Evidence-Based Practice: What a Start and ‘Oh, the Possibilities’

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ABSTRACT
Evidence-based medicine (EBM) was introduced in the early 1990s. In less than 15 years, it has dramatically changed the way that medicine is practiced and taught. Improvements in informatics and evidence resources have helped overcome some of the initial problems and allowed busy clinicians to use EBM in practice. Many barriers to using EBM still remain. Further work on translating evidence into patient care decisions and understanding patients’ preferences is required in order to realize the improvements that EBM’s early proponents envisioned.

INTRODUCTION
The evidence-based medicine (EBM) movement began in the early 1990s, growing out of the critical appraisal movement at McMaster University in the late 1970s. Prior to this push for evidence-based patient care, medicine was practiced by combining an understanding of mechanisms of disease with clinical experience. There was an authoritarian view of medicine where “experts” decided what was best care. The EBM movement was fueled by an explosion of high-quality clinical trials and improvements in information systems. The introduction of the National Library of Medicine’s Grateful Med database in 1986 meant that clinicians could now efficiently search for evidence on MEDLINE from their offices. The term Evidence-Based Medicine was first introduced by Gordon Guyatt in an editorial in the Journal of the American Medical Association (JAMA) User’s Guides to the Medical Literature, which began in 1993. The best-known definition of EBM was in an article in the British Medical Journal by David Sackett: “Evidence based medicine is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients.”

This article will explore EBM from its beginnings through the present and look at its potential for the future.

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The EBM process was initially described as defining a patient problem, efficiently searching the literature, determining the validity of the evidence, and applying the evidence to a patient problem. While the originators of EBM may have intended to give all of these steps equal weight, the initial focus was on appraising the quality of the evidence and using it to make clinical decisions. Clinical expertise and patient preferences were de-emphasized.

Although the concept of using evidence to make clinical decisions was appealing, the realities were far less helpful. When EBM first began, the vast majority of available evidence consisted of individual trials of varying quality. Meta-analyses were in their infancy and pre-appraised resources had just begun with the ACP Journal Club in 1991. More widespread awareness of EBM came with the publication of the Journal of the American Medical Association (JAMA) User’s Guides to the Medical Literature, which began in 1993. The best-known definition of EBM was in an article in the British Medical Journal by David Sackett: “Evidence based medicine is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients.”

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With the proclamation of a “paradigm shift” in medical practice, there was a backlash against the initial
The EBM movement. Many practicing clinicians were reluctant to change the way they practiced medicine because they did not have the skills to use this new technique and were concerned that EBM could actually worsen patient care.

The following example illustrates the steps that a clinician would have taken in the early days of the EBM movement. A patient presented to a physician’s office with Type I diabetes mellitus and microalbuminuria. The physician questioned whether an ACE inhibitor would help prevent progression of albuminuria in this normotensive patient. The clinician would have first asked the question, “In normotensive patients with Type I diabetes mellitus and microalbuminuria does an ACE inhibitor decrease the risk of progression to overt albuminuria?” Next, if she had a subscription, the physician would have searched for evidence on Grateful Med from her office; otherwise, she would have gone to the local medical library. This search would have revealed several articles that examined the effects of ACE inhibitors on patients with Type I diabetes mellitus. After reviewing the abstracts, the clinician would have either gone to the library to get a complete copy of the article or ordered it to be faxed to her office. She would then have critically appraised each of the articles and decided which evidence was valid and which was applicable to her patient. This could not have been done while the patient waited and may have been too time consuming for the physician to undertake at all.

WE’VE COME SO FAR

The EBM movement has made great strides since the term was first coined 14 years ago. Although there are still people who disagree with the basic principles of EBM, the numbers are decreasing. EBM has been embraced in medical education. Medical students and residents are learning the principles and practice of EBM alongside mechanisms of disease. By 1998, 37% of US internal medicine residency programs had a freestanding EBM curriculum. A 2001 survey revealed that 71% of internal medicine residencies and 23% of dermatology residencies have a dedicated EBM curriculum. This same study showed that internal medicine residency directors felt strongly that EBM is valuable and should be a part of all training programs. The breadth of clinicians using EBM has also increased, with many experts switching to the term Evidence-Based Practice to encompass all of the allied medical fields and anyone providing patient care.

Improvements in resources and informatics have led to a slight shift in the practice of EBM. The increasing number of pre-appraised evidence sources and systematic reviews have made it possible for clinicians to focus on finding evidence and applying it to patients rather than critically appraising evidence themselves. There has also been a shift toward more explicit inclusion of patients’ beliefs and desires.

Even some of the founders of the EBM movement have come to realize that their initial ideas about EBM implementation had some limitations. Time constraints and varying levels of interest by practitioners in learning these new skills have made it clear that not all practitioners will be able to become “evidence-based practitioners” using primary studies for patient care decisions. Even “evidence-based practitioners” will not be able to use the full process at all times. Guyatt has coined the term “evidence users” for those practitioners who are willing and able to use secondary or pre-appraised sources of evidence in order to make evidence-based decisions.

These pre-appraised sources that Hooper-Lane discusses in detail later in this issue (p 18) allow practitioners to more readily adopt evidence into practice. Examples include the ACP Journal Club and the Cochrane Database of Systematic Reviews.

