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Designed specifically for the advanced practice nurse, the second edition of this award-winning reference provides practical ways for nurses to integrate evidence-based practice (EBP) into their clinical work. The book teaches nurses how to appraise clinical studies, assess the literature, and make educated decisions on how best to utilize research to improve patient care. This edition expands on the previous edition, providing additional information on EBP, more examples of clinical protocols, and updating psychosocial and physical data collection and analysis methods.

Readers will learn how to find and evaluate research articles, and develop an understanding of research methods to better assess the data and make informed decisions.

New to the Second Edition:
- Includes two new chapters on establishing and sustaining EBP and how a research question drives the selection of a research design, measurement, and analysis
- Features psychosocial and physical data collection and analysis methods
- Includes guidelines on evaluating research articles, including ethical components
- Provides strategies for establishing and sustaining EBP at the institutional level
- Presents effective ways of evaluating cost as a dimension of EBP
Research for Advanced Practice Nurses
Magdalena A. Mateo, PhD, RN, FAAN, died of Parkinson’s Disease on June 13, 2013 in Phoenix, Arizona, while in the care of Hospice of the Valley. She was 67 years old. She received her BSN and MN degrees in the Philippines and her PhD from The Ohio State University. While working in clinical and academic settings as a clinical nurse specialist, and director of nursing and faculty in the Philippines, Canada, and the United States, she conducted studies and used results of studies to improve patient care. Her primary areas of research included research development and dissemination in the clinical arena, workforce diversity, and neuroscience (mild traumatic brain injury).

She was the director of research for the Department of Nursing at The Ohio State University Hospital and later at Mayo Clinics. She had recently retired from Northeastern University School of Nursing in Boston where she taught research courses. Research for Advanced Practice Nurses was based on a research manual she developed for her staff at Ohio State, to improve patient care. The book twice received the American Journal of Nursing Book of the Year Award for the research category, and she was working on the fourth edition when her health failed. She was elected a Fellow of the American Academy of Nursing in 1992.

Marquis D. Foreman, PhD, RN, FAAN, is professor and executive associate dean, Rush University College of Nursing. He has actively sought to improve the care of hospitalized older people for more than 30 years. Foreman is known best for his research on delirium in hospitalized older people. He is a Fellow of the American Academy of Nursing, and the Institute of Medicine of Chicago, and has received numerous awards, including the Mary Opal Wolanin Award for Excellence in Gerontological Clinical Nursing Research, the Harriet H. Werley New Investigator Award, and the Mosby-Cameo Nursing Research Award, all for his work on delirium in hospitalized older people.
This book is dedicated to my friend and colleague, Magdalena A. Mateo.
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Preface

The increasing focus on evidence needed for practice decisions propels us to integrate how we teach graduate students about research. The use of research summaries and the need for evidence-based quality and safety practices and for clarifying the conduct of research are all requirements for nurses functioning professionally in practice. We hope that this book meets all those needs in a single introductory volume that includes evaluation of single research reports along with summaries and guidelines that may be of use when establishing evidence-based practice (EBP). When using results from an individual report, one must have a working knowledge of the research conducted if one is to evaluate the scientific merit and relevance of a single study.

Evidence-based practice concepts related to patient care are integrated throughout the chapters, with important points highlighted in exhibits. Clinically relevant examples present ways students and staff nurses can apply knowledge to daily clinical practice. We have also expanded, from the previous edition of this book, the information on EBP and examples of clinical protocols.

Part I: Evidence-Based Practice. Chapters focus on an overview of EBP: the definitions of EBP that have evolved over time, types of evidence, and models of EBP. Ways of finding evidence are presented to guide the reader to respond to the mandate for EBP. This information on EBP is vital to graduate students who are developing skills that will prepare them to assume their advanced practice role in health care.

