Clinicians often ask how much and what type of evidence is needed to change practice. A good rule of thumb to answer this question is that there needs to be strong enough evidence to make a practice change. Specifically, the level of evidence plus the quality of evidence equals the strength of the evidence, which provides clinicians the confidence that is needed to change clinical practice (Box 1.1).

**Rule of Thumb for Determining Whether a Practice Change Should be Made**

The level of the evidence + quality of the evidence = strength of the evidence → Confidence to act upon the evidence and change practice!

**Origins of the Evidence-Based Practice Movement**

The EBP movement was founded by Dr. Archie Cochrane, a British epidemiologist, who struggled with the efficacy (effectiveness) of healthcare and challenged the public to pay only for care that had been empirically supported as effective (Enkin, 1992). In 1972, Cochrane published a landmark book that criticized the medical profession for not providing rigorous reviews of evidence so that policy-makers and organizations could make the best decisions about healthcare. Cochrane was a strong proponent of using evidence from RCTs because he believed that this was the strongest evidence on which to base clinical practice treatment decisions. He asserted that reviews of research evidence across all specialty areas need to be prepared systematically through a rigorous process and that they should be maintained to consider the generation of new evidence (The Cochrane Collaboration, 2001).

In an exemplar case, Cochrane noted that thousands of low-birth-weight premature infants died needlessly. He emphasized that the results of several RCTs supporting the effectiveness of corticosteroid therapy to halt premature labor in high-risk women had never been analyzed and compiled in the form of a systematic review. The data from that systematic review showed that corticosteroid therapy reduced the odds of premature infant death from 50% to 30% (The Cochrane Collaboration, 2001).

Dr. Cochrane died in 1988. However, as a result of his influence and call for updates of systematic reviews of RCTs, the Cochrane Center was launched in Oxford, England, in 1992, and The Cochrane Collaboration was founded a year later. The major purpose of the Collaboration, an international network of more than 31,000 dedicated people from over 120 countries, is to assist healthcare practitioners, policy-makers, patients, and their advocates in making well-informed decisions about healthcare by developing, maintaining, and updating systematic reviews of healthcare interventions (i.e., Cochrane Reviews) and ensuring that these reviews are accessible to the public (The Cochrane Collaboration, 2001).

Further information about the Cochrane Collaboration can be accessed at [http://www.cochrane.org/](http://www.cochrane.org/)

**Why Evidence-Based Practice?**

The most important reasons for consistently implementing EBP are that it leads to the highest quality of care and the best patient outcomes (Reigle et al., 2008; Talsma, Grady, Feetham, Heinrich, & Steinwachs, 2008). In addition, EBP reduces healthcare costs and geographic variation in the delivery of care (McGinty & Anderson, 2008; Williams, 2004). Findings from studies also indicate that clinicians report feeling more empowered and satisfied in their roles when they engage in EBP (Malajian, Caramanica, Taylor, MacRae, & Beland, 2002; Strout, 2005). With recent reports of pervasive “burnout”
among healthcare professionals and the pressure that many influential healthcare organizations exert on clinicians to deliver high-quality, safe care under increasingly heavy patient loads, the use and teaching of EBP may be key not only to providing outstanding care to patients and saving healthcare dollars, but also to reducing the escalating turnover rate in certain healthcare professions (Melnyk, Fineout-Overholt, Giggelen, & Cruz, 2010).

Despite the multitude of positive outcomes associated with EBP and the strong desire of clinicians to be the recipient of evidence-based care, an alarming number of healthcare providers do not consistently implement EBP or follow evidence-based clinical practice guidelines (Melnyk, Grossman, et al., 2012; Vlada et al., 2013). Findings from a survey to assess nurses’ readiness to engage in EBP conducted by the Nursing Informatics Expert Panel of the American Academy of Nursing with a nationwide sample of 1,097 randomly selected registered nurses indicated that (a) almost half were not familiar with the term evidence-based practice, (b) more than half reported that they did not believe their colleagues use research findings in practice, (c) only 27% of the respondents had been taught how to use electronic databases, (d) most did not search information databases (e.g., Medline and CINAHL) to gather practice information, and (e) those who did search these resources did not believe they had adequate searching skills (Pravikoff, Pierce, & Tanner, 2005). Although a more recent national survey of more than 1,000 randomly selected nurses from the American Nurses Association showed improvement in the valuing of EBP, major barriers that were identified in the earlier survey continue to be reported by nurses, including time, organizational culture, and lack of EBP knowledge and skills (Melnyk, Fineout-Overholt, Gallagher-Ford, & Kaplan, 2012). In addition, nurses in this latest survey reported that, in addition to peer and physician resistance, a major barrier for implementation of EBP is nurse leader/manager resistance (Melnyk, Fineout-Overholt, Gallagher-Ford et al., 2012).

On a daily basis, nurse practitioners, nurses, physicians, pharmacists, and other healthcare professionals seek answers to numerous clinical questions (e.g., In postoperative surgical patients, how does relaxation breathing compared to cognitive-behavioral skills building affect anxiety? In adults with dementia, how does a warm bath compared to music therapy improve sleep? In depressed adolescents, how does cognitive-behavioral therapy combined with Prozac compared to Prozac alone reduce depressive symptoms?). An evidence-based approach to care allows healthcare providers to access the best evidence to answer these pressing clinical questions in a timely fashion and to translate that evidence into clinical practice to improve patient care and outcomes.

