

Paving the way for Evidence-based medicine in Pakistan

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Abstract

Evidence-based Medicine (EBM) is the process of systematically reviewing, appraising and using clinical research findings to aid the delivery of optimal clinical care to patients. EBM has become popular due to: the need for valid information about diagnosis, prognosis, therapy and prevention during patient care; traditional sources such as textbooks and expert opinion being frequently out-of-date; and knowledge of current best evidence declining with time from graduation from medical college. EBM has become feasible for practicing clinicians due to: new strategies for appraising studies; availability of systematic reviews (summaries) of current best evidence; and information technology (computers with Internet access). In a resource-limited country such as Pakistan, an evidence-based approach can be cost-effective by reducing clinical practices that have no proven benefit. Commonly perceived obstacles to EBM include limited access to computers, the Internet and online resources. Reliable resources of EBM are available (such as The Cochrane Database of Systematic Reviews <http://www.cochrane.org>) although many of these require paid subscriptions. Another difficulty is the issue of applicability of data from other countries to patients in our setting with different socio-economic factors. Other barriers to EBM in developing countries include: inexperience in small-group learning, limited time to attend workshops, and the lack of role models for practicing EBM. We have also tried to address the common fallacies related to EBM in the hope of greater use of these skills by busy clinicians as well as academic researchers.

What is Evidence-Based Practice (EBP)?

Evidence-based medicine (EBM) is defined as "integration of best research evidence with clinical expertise and patient values".¹ Though the current EBM paradigm started in 1990s but the idea has been around for a long time. EBM identifies with the expression in 981-1037 when Ibn Sina defined requirements for new treatments in his famous book, *Al-Qanoon*. Similarly in post-revolutionary Paris when clinicians like Pierre Louis rejected the pronouncements of authorities and sought the truth in systematic observation of patients. In the current era, they were consolidated and named EBM in 1992 by a group led by Gordon Guyatt at McMaster University in Canada.²

Since then, the number of articles about evidence-based practice has grown exponentially and international interest has led to the development of several evidence-based journals that summarize the most relevant studies for clinical practice.

The subsequent rapid spread of EBM has arisen from 4 realizations:

1. Our daily need for valid information about diagnosis, prognosis, therapy and prevention can be up to 5 times per in-patient³ and 2 times for every 3 out-patients⁴
2. Traditional resources are out-of-date (textbooks)⁵, frequently wrong (expert opinion)⁶, ineffective (didactic continuing medical education)⁷ or too overwhelming in their volume and too variable in their validity for practical clinical use (medical journals).
3. The disparity between our diagnostic skills and clinical judgement, which increase with experience, and our up-to-date knowledge⁸ and clinical performance⁹, which decline.
4. Time constraints for finding and assimilating this evidence.¹⁰

The principles of EBM have been thought as cumbersome and time consuming by busy clinicians but EBM has become doable by the following developments over the past few years.

1. The development of strategies for searching and appraising evidence (for its validity and relevance).¹
2. The creation of systematic reviews and concise summaries of the effects of health care (epitomized by the Cochrane Collaboration).¹¹
3. The creation of evidence-based journals of secondary publication (that are both valid and of immediate clinical use).
4. The creation of information systems for bringing the foregoing to us in seconds.
5. The identification and application of effective strategies for life-long learning and for improving our clinical performance.¹²

Teaching of EBM has been increasingly employed in several under and post graduate activities. We at Shifa College of Medicine have tried to incorporate principles of EBM in morning reports, journal clubs, teaching rounds,

ambulatory preceptorships and mortality and morbidity conferences. In addition we have developed a in house training program based on McMaster-style workshop sessions for faculty development in EBM.

This brief review will address the basic philosophy behind EBM and some of the issues and their solutions in practicing EBM in a developing country like Pakistan.

Traditional vs EBP

The key difference between evidence-based medicine and traditional medicine is not that EBM considers the research evidence while the latter does not. However, EBM starts with the notion that all evidence is not equal and something which traditional practice has missed out. Traditionally it was assumed anything published in research articles was correct and could be used in clinical practice. EBM laid down the principles for grading the quality of medical evidence for best practice.¹³

On the other hand, Evidence-based practice also does not mean being dictated by the literature alone nor is it an attempt by journal publishers to take over the clinical world. It is just another tool one can use to make sure that patients get the best possible care. Without best evidence, patients may not be benefited by the recent advances and in fact can potentially be harmed by the outdated practices.

