

Teaching EBP: “Getting from Zero to One.” Moving from Recognizing and Admitting Uncertainties to Asking Searchable, Answerable Questions

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Our first column introduced readers to the emergence of new research-related content in nursing and medical curricula: the teaching of skills necessary for health care professionals to practice from an evidential base. We intend to address in upcoming columns the ongoing dialogue among educators and researchers about how best to teach evidence-based practice (EBP). Each column will focus on one of the steps in the five-step model of EBP (Cook et al. 1992). We will present evidence from the literature that supports identified teaching approaches for each of the steps and complement the evidence with descriptions of our experiences as well as the experiences of others, along with practical tips for developing your methods of teaching and assessment.

The five-step model of EBP is comprised of:

- 1 Translation of uncertainty to an answerable question,
- 2 Systematic retrieval of best evidence available,
- 3 Critical appraisal of evidence for validity, clinical relevance, and applicability,
- 4 Application of results in practice, and
- 5 Evaluation of performance.

Students require skills in each of the steps listed above in order to move from the question arising from clinical practice through to outcome evaluation of evidence application. Curricular frameworks should take into account the importance of all the steps. The recently released Sicily Statement on EBP (Dawes et al. 2005) is based on current literature and incorporates the experiences of delegates

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1545-102X/05

who attended the 2003 conference “Signposting the future of EBHC (evidence-based health care).” The statement proposes a curriculum that is based on the steps above, and outlines the minimum standard educational requirements for training health professionals in EBP.

Anecdotally, the most difficult step in the EBP process is what is known as “Step 0”—getting students/clinicians to recognize and admit uncertainties. We know that uncertainties exist in health care; however, the challenge is in clinicians achieving a comfort level so that they can embrace uncertainties as opportunities for change. At a minimum, practitioners should have a critical attitude toward their own practice. This heightened awareness of what can be done to resolve recognizing uncertainty better provides opportunity for clinical questions to arise continuously in the course of providing routine care. Step 1 of the EBP process, focusing the question so that it is answerable, clarifies the objective of the literature search and guides the use of the appropriate tools for appraisal (Cook et al. 1992). Most questions arising from practice can be formulated in terms of a relationship among the patient, some “intervention,” and one or more specific outcomes of interest.

Dawes and colleagues (2005) have identified an educational outcome for the process of translating uncertainty into an answerable question. That outcome is that students identify gaps in their knowledge as a result of reflecting on their practice, and frame questions sufficiently focused to lead to effective search and appraisal strategies. The Sicily Statement on EBP provides examples of teaching methods, such as presenting a clinical scenario or asking students to present a problem they have encountered in their clinical practice, to assist students to frame a focused question within a structured format (Dawes et al. 2005).

An “evidence-based medicine learning prescription” was first reported by Sackett and colleagues (1997) as an approach to applying evidence to the real life clinical situation. This approach has been subsequently adapted with “EBM Rx”—a pressure-sensitive pad, much like a prescription pad, that is used by clinicians at the bedside to identify

areas of uncertainty in relation to patient care (Rucker & Morrison 2000). The teacher helps learners frame a focused question arising from practice before handing the learner a copy of the prescription form with an assigned due date. The teacher retains a copy to ensure completion of the assignment. The learner performs the literature search, retrieves relevant literature, and completes a critical appraisal. A pilot study evaluating this approach to teaching EBP indicated the technique was useful in bringing EBP from academic exercise to the clinical care context (Rucker & Morrison 2000).

Mangrulkar and colleagues (2002) advocate the amalgam of two teaching approaches—the clinical “pearl” and EBP—at the bedside to aid in getting past Step 0 (Mangrulkar et al. 2002). The clinical pearl is a short, pithy, instructive, and often anecdotal saying that may be used by the senior clinician as a teaching point. The pearl can be used to draw attention to a disorder that should be considered in a patient, to highlight treatment options, or to alter the proposed likelihood of a disease currently under consideration. While the attitude of many clinicians may be that the process of EBP is rigid and impractical, the pearl may be considered anecdotal and lacking in scientific rigor. However, the approaches are complementary in terms of generating reflection and, together, have been used as a teaching exercise that capitalizes on the advantages of both. This type of exercise brings evidence to the clinical setting. As the pearl is always delivered within a clinical context, the search for evidence in relation to the pearl also will be clinically relevant. Learners engage in higher-order thinking as they seek and synthesize literature that may support or refute the pearl. The principles of EBP are therefore used to lend validity to the pearl (Mangrulkar et al. 2002).