Without current best evidence, practice is rapidly outdated, often to the detriment of patients. As a classic example, for years, pediatric primary care providers advised parents to place their infants in a prone position while sleeping, with the underlying reasoning that this is the best position to prevent aspiration in the event of vomiting. With evidence indicating that prone positioning increases the risk of sudden infant death syndrome (SIDS), the American Academy of Pediatrics (AAP) released a clinical practice guideline recommending a supine position for infant sleep that resulted in a decline in infant mortality caused by SIDS (AAP, 2000). As a second example, despite strong evidence that the use of beta-blockers following an acute myocardial infarction reduces morbidity and mortality, these medications are considerably underused in older adults in lieu of administering calcium channel blockers (Slutsky, 2003). Further, another recent study indicated adherence to evidence-based guidelines in the treatment of severe acute pancreatitis is poor (Vlada et al., 2013). Therefore, the critical question that all healthcare providers need to ask themselves is: Can we continue to implement practices that are not based on sound evidence and, if so, at what cost (e.g., physical, emotional, and financial) to our patients and their family members?

Even if healthcare professionals answer this question negatively and remain resistant to implementing EBP, the time has come when third-party payers will provide reimbursement only for healthcare practices whose effectiveness is supported by scientific evidence (i.e., pay for performance). Furthermore, hospitals are now being denied payment for patient complications that develop when evidence-based guidelines are not being followed. In addition to pressure from third-party payers, a growing number of patients and family members are seeking the latest evidence posted on websites about the most effective treatments for their health conditions. This is likely to exert even greater pressure on healthcare
providers to provide the most up-to-date practices and health-related information. Therefore, despite continued resistance from some clinicians who are skeptical of or who refuse to learn EBP, the EBP movement continues to forge ahead with full steam.

Another important reason that clinicians must include the latest evidence in their daily decision making is that evidence evolves on a continual basis. As a classic example, because of the release of findings from the Prempor arm of the Women's Health Initiative Study that was sponsored by the National Institutes of Health, the clinical trial on hormone replacement therapy (HRT) with Prempor was ceased early—after only 2.5 years—because the overall health risks (e.g., myocardial infarction, venous thromboembolism, and invasive breast cancer) of taking this combined estrogen/progestin HRT were found to be far greater than the benefits (e.g., prevention of osteoporosis and endometrial cancer). Compared with women taking a placebo, women who received Prempor had a 29% greater risk of coronary heart disease, a 41% higher rate of stroke, and a 26% increase in invasive breast cancer (Hendrix, 2002a). For years, practitioners prescribed long-term hormone therapy in the belief that it protected menopausal women from cardiovascular disease because many earlier studies supported this practice. However, there were studies that left some degree of uncertainty and prompted further investigation (i.e., the Prempor study) of what was the best practice for these women. As a result of the Women's Health Initiative Study, practice recommendations changed. The evolution of evidence in this case is a good example of the importance of basing practice on the latest, best evidence available and of engaging in a lifelong learning approach (i.e., EBP) about how to gather, generate, and apply evidence.

Another example is an RCT that was funded by the National Institutes of Health, which compared the use of the medication Metformin, standard care, and lifestyle changes (e.g., activity, diet, and weight loss) to prevent type 2 diabetes in high-risk individuals. The trial was stopped early because the evidence was so strong for the benefits of the lifestyle intervention. The intervention from this trial was translated into practice within a year by the Federally Qualified Health Centers participating in the Health Disparities Collaborative, a national effort to improve health outcomes for all medically underserved individuals (Talsma et al., 2008). This rapid transition of research findings into practice is what needs to become the norm instead of the rarity.

KEY INITIATIVES UNDERWAY TO ADVANCE EVIDENCE-BASED PRACTICE

The gap between the publishing of research evidence and its translation into practice to improve patient care often takes decades (Balas & Boren, 2000; Melnyk & Fineout-Overholt, 2011) and continues to be a major concern for healthcare organizations as well as federal agencies. In order to address this research-practice time gap, major initiatives such as the federal funding of EBP centers and the creation of formal task forces that critically appraise evidence in order to develop screening and management clinical practice guidelines have been established.

The Institute of Medicine's Roundtable on Evidence-Based Medicine helped to transform the manner in which evidence on clinical effectiveness is generated and used to improve healthcare and the health of Americans. The goal set by this Roundtable is that, by the year 2020, 90% of clinical decisions will be supported by accurate, timely, and up-to-date information that is based on the best available evidence (McClellan, McGinnis, Nabel, & Olsen, 2007). The Roundtable convened senior leadership from multiple sectors (e.g., patients, healthcare professionals, third-party payers, policy-makers, and researchers) to determine how evidence can be better generated and applied to improve the effectiveness and efficiency of healthcare in the U.S. (Institute of Medicine of the National Academies, n.d.). It stressed the need for better and timelier evidence concerning which interventions work best, for whom, and under what types of circumstances so that sound clinical decisions can be made. The Roundtable placed its emphasis on three areas:

1. accelerating the progress toward a learning healthcare system, in which evidence is applied and developed as a product of patient care;
2. generating evidence to support which healthcare strategies are most effective and produce the greatest value; and
3. improving public awareness and understanding about the nature of evidence, and its importance for their healthcare (Institute of Medicine of the National Academies, n.d.).

Among other key initiatives to advance EBP is the U.S. Preventive Services Task Force (USPSTF), which is an independent panel of 16 experts in primary care and prevention who systematically review the evidence of effectiveness and develop recommendations for clinical preventive services, including screening, counseling, and preventive medications. Emphasis is placed upon which preventive services should be incorporated by healthcare providers in primary care and for which populations. The USPSTF is sponsored by the Agency for Healthcare Research and Quality (AHRQ), and its recommendations are considered the gold standard for clinical preventive services (AHRQ, 2008). EBP centers, funded by AHRQ, conduct systematic reviews for the USPSTF and are the basis upon which it makes its recommendations. The USPSTF reviews the evidence presented by the EBP centers and estimates the magnitude of benefits and harms for each preventive service. Consensus about the net benefit for each preventive service is garnered, and the USPSTF then issues a recommendation for clinical practice. If there is insufficient evidence on a particular topic, the USPSTF recommends a research agenda for primary care for the generation of evidence needed to guide practice (Melnick, Grossman et al., 2012). The USPSTF (2008) produces an annual Guide to Clinical Preventive Services that includes its recommendations on screening (e.g., breast cancer screening, visual screening, colon screening, depression screening), counseling, and preventive medication topics along with clinical considerations for each topic. This guide provides general practitioners, internists, pediatricians, nurse practitioners, nurses, and family practitioners with an authoritative source for evidence to make decisions about the delivery of preventive services in primary care.