EBM starts with asking a clinical question at the point of care (most commonly physician-patient encounter), acquiring evidence by literature search, appraising evidence on rigorous principles, applying valid evidence to patient care incorporating patient's values and preferences. These 4 As are the pillars of practicing EBM.¹⁴ The process of searching and appraising require skills which physicians may find a little tedious and time consuming. This problem has been overcome by availability of several secondary sources of evidence where clinical questions are constantly asked and the answers are compiled by EBM experts into ready to use format. (For a list of reputable EBM resources, see Table 1)

One of the greatest achievements of evidence-based medicine has been the development of systematic reviews (SR) and meta-analyses (MA), which is now considered as the highest level of clinical evidence.¹⁵ In a SR or MA, researchers identify multiple studies on a particular clinical question, and then critically analyze them to come up with a summary of the best available evidence. A brief schematic hierarchy of medical evidence is shown in the evidence pyramid (Figure).

However, EBM is not simply about finding evidence of what works but finding evidence that matters. We need to ask, 'How is this going to change the patient's overall prognosis and outcome and quality of life?' If it's not going

Table 1. Some Secondary sources for Evidence-based Medicine.

Name of EBM source	Brief Description	Access
American Family Physician from American Academy of Family Physicians http://www.aafp.org/afp	Clinical review journal that contains evidence-based components.	Free online access
Bandolier http://www.jr2.ox.ac.uk/bandolier	Monthly journal that searches for systematic reviews and meta-analyses published in the recent past and summarizes relevant to clinical practice.	Free online version.
Clinical Evidence from BMJ Publishing Group http://www.clinicalevidence.com	A compendium of systematic reviews, gathered from Cochrane, MEDLINE and other sources, updated and expanded every six months.	Paid subscription required for physicians in Pakistan
The Cochrane Database of Systematic Reviews http://www.cochrane.org/	The most extensive collection of systematic reviews.	Free online access to abstracts, full text by subscription
DynaMed http://www.dynamicmedical.com	A database of summaries of the evidence drawn from sources such as Clinical Evidence and the Cochrane Library.	By subscription only
Elsevier InfoRetriever http://www.infopoems.com	A search engine with access to evidence-based sources such as POEMs, practice guideline summaries and Five-Minute Clinical Consult	By subscription only orders@infopeoms.com
TRIP Database (Turning Research Into Practice) http://www.tripdatabase.com	A search engine that gathers evidence-based clinical information from MEDLINE, DARE, the National Guideline Clearinghouse and many other evidence-based Web sites	Free online for the basic version.
National Guideline Clearinghouse, U.S.A http://www.guidelines.gov	Comprehensive database of evidence-based clinical practice guidelines.	Free online.
The National Institute for Clinical Excellence www.nice.org.uk www.sign.ac.uk	NICE is an independent organisation responsible for providing national guidance on promoting good health and preventing and treating ill health. The Scottish Intercollegiate Guidelines Network (SIGN) objective is to improve the quality of health care for patients in Scotland by reducing variation in practice and outcome, through the development and dissemination of national clinical guidelines containing recommendations for effective practice based on current evidence.	Free online



Figure. The Evidence Pyramid.

to change any of these things, then we shouldn't be doing it. We need to look at the evidence in the context of the patient and make sure we are doing things that will make a difference.

Today, with the advent of large databases of medical research, a wealth of new evidence-based resources, the rise of "information mastery" and easy access to information via the Internet, evidence-based medicine is finally becoming doable for busy practitioners.

Here we would like to add a word of caution regarding Clinical Practice Guidelines or CPG's. CPG's are systematically developed statements to assist in practitioners and patient decisions about appropriate health care for specific clinical circumstances. Clinicians need to ensure that the CPG's they pick to follow are Evidence Based Guidelines. Through the integration of the principals of EBM into guideline development process, EBM guidelines no longer narrowly support the viewpoint of a particular group, instead encourage integration of best research evidence into Guidelines in a transparent and structured manner. Well developed Guidelines carry statements on the Level of Evidence, Grades of Recommendation and incorporation of patient values and preferences. Some free online sites to access CPG's are listed in Table 1.

Interestingly, the traditional lecture-style experts-based continuing education meetings are not the best sources of information, yet expert opinion and didactic sessions have been among the primary means for educating physicians for generations.

EbM in the developing world

In many developing countries, the bulk of health care expenditures continue to be shouldered by individual

patients and their families despite the efforts from the government. These health care expenses must compete for extremely scarce resources. Thus, nothing could be more appalling than a physician ordering unnecessary tests or prescribing inappropriate treatments for indigent patients. All over Pakistan, for example, resting electrocardiograms (ECG) are routinely done in asymptomatic patients to screen for coronary artery disease (CAD). The cost of the test at least in a private setting is enough to provide a full meal for an average family. A careful appraisal of the evidence would have revealed to practitioners that resting ECG's are fraught with high false negative and false positive rates.¹⁶ These problems make it virtually useless as a screening instrument for CAD and appropriate use can potentially save limited and valuable resources in terms of health expenses.

An EBM naïve practitioner is at a very high risk of being influenced by an onslaught of technology and pharmaceutical false claims. Physicians must take up the cudgels and arm themselves, in defense of the patients they care for. EBM provides them an arsenal of easy weapons with which to achieve this task.