Part II: Building Blocks for Evidence. The section starts with appraising a single research article; a building block for evidence. Components of the research process are presented from a reviewer's perspective of using the article as supporting evidence for practice in subsequent chapters. One of the documented barriers to research utilization is that practitioners feel inadequate reading and interpreting research findings. Gaining knowledge about the research process
is crucial for clinicians who must read, interpret, and determine the relevance of research findings (evidence) to practice and to consider those findings that may be used in developing practice guidelines. It also allows practitioners to advocate for patients who are considering whether to participate in research.

Part III: Using Available Evidence. Meta-analyses, systematic reviews, and practice guidelines from various sources, such as professional organizations and government websites, are other types of evidence that may be used in establishing EBP. Appraising information from these sources is suggested in this section. Program evaluation provides an opportunity for use of evidence. Considerations when planning and implementing EBP activities are also included in this section: identifying the focus of EBP activities (unit or organizational) and developing an EBP protocol.

Part IV: Evaluating the Impact of EBP and Communicating Results. Cost, outcomes, and ethical aspects are essential aspects of EBP. Communicating ideas through oral and written avenues is valuable in making EBP a reality. Techniques for acquiring oral and written methods for presenting ideas are included; such techniques are helpful in writing protocols and reporting outcomes of EBP activities.

Although graduate students are the primary audience for this book—a textbook for a graduate course in nursing research or an interdisciplinary health care course—nurses in clinical settings also will find the book helpful in fulfilling their research role toward achieving hospital Magnet Status. Our hope is that the information provided in this book can be used to provide optimal cost-efficient care to patients, which will increase their quality of life.

Magdalena A. Mateo, PhD, RN, FAAN

Marquis D. Foreman, PhD, RN, FAAN
Magdalena Mateo was a determined person whose impact was much larger than her small frame. As director of research at Ohio State University Hospital, she had a dream to help nurses use research, and she developed a research manual that was placed on every unit. When she invited me to speak to her staff, she proudly showed me the manual, which she intended to publish. I asked a few questions about it, and before long I found myself lined up as a co-editor of the project, with assigned chapters and responsibilities. That work led to publication of the first edition of this book. Magda said she would handle all the negotiations, communication with authors, and the business part of doing an edited book. She really knew how to make things happen. This made the process easy and smooth for me. She was born and raised in the Philippines, and received her education there, until she received her PhD at Ohio State. I found that the chapters I wrote came back to me with her helpful editing. She was a master at English, even though it was not her native language.

Our first edition focused solely on staff nurses, but we found that a number of baccalaureate programs were using it as a research textbook. For the second edition we tried to be more comprehensive to fit the textbook role.

Our many get-togethers were always fun, with food, laughter, and good times. Sometimes work on the book was a part of the plan. She was always the consummate hostess, preparing meals ahead of time and lining up things to do. She taught me to cook Asian food (stir fry and oriental barbecued ribs) and how to bake bread.

The subsequent edition was written for advanced practice nurses, with Springer Publishing Company. She always followed through with her responsibilities despite any health or work limitations. She was working on the latest edition of the advanced practice book when her life was cut short by Parkinson’s disease. Her husband had died less
than 3 months earlier, but she handled those arrangements with bravery and grace, despite her declining health. The hardest part for me was to watch her struggle to the podium after the service to express her thanks to those who had come.

Magda was my friend and I am better for that relationship.

Karin T. Kirchhoff, PhD, RN
Professor Emerita
University of Wisconsin School of Nursing
PART I