An app, the Electronic Preventive Services Selector (ePSS), also is available for free to help healthcare providers implement the USPSTF recommendations at https://itunes.apple.com/us/app/ahrq-epss/id311852560?mt=8

The current Guide to Clinical Preventive Services can be downloaded free of charge from http://www.ahrq.gov/clinic/pocketgd.htm

Similar to the USPSTF, a similar panel of national experts uses a rigorous systematic review process to determine the best programs and policies to prevent disease in communities. Systemic reviews by this panel answer the following questions: (a) Which program and policy interventions have been proven effective? (b) Are there effective interventions that are right for my community? and (c) What might effective interventions cost and what is the likely return on investment? These evidence-based recommendations for communities are available in a free evidence-based resource entitled The Guide to Community Preventive Services (http://www.thecommunityguide.org/index.html).

Another recently funded federal initiative is The Patient-Centered Outcomes Research Institute (PCORI), which is authorized by Congress to conduct research to provide information about the best available evidence to help patients and their healthcare providers make more informed decisions. PCORI’s studies are intended to provide patients with a better understanding of the prevention, treatment and care options available, and the science that supports those options. See http://pcori.org/

The Magnet Recognition Program by the American Nurses Credentialing Center is also facilitating the advancement of EBP in hospitals throughout the U.S. The program was started in order to recognize healthcare institutions that promote excellence in nursing practice. Magnet-designated hospitals reflect a high quality of care. The program evaluates quality indicators and standards of nursing practice as defined in the American Nurses Association’s (2004) Scope and Standards for Nurse Administrators. Conducting research and using EBP are critical for attaining Magnet status (Reigle et al., 2008). Hospitals are appraised on evidence-based quality indicators, which are referred to as Forces of Magnetism. The Magnet program is based on a model with five key components: (1) transformational leadership; (2) structural empowerment; (3) exemplary professional practice; (4) new knowledge, innovation, and improvements, which emphasize new models of care, application of existing evidence, new evidence, and visible contributions
to the science of nursing; and (5) empirical quality results, which focus on measuring outcomes to demonstrate the benefits of high-quality care (American Nurses Credentialing Center, 2008).

THE STEPS OF EVIDENCE-BASED PRACTICE

The seven critical steps of EBP are summarized in Box 1.2 and described in more detail in this section.

Step 0: Cultivate a Spirit of Inquiry

Before embarking on the well-known steps of EBP, it is critical to cultivate a spirit of inquiry (i.e., a consistently questioning attitude toward practice) so that clinicians are comfortable with and excited about asking questions regarding their patients’ care as well as challenging current institutional or unit-based practices. Without a culture and ecosystem or environment that is supportive of a spirit of inquiry and EBP, individual and organizational EBP change efforts are not likely to succeed and sustain (Melnyk, 2012; Rycroft-Malone, 2008). A culture that fosters EBP promotes this spirit of inquiry and makes it visible to clinicians by embedding it in its philosophy and mission of the institution.

Key elements of an EBP culture and environment include:

- A spirit of inquiry where all health professionals are encouraged to question their current practices
- A philosophy, mission, clinical promotion system, and evaluation process that incorporate EBP and EBP competencies
- A cadre of EBP mentors who have in-depth knowledge and skills in EBP, mentor others, and overcome barriers to individual and organizational change
- An infrastructure that provides tools to enhance EBP (e.g., computers for searching at the point of care, access to key databases and librarians, ongoing EBP educational and skills-building sessions, EBP rounds and journal clubs)
- Administrative support and leadership that values and models EBP as well as provides the needed resources to sustain it
- Regular recognition of individuals and groups who consistently implement EBP

Step 1: Formulate the Burning Clinical PICOT Question

In step 1 of EBP, clinical questions are asked in PICOT format (i.e., Patient population, Intervention or Issue of interest, Comparison intervention or group, Outcome, and Time frame) to yield the most relevant and best evidence. For example, a well-designed PICOT question would be: In teenagers (the patient population), how does cognitive-behavioral skills building (the experimental intervention)
Chapter 1: Making the Case for Evidence-Based Practice and Cultivating a Spirit of Inquiry

compared to yoga (the comparison intervention) affect anxiety (the outcome) after 6 weeks of treatment (the time frame)? When questions are asked in a PICOT format, it results in an effective search that yields the best, relevant information and saves an inordinate amount of time (Stillwell, Fineout-Overholt, Melnyk, & Williamson, 2010). In contrast, an inappropriately formed question (e.g., What is the best type of intervention to use with teenagers who are anxious?) would lead to a search outcome that would likely include hundreds of non-useable abstracts and irrelevant information.

For other clinical questions that are not intervention focused, the meaning of the letter I can be “issue of interest” instead of “intervention.” An example of a nonintervention PICOT question would be: How do new mothers who have breast-related complications perceive their ability to breast-feed past the first 3 months after their infants’ birth? In this question, the population is new breast-feeding mothers, the issue of interest is breast-feeding complications, there is no appropriate comparison group, the outcome is their perception of their ability to continue breast-feeding, and the time is the 3 months after their infants’ birth.

