



Strategies for Advancing Evidence-Based Practice in Clinical Settings

Ellen Fineout-Overholt, PhD, RN

Rona F. Levin, PhD, RN

Bernadette Mazurek Melnyk, PhD, RN, CPNP/NPP, FAAN, FNAP

Abstract

Evidence-based practice (EBP) is a problem-solving approach that incorporates the best available scientific evidence, clinicians' expertise, and patients' preferences and values. Melnyk and Fineout-Overholt have developed the ARCC (Advancing Research and Clinical practice through close Collaboration) model for the purpose of implementing EBP. A pilot study was conducted to test the ARCC model at two acute-care sites. This article shares information learned from the pilot study about what is necessary for successful implementation of EBP in the acute-care setting. These essentials include identifying EBP champions, redefining nurses' roles to include EBP activities, allocating time and money to the EBP process, and creating an organizational culture that fosters EBP. In addition, practical strategies for implementing EBP are presented to encourage implementation of EBP.

Evidence-based practice (EBP) is a problem-solving approach that incorporates the best available scientific evidence, clinicians' expertise, and patients' preferences and values (Melnik & Fineout-Overholt, 2004). In two quality-related reports, the Institute of Medicine emphasized the importance of EBP to best practice (Institute of Medicine, 2001) and to the education of healthcare professionals (Greiner & Knebel, 2003).

EBP is a recognized method for improving clinical practice and has been described as "essential for nurses to establish who they are, what they do, and what effect they have on patient outcomes" (Richardson, Miller, & Potter,

2002, p. 44). Evidence-based practice also has been shown to improve the cost-effectiveness of patient care (Kitson, 2000; Madigan, 1998; Rosenfeld, Duthie, Bier, Bower-Ferres, Fulmer, Iervolino et al., 2000; Selig, 2000; Winch, Creedy, & Chaboyer, 2002).

Although these studies have identified significantly better patient outcomes when care is based on research, healthcare institutions have been slow to implement EBP (Ciliska et al., 1996; Majanian et al., 2002; Retsas, 2000). In recent years, partially due to accreditation requirements from regulatory agencies such as the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and a desire for Magnet

Recognition from the American Nurses Credentialing Center (ANCC), healthcare organizations have begun to implement principles of EBP into performance appraisals and institutional policies. It remains to be demonstrated whether mandates and policies that reflect EBP will be translated into practice.

In New York state and across the country, opportunities for continuing education in EBP are increasing, furthering clinicians' knowledge of the process (Melnik & Fineout-Overholt, 2002). Despite these opportunities and the apparent adoption of EBP from a system perspective, there remains a pervasive culture of practice based on tradition.

Ellen Fineout-Overholt is director of the Center for the Advancement of Evidence-based Practice at Arizona State University College of Nursing, Tempe, Ariz. **Rona F. Levin** is project director of the Joan M. Stout, RN, Evidence-Based Practice Initiative at the Lienhard School of Nursing, Pace University, New York, N.Y. and professor emerita at Felician College, Lodi, N.J. **Bernadette Mazurek Melnyk** is dean and distinguished foundation professor of nursing at the Arizona State University College of Nursing, Tempe, Ariz.

Barriers to implementing EBP

Researchers have demonstrated that barriers to implementing EBP in acute-care environments include a lack of knowledge of the EBP process, a deficiency of critical appraisal skills to evaluate research, and a lack of administrative support for EBP endeavors (Champion & Leach, 1989; Kajermo, Nordstrom, Krusebrant, & Bjorvell, 1998; McCaughan, Thompson, Cullum, Sheldon, & Thompson, 2002; Melnyk & Fineout-Overholt, 2002; Parahoo, 2000; Retsas & Nolan, 1999).

Through surveys of nurses, Melnyk and her colleagues found that mentoring was perceived as essential to successfully implementing EBP principles (Melnyk, Fineout-Overholt, Feinstein, Li, Small, Wilcox, et al., 2004). The ARCC (Advancing Research and Clinical practice through close Collaboration) model was created as a mechanism to implement and test the role of the “EBP mentor” and to define other factors that contribute to best practice (Melnyk & Fineout-Overholt, 2002).

