Mohammadi, and Akbarian (2014) used philosophic inquiry to explore the meaning of “human being” in the eastern Islamic tradition. Included were implications for practice and patient care. Knowledge about the process of philosophical inquiry and a focus on value analysis, as demonstrated in these examples, provides DNPs with a basis for facilitating ethical decision making in practice.

Evaluating Qualitative Research Evidence What are the evaluative questions? Regardless of the type of research design, the general criteria for evaluation of qualitative studies are as follows:

1. *Question, purpose, and context:* Is the research question clear, the primary purpose and the focus of the study stated, and the context described?
2. *Design:* Was the design appropriate; were the units of analysis and sampling strategy described, and the sampling criteria clear?

3. *Data collection*: What types of data were collected? Were data collection processes systematic and adequately described? How were logistical issues addressed?
4. *Data analysis*: Was data analysis systematic and rigorous? What controls were in place? What analytical approach or approaches were used? How were validity and confidence in the findings established?
5. *Results*: Were results surprising, interesting, or suspect? Were conclusions supported by data and explanation (theory)? Were the authors' positions clearly stated?
6. *Ethical issues*: How were ethical issues and confidentiality addressed?
7. *Implications*: What is the worth/relevance to knowledge and practice? (Gifford, Davies, Edwards, Griffin, & Lybanon, 2007; Patton, 1990; Russell & Gregory, 2003)

Qualitative research questions and methods provide an avenue for truly knowing patients and practicing both the “art” and “science” of nursing. These are the hallmarks of nursing that nurses at every level must retain and that DNPs must foster as role models to ensure that “best practice” does not exclude the best of nursing’s perspective.

Quantitative Research Evidence

Steps in the Quantitative Research Process Two important aspects of any quantitative research project are that the project builds on prior results or evidence and provides a basis for future research and discovery (Grove et al., 2013). **Figure 3-1** shows the steps in the quantitative research process.

The *research problem* is often derived because there is a gap in knowledge that needs to be addressed or described. Research problems or questions often arise from direct observations made in practice. The *purpose* of the study is to address the problem. To better understand the problem, an extensive *literature review* must be done in order to develop an understanding of the nature and scope of the problem and to determine what research has already been done. A framework, map, or theoretical base made up of concepts is developed to provide structure and help the researcher make sense of the findings. The *research objectives, questions, or hypotheses* set the study limits in terms of who will be studied, what question(s) will be addressed, and what relationships among variables exist.

The remaining steps are to define the variables in conceptual terms (theoretical meaning) and operational terms (how the variables will be measured or manipulated); explain assumptions (those things we take for granted to be true, whether proved or not); and then select the research design, including the population to be included, the methods



Figure 3-1 The Quantitative Research Process

Modified from Grove, S.K., Burns, N., & Gray, J.R. (2013). *The practice of nursing research: Appraisal, synthesis, and generation of evidence* (7th ed., p. 39). St. Louis, MO: Elsevier Saunders.

of measurement, the plan for data collection, and data analysis. Implementing the plan follows, including piloting the study, collecting and analyzing the data, and evaluating and interpreting the research findings, including identifying study limitations (any issue within the study that serves to limit its generalizability beyond the population or sample studied) and applicability for practice. The final step is to communicate the research findings. A brief description of the research process steps and methodological considerations follows. The reader is directed to a research book for a complete description of each of the steps in this process.

Categories and Selection of a Design Quantitative research may be categorized as experimental, quasi-experimental, or nonexperimental (descriptive or correlational). Quantitative research may be either basic research (as in laboratory studies) or applied (as in clinical research). In an experimental or quasi-experimental study, the researcher actively manipulates the independent variable (treatment or intervention) to see the effect on the dependent variable. In an experimental study, the variables and the setting are highly controlled. In a nonexperimental design, the researcher may simply want to describe or explain a phenomenon or predict a relationship (Grove et al., 2013).

Quantitative designs may also be retrospective (the proposed cause and effect have already occurred), prospective (the cause, but not the effect, has occurred), cross-sectional (examines groups in various stages of development), or longitudinal (the same subjects are studied over a period of time). None of the categories are mutually exclusive (Schmidt & Brown, 2015).

Population and Sample The *population* is everyone or everything that meets the criteria for inclusion. The criteria for inclusion may be narrow or broad depending on the size and scope of the study and the specific research question to be addressed. The *sample* is a subset of the population and the process for how the subset will be selected. This may be random (all have a better than zero chance of selection), nonrandom (convenience), cross-sectional (groups studied over time), or stratified (divided to ensure representation from groups when some variables are known). Often the population and the sample are determined by the method and how accessible the population is to the researcher (Grove et al., 2013).

Measurement Instruments Measurement instruments are tools used by the researcher to answer the operational questions posed in research studies. These tools may be questionnaires, tests, indicators of health status, and a variety of other measurement techniques.

Data Collection and Analysis Plan Most data collected in quantitative research studies are coded numerically so they can be systematically analyzed and interpreted through the use of statistics. A plan for data collection and analysis is an important part of the research process and is crucial to meaningful interpretation of results.

Pilot Study A pilot study, a smaller version of a proposed study, is an important part of the research implementation plan. It allows the researcher to refine methodology, instruments, and data collection procedures before the full study is launched (Grove et al., 2013). This cursory overview of the research process provides the basis for evaluating evidence from research. The following sections describe considerations for evaluating research evidence for use in practice.

Interpreting and Evaluating Quantitative Evidence Interpretation involves “1) examining the results from data analysis, 2) exploring the significance of findings, 3) identifying study limitations, 4) forming conclusions, 5) generalizing the findings, 6) considering the implications for nursing, and 7) suggesting further studies” (Grove et al., 2013, p. 48). Once the researcher has synthesized, interpreted, and evaluated the quantitative evidence, implications for further study, practice, or both should be discussed.

When a quantitative study is appraised for use in practice, three questions are generally considered: Is the study valid? Is the study reliable? Is the study applicable in the identified case?

Is the Study Valid? Specifically, were the methods used scientifically sound? Are the independent (manipulated variable) and dependent variables (observed result) clearly identified? Is the study free from bias or confounding variables?

Bias is a standard point of view or personal prejudice, especially when there is a tendency “to affect unduly or unfairly, or to impose a steady negative potential upon” [a result or process] (Bias, 2003, p. 135). It is an influence or action that distorts or “slant[s findings] away from the true or expected” (Grove et al., 2013, p. 197). In research, bias (sometimes called systematic variation) may occur when participants’ characteristics specifically differ from those of the population (Grove et al., 2013). This is always possible because volunteers are used for samples. It is less likely to occur, however, if the sampling strategy is well planned and followed and there is random assignment to groups. Bias may also occur if the instruments or measurement tools are faulty or if the data or statistics are inaccurate.

Selection Bias When a researcher decides to prospectively compare two types of strategies for educating nursing students, such as online instruction and traditional classroom instruction, *selection bias* may occur if the students are allowed to select which group they enter. Students who select online teaching may be very different from those who choose the traditional classroom experience. Random assignment to the groups minimizes the risk of selection bias.

Gender Bias Another form of bias is *gender bias*. Gender bias occurs in research when one gender is used more than the other to study research interventions, thus impacting generalizability of results. In nursing, gender bias is prevalent, with most studies “over-sampling” women (Polit & Beck, 2008). In an update of their 2005–2006 study, the authors sampled 300 studies over the 2010–2011 period in four research journals. One third of studies and 74% of all participants were female. Less bias was seen in studies authored by males (Polit & Beck, 2013, pp. 78–79). Timmerman (1999) outlined a procedure for ensuring that research decisions avoid gender bias. The procedure includes critically analyzing the literature, testing gender-specific differences, and identifying researchers’ personal biases. The following example of binge-eating behaviors between men and women illustrates the point. Timmerman (1999), citing Hawkins and Clement (1984) and Spitzer et al. (1992), stated, “We know that men tend to binge less frequently, consume less during binges and are less distressed by their binge eating behavior than women” (p. 642). And, “In this case, the literature provides justification for either separately studying binge eating behavior in men and women, or, if the sample has both men and women, analyzing the data separately for men and women” (Timmerman, 1999, p. 642). **Table 3-2** lists some gender-based studies. Additional gender-based studies can be found online through the Office on Women’s Health of the U.S. Department of Health and Human Services.

Confounding Variables *Confounding* occurs when a third variable, either known or unknown, produces the relationship with the outcome instead of the research intervention itself. Or, stated differently, confounding may occur when comparing two groups that may be different in additional ways from the treatment being studied (Leedy & Ormrod, 2010). Randomizing participants to either the intervention or study group helps to eliminate the possibility of confusion because there is an equal chance that extraneous variables will appear equally in both groups, thus minimizing the confounding effect.

Table 3-2 Gender-Based Studies

Celik, Lagro-Janssen, Widder-shoven, & Abma (2011)	Bringing gender sensitivity into healthcare practice: A systematic review
Diaz-Granados et al. (2011)	Monitoring gender equality in health using gender-sensitive indicators: A cross-national study
Dunlop & Beauchamp (2011)	Engendering choice: Preferences for exercising in gender-segregated and gender-integrated groups and consideration of overweight status
Gelb, Pederson, & Greaves (2011)	How have health promotion frameworks considered gender?
Griffieon & Halsey (2014)	Gender differences in immediate hypersensitivity reactions to vaccines: A review of the literature
Lauffenburger, Robinson, Oramasionwu, & Fang (2014)	Racial/ethnic and gender gaps in the use of and adherence to evidence-based preventive therapies among elderly Medicare Part D beneficiaries after acute myocardial infarction
Mark et al. (2014)	The impact of sex and gender on adaptation in space
Merryfeather & Bruce (2014)	The invisibility of gender diversity: Understanding transgender and transsexuality in nursing literature
Oliver, Martin, Richardson, Kim, & Pisu (2013)	Gender differences in colon cancer treatment
Yuh-Min, Yueh-Ping, & Min-Ling (2015)	Gender differences in the predictors of physical activity among assisted living residents
Zeeman, Aranda, & Grant (2014)	Queer challenges to evidence-based practice

One type of confounder is the effect of *history*. The history effect occurs when an event outside the researcher's control occurs at the same time as, or during, the period of the intervention. For example, in a study of patients with hypertension, a researcher may be interested in the impact of a low-salt diet on hypertension levels. The plan is to take a baseline blood pressure and then start patients on the low-salt diet. However, if, during the study period, some of these same patients also began a rigorous exercise routine and others did not, a confounding effect would be present. In this case, the intervening exercise program would make it difficult to attribute the outcome solely to the effect of the intervention. Adding a control group whose members adhered to a low-salt diet and

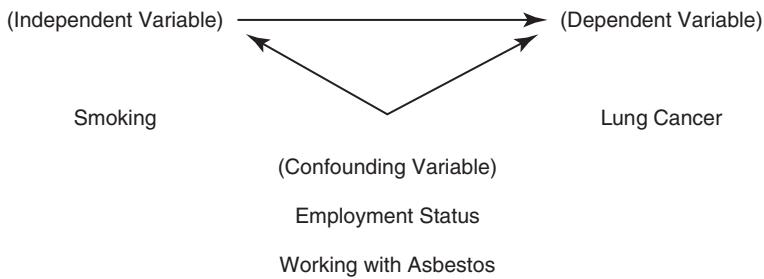


Figure 3-2 Interrelationships Among Smoking, Working in an Asbestos Coal Mine, and Risk for Lung Cancer in a Cohort/Case Control Study
Used with permission of IDRC Canada, www.idrc.ca

exercise routine or using statistical tests to control for this confounding variable would minimize the threat to validity in this study.

In another example of confounding, a researcher was interested in comparing lung cancer and smoking incidence in various regions of the country. In this study, a particular region was seen to have a significantly higher rate of lung cancer death among smokers (15 times higher) than other regions of the country. The confounding factor was that these smokers had also worked in asbestos coal mines for many years. When the researchers controlled for the variable of working with asbestos by removing the confounder, the rate of cancer due to smoking was nearly the same as that in other regions of the country. **Figure 3-2** shows the relationship among the independent variable (smoking) and confounding variable (working in an asbestos coal mine) in relationship to the dependent variable (lung cancer) (International Development Research Center, 2009).