When a clinical problem generates multiple clinical questions, priority should be given to those questions with the most important consequences or those that occur most frequently (i.e., those clinical problems that occur in high volume and/or those that carry high risk for negative outcomes to the patient). For example, nurses and physicians on a surgical unit routinely encounter the question: In postoperative adult patients, how does morphine compared to hydromorphone affect pain relief? Another question might be: In postoperative patients, how does daily walking compared to no daily walking prevent pressure sores? The clinical priority would be answering the question of pain relief first, as pain is a daily occurrence in this population, versus putting a priority on seeking an answer to the second question because pressure ulcers rarely occur in postoperative adult patients. Chapter 2 provides more in-depth information about formulating PICOT questions.

Step 2: Search for the Best Evidence

The search for best evidence should first begin by considering the elements of the PICOT question. Each of the keywords from the PICOT question should be used to begin the search. The type of study that would provide the best answer to an intervention or treatment question would be systematic reviews or meta-analyses, which are regarded as the strongest level of evidence on which to base treatment decisions (Guyatt & Rennie, 2002). There are different levels of evidence for each kind of PICOT question (see Chapter 2 for more in-depth discussion). Although there are many hierarchies of evidence available in the literature to answer intervention PICOT questions (e.g., Guyatt & Rennie, 2002; Harris et al., 2001), we have chosen to present a hierarchy of evidence to address these questions that encompasses a broad range of evidence, including systematic reviews of qualitative evidence, also referred to as meta-syntheses (Box 1.3).

Box 1.3 Rating System for the Hierarchy of Evidence for Intervention/Treatment Questions

| Level I: | Evidence from a systematic review or meta-analysis of all relevant RCTs |
| Level II: | Evidence obtained from well-designed RCTs |
| Level III: | Evidence obtained from well-designed controlled trials without randomization |
| Level IV: | Evidence from well-designed case-control and cohort studies |
| Level V: | Evidence from systematic reviews of descriptive and qualitative studies |
| Level VI: | Evidence from single descriptive or qualitative studies |
| Level VII: | Evidence from the opinion of authorities and/or reports of expert committees |

A systematic review is a summary of evidence on a particular topic, typically conducted by an expert or expert panel that uses a rigorous process for identifying, appraising, and synthesizing studies to answer a specific clinical question. Conclusions are then drawn about the data gathered through this process (e.g., in adult women with arthritis, how does massage compared to pharmacologic agents reduce pain after 2 weeks of treatment? In women, what factors predict heart disease in older adulthood?). Using a rigorous process of well-defined, prespecified criteria to select studies for inclusion in the review as well as stringent criteria to assess quality, bias is overcome and results are more credible. Population health stands a better chance for improvement when there is effective integration of scientific evidence through systematic reviews that are made available to influence policy-makers' decisions (Sweet & Moynihan, 2007).

Many systematic reviews incorporate quantitative methods to summarize the results from multiple studies. These reviews are called meta-analyses. A meta-analysis generates an overall summary statistic that represents the effect of the intervention across multiple studies. Because a meta-analysis can combine the samples of each study included in the review to create one larger study, the summary statistic is more precise than the individual findings from any one of the contributing studies alone (Ciliska, Cullum, & Marks, 2001). Thus, systematic reviews and meta-analyses yield the strongest level of evidence on which to base practice decisions. Caution must be used when searching for systematic reviews as some evidence reviews or narrative reviews may be labeled systematic reviews; however, they lack the rigorous process that is required of true systematic reviews (Fineout-Overholt, O'Mathúna, & Kent, 2008; Newhouse, 2008). Although studies are compared and contrasted in narrative and integrative reviews, a rigorous methodology with explicit criteria for reviewing the studies is often not used, and a summary statistic is not generated. Therefore, conclusions and recommendations by authors of narrative and integrative reviews may be biased.

In addition to the Cochrane Database of Systematic Reviews, the journals Worldviews on Evidence-Based Nursing and Nursing Research frequently provide systematic reviews to guide nursing practice across many topic areas. More information on Worldviews on Evidence-Based Nursing and Nursing Research can be found at [http://onlinelibrary.wiley.com/journal/10.1111/ (ISSN)1741-6787](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1741-6787) and [http://www nursingssearchononline.com](http://www nursingssearchononline.com)

Evidence-based clinical practice guidelines are specific practice recommendations grouped together that have been derived from a methodologically rigorous review of the best evidence on a specific topic. Guidelines usually do not answer a single specific question, but rather a group of questions about care. As such, they have tremendous potential as tools for clinicians to improve the quality of care, the process of care, and patient outcomes as well as reduce variation in care and unnecessary healthcare expenditures (Fein & Corrato, 2008). The National Guideline Clearinghouse (visit [http://www.guideline.gov](http://www.guideline.gov)) provides a mechanism to access detailed information on clinical practice guidelines for healthcare professionals, healthcare systems, and the public. The purpose of the National Guideline Clearinghouse is to further the dissemination and use of the guidelines. Examples of two guidelines housed at the National Guideline Clearinghouse include

- **Screening for coronary heart disease with electrocardiography: U.S. Preventive Services Task Force recommendation statement (Revised, 2012)**

It is important to note the latest publication date of clinical practice guidelines, as many guidelines need updating so that the latest evidence is included in making practice recommendations. It is also important to note the process through which the guidelines were created, as there are many guidelines that have been created by professional organizations that have not followed rigorous processes for development (e.g., systematic reviews) (Melnyk, Grossman et al., 2012). Although clinical practice guidelines have tremendous potential to improve the quality of care and outcomes for patients as well as reduce healthcare variation and costs, their success depends on a highly rigorous guideline development process and the incorporation of the latest best evidence. In addition, guideline success depends on implementation by
healthcare providers (Fein & Corrato, 2008). More information about guideline development and implementation can be found in Chapter 8.

