Evidence Based Medicine

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Clinical Epidemiology

Module 1:
Introduction to EBM

Essential EBM

- 1. Origins
- 2. Components
- 3. Why we need EBM
- 3. What is EBM ?
- 5. Steps in EBM
- 5.1 Focused question
- 5.2 Searching the literature

Evidence Based Medicine

1. Origins

- In 1992 in JAMA

- Evidence Based Medicine. A new approach to teaching the practice of medicine:

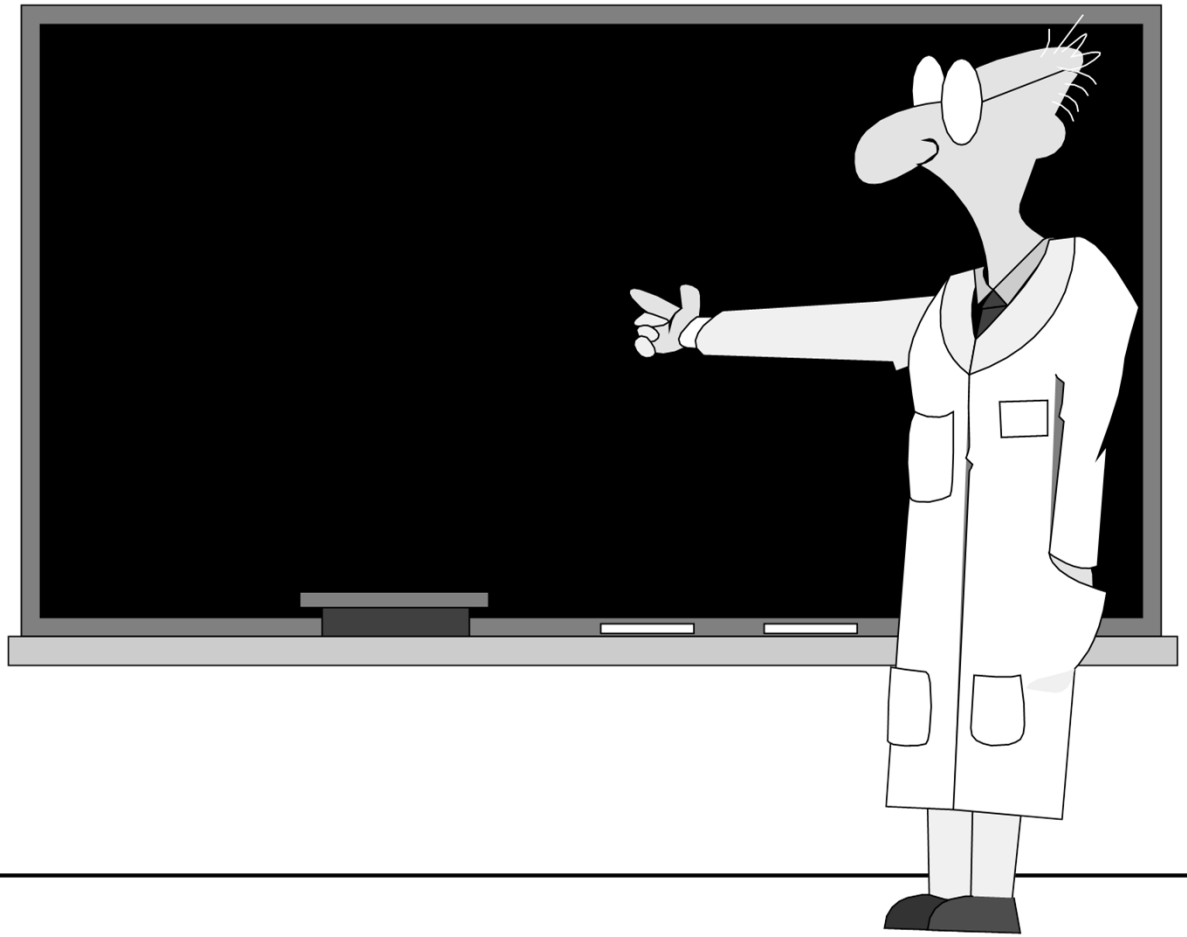
  >>> David Sacket

- However Pierre Louis: Paris

Evidence Based Medicine

- 2. Why do we need a new approach , a new paradigm ?

