Evidence Equals Excellence: The Application of an Evidence-Based Practice Model in an Academic Medical Center

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Within today’s health care environment, there are numerous initiatives for health care organizations to adopt evidence-based practice (EBP) as a framework for the ongoing development and improvement of clinical practice. EBP is a problem-solving approach to clinical practice that integrates the conscientious use of best evidence in combination with a clinician’s expertise and patient preferences and values in making decisions about patient care.1,2 Patient safety and economic initiatives have triggered efforts at adopting EBP models within health care organizations to reduce patient injury, control costs, and improve the quality of patient care. Accrediting agencies such as The Joint Commission and credentialing programs such as the Magnet Recognition Program have incorporated research and EBP as underlying themes necessary for organizations to ensure health care excellence. In two quality-related reports, the Institute of Medicine3 emphasized the importance of applying EBP to ensure the use of best practices and improve the education of health care professionals.4

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EVIDENCE-BASED PRACTICE IN AN ACADEMIC SETTING

In a large academic medical center, various levels of bureaucracy and associated decision processes often make change difficult. To implement an EBP program with promise of permanence, EBP must become part of the cultural fabric of an organization. An EBP program that is designed to develop mentors in both clinical and academic settings has the potential for transforming a health care organization. The EBP program at Barnes-Jewish Hospital at Washington University Medical Center and the Goldfarb School of Nursing at Barnes-Jewish College is innovative. The program, Evidence Equals Excellence (EEE), focuses on the education and mentoring of clinicians and nursing students to foster a level of clinical inquiry needed to make EBP a philosophy of clinical practice.

Barnes-Jewish Hospital at Washington University Medical Center is an academic teaching hospital licensed for 1200 beds. The hospital enjoys a long relationship with the Goldfarb School of Nursing at Barnes-Jewish College. The hospital also has a long-standing involvement in nursing research, and the school of nursing faculty routinely has partnered with the hospital in research and educational programs. In the fall of 2005, an EBP team of clinicians, faculty, and a nursing research scientist developed EEE, a unique EBP program. The program has two components: a clinical practice component for health care clinicians and an academic program for baccalaureate and graduate nursing students. The EBP model used in the EEE program is adapted from the Advancing Research and Clinical Practice through Close Collaboration model created by Melnyk and Fineout-Overholt at Arizona State University. The goal of the EEE program is to develop evidence-based practice mentors and clinicians who are equipped to lead the effort in using evidence to improve nursing practice.

DEVELOPING THE EVIDENCE EQUALS EXCELLENCE PROGRAM

The impetus for the EEE program began when team members attended the Arizona State University’s EBP mentorship program, a 5-day immersion program designed to prepare organizational leaders and mentors in changing organizational cultures through the promotion, implementation, and sustainability of EBP. The strength of the Arizona State model for EBP lies in its adaptability to any health care organizational structure. It does not require a major change in an organization’s infrastructure.

At Barnes-Jewish Hospital, a shared governance model is in place with unit practice committees on each nursing unit (many are multidisciplinary) and a central practice committee that meets monthly. The hospital also has a large presence of advanced practice nurses who, when trained on EBP principles, provide a solid staff resource for making practice changes. With a sound infrastructure in place, the EEE program prepares mentors who then can assist staff in making practice changes relatively quickly.

Members of the EEE team quickly became champions of EBP principles, an important characteristic needed to guide the EBP process for an organization. The team had a vision: to develop an EBP program for the hospital and school that can generate clinical EBP mentors who champion practice changes at the nursing unit level. From the beginning, the EEE team was committed to making its work both fun and challenging. Among the five members were clinicians, educators, previous managers and directors of nursing, and researchers. The variety of talent contributed to lively planning meetings and a continuous source of ideas necessary to make the program relevant and current. The EEE program is always changing because of the new ideas team members offer for program, course, and individual mentor development.
The Clinical Program

The clinical practice component consists of a 2-day multidisciplinary seminar for mentors, a semiannual refresher program for mentors, and a 4-hour class (the Champions Class) for clinicians. The team members are the faculty for the program and a library scientist from Washington University.