A toolkit to enhance the use of clinical practice guidelines is available from the Registered Nurses’ Association of Ontario and can be downloaded from its website at http://ftctoolkit.rnao.ca

If syntheses (e.g., systematic reviews, meta-analyses) are not available to answer a clinical practice treatment question, the next step should be a search for original RCTs that are found in databases such as MEDLINE or CINAHL (Cumulative Index of Nursing and Allied Health Literature). If RCTs are not available, the search process should then include other types of studies that generate evidence to guide clinical decision making (e.g., nonrandomized, descriptive, or qualitative studies). Chapter 3 contains more detailed information on searching for evidence.

Step 3: Critical Appraisal of Evidence

Step 3 in the EBP process is vital, in that it involves critical appraisal of the evidence obtained from the search process. Although healthcare professionals may view critical appraisal as an exhaustive, time-consuming process, the first steps of critical appraisal can be efficiently accomplished by answering three key questions as part of a rapid critical appraisal process in which studies are evaluated for their validity, reliability, and applicability to answer the posed clinical question (summarized in Box 1.4):

1. **Are the results of the study valid? (Validity)** That is, are the results as close to the truth as possible? Did the researchers conduct the study using the best research methods possible? For example, in intervention trials, it would be important to determine whether the subjects were randomly assigned to treatment or control groups and whether they were equal on key characteristics prior to the treatment.

2. **What are the results? (Reliability)** For example, in an intervention trial, this includes (a) whether the intervention worked, (b) how large a treatment effect was obtained, and (c) whether clinicians could expect similar results if they implemented the intervention in their own clinical practice setting (i.e., the preciseness of the intervention effect). In qualitative studies, this includes evaluating whether the research approach fits the purpose of the study, along with evaluating other aspects of the study.

3. **Will the results help me in caring for my patients? (Applicability)** This third critical appraisal question includes asking whether (a) the subjects in the study are similar to the patients for whom care is being delivered, (b) the benefits are greater than the risks of treatment (i.e., potential for harm), (c) the treatment is feasible to implement in the practice setting, and (d) the patient desires the treatment.

The answers to these questions ensure relevance and transferability of the evidence to the specific population for whom the clinician provides care. For example, if a systematic review provided evidence to support the positive effects of using distraction to alleviate pain in postsurgical patients between the ages of 20 and 40 years, those same results may not be relevant for postsurgical patients who are 65 years or older.

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**Box 1.4**

**Key General Critical Appraisal Questions**

1. Are the results of the study valid? (Validity)
2. What are the results? (Reliability)
3. Will the results help me in caring for my patients? (Applicability)
In addition, even if an RCT supported the effectiveness of a specific intervention with a patient population, careful consideration of the risks and benefits of that intervention must be done before its implementation. When critically appraising a body of evidence to guide practice decisions, it is important not only to conduct rapid critical appraisal of the studies found in the search but also to evaluate all of the studies in the form of an evidence synthesis so that it can be determined whether the findings from the studies are in agreement or disagreement. A synthesis of the studies’ findings is important in order to draw a conclusion about the body of evidence on a particular clinical issue. Unit 2 in this book contains in-depth information on critical appraisal of all types of evidence, from expert opinion and qualitative studies to RCTs and systematic reviews.

**Step 4: Integrate the Evidence With Clinical Expertise and Patient Preferences to Make the Best Clinical Decision**

The next key step in EBP is integrating the best evidence found from the literature with the healthcare provider’s expertise and patient preferences and values to implement a decision. Consumers of healthcare services want to participate in the clinical decision-making process, and it is the ethical responsibility of the healthcare provider to involve patients in treatment decisions (Melnyk & Fineout-Overholt, 2006). Even if the evidence from a rigorous search and critical appraisal strongly supports that a certain treatment is beneficial (e.g., HRT to prevent osteoporosis in a very high-risk woman), a discussion with the patient may reveal her intense fear of developing breast cancer while taking HRT or other reasons that the treatment is not acceptable. Moreover, as part of the history-taking process or physical examination, a comorbidity or contraindication may be found that increases the risks of HRT (e.g., prior history of stroke). Therefore, despite compelling evidence to support the benefits of HRT in preventing osteoporosis in high-risk women, a decision against its use may be made after a thorough assessment of the individual patient and a discussion of the risks and benefits of treatment.

Similarly, a clinician’s assessment of healthcare resources that are available to implement a treatment decision is a critical part of the EBP decision-making process. For example, on follow-up evaluation, a clinician notes that the first-line treatment of acute otitis media in a 3-year-old patient was not effective. The latest evidence indicates that antibiotic A has greater efficacy than antibiotic B as the second-line treatment of acute otitis media in young children. However, because antibiotic A is far more expensive than antibiotic B and the family of the child does not have prescription insurance coverage, the practitioner and parents together may decide to use the less expensive antibiotic to treat the child’s unresolved ear infection.

**Step 5: Evaluate the Outcomes of the Practice Change Based on Evidence**

Step 5 in EBP is evaluating the evidence-based initiative in terms of how the change affected patient outcomes or how effective the clinical decision was with a particular patient or practice setting. This type of evaluation is essential in determining whether the change based on evidence resulted in the expected outcomes when implemented in the real-world clinical practice setting. Measurement of outcomes, especially “so-what” outcomes that are important to today’s healthcare system (e.g., length of stay, readmission rates, patient complications, turnover of staff, costs), is important to determine and document the impact of the EBP change on healthcare quality and/or patient outcomes (Melnyk & Morrison-Beedy, 2012). If a change in practice based on evidence did not produce the same findings as demonstrated in rigorous research, clinicians should ask themselves a variety of questions (e.g., Was the intervention administered in exactly the same way that it was delivered in the study? Were the patients in the clinical setting similar to those in the studies?). Chapter 10 contains information on how to evaluate outcomes of practice changes based on evidence. See Figure 1.3 for the key steps of EBP to improve quality healthcare.
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Step 0:
Cultivate a spirit of inquiry