Evidence-Based Practice
Overview of Evidence-Based Practice

Mary D. Bondmass

For well over a decade, discussion and debate related to evidence-based practice (EBP) have ensued. Early data from the Institute of Medicine (IOM) suggested that health care in the United States is not as safe as it should and could be (IOM, 2000). In 2001, the IOM called for efforts to redesign health systems, including the mantra that decision making in health care be evidence-based opining that “Patients should receive care based on the best available scientific knowledge. Care should not vary illogically from clinician to clinician or from place to place” (IOM, 2001, p. 4). Core needs were identified and included in IOM’s 2001 report in that health care should be safe, effective, patient-centered, timely, efficient, and equitable. A few years later (IOM, 2003), five core competencies were recommended for health care education curriculum with a focus on EBP. During the past two decades, we have seen debate and discussion in the health care literature about multiple issues, including EBP nomenclature (“evidence-based medicine” versus “evidence-based nursing,” versus “evidence-based practice”), educational preparation and requirements (who, what, where, when, and how), and even some discussion of the very need for EBP (AACN, 1995, 2011; Burke et al., 2005; Estabrooks, 1998, 1999; IOM, 2001, 2003, 2008, 2010; Kleiber & Titler, 1998; Melnyk & Fineout-Overholt, 2005; National League for Nursing [NLN], 2005; O’Neil & The Pew Health Professions Commission, 1998; Stetler, 1994; Stetler et al., 1998; Stevens, 2002, 2004, 2009; Titler et al., 1994).

Today, as the latest edition of this text is prepared for publication, EBP and EBP curriculum in health care education changes are no longer optional or up for debate. Data are clear and compelling that health care education must change to meet the needs of EBP (IOM, 2010). In the advent of implementation of the 2010 legislation
of the Health Care and Education Reconciliation Act (HCERA) and the Affordable Care Act (ACA), nursing is at the forefront to lead this change in both education and practice. The Future of Nursing: Leading Change, Advancing Health report from the IOM and Robert Wood Johnson Foundation (RWJF) (2010) and the Quality and Safety Education for Nurses (QSEN) initiative from the University of North Carolina and the American Association of Colleges of Nursing (AACN, 2011) are two examples of exciting initiatives available to advise and guide nursing on leading change in education and EBP (IOM, 2010; QSEN Institute, 2012).

Although the Future of Nursing report plots a course to position nurses for advanced practice, the QSEN competencies provide specific skill, knowledge, and attitude that are quite similar to, and no doubt developed from, the original five core competencies proposed by the IOM in 2003 to ensure quality in patient care. Of note, The Essentials of Master's Education in Nursing (AACN, 2011) was developed also using data and recommendations from the IOM 2003 report.

Comparisons of the core competencies proposed by the IOM in 2003 and the 2012 QSEN competency categories are displayed in Exhibit 1.1. The graduate level QSEN competencies for EBP are listed in Exhibit 1.2.

### Exhibit 1.1
Comparisons of the Core Competencies Proposed by the IOM in 2003 and the 2012 QSEN Competency Categories

<table>
<thead>
<tr>
<th>Institute of Medicine, 2003</th>
<th>QSEN: Skill, Knowledge and Attitude, 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Patient-centered care</td>
<td>• Patient-centered care</td>
</tr>
<tr>
<td>• Interdisciplinary skills</td>
<td>• Teamwork and collaboration</td>
</tr>
<tr>
<td>• Quality improvement skills</td>
<td>• Quality improvement</td>
</tr>
<tr>
<td>• Information technology</td>
<td>• Informatics</td>
</tr>
<tr>
<td>• Evidence-based practice</td>
<td>• Evidence-based practice</td>
</tr>
<tr>
<td></td>
<td>• Safety</td>
</tr>
</tbody>
</table>

### DEFINITION OF EVIDENCE-BASED PRACTICE

Multiple definitions of EBP have been proposed and have evolved over the past decades. One of the most common definitions of EBP in use today was derived from an initial proposal for evidence-based medicine by Sackett, Straus, Richardson, Rosenberg, and Haynes...
### Exhibit 1.2

