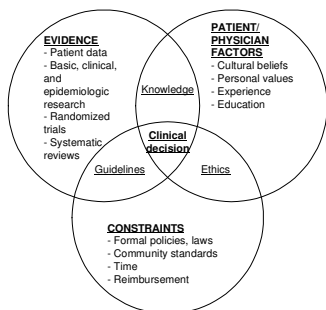


Component 2: Evidence- Based Medicine

Unit 5: Evidence-Based Practice Lecture 2

This material was developed by Oregon Health & Science University, funded by the Department of Health and Human Services, Office of the National Coordinator for Health Information Technology under Award Number H240C000015.

Making evidence-based clinical decisions (Mulrow, 1997)



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Best resources for EBM

- Three major books:
 - Straus et al., *Evidence-Based Medicine: How to Practice and Teach EBM, Third Edition, 2005*
 - Formerly known as “the Sackett book”
 - Guyatt et al., *Users’ Guides to the Medical Literature, 2008* (two books – one a handbook, the other more complete)
- Web sites
 - <http://www.cebm.net>
 - <http://www.cche.net/>
 - <http://ktclearinghouse.ca/cebm/>
 - <http://www.nettingtheevidence.org.uk/>

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The changing nature of EBM (Hersh, 1999)

- Initial approach (aka, "first generation") was for clinician to find and critically appraise evidence
 - Takes too much time, clinicians lack expertise
- More recent approach (aka, "next generation") is synthesis and synopsis of evidence for clinician
 - Access to on-line, up-to-date information makes easier
- Slawson (2005) argues we should put more emphasis on teaching information management (seeking) than the techniques of EBM

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Another viewpoint concerning evidence (Haynes, 1999)

- Can it work?
 - Efficacy studies take place under "ideal" circumstances
 - This unit looks mainly at such studies
- Does it work?
 - Effectiveness studies ascertain whether something works in the "real world"
 - Sometimes called "outcomes research" (Clancy, 1998)
- Is it worth it?
 - Cost-benefit or cost-effectiveness studies determine whether benefits worthwhile in relation to cost or other resources

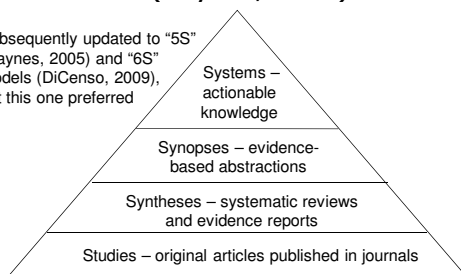
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Hierarchy of evidence – the "4S" model (Haynes, 2001)

Subsequently updated to "5S" (Haynes, 2005) and "6S" models (DiCenso, 2009), but this one preferred

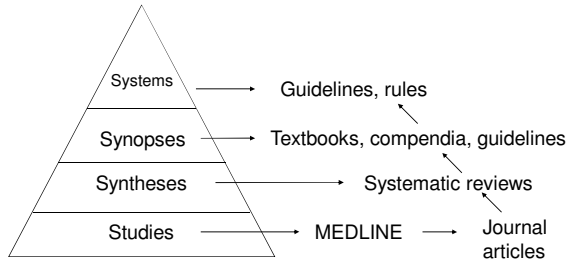


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Where the evidence comes from



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Studies

- Accessed (usually) in literature databases such as MEDLINE
- Retrieved from journals
 - Many available electronically now
- Application of critical appraisal and formulae
 - e.g., relative risk, number needed to treat, sensitivity, odds ratio, etc.

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Syntheses

- Systematic reviews
 - Exhaustive review of data on a topic done in a systematic manner
 - Not a simple literature review or overview of papers one knows about
 - Application, where appropriate, of meta-analysis, the combination of results from multiple studies in a single analysis
 - Studies must be appropriately similar, and there are methodological means to assess that

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Synopses and systems

- Synopses – highly summarized information appropriate for clinical setting, e.g.,
 - Critically appraised topics (CATs)
 - *Clinical Evidence*, InfoPOEMS, PIER
 - Clinical practice guidelines
- Systems – decision support within electronic health records
 - Best way to provide evidence to clinicians at point of decision-making

Overview of the application of EBM

- Steps include
 - Phrasing a clinical question that is pertinent and answerable
 - Identifying evidence to address the question
 - Critically appraising the evidence to determine if it applies to the patient

Phrasing the clinical question

- Background vs. foreground questions
 - Background questions ask for general knowledge about a disorder
 - Usually answered with textbooks and classical review articles
 - Foreground questions ask for knowledge about managing patients with a disorder
 - Usually answered using EBM techniques

Background questions

- General information not specific to a given patient
- Examples
 - What causes pneumonia?
 - When do complications of diabetes usually occur?
- Distinction from foreground questions can be blurry
 - New etiologies of disease
 - Level of training, e.g., specialist vs. student

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Foreground questions

- Have three or four essential components (PICO)
 - Patient and/or problem
 - Intervention
 - Comparison intervention (if appropriate)
 - Outcomes
- Example
 - In an elderly patient with congestive heart failure, are beta blockers helpful in reducing morbidity and mortality without excess side effects?

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Four categories of foreground questions

- Intervention (or Therapy) – benefit of treatment or prevention
- Diagnosis – test diagnosing disease
- Harm – etiology or cause of disease
- Prognosis – outcome of disease course

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Questions to ask about the results from any study

- Are the results valid?
- Are the results important?
- Can the results be applied to patient care?
- Specific sub-questions depend on type of question and study

Hierarchy of study designs – increasing validity of designs

<i>Level</i>	<i>Design</i>	<i>Comment</i>
I	Randomized controlled trials	Equal probability of assignment of subjects
II	Cohort studies	Defined by exposure to factor
III	Case-control studies	Defined by outcome of interest
IV	Case series	Systematic observation without controls
V	Expert opinion, physiologic studies	Only as good as the expert