How to get started in a resource-limited environment:

Justifying EBM in developing countries is easier than coming up with ways to hurdle the obstacles. In the following section we discuss some of the obstacles that can frustrate a motivated but busy physician in practice of EBM. Some practical solutions are proposed.

Limited access to literature databases

How can one track the literature for answers to specific problems, when there are no facilities for conducting an efficient search? In this age of high-speed, mega-memory computers, many homes, hospitals and academic institutions continue to operate without even the most meager computer facilities. Even where there are computers, access to literature databases may be limited. Considering the benefits that can be attained however, the budgetary requirements aren't that steep. A basic used-desktop computer with a CD-ROM drive and a MODEM could cost as low as Rs.5,000 or less and would be a worthwhile investment for any healthcare facility.

Limited access to adequate library facilities

After conducting an exhaustive search for evidence, nothing could be more frustrating for a physician than a trip to the library, only to find that most of the journals you need are not on the shelves! The problem is a difficult one that can be traced to the inadequate library facilities that are almost inevitable in developing countries.

Table 2. Questions to be asked for applicability of studies outside the study setting.

1.	Are there pathophysiologic differences in the illness under study that may lead to a different treatment response in our patient group?
2.	Are there patient differences that may diminish the treatment response?
3.	Are there important differences in patient compliance that may diminish the treatment response?
4.	Are there important differences in provider compliance that may diminish the treatment response?
5.	Do my patients have co-morbid conditions that significantly alter the potential benefits and risks of treatment?
6.	Are there important differences in untreated patients' risk of adverse outcomes that might alter the efficiency of treatment?

With the availability of online electronic data bases for both primary and secondary evidence, this problem can be overcome. MEDLINE is freely accessible via PubMed, and offers several full text articles free of cost. Moreover there are several secondary databases available free of cost. The list of some of the well known reliable secondary databases is mentioned in Table 1.

Questionable applicability of data from developed countries

What assurance does a practitioner have that a treatment that worked in developed countries will work as well in his/her environment? The tempting answer is that we can never be sure, unless we duplicate all these studies in our own individual settings. In the case of trials on effectiveness, the issue of applicability is being addressed from several fronts. We recommend some of the important questions need to be asked by a physician prior to importing results to our practice setting (Table 2).

Aside from helping clinicians decide if a trial result is applicable to a particular patient, these criteria will help researchers decide exactly when these trials should be replicated.

How do we overcome obstacles to teaching EBM in developing countries?

As there are hurdles to applying EBM, so too are there obstacles to teaching it. The problems listed below are those which we have commonly encountered in teaching EBM in our workshops. Again, some practical solutions are proposed.

Inexperience in small-group learning

Small group problem-based learning has been the core of workshops in EBM conducted in many countries. In developing countries however, small group learning means an increase in the number of faculty members per student.

Again, because of limited resources, this has not been easy to do. Thus, most medical schools stick to standard methods of teaching and passive learning, conducted in large classrooms. As a result, our typical workshop participant is a shy, inhibited individual, unaccustomed to public discussions and spontaneous interactions. Facilitators are problematic as well. Accustomed to giving lectures, they give in easily to prodding by wily participants, and break into elaborate discourses in the middle of what is supposed to be a small group discussion.

In our experience, neither of these problems is insurmountable, and both are worth addressing. Given enough time and exposure, facilitators get the hang of things, spending less time talking and more time encouraging participation. Participants, on the other hand, soon get the idea and join the fray. The result has been an empowerment to the participants of their learning needs. Each session assembles a unique combination of individual personalities, which brings fresh insights into the practice of EBM in developing countries.

Lack of time to attend workshops

Time has been a major problem for busy physicians for attending EBM workshops. We successfully tried customized workshops spanning over a period of several weeks rather than 3-5 consecutive days according to the participants needs. Participants are also given the opportunity to solve clinical scenarios through hands-on searches, retrieval, appraisal, formulation of a patient-related decision, and finally, preparation and presentation of critically appraised topics (CATs).

Lack of role models for practicing EBM

An initial problem in teaching EBM was the lack of role models who could demonstrate various strategies of implementation. As our group of EBM practitioners grew, however, several role models emerged. Some practice active EBM in their busy clinical practice, using actual patient problems as stimulus for educational prescriptions and the generation of CATs.

In conclusion, practice of EBM, can not only promote critical thinking and problem solving in the context of patient-physician encounter but also provides an up to date care to the patients which can be potentially cost saving. Several obstacles to teaching and applying EBM in developing countries have been identified. Most of these problems are daunting, but none of them are insurmountable. Through our center for evidence-based medicine, we hope to provide physicians, trainees, medical students, and other healthcare professionals with tools for EBM with a hope that this movement will spread across the country and will lead to improved quality of healthcare in Pakistan.

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