Step 1:
Ask a burning clinical question in PICOT format

Step 2:
Search for the best evidence to answer the PICOT question

*Search first for SYNTHESIS*
For treatment questions: search first for systematic reviews of randomized controlled trials
For meaning questions: search first for meta-syntheses of qualitative studies
For prognosis or prediction questions: search first for syntheses of cohort case-control studies
For diagnosis questions: search first for syntheses of randomized control trials or cohort studies
For etiology questions: search first for syntheses of cohort or case-control studies

Step 3:
Conduct rapid critical appraisal of the studies found from the search
- Keep the valid and reliable studies
- Evaluate the keeper studies
- Synthesize the evidence from the keeper studies

**IS THERE ENOUGH VALID AND RELIABLE EVIDENCE FROM THE SEARCH TO MAKE A RECOMMENDED CHANGE IN CLINICAL PRACTICE?**

**REMEMBER,**
LEVEL OF THE EVIDENCE PLUS THE QUALITY OF THE EVIDENCE =
STRENGTH OF THE EVIDENCE → THE CONFIDENCE TO ACT

If YES, Step 4
Integrate the evidence with clinical expertise (including internal evidence) and patient preferences and values to implement the best practice.

Step 5
Evaluate the outcome of the practice change and, if positive, continue monitoring the best practice.

Step 6
Disseminate the outcomes of the EBP change.

If NO, alternative Step 4a
Generate internal evidence through an EBP implementation/outcomes management project, or generate external evidence through rigorous research.

Step 4b
Integrate the evidence with clinical expertise and patient preferences and values to implement the best practice.

Step 5
Evaluate the outcome of the practice change and, if positive, continue monitoring the best practice.

Step 6
Disseminate the outcomes of the EBP change.

*Figure 1.3: Steps of the EBP process leading to high-quality healthcare and best patient outcomes. © Melnyk & Fineout-Overholt, 2009.*
Step 6: Disseminate the Outcomes of the Evidence-Based Practice Change

The last step in EBP is disseminating the outcomes of the EBP change. All too often, clinicians achieve many positive outcomes through making changes in their care based upon evidence, but those outcomes are not shared with others, even colleagues within their same institution. As a result, others do not learn about the outcomes, and clinicians as well as patients in other settings do not benefit from them. It is so important for clinicians to disseminate outcomes of their practice changes based on evidence through such venues as oral and poster presentations at local, regional, and national conferences; EBP rounds within their own institutions; journal and newsletter publications; and lay publications. Specific strategies for disseminating evidence are covered in Chapter 18.

OBSTACLES AND OPPORTUNITIES

Healthcare providers are struggling to deliver evidence-based care while managing demanding patient loads and attempting to keep pace with the volume of journal articles related to their clinical practices.

Barriers to Evidence-Based Practice

Nurses, physicians, and other health professionals cite a number of barriers to EBP that include

- Lack of EBP knowledge and skills
- Misperceptions or negative attitudes about research and evidence-based care
- Lack of belief that EBP will result in more positive outcomes than traditional care
- Voluminous amounts of information in professional journals
- Lack of time and resources to search for and critically appraise evidence
- Overwhelming patient loads
- Organizational constraints, such as lack of administrative support or incentives
- Lack of EBP mentors
- Demands from patients for a certain type of treatment (e.g., patients who demand antibiotics for their viral upper respiratory infections when they are not indicated)
- Peer pressure to continue with practices that are steeped in tradition
- Resistance to change
- Lack of consequences for not implementing EBP
- Peer and leader/manager resistance
- Lack of autonomy over practice and incentives
- Inadequate EBP content and behavioral skills building in educational programs along with the continued teaching of how to conduct rigorous research in baccalaureate and master’s programs instead of teaching an evidence-based approach to care (Hannes et al., 2007; McGinty & Anderson, 2008; Melnyk, Fineout-Overholt, Feinstein, Sadler, & Green-Hernandez, 2008; Melnyk, Fineout-Overholt et al., 2012).

Facilitators of Evidence-Based Practice

To overcome the barriers in implementing EBP, there must be champions at all levels of practice (i.e., clinicians who believe so strongly in the EBP paradigm that they will do what it takes to facilitate it in their daily practice and their organizational culture) and an EBP culture and environment with mechanisms to support the cause (Fein & Corrato, 2008; Melnyk, 2012). For healthcare professionals to advance the use of EBP, misconceptions about how to implement practice based on the best available evidence need to be corrected, and knowledge and skills in this area must be enhanced. It must
also be realized that changing behavior is complex and influenced by multiple factors, including beliefs, attitudes, resources, and the availability of evidence to change practice (McGinty & Anderson, 2008). Facilitating conditions that have been found to enhance EBP include:

- Support and encouragement from leadership/administration that foster a culture for EBP
- Time to critically appraise studies and implement their findings
- Research reports that are clearly written
- Evidence-based practice mentors who have excellent EBP skills as well as knowledge and proficiency in individual and organizational change strategies (Melnyk, 2007; Newhouse, Dearholt, Poe, Pugh, & White, 2007)
- Proper tools to assist with EBP at the point of care (e.g., computers dedicated to EBP; computer-based educational programs; Hart et al., 2008)
- Clinical promotion systems that incorporate EBP competencies for advancement (Newhouse et al., 2007)
- Evidence-based clinical practice policies and procedures (Oman, Duran, & Fink, 2008)
- Journal clubs and EBP rounds

OVERCOMING BARRIERS TO EVIDENCE-BASED PRACTICE

For evidence-based care to become the gold standard of practice, EBP barriers must be overcome. Federal agencies, healthcare organizations and systems, health insurers, policy-makers, and regulatory bodies must advocate for and require its use. Funding agencies must continue to establish translational research (i.e., how findings from research can best be transported into clinical practice to improve care and patient outcomes) as a high priority. Interdisciplinary professionals must work together in a collaborative team spirit to advance EBP. In addition, healthcare organizations must build a culture and environment of EBP and devise clinical promotion ladders that incorporate its use.

