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EVIDENCE-BASED PRACTICE *Step by Step*

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The Seven Steps of Evidence-Based Practice

Following this progressive, sequential approach will lead to improved health care and patient outcomes.

This is the second article in a new series from the Arizona State University College of Nursing and Health Innovation's Center for the Advancement of Evidence-Based Practice. Evidence-based practice (EBP) is a problem-solving approach to the delivery of health care that integrates the best evidence from studies and patient care data with clinician expertise and patient preferences and values. When delivered in a context of caring and in a supportive organizational culture, the highest quality of care and best patient outcomes can be achieved.

The purpose of this series is to give nurses the knowledge and skills they need to implement EBP consistently, one step at a time. Articles will appear every two months to allow you time to incorporate information as you work toward implementing EBP at your institution. Also, we've scheduled "Ask the Authors" calls every few months to provide a direct line to the experts to help you resolve questions. See details below.

Research studies show that evidence-based practice (EBP) leads to higher quality care, improved patient outcomes, reduced costs, and greater nurse satisfaction than traditional approaches to care.¹⁻⁵ Despite these favorable findings, many nurses remain inconsistent in their implementation of evidence-based care. Moreover, some nurses, whose education predates the inclusion of EBP in the nursing curriculum, still lack the computer and Internet search skills necessary to implement these practices. As a result, misconceptions about EBP—that it's too difficult or too time-consuming—continue to flourish.

In the first article in this series ("Igniting a Spirit of Inquiry: An Essential Foundation for Evidence-Based Practice," November 2009), we described EBP as a problem-solving approach to the delivery of health care that integrates the best evidence from well-designed studies and patient care data, and combines it with patient

preferences and values and nurse expertise. We also addressed the contribution of EBP to improved care and patient outcomes, described barriers to EBP as well as factors facilitating its implementation, and discussed strategies for igniting a spirit of inquiry in clinical practice, which is the foundation of EBP, referred to as Step Zero. (*Editor's note:* although EBP has seven steps, they are numbered zero to six.) In this article, we offer a brief overview of the multistep EBP process. Future articles will elaborate on each of the EBP steps, using the context provided by the

Case Scenario for EBP: Rapid Response Teams.

Step Zero: Cultivate a spirit of inquiry. If you've been following this series, you may have already started asking the kinds of questions that lay the groundwork for EBP, for example: in patients with head injuries, how does supine positioning compared with elevating the head of the bed 30 degrees affect intracranial pressure? Or, in patients with supraventricular tachycardia, how does administering the β -blocker metoprolol (Lopressor, Toprol-XL) compared with administering no medicine affect

Ask the Authors on January 22!

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the frequency of tachycardic episodes? Without this spirit of inquiry, the next steps in the EBP process are not likely to happen.

Step 1: Ask clinical questions in PICOT format. Inquiries in this format take into account patient population of interest (P), intervention or area of interest (I), comparison intervention or group (C), outcome (O), and time (T).

Research evidence alone is not sufficient to justify a change in practice.

The PICOT format provides an efficient framework for searching electronic databases, one designed to retrieve only those articles relevant to the clinical question. Using the case scenario on rapid response teams as an example, the way to frame a question about whether use of such teams would result in positive outcomes would be: “In *acute care hospitals* (patient population), how does having a *rapid response team* (intervention) compared with *not having a response team* (comparison) affect the *number of cardiac arrests* (outcome) during a *three-month period* (time)?”

Step 2: Search for the best evidence. The search for evidence to inform clinical practice is tremendously streamlined when questions are asked in PICOT format. If the nurse in the rapid response scenario had simply typed “What is the impact of having a rapid response team?” into the search field of the database, the result would have been hundreds of abstracts, most of them irrelevant. Using the PICOT format helps to identify key words or phrases that, when entered successively and then combined,

expedite the location of relevant articles in massive research databases such as MEDLINE or CINAHL. For the PICOT question on rapid response teams, the first key phrase to be entered into the database would be *acute care hospitals*, a common subject that will most likely result in thousands of citations and abstracts. The second term to be searched

would be *rapid response team*, followed by *cardiac arrests* and the remaining terms in the PICOT question. The last step of the search is to combine the results of the searches for each of the terms. This method narrows the results to articles pertinent to the clinical question, often resulting in fewer than 20. It also helps to set limits on the final search, such as “human subjects” or “English,” to eliminate animal studies or articles in foreign languages.