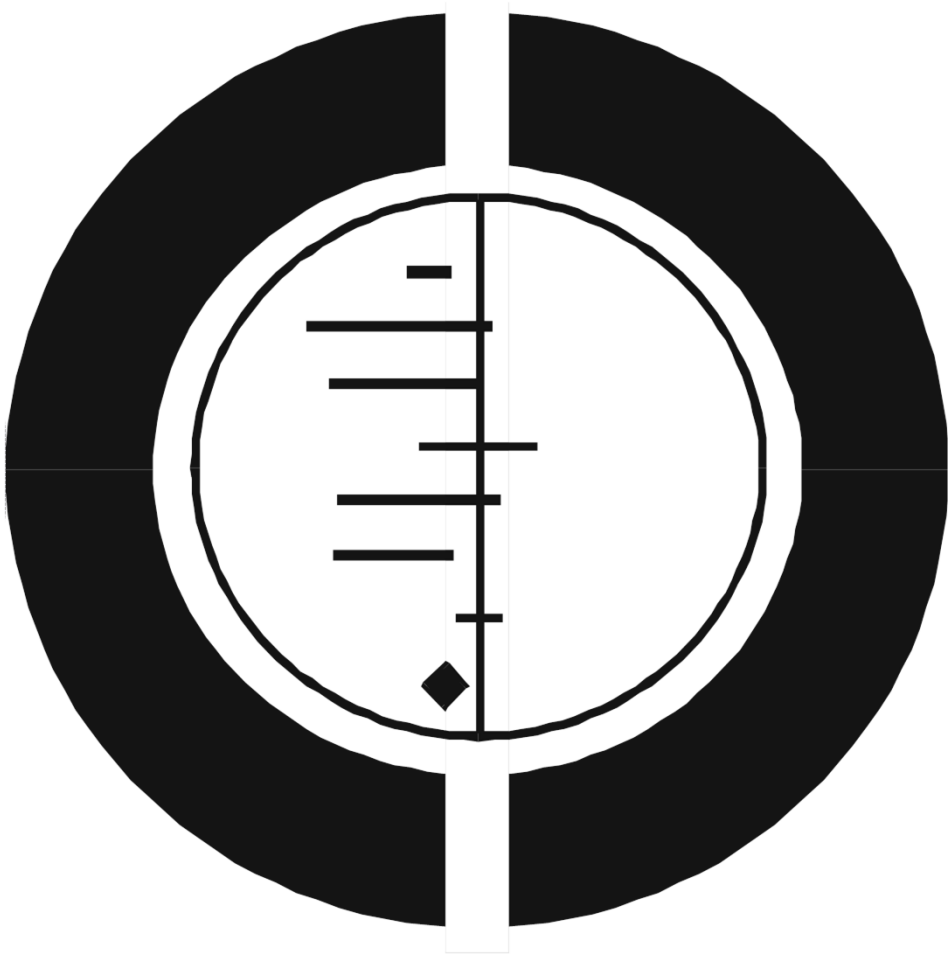
Old Paradigm



Old Paradigm

- Experience
- Pathophysiology

New Paradigm

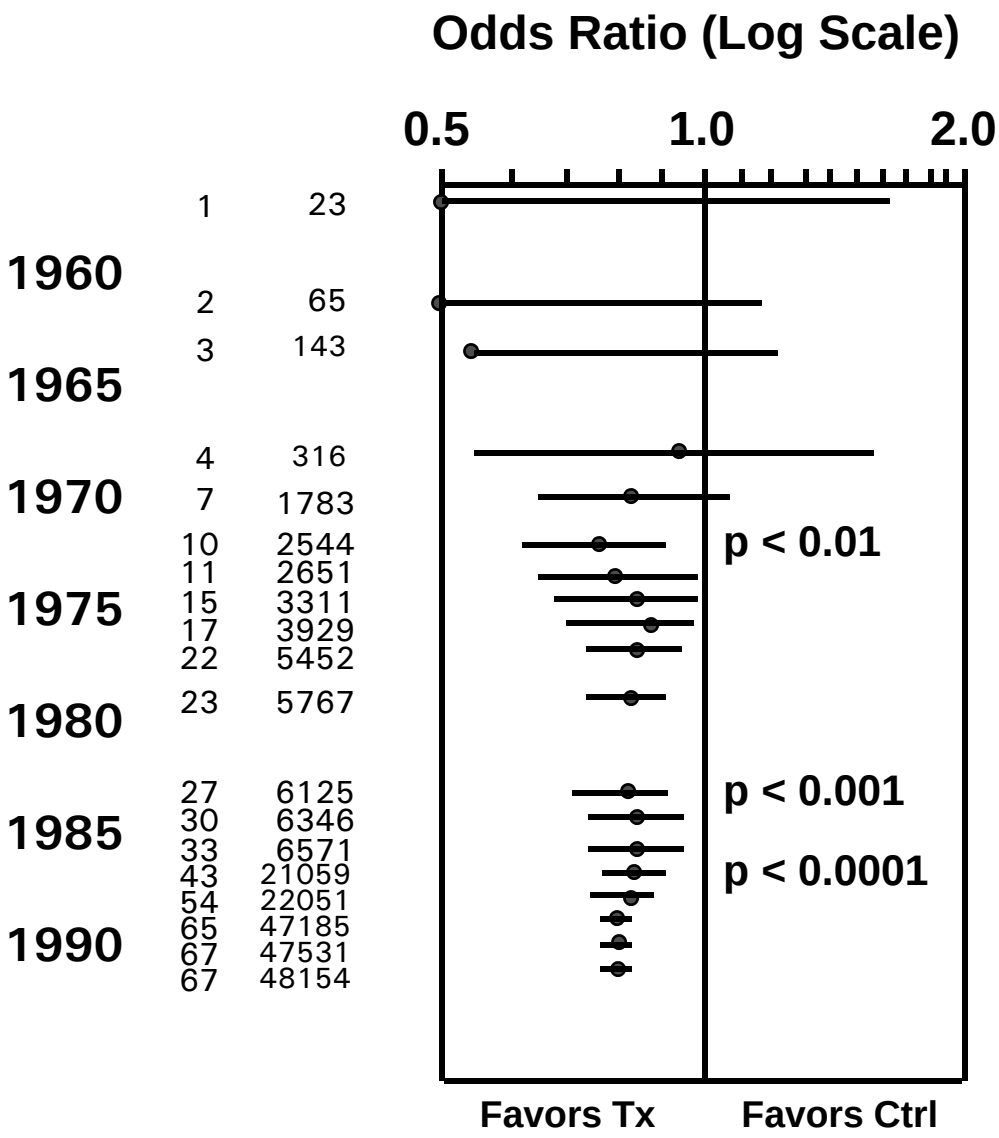


Why do we need Evidence ?