Is the Study Reliable? The *reliability* of a study is based on questions such as the following: Does the instrument or test measure what it is supposed to measure? Does it do this consistently? Do the items on the instrument consistently measure the same characteristic? How much consistency is there between raters? (Fain, 2009; Grove et al., 2013). Reliability is measured through the use of a reliability coefficient (*r*) and ranges from 00.0 (lowest) to 1.00 (highest). Therefore, the closer a reliability score is to 1.00, the higher the reliability. In most cases, a coefficient of 0.80 or higher is considered acceptable if the instrument has already been tested and has been used frequently. If an instrument is new, a reliability coefficient of 0.70 may be acceptable depending on the purpose of the study (Griffin-Sobel, 2003). Reliability also focuses on

stability (test–retest reliability—whether an instrument yields the same results for the same two people on two different occasions), homogeneity (internal consistency—the extent to which all the items within a single instrument yield similar results), and equivalence (interrater reliability—the extent to which two or more individuals evaluating the same product or performance give identical judgments) (Fain, 2009; Leedy & Ormrod, 2010).

A simple example of reliability is seen in the selection of timing devices used in sports events. Timing devices must work consistently every time so that competitors are ensured an equal chance of winning. An example of interrater reliability is that of a classroom situation in which two evaluators are trained to use the same tool with a Likert scale to measure student performance on oral presentations.

Are the Results of the Study Applicable in the Identified Case? Once the science of a study has been appraised and the reliability of results assessed, the next important questions are: Do the results apply to the case of interest? Are the populations in the study and in the proposed population for application similar? If the populations studied are not similar, the significance of results in the study has little value for real-life implementation in a given clinical situation.

Is the effect size sufficient so that application of the study intervention will make a significant difference? The *effect size* is calculated by determining the mean difference between two groups (intervention and control) and dividing by the standard deviation. It is not the same as the statistical significance, but rather is the size of the difference between two groups. The effect size is often used in meta-analysis for combining and comparing estimates from different studies to determine the effectiveness of an intervention. “An effect size is exactly equivalent to the Z-score of a normal standard deviation. For example an effect size of 0.8 means that the score of the average person in the experimental group is 0.8 standard deviations above the average person in the control group, and hence exceeds the scores of 79% of the control group” (Coe, 2002, p. 2). Thus,

$$\text{Effect size} = \frac{\text{Mean of experimental group} - \text{Mean of control group}}{\text{Standard deviation}}$$

Generally, in evaluating any quantitative study, additional questions include the following: Why was the study done? How was the sample size

decided? How were the data analyzed? Were there any surprises or unexpected events that occurred during the study? How do the results of this study compare with others? (Melnik & Fineout-Overholt, 2015).

The standard of care for practice is increasingly based on scientific evidence. Finding the most current research based on well-conducted clinical trials is an important first step. But how do we evaluate that evidence in practice? Several statistical measures help in the evaluation of study results. **Table 3-3** briefly describes some commonly used statistical tests. An excellent guide to biostatistics is also available from *MedPage Today* online (Israni, 2007).

What happens if the evidence conflicts with patients’ values and preferences? What if our own experience conflicts with the evidence? The key is that the evidence must be relevant to the problem and tested through

Table 3-3 Clinical Statistical Measures	
Clinical Statistic	Description
Odds ratio (OR)	The odds of risk for a person in the experimental group having an adverse outcome compared with a person in the control group. An odds ratio of 1 means the event is equally likely in both groups. An odds ratio greater than 1 means the event is more likely in the intervention group than the control group. An odds ratio less than 1 means the event is less likely in the intervention group than the control group. Used most in case control and retrospective studies.
Relative risk ratio (RR)	The risk of an outcome in the intervention/treatment group (Y) compared with the control group (X). $RR = Y/X$. A relative risk of 1 means there is no difference between the two groups. A relative risk of less than 1 means a smaller potential for the effect to occur in the intervention group than in the control group. Used most in randomized controlled trials and cohort studies.
Relative risk reduction (RRR)	The percentage of reduction in the treatment group (Y) compared with the control group (X). $RRR = 1 - Y/X$? 100%.
Absolute risk reduction (ARR)	The difference in risk between the control group (X) and the intervention group (Y). $ARR = X - Y$.
Number needed to treat (NNT)	The number of patients that must be treated over a given period of time to prevent one adverse outcome. $NNT = 1/(X - Y)$.
Modified from Long, C. O. (2015). Weighing in on the evidence. In N. A. Schmidt & J. M. Brown (Eds.), <i>Evidence-based practice for nurses</i> (p. 427). Burlington, MA: Jones & Bartlett Learning.	

application. In addition, some scholars (Fawcett et al., 2001; Kitson, Harvey, & McCormack, 1998; Rycroft-Malone et al., 2004) insisted that evidence as defined by medicine is too narrowly focused and does not recognize the complexities of nursing practice. Others recommended that the definition include the influence of context in the application of evidence (Scott-Findley & Pollack, 2004). This would include findings from qualitative research.

Regardless of the definition, however, once evidence is implemented, the results must be evaluated. Did the evidence support better decision making? Was the patient's care improved? In what ways were care or outcomes improved? If they were not improved, why not? (Melnik & Fineout-Overholt, 2011).

Determining and Implementing the Best Evidence for Practice

A distinguishing feature of EBN is that nurses treat and work *with* patients rather than “work on them” (McSherry, 2002). In addition, nursing's approach is more holistic, so that “effectiveness of treatment” is but one indicator; cost-effectiveness and patient acceptability also matter (McSherry, 2002). According to the Agency for Healthcare Research and Quality (AHRQ, 2002), three benchmark domains must be considered when evaluating evidence: quality, quantity, and consistency. *Quality* refers to the absence of biases due to errors in selection, measurement, and confounding biases (internal validity). *Quantity* refers to the number of relevant, related studies; total sample size across studies; size of the treatment effect; and relative risk or odds ratio strength (causality). *Consistency* refers to the similarity of findings across multiple studies regardless of differences in study design. These considerations make it essential that all types of evidence be considered when delivering individual care and implementing systems of care. Based on these domains of evidence, a critical appraisal of types of studies can be facilitated and evaluated to determine the best approach for practice (Melnik & Fineout-Overholt, 2011).

Quality Improvement and Patient-Centered Care

In patient care, a process that facilitates continuous improvement is central to an environment that produces changes in practice, is patient centered and focused on care, and is both evidence based and of high

quality. The process must be based on a commitment by all those involved to change practice, and this commitment must be made in advance so that the research findings are applied early on in the process (French, 1999). As changes are made, they must be continuously evaluated for their impact on care and care systems. The EBP process is consistent with total quality improvement, and often the same resources can be used for both processes.

The steps in the quality management, monitoring, and evaluation processes are based on the work of William Edwards Deming, an American author, professor, statistician, and consultant best known for his work in improving manufacturing production efficiency during World War II. Deming believed that quality is based on continuous improvement of processes and that when work is focused on quality, costs decrease over time (Deming, 1986).

As an APN, the DNP must be constantly attuned to and knowledgeable about changes in practice to ensure that current best practice is maintained. Considering the context of empirical evidence and patients' preferences and using processes and frameworks that aid translation evaluation help to ensure quality.

Conceptual Frameworks for Evidence and Practice Change

Two conceptual frameworks that help in the promotion and translation of evidence into practice are the PARIHS (promoting action on research implementation in health services) model (Rycroft-Malone et al., 2002) and the AGREE (appraisal of guidelines for research and evaluation) model (AGREE Collaboration, 2001). The PARIHS model, which is based on the work of Kitson et al. (1998, 2008), suggests that the integration of evidence is based on three factors: the nature of the evidence, the context of the desired change, and the mechanism of facilitating change. This evidence, and its translation for practice, includes practice guidelines and other forms of evidence specific to patient outcomes. The use of randomized controlled trials was central to implementation of this model. The model was revised by Rycroft-Malone et al. (2002) to include research information, clinical experience, and patient choice. In the new conceptualization, which involves continuous improvement of patient care, evidence based on one's "professional craft" or experience was part of the evidence contribution (Rycroft-Malone et al., 2004, p. 83).

Further work by Doran and Sidani (2007) identified gaps in the PARIHS model that led to an intervention framework that specifically

addressed indicators for evaluating nursing services, systems, performance measures, and feedback to design and evaluate practice change. The intervention framework incorporates the work of Batalden and Stoltz (1993) and Batalden, Nelson, and Roberts (1994), which identified four categories of information in making care improvements. This information included “clinical (e.g. signs and symptoms), functional (e.g. activities of daily living), satisfaction (e.g. perceived benefit of care) and cost (i.e. both direct and indirect cost to the health care system and the patient)” (Doran & Sidani, 2007, p. 5). **Figure 3-3** depicts Doran and Sidani’s (2007) outcomes-focused knowledge translation intervention framework.

The purpose of the AGREE instrument, as defined by the collaborators, “is to provide a framework for assessing the quality of clinical practice guidelines” (AGREE Collaboration, 2001, p. 2). As further described, quality means that potential biases are addressed and that the recommendations are valid and feasible for practice. In addition, as described in AGREE, “this process involves taking into account the benefits, harms, and costs of the recommendations, as well as the

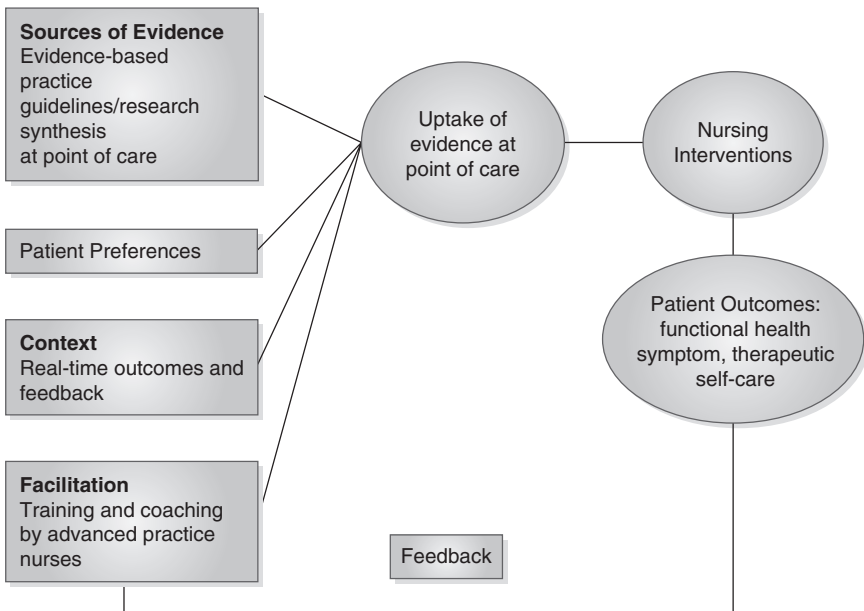


Figure 3-3 Outcomes-Focused Knowledge Translation Intervention Framework Doran, D. M., & Sidani, S. (2007). Outcomes-focused knowledge translation: A framework for knowledge translation and patient outcome improvement. *Worldviews on Evidence-Based Nursing*, 4(1), 3–13.

practical issues attached to them. Therefore, the assessment includes the judgments about the methods used for developing the guidelines, the content of the final recommendations, and the factors linked to their uptake” (AGREE Collaboration, 2001, p. 2). The AGREE instrument consists of 23 items organized in six domains: scope and purpose (items 1–3), stakeholder involvement (items 4–7), rigor of development (items 8–14), clarity of presentation (items 15–17), applicability (items 18–21), and editorial independence (items 22–23). The complete instrument and user guide are available for download from the Internet.