The ARCC model for Implementing EBP in clinical settings

The ARCC model was developed by Bernadette Melnyk as part of a strategic planning initiative involving faculty from the University of Rochester (N.Y.) School of Nursing and School of Medicine & Dentistry, nurses from an academic health center, and community leaders (Melnyk & Fineout-Overholt, 2002). As Director of the Center for Research, Melnyk extended the focus of the center to include leadership in advancing EBP and renamed it the Center for Research and Evidence-Based Practice (CREP). The School of Nursing and the nursing practice department at the University of Rochester Medical Center jointly supported a CREP position of Acute-Care Associate Director for EBP.

The primary goal of the ARCC model was to enhance integration of research and clinical practice in acute-care and community healthcare settings, both locally and nationally. Nurses surveyed by the ARCC team identified several major factors that influenced their ability to base their practice on evidence, including access to expertise; presence of mentors in EBP; assistance with outcomes management; and assistance with scholarly work (Melnyk & Fineout-Overholt, 2002).

Nurses identified mentorship as a key ingredient to successfully implementing EBP. The ARCC team created and described the role of the “EBP mentor,” which is a key concept in the ARCC model. In addition, resources, the development of efficient computer search strategies, and time to conduct EBP activities were identified as influential to implementation of evidence-based care. In contrast, perceived major barriers to successful implementation of EBP included heavy patient care demands and administrative responsibilities.

Specific goals for the ARCC model were established: a) promoting EBP among both advanced practice and staff nurses, locally and nationally; b) establishing a cadre of EBP mentors to facilitate EBP; c) disseminating the best evidence from well-designed studies to advance an evidence-based approach to clinical care; d) conducting an annual EBP conference; and e) conducting studies to evaluate the effectiveness of the ARCC model on the process and outcomes of clinical care (Melnyk & Fineout-Overholt, 2004).

Many of these goals were achieved within the first two years through activities such as: a) one-on-one mentoring for advanced practice nurses (APNs) in both acute- and primary-care settings to initiate EBP; b) partnering with community healthcare agencies to establish outcomes management projects; c) mentoring APNs in writing and submitting research grants to answer clinical questions where adequate science did not exist; d) mentoring APNs and staff nurses in disseminating evidence at regional and national professional meetings; e) disseminating the best and latest evidence that could help answer nurses’ clinical inquiries through a listserve and regularly scheduled EBP rounds; and f) educating nurses, faculty, and administrators at all levels about the EBP process by conducting local, regional, and national workshops, training sessions, conference keynotes, and plenary sessions (Greiner & Knebel, 2003).

The primary goal of the ARCC model was to enhance integration of research and clinical practice in acute-care and community healthcare settings, both locally and nationally.

Pilot study designed for acute-care settings

An ongoing dialogue about how to implement the ARCC model in acute-care settings resulted in collaboration among nurse researchers at the New York State Nurses Association (NYSNA), the Foundation of the New York State Nurses Association, and two universities in New York state. This collaboration led to the design of a pilot study to test the ARCC model at two pediatric units in a 700-bed tertiary care center and four adult units in a specialty surgery hospital.

The randomized, controlled trial pilot study was designed to determine whether using the ARCC model would lead to better outcomes for both nurses and patients in an acute-care setting.

The study was preceded by meetings with chief nursing officers, nurse managers, and advanced practice nurses of the participating organizations and units for the purpose of gaining their support, informing them of the purpose of the study, and outlining their roles in the project.

During the course of conducting the pilot study, many lessons were learned about what it takes to implement EBP in an acute-care environment. This article describes lessons the authors learned and outlines possible future strategies for implementing EBP in acute-care settings.

Success can be easily hampered if the entire healthcare team is not cohesive in basing decisions on evidence.

Essentials for implementing EBP in clinical settings

During the pilot study, researchers found several strategies that were successful in implementing EBP. These strategies assisted in removing barriers that had been identified in the literature.