Two-day seminar

The 2-day seminar is structured along the six-step model from the Arizona State University program (Box 1). An introduction to EBP is followed by individual lectures and group work on each of the six steps (Box 2). The seminar is highly participative. Before the seminar, participants are asked to submit clinical questions regarding their area of interest so that faculty can integrate questions relevant to participants in the appropriate presentations. For example, participants spend 2 hours learning how to develop clinical questions, using a population of interest/intervention of interest/comparative intervention/outcome (PICO) format. Questions framed in a PICO format improve success in obtaining relevant articles during a literature search. During the seminar participants have the opportunity to rephrase their own questions as well as those of their colleagues. The aim of this exercise is to help participants develop questions that will lead to EBP projects on their work units.

A particularly popular presentation in the seminar is “Searching the Literature.” A library scientist uses participant questions to demonstrate literature searches. Using popular databases such as PubMed, MEDLINE, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), and the Cochrane Library, participants learn advanced search techniques that prepare them to search the literature for the best scientific evidence. In everyday clinical practice, it is imperative for an EBP mentor to be able to retrieve a few relevant articles that pertain to a clinical question or problem. The advanced search techniques include approaches in using search limits and search filters and tips on navigating different databases.

The seminar also includes presentations on research methods and on critiquing the evidence that give participants the opportunity, through group work, to recognize different study designs in the literature and how to review journal articles. The group process expedites the review, gives the participants experience in working within a group to review articles, and helps participants realize that most clinicians need help in appraising research articles. Participants receive copies of critical appraisal guidelines (developed by Melnyk and Fineout-Overholt) for the different types of research (eg, randomized, controlled trials or quasi-experimental or qualitative studies).

In the presentation on “How to Make Evidence Work at the Bedside,” a faculty member, who is one of the clinical specialists, shares stories about actual EBP...
programs implemented by her unit mentors. The seminar also includes a panel presentation by previous mentors, who discuss ongoing projects and share stories of their experiences in implementing EBP. These two presentations are very popular because they allow the participants to hear stories from past mentors about actual EBP projects, the challenges and barriers to implementation, and the approaches that result in successful implementation.

**Refresher program**
To date more than 100 nurses, social workers, respiratory therapists, and radiology technologists have attended the EEE seminars. A series of semiannual refresher programs keeps the mentors informed about current EBP activities and opportunities. These programs are valuable in giving mentors time to discuss strategies for work-unit implementation. Mentors discuss ongoing projects, the approaches used to involve staff, and project outcomes. Frequently mentors share ideas that have relevant applications for other units attempting similar projects. For example, several units have introduced hourly nurse rounds as an EBP fall-prevention project. The approaches for improving staff compliance with a rounding protocol on one unit can be useful for staff on other units as well.

**The champions class**
An abbreviated version of the EEE seminar was designed to educate bedside clinicians who are unable to commit to a mentoring role. After identifying the critical components from the 2-day EEE seminar, the two clinical nurse specialists on the EEE team coordinated the Champions Class. They encourage proficient staff from all disciplines to attend. Shift changes dictate the scheduling of classes, and attendees request specific dates amenable to staffing schedules. The class commences with an overview of EBP, emphasizing the knowledge explosion in nursing and the initiatives leading to a mandate of EBP. The class highlights the basics of EBP and prepares staff to become competent in EBP language, to partner with mentors, and to support best-practice implementation.

The EEE team recognizes the need for change agents to create a culture of EBP. Duck’s Change Curve Model shows that group change requires individual change,

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**Box 2**

**Outline for the Evidence Equals Excellence seminar**

**Day 1**
- Evidence-based practice: the path to excellence
- Developing PICO questions
- Research designs
- Searching the literature for evidence
- Laboratory practice: searching evidence

**Day 2**
- Appraisal of the evidence
- Being a change agent for EBP
- Panel of EBP mentors
- Outcomes measurement
- Making EBP work at the bedside
and the greater the number of individuals involved, the more difficult effecting change will be. Thus, hospital mentors require multiple champions to support their belief in the value of applying EBP and their initiatives in doing so.

Staff members are eager to implement best practices but may be overwhelmed by the thought of conducting a literature search and appraising the studies. Changing the hospital’s culture to one that envelops EBP requires support and enthusiasm from clinicians at all levels. The EEE team asks mentors who graduate from the seminar to recruit expert staff members from their work units to attend the 3-hour Champions Class. Through the Champions Class, the program prepares a considerable number of caregivers who learn to understand the significance of searching for and using best evidence in practice. Ploeg and colleagues highlighted 10 published studies that focused on facilitators and barriers to implementing best practice. The authors noted that one of the most common themes was the presence of change champions. The involvement of bedside clinicians is critical to change the environment to one that embraces clinical inquiry or the questioning and evaluating of best practices.