As an initial step, barriers and facilitators to EBP along with organizational culture and readiness for system-wide implementation of EBP must be assessed within an organization. Surveys or focus groups should first be conducted with healthcare providers to assess their baseline knowledge, beliefs, and behaviors regarding EBP (Melnyk, Fineout-Overholt, & Mays, 2008). Objective documentation of the status of EBP is essential to demonstrate a change in outcomes, even when there is a subjective consensus of the leaders regarding the state of EBP in their agency. An additional benefit of conducting surveys or focus groups at the outset of any new EBP initiative is that research shows that these strategies also are effective in raising awareness and stimulating a change to evidence-based care (Jolley, 2002).

As part of the survey or focus group, clinicians should be asked about their baseline knowledge of EBP as well as to what extent they believe that implementing EBP will result in improved care and better patient outcomes. This is a critical question because knowledge alone usually does not change behavior. Although healthcare providers must possess basic knowledge and skills about EBP, it is critical for them to believe that EBP will produce better outcomes in order for changes in their practices to occur (Melnyk, Fineout-Overholt, & Mays, 2008).

Belief at the beginning of any successful undertaking is the one ingredient that will ensure success.
—William James

Healthcare providers who do not believe that EBP results in improved care and patient outcomes need to be exposed to real-case scenarios in which evidence-based care resulted in better outcomes than care that was steeped in traditional practices. For example, many primary care providers continue to prescribe antidepressants as the sole treatment for depressed adolescents when RCTs have indicated that medication in combination with cognitive-behavioral therapy is better than medication alone in reducing depressive
symptoms (Brent et al., 2008; Melnyk & Jensen, 2013). In addition, although rigorous systematic reviews of the effectiveness of metered-dose inhalers (MDIs) versus nebulizers in administering bronchodilators to children with asthma have indicated that MDIs are just as effective with fewer side effects, less emergency room time, and less hospital admission, nebulizers continue to be the preferred route of administration in many emergency rooms (Mason, Roberts, Yard, & Partridge, 2008).

**Correcting Misperceptions**

Because misperceptions about EBP constitute another barrier to its implementation, clarifying these perceptions and teaching the basics of EBP are critical to advancing evidence-based care. For example, many practitioners believe that searching for and critically appraising research articles is an overwhelming, time-consuming process. However, practitioners who have this belief frequently have not had exposure to databases such as the Cochrane Library and the National Guideline Clearinghouse, which can provide them with quick, easily retrievable systematic reviews and evidence-based guidelines to inform their practices. In addition, because many educational curricula continue to teach the in-depth critique of a single study versus time-efficient approaches to the gathering and critical appraisal of a body of empirical studies, clinicians may have the misperception that the EBP process is not feasible in the context of their current practice environments. Therefore, the basics of EBP (e.g., how to formulate a searchable question that will yield the best evidence, how to search for and rapidly critically appraise studies, how to synthesize the evidence) must be taught first in order to create baseline knowledge and skills.

The teaching of EBP can and should be accomplished with multiple strategies, including continuing education conferences with skills-building activities; interactive workshops; and dissemination of educational materials, such as journal articles, textbooks, and informational handouts (Davies, 2002). The best learning method incorporates the teaching of didactic information with interactive behavioral skills. Therefore, creating opportunities for clinicians to practice the skills that they are learning about in didactic sessions is superior to didactic sessions alone.

More detailed information about teaching EBP can be found in Chapters 16 and 17. Moreover, three active EBP centers housed in nursing college and schools in the U.S. can serve as resources for the teaching and implementation of EBP:

1. The Academic Center for Evidence-Based Nursing (ACE) at the University of Texas Health Science Center at San Antonio [http://www.acestar.uthscsa.edu/](http://www.acestar.uthscsa.edu/)
2. The Center for Transdisciplinary Evidence-based Practice at The Ohio State University [http://www.nursing.osu.edu/sections/ctep/](http://www.nursing.osu.edu/sections/ctep/)
3. The Sara Cole Hirsch Institute for Best Nursing Practice Based on Evidence at Case Western Reserve School of Nursing [http://fpb.case.edu/Centers/Hirsh/](http://fpb.case.edu/Centers/Hirsh/)

Both ACE and CTEP offer national and international EBP continuing education conferences for nurses and other interdisciplinary healthcare professionals, some of which have been funded by AHRQ. Pre-conference interactive workshops are also held in conjunction with ACE’s and CTEP’s conferences. The CTEP workshops focus on such topics as the foundations of EBP, implementing and sustaining EBP in healthcare systems, and teaching EBP. The Academic Center for Evidence-Based Nursing preconference workshops have varied in their focus from teaching EBP to systematic reviews. The CTEP also offers EBP mentorship immersion programs for clinicians and faculty along with an online EBP fellowship program. In addition, the Academic Center for Evidence-Based Nursing has a summer institute that offers academic and continuing education opportunities for those interested in learning more about EBP.

Centers for EBP have also been established internationally in countries such as Australia, New Zealand, Hong Kong, Germany, the United Kingdom, and Canada. The mission of most of these centers is to educate clinicians through workshops or formal courses on EBP or to conduct systematic reviews.

Other reputable sources of information about EBP are from abstraction journals, such as *Evidence-Based Medicine, Evidence-Based Nursing, Evidence-Based Mental Health, and Evidence-Based Health Policy & Management*. These are other mechanisms through which professionals can find evidence to
guide their practice. These journals summarize high-quality studies that have important clinical implications and provide a commentary by an expert in the field. The commentary addresses strengths and limitations of the research reviewed.