EBP champions

Administrative support for EBP was of paramount importance to success. Champions were necessary at all levels, from administrators to staff nurses. Champions are those who believe in EBP principles, know how to integrate them into the system culture, and can mentor others in the EBP process. Champions must have adequate knowledge of EBP principles to guide the process for others (Fineout-Overholt, Cox, Robbins, & Gray, 2005). As an initial step in developing champions, EBP knowledge and skills can be gained through both formal continuing education and self-paced, on-line tutorials. Such tutorials can be found at the Web sites of the Research Centre for Transcultural Studies in Health (2005) and the University of Rochester Medical Center (2005).

During the pilot study, the units with EBP champions had more success in collecting data and implementing EBP innovations. Units with administrative champions were more successful in achieving a greater percentage of participation in the project by staff nurses.

Physicians, including residents, also were important champions and brought interdisciplinary perspective to the team that was implementing EBP. Success can be easily hampered if the entire healthcare team is not cohesive in basing decisions on evidence. The value of current evidence in dealing with a clinical issue must be demonstrated to the entire team to facilitate practice change.

Role definition

Establishing a clear role definition for professional nurses that includes EBP is important to successful EBP implementation. In clinical settings, the focus traditionally has tended to be on the service role of professional

nurses, not on scholarship or teaching. Although continuing education has gained importance, along with the teaching and mentoring of new practitioners, the idea of scholarship typically is not considered a valued, integral part of the direct-care nurse's role.

During the pilot study, nurses reported that it was difficult to participate in the EBP process because of competing priorities. They perceived that administrators' expectations did not include EBP as a priority. For example, there were times when the mentor was present on the unit but nurses were unable to meet with the mentor because patient care was all-consuming. They reported to the mentor that they often did not have time to take a lunch or dinner break. Until a scholarly form of practice becomes vital to the role of the direct-care nurse and is part of the nursing culture, most nurses will not volunteer to take on additional responsibilities that are not valued role behaviors.

Use of resources

The pilot study revealed that an adequate infrastructure must be in place for successful implementation of EBP. Computer resources, internet access, evidence databases, and time for scholarly practice were all essential to EBP. Also, without mentorship by an expert in EBP, innovations were not accomplished.

EBP mentors

If the institution has advanced practice nurses (APNs) available, they can play a vital role in implementing EBP. The clinical nurse specialist (CNS) role traditionally has been one of an "information broker," an individual with specialized knowledge and skills who brings the latest research findings to direct care staff. With additional education and skills training, a CNS role could evolve into that of EBP mentor.

The EBP mentor should spearhead and support staff nurses and APNs to create changes in care that are based on evidence. Since EBP is just beginning to be integrated into nursing education curricula, nurses who have been in practice for even one year are likely to have a knowledge deficiency, unless they have attended continuing education

conferences on EBP or are enrolled in a graduate program that subscribes to an EBP model. An EBP mentor must therefore help nurses learn the basics of EBP, work with them to develop clinical questions, find the answers, examine and apply the evidence, and evaluate outcomes.

An EBP mentor in a clinical setting must be flexible in both time and task structure. Finding time to learn about EBP and to work on a related project is often difficult, so a rigid meeting schedule will not always be effective. Often, EBP mentorship is accomplished "as you go," taking advantage of the teachable moment. To gain credibility, an EBP mentor must be physically present on the acute-care unit in order to learn about the nurses' work, make rounds with them, and establish trust.

Doctorally prepared researchers in acute-care settings provide an additional level of mentorship by implementing EBP at a system-wide level. These EBP experts mentor the EBP mentors on the units and generate evidence to guide clinical practice when evidence does not already exist.

Time and money

Nurses' workloads involve allocation of both time and money. The pilot study included an intervention designed to address the barrier created by nurses' lack of knowledge of EBP. The nurses were expected to take time to complete the intervention in a continuing education format. However, nurses often did not have time to attend to the details of the study, including this intervention. Competing priorities, such as new initiatives directed from administration or preparing for an accreditation visit, influenced the time the nurses had available.