The nursing faculty at one family NP program, the Lienhard School of Nursing at Pace University, used the AGREE instrument to teach family NP students how to critically appraise clinical practice guidelines (Singleton & Levin, 2008). In this program, students practice critiquing single studies, systematic reviews, and clinical practice guidelines. **Tables 3-4 and 3-5** present an exemplar of a learning activity using the AGREE instrument.

In another application of the AGREE instrument, Zadvinskis and Grudell (2010) used the guideline to appraise the National Kidney Foundation Kidney Disease Outcomes Quality Initiative Clinical Practice

Table 3-4 Learning Activity for the Critical Appraisal of Clinical Practice Guidelines

Steps
1. Preparatory reading: Slutsky, J. (2005). Using evidence-based practice guidelines: Tools for improving practice. In B. M. Melnyk & E. Fineout-Overholt (Eds.), <i>Evidence-based practice in nursing and healthcare: A guide to best practice</i> (pp. 221–227). Philadelphia, PA: Lippincott Williams & Wilkins.
2. Focus for assignment: Academy of Breastfeeding Medicine (2004). <i>Breastfeeding the near term infant (35–37 weeks gestation)</i> . New Rochelle, NY: Academy of Breastfeeding Medicine.
3. Work in teams.
4. Obtain the guideline.
5. Use the AGREE instrument to critically appraise the guideline.
6. Report back.
Reprinted with permission from SLACK Incorporated: Singleton, J., & Levin, R. (2008). Strategies for learning evidence-based practice: Critically appraising clinical practice guidelines. <i>Journal of Nursing Education</i> , 47(8), 380–383.

Table 3-5 Sample Domain and Items from the AGREE Instrument for Critical Appraisal of Clinical Practice Guidelines, with Rating Scale

Scope and Purpose

The overall objective(s) of the guideline is (are) specifically described.

The clinical question(s) covered by the guideline is (are) specifically described.

The patients to whom the guideline(s) is (are) meant to apply are specifically described.

Rating Scale

Strongly agree 4 3 2 1 Strongly disagree

Reprinted with permission from SLACK Incorporated: Singleton, J., & Levin, R. (2008). Strategies for learning evidence-based practice: Critically appraising clinical practice guidelines. *Journal of Nursing Education*, 47(8), 380–383.

Guideline for Chronic Kidney Disease. **Table 3-6** shows the scoring tool and mean guideline scores across the AGREE appraisal domains for the National Kidney Foundation outcomes.

The Johns Hopkins Nursing Evidence-based Practice Model (JH-NEBP), another evidence-based model, was developed as a collaborative effort between Johns Hopkins Hospital and the Johns Hopkins School of Nursing (Johns Hopkins Center for Health Services and Outcomes Research, 2012). The model is explained in six sections. Section I introduces the concept, the evolution of EBP, and the role of critical thinking in EBP. Section II describes the components of the model, which uses the PET process—practice question, evidence, and translation. Section III further explores the PET process in developing EBP projects. Section IV describes the environment necessary for the success of EBP. Section V provides examples of EBP projects. Section VI contains tools used for EBP at Johns Hopkins. A table of contents and sample, including levels of evidence from the model and guidelines, can be downloaded from the Nursing Knowledge International website. In addition, two evidence appraisal tools, JHNEBP research and nonresearch evidence appraisal tools are downloadable through the American Nurses Association website (ANA, 2015). The JHNEBP model and guidelines have “leveled objectives” for nursing students at the baccalaureate, graduate, and doctoral levels. At the doctoral level, the focus is on reviewing, rating, synthesizing, evaluating, and translating evidence at an advanced level (Newhouse, Dearholt, Poe, Pugh, & White, 2008). An example of one evidence-based project, developed by the Neuroscience Nursing Practice Committee, is a question related to the correct procedure for establishing nasogastric

Table 3-6 Mean Guideline Scores Across Domains of the Appraisal of Guidelines, Research and Evaluation in Europe (AGREE) Instrument for National Kidney Foundation Kidney Disease Outcomes of Quality Initiative (NKF KDOQI) Clinical Practice Guidelines for Chronic Kidney Disease

AGREE Domains	Scores
Domain 1—scope and purpose	
1. The overall objective(s) of the guideline is (are) specifically described.	4.0
2. The clinical question(s) covered by the guideline is (are) specifically described.	3.9
3. The patients to whom the guideline is meant to apply are specifically described.	4.0
Standardized domain 1 score (scale, 0–100)	98.0
Domain 2—stakeholder involvement	
4. The guideline development group includes individuals from all relevant professional groups.	3.7
5. The patients' views and preferences have been sought.	1.0
6. The target users of the guideline are clearly defined.	3.9
7. The guideline has been piloted among target users.	1.7
Standardized domain 2 score (scale, 0–100)	52.4
Domain 3—rigor of development	
8. Systematic methods were used to search for evidence.	3.9
9. The criteria for selecting the evidence are clearly described.	4.0
10. The methods used for formulating the recommendations are clearly described.	3.9
11. The health benefits, adverse effects, and risks have been considered in formulating the recommendations.	3.9
12. There is an explicit link between the recommendations and the supporting evidence.	3.7
13. The guideline has been externally reviewed by experts prior to its publication.	3.9
14. A procedure for updating the guideline is provided.	1.4
Standardized domain 3 score (scale, 0–100)	87.0
Domain 4—clarity and presentation	
15. The recommendations are specific and unambiguous.	3.9
16. The different options for management of the condition are clearly presented.	3.9
17. Key recommendations are easily identifiable.	3.7
18. The guideline is supported with tools for application.	3.1
Standardized domain 4 score (scale, 0–100)	88.1

AGREE Domains	Scores
Domain 5—applicability	
19. The potential organizational barriers in applying the recommendations have been discussed.	1.3
20. The potential cost implications of applying the recommendations have been considered.	2.6
21. The guideline presents key review criteria for monitoring and/or audit purposes.	3.6
Standardized domain 5 score (scale, 0–100)	49.2
Domain 6—editorial independence	
22. The guideline is editorially independent from the funding body.	1.7
23. Conflicts of interest of guideline development members have been recorded.	3.6
Standardized domain 6 score (scale, 0–100)	54.8
Each item is rated on a 4-point scale ranging from 4 (strongly agree) to 1 (strongly disagree), with 2 mid points: 3 (agree) and 2 (disagree). The scale measures the extent to which a criterion (item) has been fulfilled.	
Zadvinskis, I. M., & Grudell, B. A. (2010). Clinical practice guideline appraisal using the AGREE instrument: Renal Screening. <i>Clinical Nurse Specialist</i> , 24(4), 209–214. © Wolters Kluwer Health/Lippincott Williams & Wilkins.	

tube placement in adult patients. Using the PICO (patient, intervention, comparison, and outcomes) format and levels of evidence, the existing protocol that required insufflations of air was discontinued. A table of the process and levels of evidence is shown in the Johns Hopkins model instructor's guide (Dearholt & Dang, 2012), available on the Internet.

Designing and Implementing Processes to Evaluate Outcomes of Practice and Systems of Care

As nursing moves practice decisions from those based on tradition to those based on empirical evidence, the APN, particularly the DNP, is in the best position to effect and assess change within the clinical setting. Why? EBP and quality management are both practice-driven processes (French, 1999). Each is informed by experience and outcomes that can be directly seen and measured. In most cases, the observations that arise during daily practice provide the basis for questions, which can be empirically tested and their results implemented and evaluated. The findings of previous research studies can be replicated in a variety of settings with resources that are already in place.

The curriculum of DNP programs includes specialty-focused competencies delineated by specialty nursing organizations, and the core essentials include courses and application experiences in research methods and statistical analysis (AACN, 2006). This education, coupled with advanced clinical knowledge, provides the DNP with the requisites necessary to design and collaborate in studies that can make a practical difference in the delivery of clinical care (French, 1999; Reavy & Tavernier, 2008). Listed in **Table 3-7** are some recent examples of clinical studies concerning advanced practice nursing interventions and outcomes designed by DNPs.

The Essentials of Doctoral Education for Advanced Nursing Practice (AACN, 2006) states that “DNP graduates must understand principles of practice management, including conceptual and practice strategies for balancing productivity and quality care” (p. 4). In addition, “they must be able to assess the impact of clinical policies and procedures on meeting the health needs of the patient populations with whom they practice” (p. 4). In addition, “they must be proficient in quality improvement strategies and in creating and sustaining changes at the organizational and policy levels” (p. 4).

Quality Improvement Initiatives to Promote Safe, Timely, Effective, Efficient, Equitable, and Patient-Centered Care

The design of quality improvement initiatives must be empirically based and dependent on sources of knowledge that include research evidence; clinical experience; reasoning; authority; quality improvement data; and the patient’s situation, values, and experience (Brown, 2005). These are the tools that can help the DNP decide whether the clinical guidelines and scientific evidence are consistent with the context, values, and desires of the patient (Glanville, Schirm, & Wineman, 2000).

For the past century, most outcome measurement has focused on the outcomes of medical care, particularly negative outcomes. However, during the past several years, there has been a greater focus on positive indicators of nursing care delivery (Melnik & Fineout-Overholt, 2011). The development of nurse-sensitive patient outcomes (NSPOs) was an outgrowth of public demand for greater accountability by healthcare providers.

Some examples of nurse-sensitive indicators of quality include health-promoting behaviors (Mitchell, Ferketich, & Jennings, 1998), compliance/adherence (Ingersoll, McIntosh, & Williams, 2000), quality of life (Ingersoll et al., 2000), support systems available to assist with caregiver

Table 3-7 Selected DNP Scholarly Publications: Evidence-Based Research Interventions and Outcomes

Author/Year	Design, Sample, Setting	Framework/Intervention/Measures	Goal/Aim	Outcomes/Findings
Bundy, E. Y., & Murphy, L. S. (2014)	QI; retrospective audit; outpatient clinic; $n = 42$ medical records.	In-service based on literature review and retrospective chart audit for use of system-based asthma action plan (AAP).	Improve use and completion of AAP post-in-service.	Statistically significant proportional outcomes following in-service, use of AAP and procedure change.
Graling, P. R. (2011)	EBP; quality improvement; $N = 283$ surgical care providers = 287 at large university hospital.	Framework for Knowledge Transfer of Patient Safety (AHRQ); Universal Protocol (The Joint Commission, 2009) Attitude Questionnaire (SAQ); team education; implementation of safety checklist.	Enhance perioperative teamwork; decrease safety events; improve compliance with Universal Protocol (The Joint Commission, 2009).	Statistically significant differences were found in safety climate and working differences overall; safety events decreased by 50%; compliance with the safety checklist increased in 2010; resources have now been allocated for perioperative safety initiatives.
Hande, K. A. (2013)	EBP; QA; retrospective audit of 90 charts (30 randomly selected for each of 3 providers).	Total Quality Management (TQM/CQI); Plan, Do, Study, Act (PDSA); EBP measures modified colorectal prevention data collection form and TQE Benchmark.	Assess adherence to colorectal cancer prevention (CRC-P) benchmarking; improve CRC-P; close gaps in detection; report improvement.	Identified practice changes; analyzed root causes; actions for improvement. Redesign of CRC-P practices.

continues

Table 3-7 Selected DNP Scholarly Publications: Evidence-Based Research Interventions and Outcomes (continued)

Author/Year	Design, Sample, Setting	Framework/Intervention/Measures	Goal/Aim	Outcomes/Findings
Krebbeks, V. P., & Cunningham, V. M. (2013)	Development of a rural DNP-managed hepatitis C clinic; patients with positive HCV antibody or active HCV virus.	Effect and Process Theory (evaluation); DNP model for rural clinic; concepts and culture of rural nursing; DNP/hepatologist collaboration.	Quality; cost effective; culturally sensitive care.	Planned: QOL; treatment compliance; medication adherence; virus eradication.
Santucci, S. (2011)	EBP; community needs assessment and gap analysis; convenience sample of 50 adults; underserved southeastern U.S. community.	Health belief model with prevention constructs. Policy change in Community Rapid Testing Program to allow referral of HIV positive patients to hospital-based ID clinic for f/u and prevention; data on system change variables, e.g., tests/results, referrals, were entered weekly in database.	Close gap to secondary prevention service to decrease HIV morbidity, mortality, and transmission.	New system expedited care to marginalized groups; change decreased time to test results/referral for treatment from 6–8 weeks to 1–2 weeks.

burden (Craft-Rosenburg, Krajicek, & Shin, 2002), trust in care provider (Ingersoll et al., 2000), and length of stay (Hodge, Asch, Olson, Kravitz, & Sauve, 2002). **Table 3-8** presents additional examples of evidence-based outcome indicators.

