

Introduction to Evidence-based Medicine

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Sackett (2000) describes evidence-based medicine (EBM) as the integration of the best available research evidence with the expertise of the clinician and the values of the individual patient. The aim is to optimise the clinical outcomes and quality of life for each patient.

Best research evidence is that which

- is clinically relevant to the patient problem
- meets explicit criteria of good research

It may be focussed on

- the usefulness of investigations, accuracy of diagnosis
- the power of prognostic markers
- the safety and effectiveness of interventions.

Clinical expertise includes

- the use of clinical skills and past experience to identify each patient's unique health state and diagnosis
- the potential risks and benefits of intervention
- knowledge of the patient's values and expectations

Whilst the origins of EBM may be debated, its recent evolution is a function of the need for valid information relevant to the key clinical activities of investigation, diagnosis, intervention and prognosis and key public health activities related to aetiology and prevention. This need has arisen with the development of a more critical attitude to traditional sources of medical information. Coinciding with these developments there has been a huge expansion in basic and clinical science research with a corresponding increase in published findings. Fortunately the storage and retrieval of this massive volume of research has been made more manageable with the introduction of information and communication technology. A further influence has been the public health perspective and the tension between resource allocation to individual health care versus resource allocation to population health care, and distributions within populations -- enter QALYS etc-- and the difficult task of balancing an individual's values/health needs and wants with those of the community.

EBM results from identifying and evaluating the best information relevant to a specific clinical problem. It takes advantage of modern information systems, in particular sophisticated search tools. This power of searching on a world-wide basis is combined with analytic tools which aid the evaluation of scientific evidence.

These tools include

- specific criteria for evaluating research
- statistical techniques for combining data from different studies

- statistical concepts which make the interpretation of research results more clinically relevant.

Evidence based medicine

Introductory tutorial

The University of North Carolina has developed a very good web-based introduction to EBM which uses clinical problems to demonstrate how to construct a "well-built question", how to use the question to interrogate the research literature and how to evaluate the resulting evidence. The website includes a self-assessment.

<http://www.hsl.unc.edu/services/tutorials/ebm/index.htm>

The Department of Internal Medicine from the same university offers a number of related resources (Check: the list of CATs; the table of likelihood ratios; the table of clinically significant drug interactions. Poor information on updates (eg likelihood ratios last update 1999).

Since it is a US website you should be alert to possible differences in language, especially names of drugs.

<http://www.med.unc.edu/medicine/edursrc/welcome>

One weakness of the University of North Carolina site is its treatment of the levels of evidence. However the Medical Research Library of Brooklyn does a better job:

<http://library.downstate.edu/ebm/2100.htm>

Brooklyn also provides a useful guide to research methods:

<http://servers.medlib.hscbklyn.edu/ebm/2toc.htm>

Advanced EBM

The Centre for Evidence Based Medicine at Oxford (UK) also provides more advanced analysis of types of evidence:

http://www.cebm.net/levels_of_evidence.asp

and research designs:

http://www.cebm.net/study_designs.asp

In addition there are many more web-based EBM resources, so if the above are too elementary you might try:

Introduction to Information Mastery from the University of Michigan (Mark H Ebell). Modules on diagnosis, therapy, prognosis systematic reviews, meta-analyses, decision analyses, asking clinical questions. These are advanced tutorials with some interactive elements.

<http://www.poems.msu.edu/InfoMastery/default.htm>

Canadian Centre for Health Evidence. Guidelines for Evidence Based Practice: These guides are based on the original series in JAMA. Very good, detailed guidelines. These guides were inspired by the need for a more intense focus on using the medical literature to solve real patient problems.

<http://www.cche.net/usersguides/main.asp>

Many of these sites have embedded glossaries, the following glossary is particularly good on statistical terms:

Searchable glossary from the University of Colorado site by Katherine McLucas.

Strong on statistical definitions

<http://denison.uchsc.edu/sq/glossary.html>

By now it will be clear that, depending on the issue, the identification, evaluation and application of relevant evidence can be a formidable task which may be beyond the capacity of individual clinicians. Fortunately there now exists a number of "best evidence" journals and a growing number of systematic reviews of health care interventions (such as produced by the Cochrane Collaboration). The purpose of these publications is to present clinicians with relevant, carefully assessed and rapidly accessible information for immediate use in the clinical setting.