Some units paid nurses for the time they spent to complete the intervention and these units had a greater return on data collection. It is not uncommon for healthcare organizations to pay nurses for the time they attend formal continuing education (CE) conferences. Some organizations require participation in CE activities because they are deemed essential to best practice.

Because educational activity is supported by administrators through the investment of time and money, nurses often perceive CE activities as valued by the organization. For EBP to be integrated into the clinical setting, it is essential that administrators demonstrate the value of EBP to the organization. They can do this by supplying nurses with the time to engage in EBP activities and paying them for the time they spend on an EBP project.

Successful implementation of EBP must also be based on a determination of nurses' workloads and how they can accommodate an EBP initiative. This requires consideration of the timing of interventions and cooperation with nursing leadership to ensure that nurses have adequate time to understand and implement EBP principles. The introduction of EBP principles must be carefully timed to avoid conflict with major events such as organization-wide policy changes or practice initiatives.

Creating a culture that fosters EBP

During the pilot study, some nurses reported that if changes were to be made on the acute-care units, the APN, nurse educator, or quality assurance coordinator would tell them about them and direct them on how to make them. The nurses did not readily participate in initiating change and were not involved in formulating clinical questions or finding, critiquing, and applying the evidence.

According to Thyer (2003), the bureaucratic environment in which nurses typically practice engenders a transactional leadership style that promotes task orientation and top-down decision making. It fosters an environment in which nurses perceive themselves as powerless and creative thinking is not rewarded (Bass & Avolio, 1993; Paware & Eastman, 1997).

Although many nurse administrators are trying to introduce a transformational leadership style (Bass & Avolio, 1993) into their nursing services, it is difficult to modify attitudes and behaviors that have been ingrained into the very fabric of institutional nursing practice.

The top-down culture can foster an attitude that leads to direct-care nurses' unwillingness to be engaged in the EBP process as part of their daily work. Although an institution may base nursing protocols and procedures on evidence, these policies and procedures are developed by designated committees or quality assurance teams and then implemented by direct-care nurses on the units. This perpetuates the top-down mentality that encourages passivity among staff nurses. Without a culture that fosters clinical inquiry and independent problem-solving using the EBP process, nurses will not consider integration of research findings as an inherent part of their everyday nursing practice.

The profession of nursing traditionally has considered direct, hands-on patient care to be its priority. Hands-on care may be becoming secondary, however, to the increasingly cumbersome, time-consuming demands for documentation of nursing care. The study process highlighted the urgent need for a new culture that values EBP. Without this culture shift, direct patient care tasks cannot be best practice.

The EBP process must become the standard for "thinking at the bedside." This involves identifying patient problems when they arise; asking searchable, answerable questions; discovering valid evidence to answer the questions; and working with other members of the healthcare team, including the EBP mentor, to develop, implement and evaluate innovative practices based on the best available evidence. Administrators

must convey that EBP is essential to patient care and is valued in terms of investment of the organization's time and money.

Practical strategies for implementing EBP

The pilot study revealed essential elements for the successful implementation of EBP in acute-care settings. Practice will not be evidence-based, however, unless nurses take initiative and implement EBP with these elements in mind. For that purpose, the authors suggest three practical strategies for initiating EBP: EBP rounds, critically appraised topics, and educational prescriptions.

EBP rounds

The use of EBP Rounds is an effective way to address EBP with a larger group. The technique can engage all levels of practitioners and allows them to become involved in the discussion as much as they desire. As the healthcare team discusses patient progress, these discussions can be structured to include supporting evidence for the chosen treatment decisions. At first, it is often helpful to have the EBP mentor, usually an APN, present the evidence. As nurses' knowledge of EBP principles grows, they can take more leadership in presenting the evidence. The five steps of the EBP process (see Table 1) should be addressed during rounds. Practitioners can choose one step they want to address or one clinician can present the entire process for a given clinical scenario.

When planning and conducting EBP rounds, it is helpful to know one's audience, survey the group for interests and clinical priorities, consider appropriate timing, make the topics relevant to the audience, and determine a convenient physical location.