1) Ineffectiveness or even harmful effects of therapy

- the tragedy of DES
- The CAST study

2) Delay in instituting effective therapy

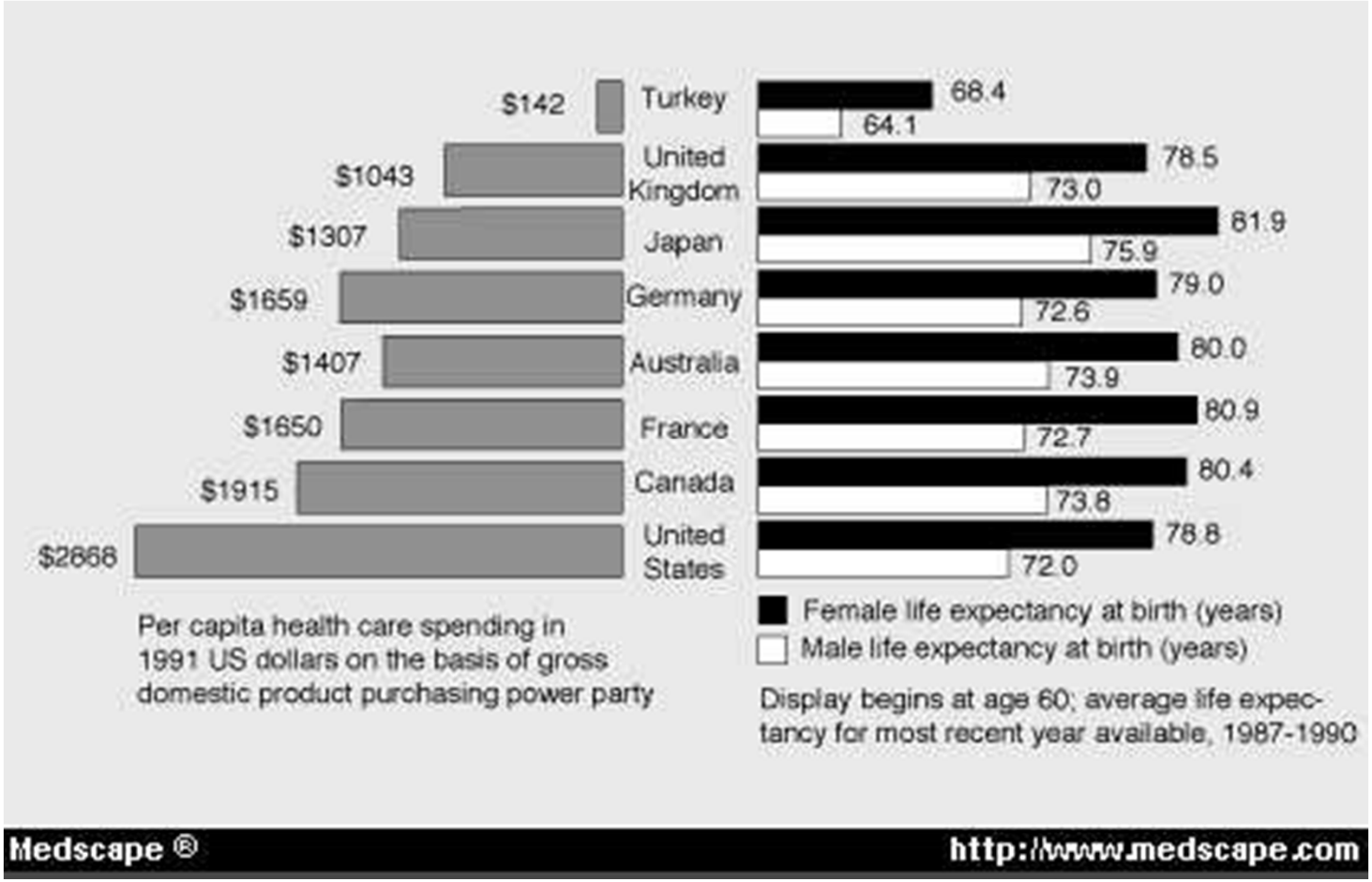


Routine	Specofic	Rare/Never	Experimental	Not Mentioned
				21
				5
			1	10
			1	2
			2	8
				7
				8
	1			12
	1		8	4
	1		7	3
5	2		2	1
15	8			6
6	1			

3) Variation in Practice

- Canada: hysterectomy rates vary 5-fold between different areas
- Rhode Island NY: 2x as many hysterectomies and prostatectomies per thousand population compared with Maine

4. Increasing medical expenditure