The Society of Internal Medicine Evidence-Based Medicine Task Force recognized that there is currently little evidence on the most effective means of teaching EBP (Straus et al. 2004). The authors suggested health care professionals would generally fall into one of three groups with respect to their incorporation of evidence into practice. For frequently encountered conditions and with no time constraints the “doer” will complete at least the first four steps of the EBP process. The “using” mode is adopted in the rushed clinical situation and where less common conditions are encountered. The critical appraisal step is skipped, with acceptance of pre-appraised resources such as Best Evidence[®]. “Replicators” abandon most of the steps and trust the recommendations of respected leaders such as clinical practice guideline developers and consensus groups. The authors have developed and tested a conceptual framework for evaluating methods of teaching EBM. The framework has been applied to the formulation of clinical questions

with attitude, knowledge, skill, behavior, and clinical outcomes as the outcomes measured. According to the framework replicators, doers and users will all recognize the importance of identifying gaps in their knowledge base, understand that it is important to generate a focused clinical question, and be open to new knowledge. All three groups will be able to list and understand the components of a structured, searchable question. With respect to behavior outcomes, however, replicators will only occasionally ask colleagues focused clinical questions, while users and doers will frequently use appropriate questions to seek new knowledge and/or record the questions that arose and those questions that have been answered, respectively. One could ask if the users and doers are more comfortable with uncertainty than the replicators. It is hoped all three groups move on through the EBP process and use those questions generated to identify gaps in practice and change practices where appropriate (Straus et al. 2004).

The Johns Hopkins Faculty Development Program in Teaching Skills (Cole et al. 2004) was initiated in 1987 as a longitudinal model for faculty development of clinical educators to promote reflective learning. The overall learning goals of this program are for participants to improve their skills in facilitating self-directed learning and create a collaborative and supportive learning environment. A recent pre- and post-study was designed to evaluate the outcomes of the structured model including teaching effectiveness, professional effectiveness other than teaching, teaching enjoyment, and learning effectiveness. Results suggested the experiential learning methods with reflection were highly valued and promoted change in participants’ knowledge, attitudes, and skills with successful application to the real-world setting of clinical practice (Cole et al. 2004).

Since early 2004, Professor Linda Johnston has conducted a “Reflective Round” in the Neonatal Unit of The Royal Children’s Hospital, Melbourne, Australia. The development of this approach to clinical inquiry was, in part, driven by the perceived irrelevance by unit nursing staff of a traditional journal club approach to investigating evidence for practice. Held every month at the change over time between day and evening shift and lasting a total of 45 minutes, the round is designed to identify areas of uncertainty in the management of a particular baby who is a patient on the unit at the time. The unit clinical educators and academic research staff identify a baby of clinical complexity where issues regarding management may have been debated earlier by clinicians caring for the baby. Round attendees and unit nursing staff, usually between four and eight in number, enter the unit and position themselves at the baby’s bedside. A discussion on the baby’s clinical condition, within the context of family-centered care, is facilitated by the academic research staff, and uncertainties

relating to management are identified. In a seminar room, questions arising from the round are framed using the PICOT framework: Patient-Intervention/exposure-Comparator-Outcome-Time. A nursing staff member volunteers to undertake a search with the assistance of hospital library staff and research staff to retrieve relevant research papers. The following month the staff member reports to the group on the types and quality of studies retrieved, and if the evidence is deemed sufficient, strategies for implementing changes to practice are developed. The latter half of the meeting is used for the conduct of another round. The clinical question generated, search strategy, and appraisal process are imported into the software developed by the Centre for Evidence Based Medicine in the United Kingdom, CATMaker®. Thus a permanent, Web-based version of the exercise is available for unit staff to review. The Reflective Round process has led to: (1) reaffirmation that best practice is occurring in the unit, (2) an understanding that changes in practice need to be considered, and in some cases, (3) the development of research projects to provide evidence that is currently lacking.

Clearly, valid approaches to assessing methods in the teaching of EBP are required. Dawes and colleagues (2005) provided an example of the type of assessment that may be undertaken to evaluate the effectiveness of a teaching approach to Step 0. They suggest a clinical scenario be presented to the student, and the student be asked to form a focused, answerable question. Ramos and colleagues (2003) have developed the Fresno test—a reliable and valid test for determining the effect of teaching in evidence-based medicine. The test begins with the presentation of two clinical scenarios and requires the student to formulate a focused, searchable question. The Sicily Statement suggests the Fresno test as a way to assess students' ability to achieve Step 0 (Dawes et al. 2005). To date, the test has only been validated in medicine, and further investigation on the utility of the test needs to be done with other clinical disciplines. The developers also suggest educators should be challenged to design tests that reliably assess the use of evidence in real clinical circumstances rather than simulations or vignettes (Ramos et al. 2003).