Let’s continue our example of the patient with Type I DM and proteinuria, but let’s move to the modern day. Today, a physician must still ask the same question, “In normotensive patients with Type I diabetes mellitus and microalbuminuria does an ACE inhibitor decrease the risk of progression to overt albuminuria?” Now, however, the physician can search the Cochrane Database of Systematic Reviews via the internet and quickly get a systematic review on her office computer, an abstract of a 1994 JAMA article via ACP Journal Club and a review of a systematic review via the Database of Abstracts of Reviews of Effects (DARE). This can easily take place while the patient is still in the office. The physician can then focus on determining the patient’s circumstances and beliefs to determine whether to start the ACE inhibitor.

“4S” OF EVIDENCE RESOURCES

Haynes describes EBM resources as a “4S hierarchical structure” or pyramid. He places “Studies” at the base with “Syntheses” just above it and “Synopses” above that. The pinnacle of EBM resources is “Systems.” Studies are individual original articles. Syntheses are systematic reviews, such as Cochrane reviews. Synopses are evidence-based journal abstracts or other summaries of individual studies and syntheses. Synopses should be concise and allow readers to understand the main results quickly. Systems rapidly provide synopses of all of the research evidence for a patient’s problem in a manner that can be quickly understood by a clinician. Haynes’ ideal System automatically links all important research
information to a patient’s specific circumstances through an electronic medical record. The research information would be based on an explicit review system that is updated as new information becomes available.

A PROMISING FUTURE

Advances in resources and informatics make obtaining evidence easier, but our current Systems still fall short. Translation of research evidence into clinical decision-making remains a major shortfall in the current EBM process. We need to push for better EBM Systems in order to seamlessly provide appropriate evidence for clinical care. The clinician should not have to search various databases for evidence, but rather we should have a system that prompts the physician with appropriate evidence while the patient is being seen. Ideally the system would give the physician the most appropriate treatment and diagnostic options and describe the benefits as well as the risks. The physician could then, with a simple mouse click, probe down through synopses, syntheses, and ultimately studies as desired. The evidence and recommendations would be frequently and automatically updated as new evidence became available.

These advanced systems may seem like a far off dream, but there is already progress toward making this a reality. Current computerized physician order entry and clinical decision support systems can automatically check drug allergies, drug interactions, and laboratory values, and provide reminders about other appropriate orders in real time while physicians are writing orders. These systems have demonstrated a decrease in serious medication errors as well as an improvement in the rates of appropriate corollary orders. Improvements are also being made in the provision of high-quality relevant evidence to clinicians. The McMaster PLUS service is being piloted in Northern Ontario. It uses explicit criteria to select high-quality articles. Each article is then rated by at least 3 clinicians as to its newsworthiness and clinical relevance. Approximately 2000 clinicians around the world are involved in this selection process. McMaster PLUS then uses an automated e-mail system to send clinicians in Northern Ontario new evidence based on the clinician’s specified preferences of medical specialty and cutoffs for newsworthiness and relevance. BMJ Publishing Group recently started bmjupdates in November 2004. This service is very similar to McMaster PLUS but, at present, is free. It will e-mail new evidence and also maintains a searchable database of high-quality studies sorted by specialty and rated for newsworthiness and relevance.

While EBM has increasingly emphasized the role of patient preferences and beliefs in making clinical decisions, there is very little evidence about the best ways to determine patient preferences. Physicians’ recommendations affect patient decisions about treatment. Gurmankin showed that when subjects were given clinical scenarios in which there was a clear treatment option that maximized health, they chose that option 86% of the time with no physician input, 92% of the time if the physician recommended it, and only 70% of the time if the physician’s recommendation went against the option that maximized health.11 Even if patient preferences are accurately determined, the best way to present evidence to patients in order for them to make informed decisions remains unclear. The way that evidence is presented to patients affects their perceptions about therapies, and using relative risk reduction makes patients more likely to choose therapy rather than presenting absolute survival benefits. Further studies are needed to evaluate how best to determine patient preferences without unduly influencing those preferences. A better understanding of how best to present findings to patients to allow an understanding of the “true” estimate of interventions’ benefits and harms is also needed.

In the future, our sample case physician will approach the problem of a Type I diabetic presenting with microalbuminuria in a much different way. When the physician goes in to see the patient and brings up the electronic record, it will determine that the patient has a urine sample that shows microalbuminuria and note that the patient is normotensive. It will then prompt the physician with evidence about patients with diabetes including interventions such as ACE inhibitors to prevent progression of microalbuminuria. This evidence will include potential risks and benefits and will provide a link to Synopses, Syntheses, and Studies that support the summarized evidence. The clinician will be able to quickly determine what the best evidence is and then use tested interventions to determine the patient’s preferences and present the evidence to the patient in a manner proven to be understood easily by that individual patient. Then the physician and patient can truly make an evidence-based, patient-centered decision about treatment.

CONCLUSIONS

EBM has transformed how medicine has been practiced and taught over the past 10 years. The initial focus—that every clinician should continually evaluate primary studies—has changed as the time constraints and skills of individual clinicians have become apparent. Vast im-
Improvements in resources have made the practice of EBM more of a reality. But there is still a long way to go to be able to seamlessly incorporate evidence into clinical decisions and truly make patient-centered decisions. The EBM-incorporated medical record may seem like an impossible dream, but with the incredible advances in the last 10 years it may not be so far off.

REFERENCES
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