**Questioning Clinical Practices, Changing Practice With Evidence, and Evaluating Impact**

*Never stop questioning!*  
—Susan L. Hendrix

After basic EBP knowledge and skills are attained, it is important for healthcare professionals to ask questions about their current clinical practices (e.g., In neonates, how does the use of pacifiers compared to no pacifiers reduce pain during intrusive procedures? In adult surgical patients, how does heparin compared to antiembolic stockings prevent deep vein thrombosis within the first 2 months after surgery?). Efforts also should be made to prioritize practice problems within an organization or practice setting. One strategy for prioritizing practice problems is described by Rosenfeld et al. (2000), who conducted a survey and focus groups with nurses in a large academic health center to develop specific action plans around particular patient problems. Once high-priority areas were recognized, it was helpful to identify colleagues who had an interest in the same clinical question so that a collaboration could be formed to search for and critically appraise the evidence found. The results of this search and appraisal could be shared with colleagues through a variety of mechanisms (e.g., journal clubs, EBP practice rounds, or informational handouts). If a current practice guideline does not exist, one can be developed and implemented. However, guideline development is a rigorous endeavor, and adequate time must be allotted for the individuals who will complete the work (Davies, 2002). Useful processes for developing and implementing clinical practice guidelines are described in Chapter 8. To complete the EBP process, evaluation of the key outcomes of evidence implementation is essential to determine its effects on the process and outcomes of care.

Change to EBP within an organization or practice requires a clear vision, a written strategic plan, a culture and environment in which EBP is valued and expected, and persistence to make it happen. In addition, the chance to succeed in making a change to EBP and sustaining it will be greater where there is administrative support, encouragement and recognition, EBP mentors, expectations for EBP as contained in clinical promotion criteria and evaluations, inter-professional collaboration, and allocated resources. It is often best to start with a small evidence-based change with high impact, especially when there is skepticism about EBP and elevated levels of stress or complacency within a system, rather than to expect a complete change to EBP to happen within a short period of time. For example, finding a mechanism for routinely discussing evidence-based literature, such as journal clubs or EBP rounds that can spark interest and enhance “buy-in” from colleagues and administration, may be a wonderful start to facilitating a change to EBP.

*I don’t think there is any other quality so essential to success of any kind as the quality of perseverance. It overcomes almost everything, even nature.*  
—John D. Rockefeller

Further information about how to infuse EBP into clinical settings is provided in Chapters 9, 11, 13, and 14, which review a variety of specific EBP strategies and implementation models. In addition, Chapter 14 outlines assessment strategies for determining an organization’s stage of change. It also provides multiple suggestions for motivating a vision for change to best practice, based primarily on evidence-based organizational change principles. For case examples on how evidence-based care can positively impact patient outcomes, see the section at the end of each unit titled Making EBP Real World: A Success Story. These case examples highlight how EBP can improve both the process and outcomes of patient
care. Countless examples similar to these can be found in the literature. Evidence-based success stories stem from first asking compelling clinical questions, which emphasizes the need to cultivate a never-ending spirit of inquiry within our colleagues, our students, and ourselves. These case examples, along with the Women’s Health Study, teach a valuable lesson: Never stop questioning because providers need to take evidence-based responsibility for clinical decisions and stay up to date with data that can further support or dramatically change their practice standards (Hendrix, 2002b). Once that spirit of inquiry is cultivated within us and our clinical settings, the journey toward a change to EBP will begin.

We have come to a time when the credibility of the health professions will be judged by which of its practices are based on the best and latest evidence from sound scientific studies in combination with clinical expertise, astute assessment, and respect for patient values and preferences. The chance to influence health policy also rests on the ability to provide policy-makers with the best evidence on which to make important decisions. However, it is important to remember that high-quality healthcare also depends on the ability to deliver EBP within a context of caring, which is the merging of science and art.

For EBP to evolve more quickly, commitments to advancing evidence-based care must be made by individuals, leaders, and organizations. Basic and graduate professional programs must teach the value and processes of EBP, leveled appropriately (see Chapter 15). Doctor of Philosophy (PhD) programs must prepare researchers and leaders who advance EBP through the generation of new knowledge from research to support the most effective practices, as well as the testing of established and new models of EBP implementation so that it can be determined which models are most effective on both staff and patient outcomes. Doctor of Nursing Practice (DNP) programs must prepare advanced practice nurses who are the best translators of evidence generated from research into clinical practice to improve care and outcomes (Melnyk, 2013). Researchers and practitioners across disciplines must also unite to produce evidence on the effectiveness of numerous practices and to answer high-priority, compelling clinical questions, as well as to determine how best those initiatives or interventions can be best translated into practice.

The time has come for practitioners from all healthcare professions to embrace EBP and quickly move from practices that are steeped in tradition or based on outdated policies to those that are supported by sound evidence from well-designed studies. In doing so, patients, healthcare professionals, and healthcare systems will be able to place more confidence in the care that is being delivered and know that the best outcomes for patients and their families are being achieved.

Knowing is not enough; We must apply. Willing is not enough; We must do.
—Goethe

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**EBP FAST FACTS**

- Research supports that EBP improves healthcare quality and safety, patient outcomes, and healthcare costs.
- Evidence-based practice is a problem-solving approach to the delivery of healthcare that integrates the best evidence from research with a clinician's expertise, including internal evidence from patient data, and a patient's preferences and values.
- The level of evidence plus the quality of that evidence will determine whether a practice change should be made.
- Without EBP, it often takes decades to translate findings from research into real-world clinical practice settings.
- There are seven steps to EBP, which should be consistently implemented by clinicians to improve healthcare quality and patient outcomes (see Box 1.2).
- An EBP culture and environment must be created within an organization for EBP to sustain.
Chapter 1: Making the Case for Evidence-Based Practice and Cultivating a Spirit of Inquiry

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