The Champions Class adapts content for relevance to the participants’ clinical backgrounds, and the clinical nurse specialists encourage interactive discussion of traditional but not necessarily evidence-based practices that are ingrained in the hospital. As in the mentor seminar, the participants submit clinical questions before the class. The faculty discusses how to establish a culture of clinical inquiry by asking relevant clinical questions. The faculty then assists the participants in formulating their questions using the PICO format. Staff with little research experience report that they have difficulty searching the literature. Structuring their questions in the PICO format helps the participants outline their clinical question clearly and simplifies the search. The participants are most engaged when the discussion leads to the identification of practice issues and how they can use EBP to improve clinical outcomes.

Conducting the Champions Class has led the faculty to recognize that nurses are seeking a guide that will help them make decisions that are accurate and timely to apply evidence in the practice setting. The class ends with an emphasis on working with the EBP mentors and resources available in the hospital. The clinical nurse specialists encourage participants to access the EBP intranet Web site, which provides staff with the steps of EBP, links to search engines, and EBP mentors and their ongoing projects.

Successful implementation of an EBP practice culture relies heavily on knowledge and belief in the value of EBP. More than 50 staff members representing the disciplines of nursing, respiratory therapy, and social work have attended the Champions Class to date. These EBP advocates have been involved in numerous projects throughout the hospital. Champions participate in journal clubs and quality improvement initiatives identified through their unit practice committees. Examples of projects by mentors and champions include the implementation of bedside reporting, a new tube-feeding protocol, fall-prevention rounds, and family presence during resuscitation efforts. As more disciplines participate in the class, participants are able to share their applications of best practice and encourage others to employ these changes in their work areas. Most importantly, participants learn the EBP language and promote discussion of why they choose specific practices. Participants become engaged in applying research and are able to communicate effectively with other disciplines, notably physicians. An educated staff increases scholarly discussions and elevates professionalism among the disciplines.

The Academic Program

During the past decade there has been a paradigm shift in teaching from a traditional nursing curriculum to one that supports and prepares nurses to practice in an
evidence-based environment. Following the Institute of Medicine’s Quality Chasm series, the Health Professions Educational Summit identified five core competencies that all educators need to address within a curriculum:

- Providing patient-centered care
- Working in interdisciplinary teams
- Employing EBP
- Applying quality improvement
- Using informatics

Many schools have responded to this mandate and incorporated EBP into their programs. It is far easier, however, to talk about the need to teach EBP than it is actually to accomplish the task.

Across the country, research courses have been revised to address the steps of EBP, and additional courses have been developed to support further student development in the use of EBP. Informatics courses are invaluable in helping students learn to search the literature effectively and in introducing databases such as The Cochrane Library (which contains four databases), CINAHL, MEDLINE, and PubMed. Clinical decision making relies on the ability to access and appraise research results; thus, education in how to find the best available evidence is critical for EBP. Some research courses teach students how to construct an evidence-based analysis and may incorporate a journal club to help teach appraisal skills. Courses with a clinical component frequently incorporate assignments that include creating an answerable PICO question, requiring students to search the literature to find an answer, and communicating their findings.

In the fall of 2005, the hospital and college collaborated in sponsoring a conference on EBP and invited Drs. Melnyk and Fineout-Overholt from Arizona State University. The hospital recently had achieved Magnet status and was working with the college to promote baccalaureate education among the nursing staff. As part of that initiative, the hospital was preparing to fund the education of 200 nurses. Following the conference, a special workshop was facilitated by the speakers for the Goldfarb School of Nursing faculty to learn how to incorporate EBP into a curriculum. The faculty on the EEE team elected to help lead the effort to revise the Registered Nurse/Bachelor of Science in Nursing (RN-BSN) curriculum to incorporate EBP for a new cohort of nurses from the hospital who would be taking the program in an online format.