**Graduate-Level QSEN Competencies for EBP**

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Skills</th>
<th>Attitudes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrate knowledge of health research methods and processes</td>
<td>Use health research methods and processes, alone or in partnership with scientists, to generate new knowledge for practice</td>
<td>Appreciate strengths and weaknesses of scientific bases for practice</td>
</tr>
<tr>
<td>Describe evidence-based practice (EBP) to include the components of research evidence, clinical expertise, and patient/family/community values</td>
<td>Role model clinical decision making based on evidence, clinical expertise, and patient/family/community preferences</td>
<td>Value all components of EBP</td>
</tr>
<tr>
<td>Identify efficient and effective search strategies to locate reliable sources of evidence</td>
<td>Employ efficient and effective search strategies to answer focused clinical or health system practices</td>
<td>Value development of search skills for locating evidence for best practice</td>
</tr>
<tr>
<td>Identify principles that comprise the critical appraisal of research evidence</td>
<td>Critically appraise original research and evidence summaries related to area of practice</td>
<td>Value knowing the evidence base for one’s practice specialty area</td>
</tr>
<tr>
<td>Summarize current evidence regarding major diagnostic and treatment actions within the practice specialty and health care delivery system</td>
<td>Exhibit contemporary knowledge of best evidence related to practice and health care systems</td>
<td>Value cutting-edge knowledge of current practice</td>
</tr>
<tr>
<td>Determine evidence gaps within the practice specialty and health care delivery system</td>
<td>Promote a research agenda for evidence that is needed in practice specialty and health care system</td>
<td>Value working in an interactive manner with the Institutional Review Board</td>
</tr>
</tbody>
</table>

Data in the above table were retrieved from [www.qsen.org](http://www.qsen.org). Terms and conditions from the QSEN Institute indicate “use of the graduate-level competencies is freely available for educational purposes” (Cronenwett et al., 2009).
I: EVIDENCE-BASED PRACTICE

(2000). This definition was later refined in 2005 to be more inclusive (Straus, Richardson, Glasziou, & Haynes, 2005). Over time, many texts and publications have agreed on the definition of EBP to be “the integration of best research evidence with clinical expertise and patient values and circumstances” (Straus et al., 2005, p. 1). Although many other excellent definitions are used in the literature, most would agree that the above definition is inclusive enough for universal use.

ORIGINS OF EVIDENCE-BASED PRACTICE

Many credit Archibald Leman Cochrane as one of the first proponents of EBP. In the 1970s, Cochrane began a series of studies on the health population studies, which pioneered the use of randomized controlled trials (RCTs). Through Cochrane’s experiences in the Spanish Civil War and later in World War II, he developed the belief that much of the medical community did not have sufficient evidence to justify its practice. In his landmark monograph Effectiveness and Efficiency: Random Reflections on Health Services (Higgins & Green, 1972) he advocated RCTs as evidence for practice. Cochrane’s initial work is credited to the eventual development of the Cochrane Library database of systematic reviews, and the establishment of the UK Cochrane Center in Oxford and the international Cochrane Collaboration.

In looking at the origins of EBP, it should be noted that Cochrane was not the only one advocating the use of research findings in practice. Well in advance of Cochrane’s observations and publications, Nightingale (1858, 1859, 1863a, 1863b), wrote extensively about the use of evidence for practice. More recently, the concept of research utilization (RU) reappeared in the nursing literature in the 1970s. Some nurse leaders called it the translation of scientific evidence into practice and expressed the need for nurses to use scientific evidence from research studies to improve the quality of care in practice (Abdellah, 1970; Lindeman, 1975). By the mid-1970s, large RU projects developed several EBP models in the United States. In particular, three models for RU are considered the foundations for the initial understanding of EBP in nursing.

The Conduct and Utilization of Research in Nursing (CURN) project developed and tested a model for using research-based knowledge in clinical practice settings. The RU process is organizational with planned changes integrated throughout. System change is essential to establishing research-based practice on a large scale (Haller, Reynolds, & Horsley, 1979; Horsley, Crane, & Bingle, 1978; Horsley, Crane, Crabtree, & Wood, 1983).