Step 3: Critically appraise the evidence. Once articles are selected for review, they must be rapidly appraised to determine which are most relevant, valid, reliable, and applicable to the clinical question. These studies are the “keeper studies.” One reason clinicians worry that they don’t have time to implement EBP is that many have been taught a laborious critiquing process, including the use of numerous questions designed to reveal every element of a study. Rapid critical appraisal uses three important questions to evaluate a study’s worth.⁶⁻⁸

- *Are the results of the study valid?* This question of study

validity centers on whether the research methods are rigorous enough to render findings as close to the truth as possible. For example, did the researchers randomly assign subjects to treatment or control groups and ensure that they shared key characteristics prior to treatment? Were valid and reliable instruments used to measure key outcomes?

- *What are the results and are they important?* For intervention studies, this question of study reliability addresses whether the intervention worked, its impact on outcomes, and the likelihood of obtaining similar results in the clinicians’ own practice settings. For qualitative studies, this includes assessing whether the research approach fits the purpose of the study, along with evaluating other aspects of the research such as whether the results can be confirmed.
- *Will the results help me care for my patients?* This question of study applicability covers clinical considerations such as whether subjects in the study are similar to one’s own patients, whether benefits outweigh risks, feasibility and cost-effectiveness, and patient values and preferences.

After appraising each study, the next step is to synthesize the studies to determine if they come to similar conclusions, thus supporting an EBP decision or change.

Step 4: Integrate the evidence with clinical expertise and patient preferences and values.

Research evidence alone is not sufficient to justify a change in practice. Clinical expertise, based on patient assessments, laboratory data, and data from outcomes management programs, as well as patients’ preferences and values are important components of

Case Scenario for EBP: Rapid Response Teams

You're a staff nurse on a busy medical-surgical unit. Over the past three months, you've noticed that the patients on your unit seem to have a higher acuity level than usual, with at least three cardiac arrests per month, and of those patients who arrested, four died. Today, you saw a report about a recently published study in *Critical Care Medicine* on the use of rapid response teams to decrease rates of in-hospital cardiac arrests and unplanned ICU admissions. The study found a significant decrease in both outcomes after implementation of a rapid response team led by physician assistants with specialized skills.⁹ You're so impressed with these findings that you bring the report to your nurse manager, believing that a rapid response team would be a great idea for your hospital. The nurse manager is excited that you have come to her with these findings and encourages you to search for more evidence to support this practice and for research on whether rapid response teams are valid and reliable.

EBP. There is no magic formula for how to weigh each of these elements; implementation of EBP is highly influenced by institutional and clinical variables. For example, say there's a strong body of evidence showing reduced incidence of depression in burn patients if they receive eight sessions of cognitive-behavioral therapy prior to hospital discharge. You want your patients to have this therapy and so do they. But budget constraints at your hospital prevent hiring a therapist to offer the treatment. This resource deficit hinders implementation of EBP.

Step 5: Evaluate the outcomes of the practice decisions or changes based on evidence.

After implementing EBP, it's important to monitor and evaluate any changes in outcomes so that positive effects can be supported and negative ones remedied. Just because an intervention was effective in a rigorously controlled trial doesn't mean it will work exactly the same way in the clinical setting. Monitoring the effect of an EBP change on health care quality and outcomes can help clinicians spot flaws in implementation and identify more precisely

which patients are most likely to benefit. When results differ from those reported in the research literature, monitoring can help determine why.

Step 6: Disseminate EBP results. Clinicians can achieve wonderful outcomes for their patients through EBP, but they often fail to share their experiences with colleagues and their own or other health care organizations. This leads to needless duplication of effort, and perpetuates clinical approaches that are not evidence based. Among ways to disseminate successful initiatives are EBP rounds in your institution, presentations at local, regional, and national conferences, and reports in peer-reviewed journals, professional newsletters, and publications for general audiences.

When health care organizations adopt EBP as the standard for clinical decision making, the steps outlined in this article naturally fall into place. The next article in our series will feature a staff nurse on a medical-surgical unit who approached her hospital's EBP mentor to learn how to formulate a clinical question about rapid response teams in PICOT format. ▼

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