The success of EBP depends on asking the right questions at the right time, critically analyzing results of other studies for fit in a given situation, observing for differences in responses, and evaluating outcomes. In this regard, quality improvement evaluation is important in advanced practice to ascertain the impact of interventions and their effect on cost-effective care. DNP and APN interventions are appropriately evaluated on the basis of physiological, psychosocial, functional, behavioral, and knowledge-focused effectiveness (Glanville et al., 2000). The evaluation process involves the selection of appropriate measurement instruments. Glanville et al. (2000) made the point that instruments that measure effectiveness in care processes are not the same as those that measure outcomes. For example, a tool that measures risk for patient infections is not the same tool as one that actually tracks infection rates in a group of postsurgical patients. Similarly, in process management, the focus is on which components produce or contribute to practice variations that may ultimately affect, but are not the same as, outcomes (Ingersoll, 2005).

Some basic provisions for an effective outcomes model are to keep the outcomes as short as possible; to use outcomes, not activities or processes;

Table 3-8 Selected Evidence-Based Outcome Indicators for Advanced Practice Nursing

Outcomes	Examples and Indicators
Patient satisfaction	Ambulatory care: Survey
Risk	Morbidity and mortality: Summary Patient falls: Reports Medication errors: Medication administration records (MARs); comprehensiveness of exams
Knowledge	Blood pressure medication: Blood pressure control
Condition-specific	Postoperative pain: Pain management scale Diabetes management: Blood glucose levels
Infection control	Surgical procedures: Hand washing; nosocomial infection rates
Compliance	Fluid restriction: Daily weights Prenatal and postpartum visits

and to use singular, not compound, outcomes (Duignan, 2006). Components of an effective outcomes management model include the following:

1) identification of the problem, 2) scanning the existing evidence and standards of care, 3) identification of benchmark targets, 4) determination and selection of outcomes measuring and monitoring tools, 5) development of specific guidelines to drive care delivery processes, 6) assessment of existing processes, 7) measurement and monitoring of processes and outcomes of care, 8) reporting findings to key stakeholders and decision makers, and 9) refining care delivery processes and data collection techniques based on findings. (Ingersoll, 2005, pp. 314–315)

A significant time commitment is required for designing systems for promoting safe, timely, patient-centered care. However, the benefits are efficiency and effectiveness. Since the Institute of Medicine (IOM) studies, patient safety has been a primary focus of quality improvement initiatives. Safety issues are of concern in every care setting—primary, secondary, and tertiary. A review of the literature from 2005 to 2015 in the CINAHL databases produced over 1,000 (CINAHL) nondissertation nursing studies that involved quality improvement projects with safety as a focus. Of these, 214 studies included the word “evidence” in the title, and 7 included “advanced practice nursing” in the title. Study topics included pharmacotherapy, environment, technology, acute care, pediatrics, critical care, intravenous infusions, long-term care and home health, rural health, diabetes, health education, chronic obstructive pulmonary disease, Alzheimer’s, mental health treatment in children, head injury and neuroscience issues, electronic medical records, pregnancy, diabetes, and behavioral health. When search terms included “advanced nursing,” a number of studies dealt with issues of timeliness (51 studies in CINAHL), effectiveness (427 studies in CINAHL), and equitable care (9 studies in CINAHL)—all of which are important dimensions of quality that need to be addressed, especially as they affect safety and quality outcomes. Patient-centered care was addressed in over 50,000 studies in the CINAHL database studies. However, few studies included “DNP” in the title of the article. Direct care providers, particularly DNPs, must take a lead role in continuing the effort to improve care delivery systems that benefit patients, families, and providers of care.

Using Practice Guidelines to Improve Practice and the Practice Environment

As Goolsby, Meyers, Johnson, Klardie, and McNaughton (2004) have noted, “clinical practice guidelines are protocol-driven, step-wise

recommendations for diagnosing and treating specific conditions, or patient populations” (p. 178). Clinical decision making is grounded in the use of clinical research, expert opinion, and clinical practice guidelines. Further, clinical practice guidelines “minimize differences in practice patterns and the risk of misdiagnosis or treatment failures” (Goolsby, Meyers, et al., 2004, p. 178).

In one example, Cooke et al. (2004) described a program at one hospital that used a quality of life model and research department “linking agents” acting as in-service providers and unit consultants for EBP to encourage and link EBP, critical thinking, and practical application. Unfortunately, practice guidelines are not always used for a variety of reasons. Time, communication, involvement, resources, patient expectations, and perceived priority are all facilitators of or barriers to the implementation of EBP guidelines (Abrahamson, Fox, & Doebbeling, 2012; DiCenso, Cullum, & Ciliska, 1998; Gagan & Hewitt-Taylor, 2004; Graham, Graham, & Davies, 2013; Lopez-Bushnell, 2002; McCaughan, Thompson, Cullum, Sheldon, & Thompson, 2002; Rutledge & Bookbinder, 2002). Nevertheless, the use of practice guidelines and published articles on their use has increased substantially since the first edition of this chapter. For the 10-year period from 2004 to 2014, using the search terms “practice guidelines,” “use,” and “advanced practice,” there were 48,072 articles in CINAHL—over 3 times the number in the prior 10 years.

Evaluation of Practice

He who every morning plans the transaction of the day and follows out that plan, carries a thread that will guide him through the maze of the most busy life. But where no plan is laid, where the disposal of time is surrendered merely to the chance of incidence, chaos will soon reign.

—Victor Hugo

Planning for evaluation is as important as the change itself and must be a systematic process. Evaluation is an ongoing process that must start early in a project and be continual. Evaluating practice and changes in practice is essential to the successful implementation of any quality improvement or EBP initiative. Classification schemes allow for an organized approach to evaluating outcomes. Outcomes may be classified according to population served (e.g., pediatric, adult, geriatric), time

(long term, medium term, or short term), or type (care related, patient related, or performance related) (Rich, 2015).

Using Benchmarks to Evaluate Clinical Outcomes and Trends

One method of evaluating practice is to evaluate practice patterns against national benchmarks to determine variances in clinical outcomes and population trends. Benchmarking is the process of comparing performance with an external standard to motivate improvement (AHRQ, 2013). Organizations that regularly collect data on outcomes in health care are state boards of health and the Centers for Medicare and Medicaid Services (CMS). The Joint Commission and the Magnet Recognition Program (American Nurses Credentialing Center, 2005) also have performance measurement standards that are based on quality indicators. In addition to these organizations, many hospitals and healthcare facilities have memberships in organizations that benchmark indicators of quality in specialty services. Benchmarking is especially important since the passage of the Patient Protection and Affordable Care Act (2010). One interesting example was a study that compared NP and PA practices and productivity in outpatient oncology clinics at national comprehensive cancer network institutions. NPs were seen to be marginally more productive in seeing follow-up patients, whereas PAs conducted slightly more procedures. Both providers were seen as a useful addition to oncology practices in these centers (Hinkel et al., 2010).

Nursing services are an important aspect of outcome evaluation and reporting at any healthcare institution because nurses make up such a large part of the healthcare workforce. Effectiveness of nursing care is determined by nurse-sensitive indicators. Nursing administrators are responsible for maintaining evaluation systems and reporting nurse-sensitive outcomes. As leaders in clinical care and outcome evaluation, DNPs must be in the forefront of designing outcome evaluation plans for advanced practice.

DNPs in advanced practice roles are also included in medical outcome working groups within their scope of practice. The American Medical Association Physician Consortium for Performance Improvement (AMA-PCPI) has performance measures available for 31 topics or conditions (Gallagher, 2009). The general approach to measurement includes six steps: “1) identifying the opportunities for improvement, 2) involving representation from medical specialties and other care disciplines, 3) linking measures to an evidence base, 4) supporting clinical judgment and patient preferences, 5) testing measures, and 6) promoting a single

Table 3-9 Websites for Healthcare Outcome Information

Organization	Website
Academy Health	http://www.academyhealth.org
Agency for Healthcare Research and Quality	http://www.ahrq.gov
Centers for Medicare and Medicaid Services	http://www.cms.gov
Institute for Healthcare Improvement	http://www.ihl.org
International Society for Pharmacoeconomics and Outcomes Research	http://www.ispor.org
Johns Hopkins Center for Health Services and Outcomes Research	http://www.jhsph.edu
The Joint Commission	http://www.jointcommission.org
National Cancer Institute	http://www.cancer.gov/
National Committee for Quality Assurance	http://www.ncqa.org
National Quality Forum	http://www.qualityforum.org/Home.aspx
University of Iowa College of Nursing	http://www.nursing.uiowa.edu/excellence/evidence-based-practice-guidelines
University of Arizona Health Outcomes and Pharmacoeconomics Research (HOPE)	www.pharmacy.arizona.edu

Modified from Rich, K. A. (2015). Evaluating outcomes of innovations. In N. A. Schmidt & J. M. Brown (Eds.), *Evidence-based practice for nurses* (p. 491). Burlington, MA: Jones & Bartlett Learning.

set of measures for widespread use and multiple purpose” (Gallagher, 2009, p. 185). **Table 3-9** contains a brief listing of websites for healthcare outcomes and data.

Database Design to Generate Meaningful Evidence for Nursing Practice

A systematic process for patient care and practice data is essential to guide practice. This requires the development of standardized databases to guide outcomes research for practice. Clinical databases from computerized medical records and disease registries are the result of documentation of care or research protocols. Outcome data are also available from birth logs, death records, discharge summaries, and clinical pathways.

Most important, the outcome must be measurable, and the data must relate to the care processes or interventions (Arthur, Marfell, & Ulrich, 2009).

Another useful resource for evidence-based outcomes is the National Guideline Clearinghouse (NGC), an initiative of the AHRQ, the American Medical Association (AMA), and America's Health Insurance Plans. Users can subscribe to the NGC weekly email update service. The site provides information about new and updated guidelines from the Centers for Disease Control and Prevention (CDC), the National Institute for Clinical Excellence, the Program for Evidence-Based Care, and others. Conference information is also available from the NGC, as well as nutrition, chemicals, and drug advisory information.

The Cochrane Collaboration Review is another source that provides reprints online of the newest intervention reviews. The *Review* lists authors and their affiliations; an abstract, including background, objectives, search strategies, selection criteria, data collection, and analysis; authors' conclusions; and a plain-language summary. The library contains sections for clinicians, researchers, patients, and policy makers. The Cochrane Library, a collection of medical and healthcare databases, is available online through Wiley InterScience. Podcasts are also available.

These and other evidence-based resources are effective tools to aid in the efficient delivery of evidence-based care. **Table 3-10** provides a brief description of other available databases. The use of these resources is valuable when combined with the best empirical knowledge and judgment. The true measure of their effectiveness is in the evaluation of the outcomes of management and care decisions, and delivery processes.

As nursing takes on larger, more autonomous roles in the delivery of health care through advanced practice, the need for accountability will continue to increase. DNPs, with their knowledge of clinical practice, research, and informatics, can best represent advanced practice nursing by participating in and guiding the development of databases that are relevant to the care that DNPs and APNs provide. Becoming involved in professional organizations that have quality initiatives is an excellent way for DNPs to become knowledgeable in research that contributes to quality care and the profession.