The Stetler Model of Research Utilization applied research findings at the individual practitioner level. The model has six phases and emphasizes critical thinking and decision making (Stetler, 1983, 1985, 1994; Stetler & Marram, 1976).
The Iowa Model for Research in Practice consists of research integrated into practice to improve the quality of care (Titler et al., 1994), and is an outgrowth of the Quality Assurance Model Using Research (QAMUR; Watson, Bulecheck, & McCloskey, 1987). Research utilization is an organizational process, with planned change principles integrating research and practice using a multidisciplinary team approach (Kleiber & Titler, 1998).

Both the Stetler and Iowa models have continued to evolve over the past few decades and have become more consistent with the EBP versus the more limited RU paradigm (Stetler, 2001a; Titler & Everett, 2001; Titler et al., 2001). Both models still provide guidance for evidence-based clinical decision making, including change requirements at both the organizational/system and individual levels. An in-depth discussion of the pros and cons of all available models, although beyond the scope of this chapter, is encouraged prior to the implementation of an EBP model at any institution or within any practice.

TRANSITION FROM RESEARCH UTILIZATION TO EVIDENCE-BASED PRACTICE

Oftentimes in the literature and in practice conversation, the terms “EBP” and “RU” are often used interchangeably; although they are similar, they are not synonymous (Estabrooks, 1999). Kirchhoff (2009) made the case that the primary differences between EBP and RU are the processes (steps) used and the level of evidence being appraised for practice. Whereas summary evidence (systematic reviews) is considered the “heart” of EBP, the singular primary research article is the basic unit of analysis relied on in RU (Stevens, 2001).

ONE MODEL FOR EVIDENCE-BASED PRACTICE

ACE Star Model of Knowledge Transformation

Many models are available for learning and implementing EBP; one such model, more specific to learning and understanding EBP, is briefly presented here in this overview chapter. The ACE Star Model was selected to be presented here because it simply and parsimoniously “organizes both old and new concepts of improving care into a whole and provides a framework with which to organize EBP processes and approaches” (Stevens, 2004). The ACE Star Model of Knowledge Transformation depicts the cyclic stages that knowledge or evidence must pass through to be transformed into a smaller, more user-friendly form for health care decision making. Stevens conceptualized that the current volume was too large and the packaging or form of the tremendous health care knowledge base was just not usable. Stevens developed the model, as
a simple five-point star with each star point representing knowledge in a form to be transformed: Discovery, Evidence Summary, Translation, Integration, and Evaluation (Stevens, 2004).

The first star point, Discovery, represents the stage wherein new knowledge is generated. The knowledge is in the form of individual or primary research reports and in this form can be found in research journals, abstracts and/or conference proceedings. Kirchhoff (2009) referred to knowledge from a single or individual research study as a “brick” that when added to other “bricks” (e.g., other single studies) will be transformed into a wall of evidence.

Evidence summary is the second star point, wherein the individual studies, that is, knowledge in the discovery form, are transformed through evidence synthesis and/or meta-analysis into a meaningful statement. This knowledge transformation is conducted by experts in their respective fields and the statements produced are often packaged as a systematic review. Few would argue that the most rigorous systematic reviews can be found within the Cochrane Collaboration. The rigorous steps involved in a Cochrane systematic review can be found in the Cochrane Handbook (Cochrane Collaboration, 2009).

Translation is the third star point, wherein the synthesized knowledge of multiple systematic reviews is transformed in an evidence-based clinical practice guideline (CPG). In this stage of the model, our knowledge is transformed into a very user-friendly form for practice. Evidence-base CPG generally contains an evidence rating for each intervention listed. The most comprehensive set of open access CPGs, most of which are evidence-based, can be found via the National Guideline Clearinghouse, under the auspices of the Agency for Healthcare Research and Quality (AHRQ) of the U.S. Department of Health and Human Services. Advanced practice nurses generally need to develop the skills required to critically appraise CPGs as this function is not done by AHRQ; it is the user’s responsibility to determine value through evidence rating scales (Bondmass, 2009).

