

Experience-Based & Integrative Evidence-Based Medicine (EBM)

Evidence-Based Medicine (EBM) is both a “content area” and a “process” for teaching and practicing medicine. As a content area, residents must learn to become proficient in the basic skills of framing testable questions, searching for best evidence, and critically appraising that evidence. To fully utilize EBM as a method for teaching and practicing medicine, residency faculty must model EBM when treating patients and when discussing patient care with residents during clinical experiences. There have been criticisms of the EBM movement for ignoring both the wisdom of experience and the wishes of the patient. In their second edition, [Sackett et al.](#) defined EBM as an “integration of best research evidence with clinical expertise and patient values.” This definition promotes the use of evidence and “informed opinion” in the unique context of the needs of the individual patient. The following key characteristics of Integrative, Evidence-Based Medicine are consistent with the characteristics of “Teaching from a Competency Perspective.”

- On-line modules and journal club activities can be effective, efficient techniques for teaching the basics of EBM. For EBM to become a part of residents’ approach to practicing medicine, however, it must be integrated into the daily routine of examining and evaluating patients. (Explicit and Real-Life)
- Modeling an evidence-based approach to practicing medicine fosters the critical appraisal of personal assumptions as well as the framing and testing of good clinical questions that ultimately guide practice. (Self Assessment)
- Learning to practice medicine using an EBM approach includes learning how to weigh the value of clinical experience, patient values, and best evidence. It also includes learning what to do when “best evidence” is not very enlightening. (Real-life)
- As defined above, EBM fosters accountability, as the integration of “documented best practice” and expert clinical opinion become the criterion set for patient care. (Accountability)

Example 1

Scenario: Focusing a clinical question to teach Practice-based Learning and Improvement on the in-patient service.

You are an associate residency director in a busy Psychiatry residency program and are in charge of teaching residents on the inpatient service. A lecture was given on the topic of “formulating testable questions.” As a follow-up, you want to reinforce this skill in a patient care setting through discussions of newly-admitted patients.

The illustration below describes how you can address this and other *Practice-Based Learning and Improvement* learning objectives on the inpatient service. The **objectives** are that residents will be able to: (a) focus a clinical question, and (b) search the literature and locate evidence that addresses the question.

Illustration:

Identifying a focused clinical question is the first step in evidence-based medicine. Using the systematic approach developed by [Sackett, et al.](#), you provide the admitting resident with a worksheet outlining the “Patient, Intervention, Comparison, and Outcome” model for building an answerable question. You guide the resident through the list by asking:

- “P” How would you describe a group of patients similar to this patient?
- “I” Which main intervention, prognostic factor, or exposure are you considering?
- “C” What is the main alternative to compare with the intervention? (if appropriate)
- “O” What can you hope to accomplish, measure, improve, effect?

After a few attempts, the resident team arrives at the following question. “In a 15 year-old girl with depression and one episode of suicidal ideation, does admission to an adolescent inpatient unit decrease the incidence of another suicide attempt?” Then using a database such as (**InfoRetriever^R**) on one of the resident’s pocket PC, you search for new clinical information that may apply to this patient. You find that there are no definitive studies addressing this question. The team discusses the question and decides to expand the search to address all adolescents and all types of treatments. By broadening the search, the team found 21 controlled studies examining issues pertaining to “adolescent,” “suicidal ideation,” and “treatment,” five of which were pertinent to their patient.

Example 2

Scenario: Using a “real-time” EBM approach to teach Practice-Based Learning and Improvement and to increase Medical Knowledge on the in-patient service.

You are a faculty member in a large pediatric residency program, and have been asked by the director to coordinate the “evidence-based medicine” curriculum. You would like to demonstrate that while actively seeing patients, residents may practice evidence-based medicine. The residents are skeptical that this can be accomplished in the time allotted.

The illustration below describes how you may address *Practice-Based Learning and Improvement* and *Medical Knowledge* learning objectives on the in-patient wards. The **objectives** are that residents (1) will obtain current, evidence-based information about the treatment of common medical conditions (*Medical Knowledge*); and (2) will be able to: (a) formulate a good clinical question; (b) efficiently search for appropriate evidence and guidelines of care; (c) critically appraise the evidence; and (d) decide whether evidence and guidelines apply to the care of a specific patient (*Practice Based Learning and Improvement*).

Illustration:

During a patient care session in the clinic, you are supervising a resident. His patient is a six-year-old child with recurrent otitis media. Using an EBM approach to teaching, you want to demonstrate that new information on common problems is published every day. You ask the resident the following questions: “What is the most sensitive clinical examination finding for otitis media?” and “When should a child be referred for PE tubes?” The resident is unsure, and together you focus a new question: “What are the indications for PE tubes therapy for recurrent otitis media in a six year-old child?” A computer with Worldwide Web access in the supervision room allows you to search for recent guidelines published on the subject using the **National Guideline Clearinghouse** (NGC) (www.guideline.gov/) and **Cochrane Database** (www.cochrane.org/index0.htm). The answer was available after a four-minute search of the NGC. You then review the guidelines and the associated grading system, and consider whether the guidelines are relevant for this patient and clinical setting. In another residency setting that does not have ready access to the Worldwide Web, you could use CD ROM materials, which are updated quarterly and may be used to answer common medical questions. By gathering and using these resources, residents learn new knowledge and sharpen their critical appraisal skills while improving the outcomes for patients.

Example 3

Scenario: Using an experience-based integrative EBM approach to teach Practice-based Learning and Improvement during administrative conferences.

You are the chief resident in a busy general surgery residency program. You and your residency faculty advisor have been asked to suggest ways to improve teamwork and reduce the number of medical errors attributed to failure of teamwork in the residency program. You remember hearing a presentation at the Surgical Education conference about how improving team communication reduced errors and improved patient satisfaction. You wonder whether communication skill training would help solve these problems in your residency.