Table 1: The Five Steps of Evidence-Based Practice

1. Ask the clinical question in PICO format to yield the most relevant and best evidence. The PICO format includes these basic elements: P: Patient population of interest; I: Intervention of interest or Issue of interest; C: Comparison of interest; and O: Outcome of interest.
2. Collect the most relevant and best evidence to answer the clinical question, searching first for systematic reviews/meta-analyses or evidence-based clinical practice guidelines.
3. Critically appraise the evidence that has been collected for its validity, relevance, and applicability.
4. Integrate the evidence with one's clinical expertise, an assessment of patient characteristics and healthcare resources available, and patient preferences and values in order to implement an EBP decision.
5. Evaluate the EBP change

Source: Melnyk, B. M. & Fineout-Overholt, E. (2004). Making the case for evidence-based practice. In B. M. Melnyk & E. Fineout-Overholt (Eds.) *Evidence-based practice in nursing and healthcare: A guide to best practice* (p. 3-24). Philadelphia: Lippincott, Williams & Wilkins. Used with permission.

Critically appraised topics

The critically appraised topics (CAT) technique requires less group participation than EBP rounds. Often a CAT can be a one-page summary of the evidence with bottom-line recommendations for practice supported by statistics, such as the number needed to treat (NNT). Clinically relevant topics are paramount, as are comments about a study's applicability. An ideal mechanism for this approach is a poster on the patient care unit. The poster format allows all staff to participate in the CAT and to benefit from seeing the entire process posted. In addition, the CAT poster is a good place to begin dialogue about EBP initiatives and to resolve clinical problems identified and "answered."

Educational prescriptions

Educational prescriptions are self-initiated prescriptions in which individuals reflect on the EBP process and determine where their learning gaps exist. Learners then write out their own prescriptions of what they will do to bridge these learning gaps. The culmination of this activity is presentation of the process to a group, increasing accountability for the learner. The best-case scenario is for the group leadership to present a clinical case. The group members then present the clinical question, search strategy, retrieve evidence, conduct critical appraisal, and apply the evidence, along with defined outcomes, to determine the success of

the implementation. Which portion learners will present is chosen by them and addresses their learning needs.

Choosing an appropriate strategy to get started with EBP is important to success. Learners have different needs that will inform the choice and the culture may influence which strategy is chosen. Although initiating EBP requires careful thought and planning, lack of action is detrimental to quality patient care and should be avoided.

Steps toward the future

The study described in this article provided some perspective on what it takes to implement EBP in the acute-care setting. Strategies for facilitating success have been identified. Every nurse must find ways to ensure best practice in all healthcare settings through collaboration, learning, and implementation of the EBP process.

Acknowledgements

The authors extend appreciation and thanks to University of Rochester School of Nursing, the Helene Fuld Health Trust, Inc., Pace University Lienhard School of Nursing, and the Hugoton Foundation for support of the pilot project and this article.