New since the last edition of this chapter is the Doctors of Nursing Practice, Inc., an organization whose purpose is to promote global networking, curricular and program enhancement, and research collaboration. The organization offers conferences, practice updates, and scholarship of particular interest to DNPs. In addition, the ANA and specialty organizations such as the Oncology Nursing Society, the

Table 3-10 Evidence Databases

Source	Content
American College of Physicians (ACP) Journal Club	Articles reporting original studies and systematic reviews.
ACP JournalWise	Personalized journal alerting service sends messages to a smartphone or email inbox according to subscriber interest and specialties.
AHRQ	Guidelines and technology assessments on selected topics from 12 evidence-based practice centers.
AHRQ (SHARE)	A five-step process for shared decision making that includes exploring and comparing the benefits, harms, and risks of each option through meaningful dialogue about what matters most to the patient.
AIDSLINE	Indexes the published literature on HIV and AIDS. The index includes journal articles; monographs; meeting abstracts; and papers, newsletters, and government reports (Fain, 2009).
Bandolier	Reviews literature; offers subjects by medical specialty.
CANCERLIT	Includes cancer literature from journal articles, government reports, technical reports, meeting abstracts and papers, and monographs.
CDC Sexually Transmitted Disease Treatment Guidelines	Includes Web-browsable sources with crosslinks.
Cochrane Database of Systematic Reviews	"Reviews individual clinical trials and summarizes systematic reviews from over 100 medical journals" (Fain, 2009, p. 277).
DynaMed	Point-of-care resource to support clinical decision making.
EPPI Centre	Evidence for Policy and Practice Information and Coordinating Centre, Institute of Education, University of London.
Essential Evidence Plus (formerly InfoPOEMs)	Includes reviews and commentary of recently published articles by the <i>Journal of Family Practice</i> .
Evidence-Based Practice at the University of Iowa	Includes an evidence-based practice toolkit, information about recent evidence-based practice projects, and an evidence-based practice model and resources.
HSTAT	Health Services Technology Assessment Text, full-text guidelines.
Johns Hopkins Evidence-Based Practice Center	Includes systematic reviews of evidence.

continues

Table 3-10 Evidence Databases (*continued*)

Source	Content
MD Consult	Includes full-text access to journal articles, textbooks, practice guidelines, patient education handouts, and drug awareness information. MD Consult is a good, quick source for background information on a topic.
MEDLINE	A compilation of information from Index Medicus, Index to Dental Literature, and the International Nursing Index. It includes published research in allied health, biological sciences, information sciences, physical sciences, and the humanities.
MedPage Today	Includes daily research updates, news by specialty, policy news, continuing medical education (CME), and surveys. Includes an excellent tool, MedPage Tools Guide to Biostatistics, that can be used as a reference guide when reading research articles.
Prescriber's Letter	Includes evidence-based information on new drug developments, with links to articles and continuing education offerings.
PubMed	Provides source for queries and evidence-based filters for MEDLINE.
School of Health and Related Research (SchHarr)	Comprehensive up-to-date evidence on the Web.
The Joanna Briggs Institute	International institute that provides resources for evidence-based practice for healthcare professionals in nursing, medicine, midwifery, and allied health.
The National Guideline Clearinghouse (NGC)	Provides nonintegrated evidence-based practice clinical guidelines and recommendations on selected topics from a number of organizations.

Modified from Fain, J. A. (2009). Understanding evidence-based practice. In *Reading, understanding and applying nursing research* (3rd ed., pp. 276–278). Philadelphia, PA: F. A. Davis. Used with permission.

National Quality Forum, the AHRQ, and the CMS provide avenues for collaboration and dissemination of information on quality and nurse-sensitive outcomes (Grove et al., 2013).

Information Technology, Databases, and Evidence for Practice

Digital technologies, including computers, handheld devices, and Internet software applications, have changed the face of clinical care, making them a necessary tool for research and EBP. They provide efficiency in the inputting

of statistical data and the retrieval of the most current information on relevant clinical trial outcomes, supportive research, and accepted practice protocols. It is essential to pay attention to the kinds of data that are retrieved and how they are used to make clinical decisions and evaluate practice.

Collecting Appropriate and Accurate Data

Data and observations from practice can be augmented and strengthened through evidence from clinical trials. Several electronic databases provide access to clinical trial data and other peer-reviewed research and outcome data. However, clinical trial data and data from other aggregate sources do not always address the outcomes that can be uniquely attributed to APN/DNP practice. For APN/DNPs to assess and demonstrate their effectiveness, data are needed that reflect what they do. Although the primary goal of outcome data and analysis is to improve care, DNPs in direct practice may be asked to justify their roles in terms of factors such as cost, time, patient outcomes, and revenue generation, among other indicators (S. Burns, 2009).

Most institutions rely on aggregated data to determine nursing outcomes. Unfortunately, most aggregated data do not show the APN/DNP's specific contribution to the outcomes (S. Burns, 2009). For this reason, it is important that measures be selected that truly reflect the APN/DNP role. This means developing role-sensitive indicators and collecting data that are specific to those indicators in a systematic way. Indicators such as satisfaction with APN/DNP care related to a particular program or procedure that the APN/DNP initiates, controls, or coordinates are better than trying to extrapolate the APN/DNP's role in a multidisciplinary effort. Time savings or clinical outcomes related to a change in practice coordinated by the APN/DNP may also be role sensitive.

A well-designed assessment plan uses a model that considers organizational factors, employee behavior, patient characteristics, patient experience, and outcomes (Minnick & Roberts, 1991, Figure 4-1, as cited in Minnick, 2009). Instruments for measuring outcomes are also a necessary component in the assessment process. A systematic search of the databases mentioned in Table 3-10, such as AHRQ, PubMed, and CANCERLIT, may be helpful as a starting place for appropriate measurement tools.

Analyzing Data from Clinical Practice

Data from practice are rich and can be analyzed in a number of ways, depending on the nature of the research question. Computer-based statistical tools such as absolute risk (AR) and absolute risk reduction

(ARR) calculations, relative risk (RR) and relative risk reduction (RRR) calculations, number needed to treat (NNT), survival curves, hazard ratios, and sensitivity and specificity are helpful measures for assessing risk of disease in studies of different cohort groups and in aiding clinical decision making. In an excellent article in the *Journal of the American Academy of Nurse Practitioners*, Goolsby, Klardie, Johnson, McNaughton, and Meyers (2004) analyzed the implementation of clinical practice guidelines and their outcomes in a hypothetical patient situation. The analysis includes a review of commonly used statistical concepts, including some of those just mentioned, with examples of their application in interpreting and reporting research. O'Mathuna et al. (2011) also provided a detailed section on statistical measures and their meaning in a chapter entitled "Critically Appraising Quantitative Evidence for Clinical Decision-Making."

Designing Evidence-Based Interventions

Selecting and defining the problem is one of the most critical steps in the design of any evidence-based intervention. The problem statement provides the direction for the study design and is usually stated at the beginning. Essential to good design is adequate background information that includes a rationale for pursuing an intervention, evidence from research that has already been done on the topic, and the goals to be achieved (Fain, 2013). Depending on the problem to be addressed, evidence-based interventions may be generated from quantitative research, qualitative research, outcome studies, patient concerns and choices, or clinical judgment.

Models serve as good frameworks for design. Several models that were originally designed for research utilization were the historical precursors to EBP. Four well-known models for research utilization and EBP are: the Conduct and Utilization of Research in Nursing (CURN) model (Horsely, Crane, & Bingle, 1978), the Kitson model (Kitson et al., 1998), the Stetler/Marram model (Stetler, 1994; Stetler & Marram, 1976), and the Iowa Model of Research Utilization (Titler et al., 1994). As EBP has evolved, these models have been adapted, and other models have been developed. Some later models include the Advancing Research and Clinical Practice through Close Collaboration (ARCC) model (Melnik & Fineout-Overholt, 2002), the Rosswurm and Larrabee model (1999), the Iowa Model of Evidence-Based Practice to Promote Quality Care (Titler, 2002), and the Johns Hopkins model (Newhouse et al., 2008). Each of these models has been successful in disseminating research or in facilitating change toward EBP. **Figure 3-4** shows a schematic of the Iowa model.

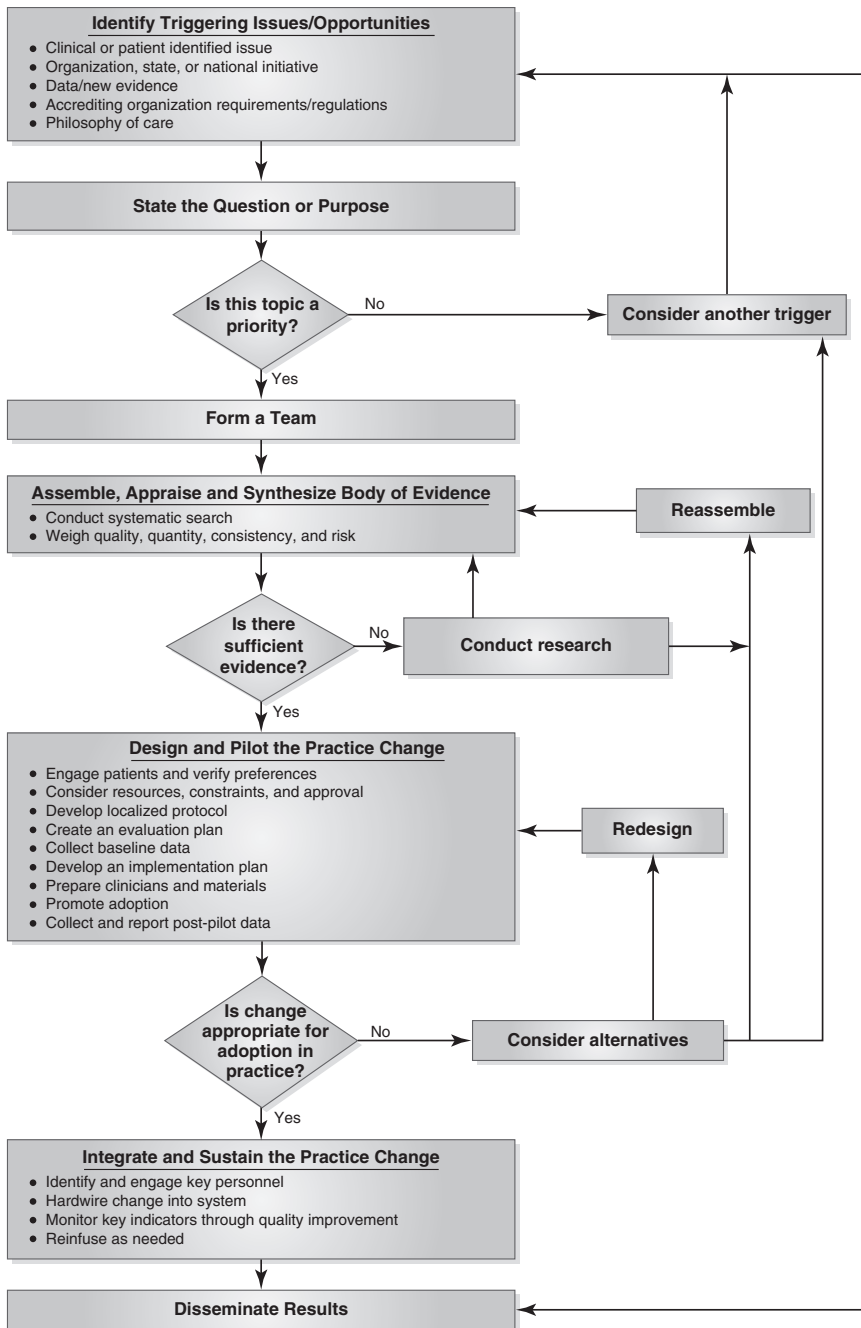


Figure 3-4 The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care

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It is beyond the scope of this chapter to detail the specifics of each model. However, although there are nuances and structural differences, all the models support some form of practice change through the systematic review of research and other evidence, such as clinical practice guidelines, to create a culture of research conduct and research utilization. Certainly, the first step in the design of any practice intervention is to define the clinical practice questions. Once that is accomplished, critical questions include the following: What patients will be affected? What treatment or intervention or practice change is involved? What old practice would need to be discontinued? What outcomes are expected? (Collins et al., 2008).