The fourth star point is Integration, wherein our knowledge has been transformed to the point at which it is usable by all clinicians and disseminated throughout our institutions. Frequently, systemwide change in practice is difficult, even change based on the best evidence and in the best possible form is difficult. Efforts to overcome barriers to EBP continue to be the focus of many outcomes by researchers.

The last star point is Evaluation, wherein knowledge in the form we are using is evaluated from the perspective of its impact on outcomes. Possible EBP outcomes at this stage include patient satisfaction, safety, efficacy, efficiency, and health status of whole populations. Evaluation knowledge directs further issues to be researched in Discovery, and the cycle continues as knowledge is transformed into usable evidence at each star point.
The ACE Star Model, although less specific about the implementation of EBP at the “bedside,” has been found to be particularly useful for research related to the teaching and learning of EBP for nurses (Bondmass, 2011, in press; Bondmass, Kesten, & Dennison, 2012). It is important to note that the conceptual EBP knowledge obtained from the use of this model may be useful in preparing nurses and other health care providers for their roles in fulfilling the IOM’s EBP recommendations (2003).

**EBP COMPETENCIES**

*Essential Competencies for Evidence-Based Practice in Nursing* (ECEBP) were developed by Stevens in 2005 (Stevens, 2005) and revised in 2009 to include all levels of education, associate through doctoral. The ECEBP are aligned with the ACE Star Model of Knowledge Transformation with specific competencies addressing each respective star point; the ECEBP are also divided by educational preparation per star point. Although the QSEN competencies are directed toward the education of nurses in the academic setting, the ECEBP are used by practicing nurses and set as an expectation for practice. Prior to the advent of the QSEN, researchers used the ECEBP in academic settings to evaluate the teaching and learning of EBP in both undergraduate and graduate nursing education (Bondmass, 2011, in press; Bondmass et al., 2012). Additional information about the ACE Star model and EBP competencies can be found at the website for the Academic Center for Evidence-Based Practice (http://www.acestar.uthscsa.edu).

**SUMMARY**

In the past 20 years, EBP has emerged as a global movement. This movement includes more than RU, and many relevant EBP models have been developed to promote scientific and other evidence sources to improve the quality of care (Burrow & McLeish, 1995; Camiah, 1997; Davies, 2002; Estabrooks, 1999; Goode, Lovett, Hayes, & Butcher, 1987; International Council of Nurses [ICN], 1990; Kitson, Ahmed, Harvey, Seers, & Thompson, 1996; Kitson, Harvey, & McCormack, 1998; Olade, 1990, 2001; Redfern & Christian, 2003; Rolfe, 1999; Rosswurm & Larrabee, 1999; Stetler, 2001a, 2001b, 2003; Stevens, 2004; Titler et al., 1994). In the new millennium, EBP is an umbrella term for many sources of evidence, including, but not limited to, meta-analysis, systematic reviews, consensus recommendations by experts, and clinical guidelines (Bondmass, 2009; IOM, 2003, 2010; Jenning & Loan, 2001; Kirchhoff, 2009; Melnyk & Fineout-Overholt, 2005; QSEN, 2012; Roberts, 1998; Rolfe, 1999; Stetler et al., 1998; Stevens, 2001).
This chapter intends to give a brief overview of EBP for the advanced practice nurse. Origins, definitions, EBP models, and academic and clinical EBP competencies were presented as a snapshot of the challenges and expectations of advanced practice nurses in an interprofessional EBP environment. In the various proceeding chapters of this text, in-depth and specific material will be presented with the intent to prepare advanced practice nurses for their leadership role in health care related to research and EBP.

**SUGGESTED ACTIVITIES**

1. Select a clinical topic and conduct a literature search to find evidence in the various stages of the knowledge transformation on that topic: *Discovery, Evidence Summary, Translation, Integration, and Evaluation.*

2. Gather a group of colleagues, either in your clinical or classroom setting, and conduct a self-assessment using the QSEN and/or the ECEBP. Compare your results.

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