Evidence Based Medicine

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The origin of the concepts of Evidence Based Medicine (EBM) are credited to Louis, Bichat and Magendie of Paris in the mid nineteenth century. Currently however the 'homes' of EBM are considered the Clinical Epidemiology and Biostatistics Department of MacMasters University of Canada and the Centre for EBM in Oxford, which have been responsible for a resurgence of interest and the propagation of EBM during the last two decades. EBM is the conscientious, explicit and judicious use of the current best evidence in making decisions about the care of individual patients[1]. The evidence will relate to diagnosis, prognosis, therapy and other clinical and health issues. Proponents of EBM are very conscientious and explicit in their attempts to apply current best external evidence in to their clinical practice. Often however there is a failure to integrate clinical expertise and judgment and they fail to apply this evidence judiciously, after critical appraisal of its clinical applicability. They tend to treat all patients alike, ignoring the circumstances and the individual characteristics and preferences of patients.

Principles of EBM

A basic knowledge of epidemiology and biostatistics is essential to critically appraise clinical evidence for its validity (closeness to the truth) and its potential usefulness (clinical applicability). The results of this appraisal should be integrated with clinical expertise to make clinical decisions regarding an individual patient. To improve patient care the informed choice and preferences of individual patients, taking into account the facilities available, should also be considered when deciding on a therapeutic option[2].

Neither external best evidence nor clinical expertise alone is adequate by itself. External best evidence may be inapplicable or inappropriate for an individual patient. What is best for a well nourished, omnivorous, obese woman living in the snowy mountains of Switzerland may be totally inappropriate for a thin, malnourished, vegetarian woman in the dry zone of Sri Lanka. Clinical techniques may rapidly become outdated. In-utero inseminations are carried out today after removing the seminal plasma and extracting only good quality sperms, unlike earlier when the unprocessed seminal fluid was used.

Practicing EBM is not like following a recipe book for cooking (even in such recipes salt, chilies and spices etc have to be added according to personal taste!) External evidence builds on and reinforces but can never replace clinical expertise (clinical judgment, skills and experience), which will be needed to decide whether or not and how the external best evidence should be applied to an individual patient, according to the facilities available, taking the patients preference into consideration. To practice EBM one should first be an excellent interviewer, history taker, clinical examiner, diagnostician and therapist. Then, with the addition of the concepts of EBM one can become an excellent practitioner of the healing art. The practice of EBM is a process of life long, self directed learning to gather important information about diagnosis, prognosis, therapy and other clinical and health issues which can be translated in to the following five steps.

i. Converting the information needed to answerable questions
ii. Efficiently tracking down (from clinical features, investigations, research evidence etc.) the best evidence to answer them
iii. Critically appraising this evidence for its validity (closeness to the truth) and usefulness (clinical applicability)
iv. Applying valid and useful evidence to clinical practice
v. Evaluating and auditing clinical practice after adopting EBM.

Clinicians should understand the limitations of their basic undergraduate and postgraduate education and training, and yearn for self improvement and knowledge about the continuing advancements in medicine. They should be enthusiastic in pursuing the practice of EBM. One can never be forced to adopt EBM.

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Best External Evidence

The source of best external evidence is not always meta-analyses of randomized control trials (level I a) or randomized control trials (level I b). Successful interventions for a fatal condition do not require a randomized control trial (RCT). Sometimes there may not be time to await the results of an RCT. Sometimes it may be unethical to carry out an RCT. In such situations the trail should be followed to track down the next best available evidence. eg. a primary non randomized trial (levels II / III) or expert opinion (level IV).

The Value of EBM

It is well known that from the time a person graduates from medical school there is a statistically and clinically significant progressive decline in the knowledge of up-to-date care[3]. It has also been suggested that traditional, instructional, continuing medical education and continuing professional development programmes may fail to modify clinical practice and may be ineffective in improving the health outcomes of patients[4,5,6]. However adopting EBM based guidelines and subjecting oneself to individualized audit and feed back have been shown to be effective in changing clinical practice for the better[6].

The most effective strategy to improve ones clinical practice health care capabilities is to become a life long self directed leaner of EBM. To learn EBM, a sound knowledge and understanding of RCT and meta-analyses are needed as a large number of them are now being published. Knowledge obtained from a 'new' text book can be out of date by the time it is printed[3]. The volume of clinical literature published in journals is so large that, it has been estimated that a general physician who wishes to keep abreast of recent advances has to read at least 19 articles a day for 365 days[8]. Therefore two new journals are now being published: The ACP journal club[9] and its successor Evidence Based Medicine[8]. The aim of these journals is to provide doctors with update knowledge which is easily readable. The ACP journal set the pattern of extracting and presenting in the form of a single page structured abstract, with adequate details and an expert commentary, the core or essence of important publications in about 100 international journals. These journals can be of immense value for the practice of EBM.

The next best strategy is to search for and apply EBM summaries generated by others. Sources of EBM summaries include the Cochrane Data base[10] the Reproductive Health Library[11] and the Medline[12]. It has been shown that up to half the total number of relevant published trials can be missed even with a comprehensive Medline search[13]. Therefore complementing a Medline search with detailed journal searching by hand, is recommended to avoid bias when carrying out systematic reviews[2,13].

The third strategy would be to accept and apply evidence based practice guidelines developed by colleagues and experts in the field. Then clinical practice could be subjected to audit and feed back to further improve it. National and regional guidelines should be developed for as many clinical problems as possible. Individualized management with appropriate modifications of the guidelines should be adopted by the attending clinician, depending on the facilities available, and the clinical characteristics and the preferences of the patient. These guidelines should not be named as 'protocols' as this would imply that they should be strictly followed allowing no modifications at all. One patient is different from another. Therefore each patient should be managed on an individual basis, considering her clinical characteristics and preferences, and the guidelines should be modified to suit her if necessary.

Conclusion

To practice EBM a clinician should be motivated and enthusiastic about it. He should first acquire adequate clinical expertise (judgment, skills and experience) which is essential to decide whether or not it is appropriate to apply external best evidence to an individual patient, and if appropriate how it should be applied. The learning of EBM should commence at the beginning of undergraduate training and continue right through to the end of a person's post graduate career. It should be a dedicated, continuous, powerful, reinforcing and self directed, educational process which should result in great personal satisfaction as well as a highly satisfied patient.

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