The next step is to review the evidence, basing the analysis on the hierarchy of evidence (see Table 3-1) and a search of all relevant databases (e.g., Cochrane, CINAHL, NGC, PubMed). Once the evidence has been verified, assessing applicability to the population and environment is crucial. Questions to be considered may include the following: Will implementing this practice increase patient safety? Are there ethical or legal considerations? Will other departments or providers be affected? How will the change affect practitioner time? How will patients react to the change? The next step is to develop a plan for the change. Who are the key stakeholders? How will they be apprised and included? Who has final sign-off authority? Is a pilot study indicated before full-scale implementation? Finally, determine the methods of education and communication. How much time, money, and personnel resources will be needed?

When implementing the plan, the following questions should be considered: Who is responsible for coordinating the effort? What contingency plans are in place in the event that a change must be made? Who is managing issues that may arise? Will evaluation of implementation be ongoing? How will feedback be generated? Who will conduct the evaluation? What is the method of analysis? What are the measurement tools? How will results of the evaluation be presented? (Collins et al., 2008). Carey, Buchan, and Sanson-Fisher (2009) outlined some specific strategies to promote guideline implementation. **Table 3-11** summarizes their recommendations. Although the examples reference general practitioner (GP) practice, the strategies and constructs are applicable to DNP/APN practice.

Predicting and Analyzing Outcomes

Often in clinical practice, the occurrence of one event in time may be the basis for predicting a future event. In such instances, a predictive relationship is established. In this case, the practitioner or researcher is

Table 3-11 Strategies to Promote Guideline Implementation: Theoretical Constructs and Examples of Application

Strategy	Relevant Constructs	Key Illustrative Examples
		Phase 1
Concrete and specific recommendations	Knowledge, executability, decidability	Concrete and specific recommendations were more likely to be adopted by general practitioners (GPs) than vague, nonspecific recommendations. Observational study. (Grol et al., 1998)
Identify priorities	Goal setting, action planning	Of 228 primary care patients with cardiovascular disease risk factors who made an action plan to identify behavioral change goals, 53% also reported making behavioral change related to their action plan. Descriptive study. (Handley et al., 2006)
Set targets for implementation	Goal setting	
Present a rationale	Beliefs, attitudes, perceived relative advantage	Recommendations compatible with current values were more likely to be adopted by GPs than those perceived as controversial or incompatible with values. Observational study. (Grol et al., 1998)
Highlight clinical norms	Normative beliefs, attitudes, modeling/verbal persuasion	An intervention to improve myocardial infarction care that involved using local medical opinion leaders to influence peers through small-group discussions, informal consultation, and revisions of clinical protocols was compared with performance feedback alone. Hospitals in both groups improved from baseline to follow-up on indicators of quality; however, the improvement was greatest for those allocated to the peer intervention. Randomized controlled trial. (Soumerai et al., 1998)
Orient to the need of the end user	Complexity	Among the guideline characteristics most commonly endorsed to promote use by GPs was "clarity, simplicity and availability of a short format." Descriptive study of 391 GPs. (Watkins, Harvey, Langley, Gray, & Faulkner, 1999)
Skills training	Skills, knowledge, self-efficacy	Continuing medical education (CME) improves knowledge, skills, attitudes, and patient outcomes. CME that is interactive, uses multimedia, uses live media, and involves multiple exposures is more effective than other types. Systematic review. (Marinopoulos et al., 2007)

continues

Table 3-11 Strategies to Promote Guideline Implementation: Theoretical Constructs and Examples of Application (*continued*)

Strategy	Relevant Constructs	Key Illustrative Examples
		Phase 1
Social influences	Normative beliefs, attitudes, modeling, verbal persuasion	The use of local opinion leaders in hospital settings can be effective in promoting evidence-based practice. Systematic review of 12 studies (Doumitt, Gattellari, Grimshaw, & O'Brien, 2007)
Environmental influences	Cues to action, environmental triggers	Guideline adherence improved due to the implementation of a computerized clinical decision aid that gave clinicians real-time recommendations for venous thromboembolism prophylaxis. Time series study (Durieux, Nizard, Ravaud, Mounier, & Lepage, 2000)
Patient-mediated	Knowledge, skills, and attitudes of patients	Patient request for a new drug and patient acceptability were cited as contributing to decisions to prescribe a new drug in approximately 20% of cases. Descriptive study (Prosser, Almond, & Walley, 2003)
Feedback	Positive/negative reinforcement; goal setting; skill development	Audit and feedback are effective strategies for improving care, particularly when baseline adherence to the recommended practice is low. Systematic review of 118 studies (Jamtvedt, Young, Kristofferson, O'Brien, & Oxman, 2006)
Incentives	Positive/negative reinforcement	Five of six studies examining physician-level incentives and seven of nine studies examining provider-group-level incentives demonstrated partial or positive effects on quality indicators. Systematic review (Peterson, Woodward, Urech, Daw, & Sookanan, 2006)
Pilot testing with iterative refinement of implementation strategies	Perceived advantages; beliefs; trialability	Breakthrough collaborative model intervention that involved a series of iterative plan-do-study-act cycles was found to be effective in improving care for chronic heart failure. Quasi-experimental, controlled study (Asch et al., 2005)

Carey, M., Buchan, H., & Sanson-Fisher, R. (2009). The cycle of change: Implementing the best-evidence clinical practice. *International Journal for Quality in Health Care*, 21(1), 37–43. Reproduced with permission.

looking for a correlation between the two events that may predict the outcome of a future intervention or occurrence that could be designed to affect or influence the independent variable. Although correlational prediction is not the same as cause and effect, it is stronger than a purely descriptive study (Melnik & Cole, 2011). This type of study would be appropriate if, for example, the DNP was interested in how a person's initial attitude toward insulin affected compliance with the regimen 3, 6, or 12 months after the therapy began.

Correlation statistics would be used to measure the relationship between the two variables. The results of the correlation could later be used to design interventions, such as educational strategies or follow-up programs, that would help those with negative attitudes toward therapy learn, adapt, and achieve more positive outcomes. Correlational statistics are also used to measure the strength of relationship between two variables. A direct correlation is seen in correlation coefficients between the values of 0 (no correlation) and 1 (large positive correlation) and means that when there is a large change in the value of one predictor, there is a large change in the value of the other predictor; likewise, a small change in one predictor is accompanied by a small change in the other predictor. A relationship that has a correlation coefficient of 0.5 is stronger than 0, but less than 1.0. Conversely, in a negative correlation—between 0 (no correlation) and -1 (large negative correlation)—large changes in the value of one predictor would be accompanied by small changes in the other, or small changes in one would be accompanied by large changes in the other. Therefore, a negative correlation coefficient of -0.6 shows a stronger negative relationship between two variables than a coefficient of 0, but not as strong as a coefficient of -1.0 (Lanthier, 2002).

An example of this kind of analysis is shown in a correlation study on salary and income levels. **Table 3-12** shows salary levels and corresponding years of education. **Figure 3-5** shows an example of a correlation scatter plot, with years of education on the y axis and income on the x axis. Each point on the plot shows one person's answers to the questions regarding years of education and income. In a positive correlation such as this, the line is always in the upward direction. In another example, **Table 3-13** and **Figure 3-6** show a negative relationship between grade point average (GPA) and number of hours spent watching television. The scatter plot (Figure 3-6) shows the direction of the line when the correlation is negative. In these cases, the researcher is measuring conditions that already exist and looking for relationships—either positive or negative.

Table 3-12 Salary and Years of Education

Participant	Income	Years of Education
#1	125,000	19
#2	100,000	20
#3	40,000	16
#4	35,000	16
#5	41,000	18
#6	29,000	12
#7	35,000	14
#8	24,000	12
#9	50,000	16
#10	60,000	17

Lanthier, E. (2002). Correlation. www.nvcc.edu/home/elanthier/methods/correlation.htm. Copyright 2002 by Elizabeth Lanthier, PhD. Reproduced with permission.

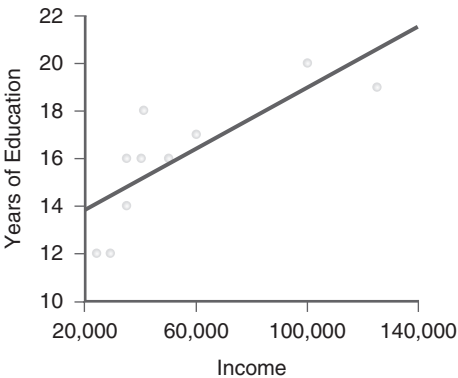


Figure 3-5 Regression Scatter Plot, Salary, and Education in Years
Lanthier, E. (2002). Correlation. www.nvcc.edu/home/elanthier/methods/correlation.htm. Copyright 2002 by Elizabeth Lanthier, PhD. Reproduced with permission.

Examining Patterns of Behavior and Outcomes

Although much of the research and evidence for practice is focused on cause and effect, patterns of behavior, dispositions, and attitudes are also outcomes that require examination. Behavioral theories can be

Table 3-13 Grade Point Average and TV Use

Participant	GPA	TV Use (hrs/wk)
#1	3.1	14
#2	2.4	10
#3	2.0	20
#4	3.8	7
#5	2.2	25
#6	3.4	9
#7	2.9	15
#8	3.2	13
#9	3.7	4
#10	3.5	21

Lanthier, E. (2002). *Correlation samples*. www.nvcc.edu/home/elanthier/methods/correlation.htm. Copyright 2002 by Elizabeth Lanthier, PhD. Reproduced with permission.

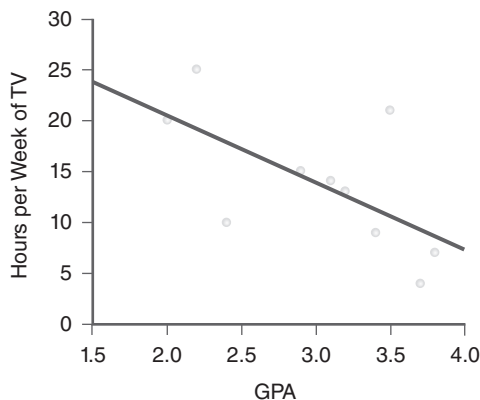


Figure 3-6 Regression Scatter Plot, Hours of Television Use, and Grade Point Average
 Lanthier, E. (2002). *Correlation samples*. www.nvcc.edu/home/elanthier/methods/correlation.htm. Copyright 2002 by Elizabeth Lanthier, PhD. Reproduced with permission.

classified as intrapersonal (individual), interpersonal (relational), and community based. The stages of change model (Prochaska & DiClemente, 1986), the health belief model (Rosenstock, 1966), and the theory of reasoned action (Fishbein & Ajzen, 1980) are useful in examining behaviors and their relationship to outcomes.

One way of examining data is through the use of aggregated data derived from large data sets. Organizations such as AHRQ, the CDC, the National Institute for Child Health and Development, and the National Institutes of Health (NIH) have large national data sets from various sources, such as quality of life surveys, hospital discharge data, and infection control data. The data sets can be accessed or purchased to allow researchers to develop clinical, behavioral, or interventional outcome questions that can be statistically analyzed. The advantage of this kind of analysis is that the data sets are large enough to provide an adequate sample and effect size from which to generalize intervention effects. AHRQ also maintains a database of comparative effectiveness reviews that synthesizes information from the most current studies on numerous diseases through the Evidence-Based Practice Centers (AHRQ, 2015b).