Databases of Reviews, Critically Appraised Topics (CATS) etc

Access to the: Cochrane Database of Systematic Reviews, Cochrane Database of Methodology Reviews, Database of Abstracts of Reviews of Effectiveness, Cochrane Controlled Trials Register, NHS Economic Evaluation Database, Health Technology Assessment Database, Cochrane Methodology Register

<http://www.moh.govt.nz/cochranelibrary>

University of York, Centre for Systematic Reviews and Dissemination. Access page for three databases: NHS Economic Evaluation; Health Technology Assessment; Effective Healthcare Bulletins. Lists completed reviews: abstracts available.

<http://www.york.ac.uk/inst/crd/crddatabases.htm>

Bandolier collects together and abstracts good quality evidence under a variety of different headings: systematic reviews of treatments, evidence about diagnosis, epidemiology or health economics.

<http://www.jr2.ox.ac.uk/bandolier/knowledge.html>

CATs from UNC

<http://www.med.unc.edu/medicine/edursrc/catlist.htm>

Clinical guidelines

Another development in response to the increasing information load has been in the form of clinical guidelines which aim to provide evidence-based advice on best practice.

New Zealand Guidelines Group includes evidence for practice, guidelines and publications, and links to other sources of evidence

<http://www.nzgg.org.nz/>

Searchable index to US national guidelines from the National Guideline Clearinghouse sponsored by the Agency for Healthcare Research and Quality (AHRQ), U.S. Department of Health and Human Services, in partnership with the American Medical Association and the American Association of Health Plans-Health Insurance Association of America.

<http://www.guideline.gov/>

http://www.guideline.gov/resources/guideline_index.aspx

University of California San Francisco clinical practice guidelines (Primary Care).

<http://medicine.ucsf.edu/resources/guidelines/guide.html>

Completed guidelines and cancer service guidance from the UK National Institute for Clinical Evidence (NICE)

<http://www.nice.org.uk/catcg2.asp?c=20034>

Resources for conducting your own EBM

Critical appraisal worksheets (diagnosis; harm; prognosis; therapy) from the University of Toronto (Downloadable)

<http://www.cebm.utoronto.ca/teach/materials/caworksheets.htm>

Performing EBM online: some tips from Brooklyn

<http://library.downstate.edu/ebm/4toc.htm>

Clinical Audit

This is a 2.3mb pdf from the National Institute for Clinical Excellence (NICE, UK), effectively a textbook on clinical audit. It will take several minutes to download on a fast system (eg OU) and maybe 20 mins on a slow system.

<http://www.nice.org.uk/pdf/BestPracticeClinicalAudit.pdf>

Related

JAMA Rational Clinical Examination series bibliography. References on the identification of findings on clinical examination that are useful or useless, based on the quality of evidence

<http://medicine.ucsf.edu/resources/guidelines/rational.html#12>

Patient-centred medicine

Patient values and expectations

Sackett's definition of EBM includes reference to the **patient's values**. Values and expectations are unique to each patient. They are present in every clinical encounter and to a large extent they determine the value of the clinical encounter for the patient.

By including 'non-clinical' patient information in the formulation of the problem and the shaping of the management plan, Sackett is recognising the place of the *person*

of the patient in the consultation. This may be seen as a development or extension of the clinical method and sometimes is referred to as "**the patient-centred clinical method**".

Ian McWhinney and colleagues from the Department of Family Medicine, University of Western Ontario, have written and researched extensively on this theme and references are provided below. They have a website (but it is not that easy to read): <http://www.geocities.com/manuelmed/PTCENTER1.HTML>

Best treatments: Clinical evidence for patients from the BMJ
<http://www.besttreatments.net/btgeneric/home.html>

References

Evidence-based Medicine: How to practice and teach EBM 2nd Ed.. Sackett DL et al. Churchill Livingstone 2000, Edinburgh.

Textbook of Family Medicine 2nd Ed. Ian R McWhinney, Oxford University Press 1997, New York.

Patient-centered medicine: transforming the clinical method. Moira Stewart et al, Sage 2003, Thousand Oaks Ca., ISBN 1857759818