The faculty and clinicians on the EEE team collaborated to explore ways to engage RN-BSN graduates in EBP upon completion of their academic program. Because the graduates would be learning the essential skills necessary for EBP, changes would have to be made in the hospital environment so the graduates could have the opportunity to apply their knowledge and continue to practice evidence-based nursing. This partnership of educators and clinicians, through the EEE program, has promoted change within the hospital with the development of EBP mentors and champions. The ultimate goal of the academic program is to partner new graduates with unit-based EBP mentors to support and initiate successful practice changes.

Initially, EBP was incorporated fully into the school’s online RN-BSN curriculum. Although faculty had brought the curriculum outline back from the immersion workshop at Arizona State University, the faculty as a whole worked to develop each of the courses. Faculty divided into teams and applied the concepts learned in previous workshops with the guidance of faculty mentors. As students begin the program, they are introduced to change theory and models for EBP. Assignments within the beginning courses focus on the construction of PICO questions and how to search the literature effectively. The nursing research course is positioned early in
the curriculum to emphasize the steps of EBP and to help students learn how to appraise studies critically. In the course, students develop a PICO question and then construct an evidence-based analysis to arrive at an answer. In subsequent nursing courses, students are challenged to begin projects within their work setting to illustrate EBP. For example, students have created PICO question boxes on their units, developed posters to illustrate the steps of EBP, and participated in EBP projects with mentors who attended the EEE seminar.

The incorporation of EBP into the online curriculum generated positive feedback from students and faculty. As a result, each of the courses within the remaining baccalaureate programs has been redesigned with a new description, course outcomes, and assignments that support the development of EBP. Faculty members strive to create at least one assignment within each course that furthers understanding and application of EBP. Students develop PICO questions in each of the clinical courses and share the evidence they find to answer their questions with peers and the nursing staff on their practicum unit. During one of the semesters, students worked with managers from the community outreach department of a local pediatric hospital to determine whether the programs being offered in the community were evidence based. Students shared their findings with the hospital management and were able to see the impact of their analysis as changes were proposed for the programs.

The graduate program also was revised to emphasize EBP and the new role expectations for advanced-practice nurses. Students continue to develop PICO questions as they complete clinical hours and now are expected to use their findings to guide decision making at point of care. Students have revised clinical protocols, such as the guideline now used at a National Cancer Institute–designated cancer center for central venous catheter dressing changes in neutropenic patients. Some of the evidence-based analyses that students have completed have led to research studies on their units. For example, students were interested in the use of chewing gum to promote gastrointestinal motility in postoperative colorectal patients. They concluded that the evidence was not strong enough to support a practice change and now are conducting a study to confirm their findings.

Communicating the results is an important component of EBP and is part of the academic programs. Students have developed posters and papers that have been presented at local and statewide research conferences. Developing a poster and an abstract with an evidence-based analysis is an assignment in the graduate research course. The capstone project for the graduate program reflects the application of EBP and supports the student’s role as an EBP mentor and change-agent upon graduation.

A CASE STUDY: MAKING EVIDENCE-BASED PRACTICE WORK AT THE BEDSIDE

EBP can be infused into the work culture of a hospital department in multiple ways. Strategies for implementation include developing policy and procedures, creating work teams focused on nursing interventions, integrating EBP concepts into employee performance expectations, and purposeful recruiting of new employees who are familiar with EBP concepts. Within the emergency department (ED), all these approaches have been embraced and used to enhance the nurse’s role as an active and informed partner in patient care.

The policies and procedures in the ED are developed and reviewed annually for currency and relevance. As part of this process the procedure and references are verified using the PICO method to assure that all changes and updates are evidence based. An example of this practice involved the revision of the triage policy to include
an alcohol screening by the nursing staff. Recent guidelines\textsuperscript{19,20} demonstrated the value of including a brief alcohol consumption screen by the nurse and pairing it with a short intervention. This screen was added to the triage policy along with a list of resources for individuals who may be at risk for binge drinking or alcoholism. The nurse provides the list of resources to the patient upon completing the screen. The next step in this process will be the full implementation of the brief intervention by the nurse when a patient has a positive screening. A rewarding finding from this practice implementation has been seeing patients who screened positively for at-risk alcohol consumption and who were admitted later asking for assistance and resources. The initial screening seems to stimulate the conversation about alcohol use and to encourage at-risk individuals to consider assistance.