In addition to aggregated evidence, clinical trial data, and comparative effectiveness reviews, some innovative healthcare systems are bringing “‘practice-based evidence’ to the bedside or work setting in aggregate form so that providers have the most up-to-date information available on outcomes before evidence based interventions are begun” (Lambert & Burlingame, 2009, p. 1). As an example, this kind of decision support has been trialed in the Mental Health Services Centers for the state of Utah. The state partnered with an outcomes measurement vendor (OQ, LLC) to provide aggregated evidence from clinical trials and laboratory research that resulted in a 5-minute self-report outcome measurement for patients in any setting—outpatient, inpatient, or residential. Adult patients use a handheld personal digital assistant, computer kiosk, or paper survey to report information to clinicians based on the domains of symptomatic distress, interpersonal relations, and functional ability. Adolescents and parent/guardians provide information on age-normed questionnaires. The scoring is derived from empirically tested software that alerts the provider that a patient is at risk for a less than optimal outcome from treatment and gives the care provider options for consideration using a clinical decision support tree. According to the designers, the advantage of this kind of tracking is that the system provides immediate evidence-based support for direct patient care. Furthermore, it provides a method for storing data for future review, evaluation, and benchmarking (Lambert & Burlingame, 2009). Recent studies by researchers such as Bischoff and Hinjosa (2015) and Garrett and Klein (2008) have shown that use and expansion of this kind of system to document and support advanced clinical practice and scholarship in public health and other settings “support[s] the application of current standards, and knowledge for clinical decision making” (Stroud, Erkel, & Smith, 2005).

Identifying Gaps in Evidence for Practice

In a systematic analysis of reviews published by the Joanna Briggs Institute between 1998 and 2002, high-quality evidence to support nursing interventions was not evident (Averis & Pearson, 2003). Further, the report identified considerable gaps in the evidence base available for nurses in relation to 22 discrete areas of practice that were examined in the analysis. Since the impetus to improve patient safety generated by the IOM reports *To Err Is Human* (Kohn, Corrigan, & Donaldson, 2000), *Crossing the Quality Chasm* (IOM, 2001), and *Health Professions Education: A Bridge to Quality* (IOM, 2003), significant gains have been made in the availability of support for EBP through educational restructuring and systems support. A literature search of recent articles in CINAHL produced some 70 nursing articles identifying synthesis articles, systematic reviews, and meta-analyses of nursing interventions, including those based on randomized controlled trials. Of those found, 70% were written within the last 10 years. However, when meta-analysis and “advanced practice” or “DNP” nursing interventions were added to the search terms, only five additional articles were found in PubMed and CINAHL that were actually systematic reviews or meta-analyses. Of those, two dealt with interventions related to nursing education. Therefore, considerable gaps in the evidence for practice remain.

Research by nurses and family physicians suggests that a translational model to fill the gaps is necessary (Armson et al., 2007; Gumei, Tiedje, & Oweis, 2007). One such model, developed in Canada, uses a small, self-formed group-discussion format within local communities. The impetus for this model was the need to stay competent in view of the vast amount of medical information currently available. In these groups, a facilitator guides physicians’ discussion using sample patient cases and prepared modules on selected clinical topics. The group discussions have been ongoing for 15 years and have attracted international interest (Armson et al., 2007; Kelly, Cunningham, McCalister, Cassidy, & MacVicar, 2007). Nurses engage in similar forums in hospital grand rounds within their professional specialty organizations and at regional and national conferences. However, collaborative engagement needs to be broader and more systematic. DNPs are in an excellent position to initiate this kind of practice-based dialogue in community-based practice settings.

The AMA, the AACN, the NONPF, and other professional nursing organizations in each specialty all have agendas for advancing research and evidence for practice in their respective areas. As examples, the American Academy of Nurse Practitioners, Nurse Practitioner Associates

for Continuing Education, and the Practicing Clinicians Exchange provide excellent forums for translating current research into practice and for networking with peers about research and clinical outcome information.

The Joint Commission, the National Database of Nursing Quality Indicators, and individual hospital report cards may be used as sources of research or outcome analysis to identify gaps in care delivery or in patient or staff education in particular institutions or practice groups. Examples include adverse events, smoking cessation, rates of adherence to best practice, blood glucose control, patient satisfaction rates, time spent with patients, tests ordered, and number of consultations (care related); knowledge, functional status, and access to care (patient related); and collaboration, technical quality, exam comprehensiveness, and adherence to guidelines (performance related) (Kleinpell, 2009). Within these and other categories, the gaps may be identified through the development of a specific plan based on target areas of APN practice. Planning questions should include the following: What exactly can be measured? How can it be measured? What will be done with the information? When should it be done? (Kleinpell, 2007, 2013). **Figure 3-7** shows a sample timeline for outcome assessment.

As advanced practice nursing continues to evolve into the DNP role, it will be imperative that direct care providers, senior-level nurse executives, and doctorally prepared nurse educators take lead roles in quality improvement to positively affect patient safety (O’Grady, 2008). Identifying, testing, and disseminating information about nurse-sensitive quality indicators is essential to close the gap in quality care delivery.

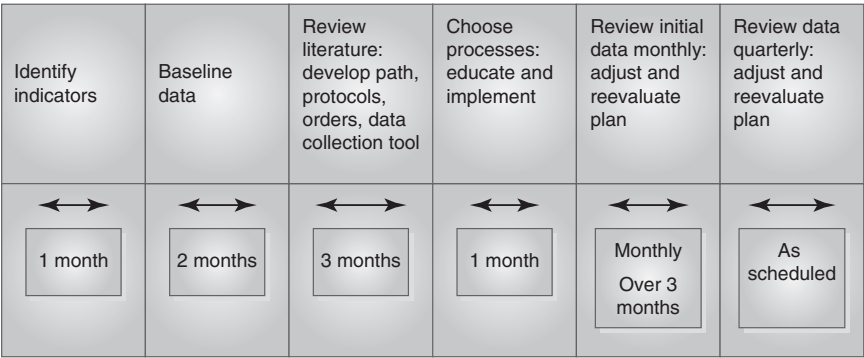


Figure 3-7 Timeline for Outcome Assessment for APN Practice
Modified from Kleinpell, R. M. (2007, May). APNs: Invisible champions. *Nursing Management*, 38(5), 18–22.

All APNs prepared at the clinical doctorate level must be involved in this effort.

Participation in Collaborative Research

It is a credit to the profession of nursing and its leaders that there are several EBP centers in the United States: the ANA National Center for Nursing Quality, Sigma Theta Tau International, the National Institute of Nursing Research at the NIH, and centers at many of the major university schools of nursing. However, as O'Grady (2008) noted, turf battles have limited collaboration. On the macro level, "APN organizations along with governmental and private research enterprise must come together to develop a research plan that identifies the most critical research questions" (O'Grady, 2008, p. 12). On the micro and macro levels, APNs individually and as a group must "demonstrate specific clinical performance and patient outcomes" (p. 12). This means "clearly distinguishing APNs in the context of interdisciplinary practice" (p. 12). Individual studies can demonstrate gaps in care in smaller samples, but the time has come for a more comprehensive and collaborative agenda for research that focuses on such issues as roles, function, outcomes, access improvements for vulnerable populations, interdisciplinary collaboration impacts, cost-effectiveness, safety, and other indicators. To discover gaps in care that are of concern to APNs/DNPs, nurses must have representatives from their ranks on research decision-making bodies. The AHRQ is positioned to take the lead in outcomes research, whereas the NIH focuses on biomedical aspects of disease management (O'Grady, 2008). To have their voices heard and their studies funded and disseminated, DNPs must use the power of their professional organizations and garner positions on national and international research collaboratives.

Participating in collaborative research is an excellent way for APNs to resolve clinical dilemmas and highlight their expertise through well-constructed questions that interest scientists and engage professional peers within and outside nursing. The dynamic nature of scientific evidence and the speed with which it is now possible to generate new knowledge through the use of technology demand that all care providers combine their expertise to interpret, plan, and evaluate the outcomes of interventions based on these new discoveries. Collaboration "implies collective action toward a common goal in a spirit of trust and harmony" (D'Amour, Ferrada-Videla, San Martin-Rodriguez, & Beaulieu, 2005, p. 116). Examples of interprofessional education programs to better integrate teaching, research, and professional activities among the

healthcare and related disciplines are increasing. Some best practice models are those of the University of Washington School of Medicine (Seattle), Rosalind Franklin University of Medicine (North Chicago, Illinois), and the University of Florida (Gainesville) (Bridges, Davidson, Odegard, Maki, & Tomkowiak, 2011). The models incorporate didactic, community-based, and simulation experiences with interprofessional team-building and service learning in a variety of ways. Even within nursing, specialization demands collaboration between peers and patients to resolve complex clinical dilemmas if patients are to be treated holistically instead of as a collection of organ systems. In fact, as Nolan (2005) noted, patients must be included as “shapers of knowledge and action” (p. 503).

Nursing now has a body of knowledge, separate and unique from that of medicine, that provides the basis for unique contributions to science and to the care of individuals. At the same time, “nursing scholarship remains contextual and contingently situated” (Fairman, 2008, p. 10). Nurses have shown in practice that they are creative and capable of managing changing circumstances and dynamic cultural milieus, thus ensuring that APNs with both research and clinical skills are in a prime position to function as practice consultants in collaborative knowledge-generating research (AACN, 2006). This role is illustrated in the following example.

A DNP was a voluntary member of an advisory board of a suburban primary healthcare network that provided care to uninsured patients. The members of the board were very interested in ascertaining information about the effectiveness of the organization and its efforts to provide cost-effective, timely primary care. A question of particular interest was: Are emergency department visits decreased by offering this service? If they are, how much cost is actually saved? The DNP collaborated with the organization’s administrator and developed an initial research question and a preliminary plan for presentation to a grant funding agency. The DNP researched the literature and took the preliminary plan to her institution’s research group; with the help of a colleague from the college’s health administration program, the DNP designed a study that was submitted to a grant funding agency specializing in grants to medical centers and community health agencies. The agency did not fund the grant that year. However, the following year, the original proposal was reframed as a cohort study, “Emergency Room Usage among Uninsured Patients with Access to a Primary Care Provider” (Tymkow, Shen, & MacMullen, 2006) and resubmitted as a subproject of a much larger NIH grant that was funded. A primary aim of the larger National Center

on Minority Health and Health Disparities grant was to build capacity for research in healthcare disparities through mentoring by senior-level researchers (Samson, 2006). The DNP who was a mentee became the primary investigator and worked with two coinvestigators on this project.

In another example of collaborative research, Oman, Duran, and Fink (2008) described a collaborative EBP project to institute evidence-based policy and procedure development at the University of Colorado Hospital using the hospital's evidence-based multidisciplinary practice model. The model established the evidence base through valid and current research and through other forms of evidence or benchmark data, including cost-effectiveness analysis; pathophysiology; retrospective or concurrent chart review; quality improvement and risk data; international, national, and local standards; infection control data; patient preferences; and clinical expertise. The more sources that are added to the research core, the stronger the evidence. However, all sources are contributory to the evidence.

The Evidence-Based Practice Council used the levels of evidence of Stetler (1994) to guide the process of gathering evidence. As described by Oman et al. (2008), because there was nothing addressing policy and procedure in the literature, the members identified steps and created an algorithm to describe the process. Once developed, the algorithm was piloted on the units using six nurse champions, mentored by a researcher. The champions and researcher reviewed an orthostatic vital sign policy that was scheduled for update. After obtaining 12 research-based articles, eight clinical articles, one national guideline, and anecdotal recommendations, the group was divided into subgroups, and each person was assigned two reports to review using a standardized critique form. Each nurse was responsible for reading the articles, completing the critique form (with levels of evidence), and presenting the findings at a journal club. The policy being reviewed was checked for references and levels of evidence by the research scientist. A comparison of agreement between the policy author and reviewers was then determined, and the percentage of agreement between reviewer and author tabulated. Only clinically based policies were reviewed. This process is a good example of how collaboration between practice and education could be merged in any number of areas.