The illustration below describes how you may address *Practice-Based Learning and Improvement* learning objectives during administrative conference time. The **learning objectives** are that residents will be able to: (a) search for evidence to answer a focused question; (b) critically appraise the evidence; and (c) incorporate scientific evidence into decisions and plans for improving patient care.

Illustration:

Although EBM is typically used to help make informed decisions about patient care practices, systematic reviews related to a wide range of topics are also appearing in EBM databases. In this example, you and your faculty advisor decide to use an administrative resident meeting to approach a group practice and communication problem from an EBM perspective. You and your advisor determine that including all residents in this process will increase participation should they find confirming evidence. At the resident administrative meeting, you lead a short discussion on the problem, state the question, and divide the residents into two teams. Using the computers provided, both teams of residents find systematic reviews (**Cochrane Database of Systematic Reviews**) and primary research addressing this subject in less than five minutes. The first of six systematic reviews includes behavior change as well as attitude change as outcomes, and presented 12 studies that met criteria as controlled studies. From this evidence, the residents agreed that communication training across the health care team was worth pursuing. You and your faculty advisor take the recommendation to the Residency Director.

Tips for Using Experience-Based, Integrative Evidence-Based Medicine (EBM)

Teaching with an EBM approach fosters development of the skills needed to bring the most current information to the real-time practice of medicine. With the advent of reliable, evidence databases that provide screened meta-analyses and systematic reviews, a residency director might wonder which skills are most needed and most practical. Do residents need to be able to perform a systematic review of the primary research, or should they instead focus attention on learning to access already-prepared systematic reviews and integrate “best evidence” into the care of their patients? Unfortunately, there is little evidence in the literature to help us answer this question. Residency Directors do not need to make this choice, however, because both methods may be learned during a three-year residency program. The educational research examining the implementation of EBM curricula suggests the following:

1. There is little evidence to support that the conclusion that learning EBM as a “content area” through didactics alone (or even through journal clubs) encourages residents to use EBM in their practices. EBM must be integrated into clinical practice on the wards and in the clinics.
2. Faculty members need both to embrace the EBM approach to teaching medicine and to model its use in their own practice. Some ways to do this might be to:
 - cite systematic reviews when lecturing and expect residents to do the same when presenting;
 - keep an updated file of systematic reviews in your area of practice, update it quarterly, and use it while precepting; (Residents may also be responsible for updating a “practice database.”)
 - use computer resources (both online and CD-ROM) on site;
 - expect “evidence” to be part of morning report, ambulatory rounds, work rounds, etc.;
 - model integrating “best evidence” with expert opinion and the specific needs of patients; and
 - model “communicating best evidence” with patients.

Key References (Click ► here for selected references list on this topic)

Rollover Definitions/Descriptions

1. InfoRetriever^R: A commercially-available database for handheld PDA's that provides a system of filtered, synopsisized, evidence-based information.
2. National Guideline Clearinghouse (NGC): A public resource for evidence-based clinical guidelines sponsored by the Agency for Healthcare Research and Quality (AHRQ), U.S. Department of Health and Human Services, in partnership with the American Medical Association and the American Association of Health Plans-Health Insurance Association of America.
3. Cochrane Collaborative: An international, non-profit organization that produces and disseminates systematic reviews of healthcare interventions through the Cochrane Library. This library includes the following databases:
 - Cochrane Library of Systematic Reviews
 - Database of Abstracts of Reviews of Effects
 - The Cochrane Central Register of Controlled Trials
 - The Cochrane Methodology Register
 - The NHS Economic Evaluation Database
 - Health Technology Assessment Database
 - Cochrane Database of Methodology Reviews

Experiential and Integrative Learning and EBM Bibliography

1. Badgett RG, O'Keefe MO, Henderson MC. Using systematic reviews in clinical education. *Annals of Internal Medicine* 1997;126:886-91.
2. Bazarian JJ, Davis CO, Spillane LL, Blumstein H, Schneider SM. Teaching emergency medicine residents evidence-based critical appraisal skills: A controlled trial. *Annals of Emergency Medicine* 1999;34:148-54.
3. Edwards KS, Woolf PK, Hetzler T. Pediatric residents as learners and teachers of evidence-based medicine. *Academic Medicine* 2002;77:748.
4. Epling J, Smucny J, Patil, A, Tudiver, F. Teaching evidence-based medicine skills through a residency-developed guideline. *Family Medicine* 2002;34:646-48.
5. Geyman JP, Deyo RA, Ramsey, SD. *Evidence-based clinical practice. Concepts and approaches*. Boston: Butterworth-Heinemann, 2000.
6. InfoRetriever. The Clinical awareness system. www.infoPoems.com , 2003.
7. Kellum JA, Rieker, JP, Power, M, Powner DJ. Teaching critical appraisal during a critical care fellowship training: A foundation for evidence-based critical care medicine. *Critical Care Medicine* 2000;28:3067-70.
8. Korenstein D, Dunn A, McGinn T. Mixing it up: Integrating evidence-based medicine and patient care. *Academic Medicine* 2002;77:741-42.
9. Ozuah PO, Orbe J, Sharif I. Ambulatory rounds: A venue for evidence-based medicine. *Academic Medicine* 2002;77:740-41.
10. Pursley HG, Kwolek DS. A women's health track for internal medicine residents using evidence-based medicine. *Academic Medicine* 2002;77:743-44.
11. Sackett DL, Straus, SE, Richardson WS, Rosengurg W, Haynes RB. *Evidence-based medicine: How to practice and teach EBM (2nd Edition)*. Churchill Livingstone, Edinburgh, London. 2000.