Most students and residents have learned the basics of evidence-based medicine (EBM) in didactic sessions. However, a major hurdle in getting learners to use an EBM approach during clinical care is the lack of opportunity for the learners to use the concepts they have learned. As learners learn to perform a meticulous cardiovascular exam by practicing what they learn from didactic sessions, similarly they will learn to use an EBM approach if they apply EBM principles when making clinical decisions for their patients. This paper’s purpose was to provide a realistic example of how office-based teachers can help learners practice EBM in the clinical setting based on our experiences at the Department of Family Medicine, University of North Texas Health Science Center at Fort Worth.

**Asking an Answerable Question**

Most learners are able to formulate a foreground question that reflects their learning needs in regard to a diagnosis or management issue. If the learner has difficulty coming up with a question, you may need to probe and find out what he/she already knows. You also may have the opportunity to help the learner be less vague and more systematic in asking a clinical question by using the PICO (Population, Intervention, ± Comparison, and Outcome) format.\(^1\) For those posing an unclear question, you may find it helpful to ask, “How would you rephrase that question so it will be easier to answer?” If the learner is not sure, you can provide guidance by asking:

1. **Who are you talking about?** (Population). Example: “An obese 45-year-old Caucasian female with type 2 diabetes mellitus”
2. **What is the therapy (test, etc) you are asking about?** (Intervention). Example: “Metformin.”
3. **Are you comparing it to something?** (± Comparison) Example: “Diet alone.”
4. **What outcome(s) are you interested in?** Example: “All-cause mortality.”

**Our example:** A learner and his family medicine preceptor developed the following EBM question after seeing a patient during clinic, “In an obese 45-year-old Caucasian female with newly diagnosed type 2 diabetes mellitus (Population), does taking metformin (Intervention) compared with diet alone (Comparison) affect all-cause mortality (Outcome)?”

We highly suggest using an “EBM educational prescription” to write these questions down during clinic.\(^2\) The prescription lays out the steps for the learner to formulate an answerable question and leaves

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2. From the Center for Evidence-based Medicine (Dr Cardarelli) and the Division of Education and Research (Dr Sanders), University of North Texas Health Science Center at Fort Worth; and the Department of Family Medicine, Texas College of Osteopathic Medicine (both).
space for the learner to document the answers he/she finds to different parts of the question. It also serves as a reminder to research the question later on if there is no time to do so at the moment.

**Searching for the Evidence**

This next step can be challenging in the midst of a busy clinic session. How can you go on-line and locate articles if you are seeing 24 to 30 patients a day? You start by being realistic. First, the learners do not have to create a clinical question for every patient they see, as you do not run to a computer every time a patient comes in for a simple problem such as an upper respiratory infection. Learners can perform some of the searches on their own free time if they are merely looking to enhance their background knowledge, and there is not an urgent decision that needs to be made.

On the other hand, when significant point-of-care decisions need to be made for therapy or diagnostic tests, it is important to know how to efficiently and efficaciously find the evidence that will help the decision-making process. To begin the search for evidence, it is easiest to start at one of the Web sites listed in Table 1. Usually, learners can access these through the medical school’s library system or by bookmarking the Uniform Resource Locators listed in Table 1 on their computers.

**Our example:** The learner and the preceptor used the clinic’s computer, and they accessed Ovid MEDLINE through the medical school’s library (30 seconds). They chose the “All EBM reviews” database because the learner and preceptor needed to answer their clinical question at the point of care and wanted to find a complete appraisal. Using the search terms “Metformin AND Mortality,” they retrieved 35 articles (1 minute). They scanned the titles and found an article that was a good fit to the clinical question (2 minutes): Effect of Intensive Blood-glucose Control With Metformin on Complications in Overweight Patients With Type 2 Diabetes (UKPDS 34). UK Prospective Diabetes Study (UKPDS) Group. Lancet 1998;352(9131): 854-65.

**Appraising the Evidence**

The advantage of using the Web sites listed in Table 1 is that their content includes appraisals of evidence for common clinical situations. Consider looking through this preappraised evidence to give you an idea on the appraisal process and to save you time in finding answers to common questions for which the evidence has already been appraised. When you and the learner research an issue that has not been appraised by others, you can follow the appraisal process that is used in examples of the *Users’ Guides to Evidence-based Practice.* To ensure that the learner learns how to appraise different types of articles, you can give your learner nightly reading assignments from the *Users’ Guides to Evidence-based Practice* and review them together the next morning. Patience is initially required, but after learners know how to appraise an article and what is expected from them, they eventually become self-sufficient.

**Our example:** The learner and preceptor reviewed the outcome of interest and found that patients who were intensively treated with metformin, compared to the conventional group (diet alone), had a risk reduction of 36% for all-cause mortality.

**Applying the Evidence to the Patient**

This last step is easily applied at the point of care. You should reemphasize to the learner to keep the entire context of the patient in mind prior to making and offering medical decisions. The most important learning point is to incorporate the patient’s beliefs, values, and principles into the clinical decision. This reiterates the importance of the patient-physician relationship. You can ask the learner, “So what do you want to do with what you found?” Allow learners to point out the potential obstacles and corresponding solutions and then guide them. With practice, the learners become confident in practicing EBM and applying their findings to the patients they care for.

**Our example:** Since the findings were significant and the population

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**Table 1**

**Useful Evidence-based Medicine Web Sites**

- Ovid MEDLINE (http://gateway.ovid.com)
- American College of Physicians Journal Club (www.acpjc.org)
- Cochrane Collaboration (www.cochrane.org)
- Database of Abstracts of Reviews of Effects (DARE) (www.york.ac.uk/inst/crd/darehp.htm)
- Evidence-based Medicine journal (http://ebm.bmjjournals.com)
- National Guideline Clearinghouse (www.guideline.gov)
- Bandolier journal (www.jr2.ox.ac.uk/bandolier)

(All accessed on November 18, 2004)
of the study was similar to their patient, the learner and preceptor felt comfortable applying the evidence and recommending that the patient start on metformin. More importantly, the patient was willing to start this medication since she had family relatives who had died from diabetic complications.

Conclusions

Actively practicing EBM on every patient is not realistic. We have much clinical expertise and the inherent knowledge to handle the majority of the issues we face daily. As it is up to us to ensure that our inherent knowledge stays up to date with sound evidence-based information, similarly it is our responsibility to help learners expand their knowledge base and learn as much evidence-based information as possible.

Learners must master a number of skills, including history taking, doing a careful physical exam, increasing their knowledge base, developing therapeutic relationships with patients, and performing clinical procedures. However, clinical encounters are also an excellent opportunity for learners to apply concepts of EBM when making decisions for their patients. As clinical teachers, we should make efforts to initiate and teach EBM where possible and help learners provide the best care for their patients.

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REFERENCES