The value in demonstrating that nursing polices and practices are evidence based has created a culture in the department in which staff members routinely seek out the evidence that supports treatment decisions. All members of the treatment team are encouraged to inquire about the evidence supporting a practice, especially when nurses and physicians are discussing the plan of care. In addition, the physician residency program supports and encourages the use of EBP. The physicians host a monthly EBP journal club that all physicians and ED nursing staff are welcome to attend. The topics reflect ongoing developments in clinical practice, and the forum is used to explore new treatment approaches the department is considering adopting. This support has led to a practice environment that encourages open discussion and values the input from all team members.

The clinical nurse specialist in the ED, who is an EEE faculty member, developed a cadre of staff nurses in both formal and informal leadership roles as EBP mentors. Ten direct-care nursing staff members have attended the EEE seminar in the past 2 years. As this group formed, they began to develop unit-specific patient care questions and, as a team, used the tools they had acquired at the workshop. The team began by identifying a single practice question: what is the evidence to support a practice change for supported family presence during medical resuscitation? The group reviewed the current literature and developed a consensus document in support of the practice. The team determined that family presence should be implemented in the ED and then sought administrative support. Providing the nursing and physician leadership with an evidence-based position statement facilitated the formal implementation of the program. The ED EBP team then identified the opportunity to develop the project into a formal research study regarding the staff beliefs about the practice of family presence. After seeking Human Studies Committee approval, the team distributed the pre-implementation survey and used the results to develop and expand the education and training plan. A post-implementation survey was distributed 6 months after the initial survey to evaluate whether changes had occurred in the department. Statistically significant improvement ($P < .05$) in staff members’ willingness to have family present at the bedside during resuscitation or invasive procedures was achieved.

The changes regarding family presence are an excellent example of the impact of EBP in patient care. The group continues to grow and address other concerns in the department including skin care, the effective use of capnography, and the use of noninvasive technology to assess tissue oxygenation and stroke volume. The team communicates their findings to the department via posters, monthly newsletters, e-mail, and through the unit practice committee.

The ED EBP team members participate actively on specific disease process–focused committees within the department. As members of those core clinical practice treatment teams, they are able to represent the larger nursing staff
and can address issues brought forward using an EBP approach. Examples of clinical practice teams that benefit from this input are the acute stroke tissue plasminogen activator reperfusion team, acute myocardial treatment team, pneumonia treatment team, and sepsis treatment team. Focusing the teams on an EBP framework has streamlined and standardized care among the large numbers of nursing and physician staff, resulting in positive patient outcomes that have been sustained over time.

Approaching recruitment and retention through an EBP model also has led to changes. Potential candidates for the ED are assessed to determine their level of familiarity with EBP concepts and how these concepts are related strategically to their position in the department. One successful example of this philosophy was the hire of a new graduate nurse who had attended the college’s RN-BSN program that emphasized EBP. He had used EBP throughout his academic program to identify clinical patient care issues and address the appropriate nursing interventions with evidence support. Once graduated, he actively sought a department that would embrace excellent clinical nursing practice and incorporate evidence into its care structure. Consequently, he chose the ED. During his first year as a nurse in the ED, he became involved in the use of evidence-based protocols for the management of the patients who had suffered an acute myocardial infarction and of septic patients. He was able to identify multiple opportunities to develop and implement EBP as they relate to fall prevention in the ED and is redesigning the current standards. He will attend the EEE mentorship workshop in the future to develop further his literature searching strategies and to focus his clinical practice questions.

Actively engaging the staff in the practice of EBP has implications for retention. As part of the performance appraisal process, employees in the ED receive feedback on their individual performance in relation to the core clinical practice measures. Meeting those measures is a role expectation in the unit. The nurses report that they feel a sense of ownership of the EBP process and subsequent practice changes. Promoting a sense of autonomy has decreased the staff turnover and created a positive environment.

SUMMARY

The application of EBP within a large, academic medical center requires an infrastructure to support practice change as well as the development of clinicians and students who become adept at using EBP principles. The partnering of clinicians and academic faculty in developing an EBP program brings together multiple talents and perspectives to create a program that is innovative, dynamic, and diverse. The EEE program has been successful in preparing clinicians to apply EBP principles and in creating an environment where they can successfully make changes to improve practice, quality of care, and patient and staff satisfaction.

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