Villanueva and colleagues (2001) have conducted a randomized controlled trial that tested an intervention de-

signed to improve clinical question formulation. First-time users of an evidence center were randomized to receive the standard request form or the form with additional instructions for proper question formulation and a diagrammatic example of how the components of an answerable question may be arranged. The primary outcome of interest was the change in the proportion of reformulated questions that included all components. Results suggested a significant impact of specific instructions on the proportion of properly formulated clinical questions (Villanueva et al. 2001).

Changes in health care delivery in the last decade have required changes in nursing education to produce competent graduates who can practice in an environment where treatment-effectiveness data drives care decisions (NLN 2002). Many of the teaching methods used in nursing education to enhance critical thinking skills focus on teaching students how to directly apply knowledge. This approach utilizes structured learning situations to teach how to apply knowledge in a logical way that will result in the desired outcomes. However, as Schon (1983) contends, thinking in practice presents a complexity as problems in the clinical world do not generally present themselves with an identifiable structure.

The “new” paradigm of EBP advocates the formulated clinical question as the starting point from which to identify research evidence that can be integrated with expertise and the desires of the consumer. EBP has evolved from the application of clinical epidemiology and critical appraisal of evidence to the process of explicit decision making within the context of daily clinical practice. It is clear that the types of learners and the context in which they make decisions have influenced the uptake of this process. Similarly, educators in the academic and clinical settings need to identify approaches to teaching the necessary skills that take these differences into account. Uncertainty exists in health care; our comfort with this opportunity for problem solving and clinical decision making begins with educators who carefully and thoughtfully apply to their teaching the best available evidence to assist learners in achieving such comfort.

Knowing is not enough; we must apply. Willing is not enough, we must do.

Goethe

Framing YOUR Question

PICOT is designed to help turn not only a clinical problem, but also a research idea, into an answerable research question. If you have had the experience of interrogating a database for information and spending hours finding nothing or thousands of “hits” of no relevance, then the **PICOT** approach is for you:

Population:

Demographic data describing your patient population of interest, that is, who should be in the study?

Intervention:

The treatment, diagnostic test, or predictor you are interested in.

Comparator:

The gold standard against which the intervention is tested, or the control comparison.

Outcome:

What outcome measurements are of interest to you?

Time:

Over what time period are you interested?

Population

Population refers to the particular group of people or patients of the problem under study. This could include a particular patient or group of patients with a similar condition. It may include health care providers of a particular professional group or an organization. Examples of situations are: persons with dementia attending a day care center (an aspect of health care delivery), or independently living women over the age of 65 years with urinary incontinence (a group of patients sharing similar demographic characteristics and a group of patients with a particular condition).

Intervention

The intervention refers to the dimension of health care under question. Interventions can be: diagnostic, therapeutic, preventive, managerial, or a matter of health economics. Examples of interventions are: newborn hearing screening (preventive), lung function testing (diagnostic), timed voiding for management or urinary incontinence (therapeutic), nurse-led telephone triage (managerial), and home monitoring of warfarin levels by point-of-care testing (health economics).

Comparator

In some, but not all, cases there may be a comparator of interest, such as a counter-intervention or gold standard. This includes standard treatment or no treatment at all. In the timed voiding example, the counter-intervention could be the use of drug treatment as an alternative. A gold standard for an instrument to measure warfarin levels at home would be collection and analysis in a laboratory.

Outcome

The outcome is the result that is of interest from the consumers' perspective. Examples of outcomes could include: faster referral to specialist services, reduction in number of incontinent episodes, or reduced cost of warfarin monitoring.

Time

The time period of interest will, to some extent, depend on the outcome of interest and its means of measurement. Sometimes time will not be a relevant component of your question.

Use a table format to ensure all components of the searchable question are included. This question then contains the search terms to use when interrogating databases.

Participants	Intervention	Comparator	Outcome	Time
Independently living women over the age of 65 years with urinary incontinence	Timed voiding	Usual care	Frequency of wet episodes	12 months
Question	What is the effectiveness of timed voiding training for a period of 12 months in reducing the number of incontinent episodes in independently living women over the age of 65 years?			

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