REFERENCES

- Bass, B.M., & Avolio, B.J. (1993). Transformational leadership: A response to critiques. In M.M. Chemers & R. Auman (Eds.), *Leadership theory and research* (pp. 49-80). San Diego, CA: Academic Press.
- Ciliska, D., Mitchell, A., Baumann, A., Sheppard, K., Van Berkel, C., Adam, V., et al. (1996). Changing nursing practice—trisectional collaboration in decision making. *Canadian Journal of Nursing Administration*, 9(2), 60-73.
- Champion, V.L., & Leach, A. (1989). Variables related to research utilization in nursing: an empirical investigation. *Journal of Advanced Nursing*, 14(9), 705-710.
- Fineout-Overholt, E., Cox, J., Robbins, B., & Gray, Y. (2004). Teaching evidence-based practice. In B.M. Melnyk & E. Fineout-Overholt (Eds.) *Evidence-based practice in nursing and healthcare: A guide to best practice* (pp. 407-442). Philadelphia: Lippincott, Williams & Wilkins.
- Greiner, A., & Knebel, E. (Eds.) (2003). *Health professions education: A bridge to quality*. Washington, DC: National Academy Press.
- Institute of Medicine (2001). *Crossing the quality chasm: A new health system for the 21st century*. Washington, DC: National Academy Press.
- Kajermo, K.N., Nordstrom, G., Krusebrant, A., & Bjorvell, H. (1998). Barriers and facilitators of research utilization, as perceived by a group of registered nurses in Sweden. *Journal of Advanced Nursing*, 27, 798-807.
- Kitson, A. (2000). Toward evidence-based quality improvement: Perspectives from nursing practice. *International Journal for Quality in Health Care*, 12(6), 459-464.
- Madigan, E. A. (1998). Evidence-based practice in home healthcare. A springboard for discussion. *Home Healthcare Nurse*, 16(6), 411-415.
- Maljanian, R., Caramanica, L., Taylor, S. K., MacRae, J. B., & Beland, D. K. (2002). Evidence-based nursing practice, Part 2: Building skills through research roundtables. *Journal of Nursing Administration*, 32(2), 85-90.
- McCaughan, D., Thompson, C., Cullum, N., Sheldon, T.A., & Thompson DR. (2002). Acute care nurses' perceptions of barriers to using research information in clinical decision-making. *Journal of Advanced Nursing*, 39(1), 46-60.
- Melnyk, B. M. & Fineout-Overholt, E. (2004). *Evidence-based practice in nursing and healthcare: A guide to best practice*. Philadelphia: Lippincott, Williams & Wilkins.
- Melnyk, B.M., & Fineout-Overholt, E. (2002). Putting research into practice. Rochester ARCC. *Reflections on Nursing Leadership*, 28(2), 22-25.
- Melnyk, B.M., Fineout-Overholt, E., Feinstein, N., Li, H.S., Small, L., Wilcox, L. & Kraus, R. (2004). Nurses' perceived knowledge, beliefs, skills, and needs regarding evidence-based practice: Implications for accelerating the paradigm shift. *Worldviews on Evidence-based Nursing*, 1(3), 185-193.
- Parahoo, K. (2000). Barriers to, and facilitators of, research utilization among nurses in Northern Ireland. *Journal of Advanced Nursing*, 31(1), 89-98.
- Paware, B.S., & Eastman, K.K. (1997). The nature and implications of contextual influences on transformational leadership: A conceptual examination. *Academy of Management Review*, 22(1), 80-109.
- Research Centre for Transcultural Studies in Health (2005). Teaching/Learning Sources for Evidence-Based Practice. Retrieved January 26, 2005 at <http://www.mdx.ac.uk/www/rctsh/ebp/main.htm>
- Retsas, A. (2000). Barriers to using research evidence in nursing practice. *Journal of Advanced Nursing*, 31(3), 599-606.
- Retsas, A., & Nolan, M. (1999). Barriers to nurses' use of research. An Australian hospital study. *International Journal of Nursing Studies*, 36, 335-343.
- Richardson, A., Miller, M., & Potter, H. (2002). Developing, delivering, and evaluating cancer nursing services: Searching for a United Kingdom evidence base for practice. *Cancer Nursing*, 25(5), 404-415.
- Rosenfeld, P., Duthie, E., Bier, J., Bower-Ferres, S., Fulmer, T., Iervolino, L., et al. (2000). Engaging staff in evidence-based research to identify nursing practice problems and solutions. *Applied Nursing Research*, 13(4), 197-203.
- Selig, C. (2000). Sexual assault nurse examiner and sexual assault response team (SANE/SART) program. *Nursing Clinics of North America*, 32(5), 311-319.
- Thyer, G.L. (2003). Dare to be different: Transformational leadership may hold the key to reducing the nursing shortage. *Journal of Nursing Management*, 11(2), 73-79.
- University of Rochester Medical Center (2005). Nesbit Guide to Evidence Based Resources. Retrieved January 26, 2005 at http://www.urmc.rochester.edu/hslt/miner/resources/evidence_based/index.cfm
- Winch, S., Creedy, D., & Chaboyer, A. W. (2002). Governing nursing conduct: the rise of evidence-based practice. *Nursing Inquiry*, 9(3), 156-61.