

# Virtual Mentor

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## Medical Education

### Evidence—an Input, Not an Answer

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Evidence-based medicine (EBM) has become a buzzword in medicine. Many authorities urge us to use EBM to make medical decisions. How can anyone oppose its logical and statistical guide to medical care?

As I read the EBM literature, I see a good idea taken to extremes. EBM should be treated as another tool in the toolbox that we use to make medical decisions—not the only and final word. As physicians, we must always interpret the data ourselves and consider it in the context of the patient. A few examples should illustrate what I mean.

A few years ago several retrospective analyses demonstrated that patients with pneumonia who received antibiotics within the first four hours of their hospital visit (starting from ER registration) had better outcomes than those whose antibiotics were delayed [1]. While this evidence does not come from a randomized controlled trial—such a trial would be unethical—it was considered to be the best available evidence. Thus, treating patients who had pneumonia within four hours of their arrival at the hospital became an “evidence-based” rule. Both the Joint Commission for the Accreditation of Healthcare Organizations (JCAHO) and the Centers for Medicare and Medicaid Services (CMS) adopted this rule as a performance measure and, subsequently, CMS endorsed it as a component of hospital pay-for-performance criteria.

Now consider this thought experiment. What would be likely to happen if hospitals began to receive incentives to increase the percentage of patients with pneumonia who received their first antibiotic dose within four hours?

Your conclusion and the real life results are the same: When you increase sensitivity, you decrease specificity. Said another way, in attempting to increase the percentage of true positives (accurate diagnoses of pneumonia) you will increase the percentage of false positives (those diagnosed and treated who did not have pneumonia).

Further research has explained the results of the study that inspired the “four-hour rule” [2, 3]. The patients who did not receive antibiotics within several hours of admission had atypical presentations; they had comorbidities that made their diagnoses less clear. The four-hour treatment guideline was based on a piece of

evidence that, by extrapolation, became a rule that may conflict with good clinical judgment.

Now some EBM devotees will cry foul, saying that JCAHO and CMS should never have endorsed the rule because the evidence did not meet clinical practice standards. I counter that, in fact, this *is* the problem with EBM: rather than analyzing the evidence in the context of a variety of clinical situations, JCAHO and CMS focused solely on the data. Too often evidence is invoked in this context-free way.

And the evidence changes, of course. For many years we routinely prescribed estrogens at menopause to prevent cardiovascular complications. We based this practice on the best evidence available at the time. Later, better evidence came along which showed that we were wrong.

Current EBM treatment guidelines for chronic atrial fibrillation come from randomized controlled trial (RCT) data [4]. First the guidelines state that all patients should receive oral anticoagulation medication. Next, they state that one should assess the risks of anticoagulation, and make appropriate decisions. Many recommendations and evidence-based proclamations like these come from RCT data. But what happens when our patients do not fit neatly into the RCT criteria? If our patient would not have entered or been eligible for the RCT, then how should we assess him? EBM gives us a reasonable starting point. It provides input and guidance to our decision making. But we must apply clinical judgment to understand the risks and benefits of prescribing anticoagulation medication to a specific patient.

Some advocate that evidence-based guidelines themselves list all the contraindications for use of, in this example, anti-coagulation drugs in an atrial fibrillation patient. I prefer that we maintain the latitude to make such assessments ourselves, based on the individual patient's clinical picture.

The value of EBM comes from a careful, systematic review of the existing literature. As long as we put that information into context, it can help us make good patient care decisions. When EBM becomes distorted into a requirement for strict adherence to rules (which rarely consider clinical context) then we have a problem. Nietzsche said, "There are no facts, only interpretations" [5]. Too many EBM devotees forget the interpretation part.

EBM is a good start, but good clinicians do not believe that it is the final answer. It provides knowledge, but it does not provide wisdom. Caring for patients requires applying information with wisdom for the benefit of the patient. Osler's well known quote applies here: "The good physician treats the disease; the great physician treats the patient who has the disease" [6].

## References

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