Whether collaboration involves clinical research or quality improvement, DNPs in clinical and leadership roles are key stakeholders in the process. As identified in the IOM report *Crossing the Quality Chasm* (IOM, 2001), communication and collaboration are requisites to the achievement of quality systems and patient outcomes. These skills are also a

necessary part of a culture of collaboration that begins in educational programs and continues in the professional work setting. Collaborative efforts may include small unit-based or practice-based efforts or large system-wide initiatives. These efforts have been driven by consumer demand for excellence, accountability, and transparency in quality care, patient safety, and patient satisfaction (Freshman, Rubino, & Chassiakos, 2010). In any collaborative initiative, three levels of expertise are required: system leadership, including the authority to implement change; clinical technical expertise (guidance and know-how); and day-to-day leadership (details of the system) (Baker, Reising, Johnson, Stewart, & Baker, 1997, as cited in Freshman et al., 2010).

Disseminating Findings from Evidence-Based Practice

A primary reason for disseminating research is to use the findings to improve practice and health outcomes. Communicating the results of research and EBP trials is the culminating step of the research and research utilization processes. It is one of *the* most important steps in research and the application of research in practice because it is the communication of research findings that provides the basis for meaningful critique, development of new questions, and testing of research evidence in practice (Lyder & Fain, 2009).

The methods used to communicate evidence from practice trials are similar to those used for communicating research findings: journal publications, podium or poster presentations, Internet webinar sessions, media communications, journal clubs, and community presentations. However, the forums for dissemination may be broader because the audience of interest may be more diverse, including those with practice, research, and community development interests. In addition, the choice of method for communicating information depends on a number of important factors. For example, a journal publication may be personally advantageous to the author, but the time from submission to actual publication and dissemination may delay utilization of important evidence-based treatments in practice. Oral reports at national conferences may facilitate timelier dissemination. Webinars may be the fastest way to disseminate information but may not reach all the desired audiences. Journal clubs are useful forums for discussions of research findings in academic settings. Reports of community-based studies to advisory boards or media venues may also become the basis for further research and political support that help nonprofit and other community

organizations. Nevertheless, because theory, research, and practice must be constantly intertwined, the circular and reciprocal relationship among these elements must be apparent regardless of where the research is presented (McEwen & Wills, 2014).

Preparing a Journal Publication

Preparing a journal article for publication is time consuming and at times tedious, but the rewards of feeling that you have made a contribution and seeing your work in print are worth the effort. Once the topic for an article has been established, the next step is selecting the journal. Peer-reviewed journals have the most rigorous review criteria. Therefore, publication in one of these journals is considered to be more credible. The actual content will be determined by the editorial guidelines of the journal, which may be found in the “Information for Authors” section of the journal. In most cases, the guidelines may also be obtained from the journal’s website. Generally, the submission requirements cover technical details such as page length, margins, font style and size, reference format, use of graphics and figures, and method of submission. It is very important to follow the submission requirements because many journals will not review articles that are not submitted in the correct format.

Once submitted, articles in peer-reviewed journals are blind (anonymously) reviewed by several reviewers. It is not uncommon for the review process to last several weeks or months; articles may be rejected, accepted with revisions, or accepted. It is common to have articles returned for revision. The key to success is to be persistent, correct those things that can be corrected, give an explanation for those that cannot, and return the submission in the agreed-on time frame.

Preparing a Research Presentation

Regardless of where or how evidence is reported, the essential element is that it combines the knowledge and values of the study patients or population with practitioner expertise and the best in available and current research evidence. Reporting evidence also requires knowledge of the audience and their needs. Specifically, the presenter must ask: What is the specific content to be addressed? How will the audience use the information? What is the knowledge level of those who are to receive the information? What is the time allowed for the presentation? What audio-visual resources are available for the presentation? Once these questions

Table 3-14 Outline for Research Presentation

- I. Introduction
- II. Purpose of the study
- III. Theoretical framework
- IV. Hypothesis
- V. Design
 - A. What kind of study
 - B. Intervention
 - C. Sample
 - 1. Population
 - 2. Inclusion/exclusion criteria
 - D. Instruments
- VI. Analysis
 - A. Method
 - B. Types of statistical tests used
- VII. Findings
- VIII. Discussion
- IX. Implications
 - A. Research
 - B. Clinical practice

have been answered, specific learning objectives should be developed in order to guide and organize the presentation.

An outline for presentation of research study findings is shown in **Table 3-14**. Important points of each aspect of the study can be displayed in a PowerPoint presentation to help keep the presentation within the designated time frame and allow the audience to stay focused on the important elements. Some useful websites for building PowerPoint presentations are listed in **Table 3-15**.

Preparing a Poster Presentation

Disseminating information from scholarship—original research, practice innovations, clinical projects—through poster presentations has become an accepted medium for the exchange of ideas in a more personal and less formal environment than the podium presentation.

Table 3-15 Resources and Websites for Developing Multimedia and PowerPoint Presentations

PosterPresentations.com (Scientific Template)	http://www.posterpresentations.com
Indiana University-Purdue University, Indianapolis, Center for Teaching and Learning	http://ctl.iupui.edu/Resources/Documenting-Your-Teaching/Resources-for-Poster-Presentations
Michigan State University, Office of Faculty and Organizational Development, Poster Presentations	http://fod.msu.edu/oir/poster-presentations
University of Texas Health Science Center, Learn about poster presentations	http://library.uthscsa.edu/2011/12/poster-presentations/
University of North Carolina, Academic Poster Presentations	http://gradschool.unc.edu/academics/resources/postertips.html

It is both efficient and effective. Presenters and participants have the freedom to engage in a dialogue that allows for education, clarification, and networking. Posters also allow for the formatting of data in creative ways. As Berg (2005) noted, “imagery can be substituted for words and this is a powerful way to convey information” (p. 245). Like any presentation, posters require preparation. The following steps are essential.

Plan Ahead

A good poster presentation takes considerable time. The planning stage is a most important step. In this stage, considerable thought should be given to the message you are trying to convey. What is the purpose? The format for a research presentation will be different from that of a practice innovation. Is the conference only for nurses, only for APNs, or for a multidisciplinary audience? How much background information or detail do you need to include? Is the audience generally familiar with the topic? If they are, do not include familiar details, but if they are not, do not make the information so specific that those who are not familiar with the topic will be put off. Avoid using abbreviations that only a select audience will understand.

These and other considerations specific to the venue should be addressed during the planning stage (Berg, 2005; Hardicre, Devitt, & Coad, 2007).

Decide on Layout and Format

A good poster presentation is focused on a single message, uses graphics to tell the story, and is orderly with an obvious sequence (Hess, Tosney, & Liegel, 2013). Most people read top to bottom, left to right. This is the usual sequence for poster layout. Generally, the layout for a research poster presentation is as follows: title, abstract, introduction, methods, results, discussion, and acknowledgments. If the presentation is a practice innovation, the layout will be different. The innovation is usually in the center, with explanatory text at the periphery or below the diagram or explanation of the protocol or change (Hardicre et al., 2007). References are also included, as in the research poster. The poster should be easy to read from a distance of 4 to 6 feet (Halligan, 2005; Hess et al., 2013). Section heads should be at least 40 pt and supporting text 32 pt (Halligan, 2005, p. 49). Titles should be short, with letters 2 to 3 inches high (Berg, 2005).

Determine the Content

If the purpose of the poster is to display a research project, it will not be the same as one designed to describe a clinical innovation. The content of the research poster should follow the format established by the conference guidelines. If the study is funded by an outside or government agency, some grant-funded studies require specific wording of the acknowledgment; this should be determined during the poster planning. If an abstract is required, it should include the main purpose of the study, be clearly worded, and be succinct. A key component is to keep it simple because posters “show,” they do not “tell” (Miracle, 2008).

Clinical project content will vary according to the specific topic and scope. The title for either a research study or clinical innovation should be creative, but, most important, it should accurately reflect the content of the project. The title banner should also include authors and affiliations in order of authorship and/or contribution to the effort. In many instances, the organization’s logo will be included as well (Hardicre et al., 2007).

Prepare a Brief Presentation

“The poster is a story board of information” (Jackson & Sheldon, 1998, as cited in Hardicre et al., 2007, p. 398). However, it also gives the presenters an opportunity to present themselves. As with any kind of communication, you want to convey confidence and knowledge. Preparing a short presentation script or handouts for participants allows you to organize your thoughts and prepare for possible questions. The

handouts are always welcomed by participants, who are inundated with information during a conference. Be sure to include your name and contact number or attach a business card so that participants may contact you with questions. This is a very effective networking tool (Miracle, 2008).

Media Communications

Communicating with large audiences is often facilitated through professional media communications. This kind of communication is essential when there is a major event or change, such as a policy to be initiated. It is usually best to engage the resources of a professional organization to make the preliminary contact and to aid in constructing the message.

Journal Club Presentations

Another way to facilitate the communication of evidence-based research is through journal club presentations. Journal clubs are not new, especially in academic and many professional settings. However, using them to facilitate EBP is a more recent development, especially as a forum for clinical guideline development (Kirchoff & Beck, 1995, as cited in McQueen, Miller, Nivison, & Husband, 2006). In a small survey study of the use of journal clubs to determine changes in practice, McQueen et al. (2006) found that journal clubs were effective in “1) focusing staff on clinical evidence in discussions, 2) increasing confidence as they became more aware of evidence, and 3) bridging the evidence-practice gap” (p. 315).

Additionally, with the aid of the Internet, evidence-based articles or studies can be posted in advance and facilitated online, thus increasing the possibility of wider participation. In one pilot study of this format, nurses in New Zealand branded the journal club’s website and the articles for discussion. An article is posted for one month and removed on the Friday before the following month’s posting (Trim, 2008). **Table 3-16** presents an outline of a journal club.

Whether live or Internet based, journal clubs provide a mechanism for promoting professional debate, increasing confidence, and, most important, improving practice and quality care (Sheratt, 2005, as cited in McQueen et al., 2006). With their educational background and advanced skills, DNP’s are in an excellent position to implement this kind of strategy in a collaborative, interdisciplinary format.

Table 3-16 Online Journal Club

Outline of the Journal Club

1. A specific clinical question is chosen.
2. All evidence-based literature related to the question is derived from online databases.
3. A reference list of all literature for review is generated.
4. High-level-evidence, randomized controlled trials, and systematic reviews are critiqued and given more weight than quasi-experimental case studies and opinions.
5. Participants critically appraise the relevant literature before attending the journal club.
6. Journal club discussions center on the critical appraisal of evidence found for clinical interventions.
7. Implications for practice and further research are discussed, with key findings recorded in minutes.
8. A resource folder that includes a reference list of resource critiques, guidelines for practice, treatment resources, standardized assessments, disease management strategies, and gaps in evidence is created.
9. A system for ongoing evaluation of outcomes and changes in practice is developed and communicated.

Modified from McQueen, J., Miller, C., Nivison, C., & Husband, V. (2006). An investigation into the use of a journal club for evidence-based practice. *International Journal of Therapy and Rehabilitation*, 13(7), 313. Modified with permission.

Summary

Scholarship and EBP are not the same, but each has elements that support the other. Scholarship involves research and application, as does EBP. Whereas scholarship may be a joint or singular effort, EBP requires teamwork and collaboration. The outcome of scholarship is a scholarly product, a new way of thinking, or a change in awareness about a subject or phenomenon—an end in itself. EBP is based on the scholarship of research and evidence gathering and synthesis. It is a means for improving care for patients or effecting a change in a system that results in better care for patients, providers, and communities. It is a transformation of knowledge to new levels of understanding and integration. Changing to a model of EBP does not just happen; it requires the integration of a number of skills, such as the use of good research and the synthesis of best information and other “evidences,” including patient choice and professional expertise. Dissemination of information gleaned from synthesis and translation in practice is essential for successful change. Using

the knowledge of research methods to discover and interpret the best evidence for practice gives the DNP the tools to transform care.

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