Per capita expenditure for health care versus life expectancy by country. Mengel MB, Holleman WL. Fundamentals of clinical practice: a textbook on the patient, doctor, and society. New York: Plenum Medical Book Co, 1997:301.

5) Clinicians need evidence in Practice

- Probably 2 questions for every three patients seen

- We probably only get 30% of what we need
  - Textbooks, peers, journals

3. So what is evidence-based medicine?

The practice of EBM is the integration of

- individual clinical expertise

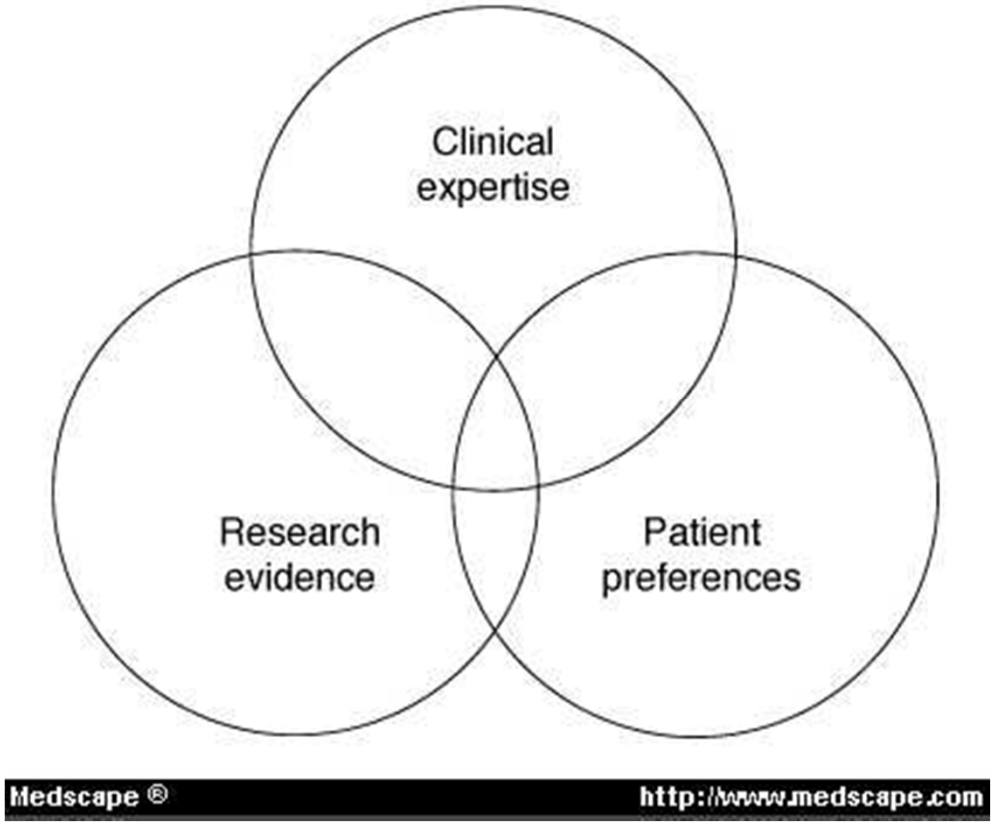
  with the

- best available external clinical evidence from systematic research.

and

- patient's values and expectations

EVIDENCE BASED MEDICINE



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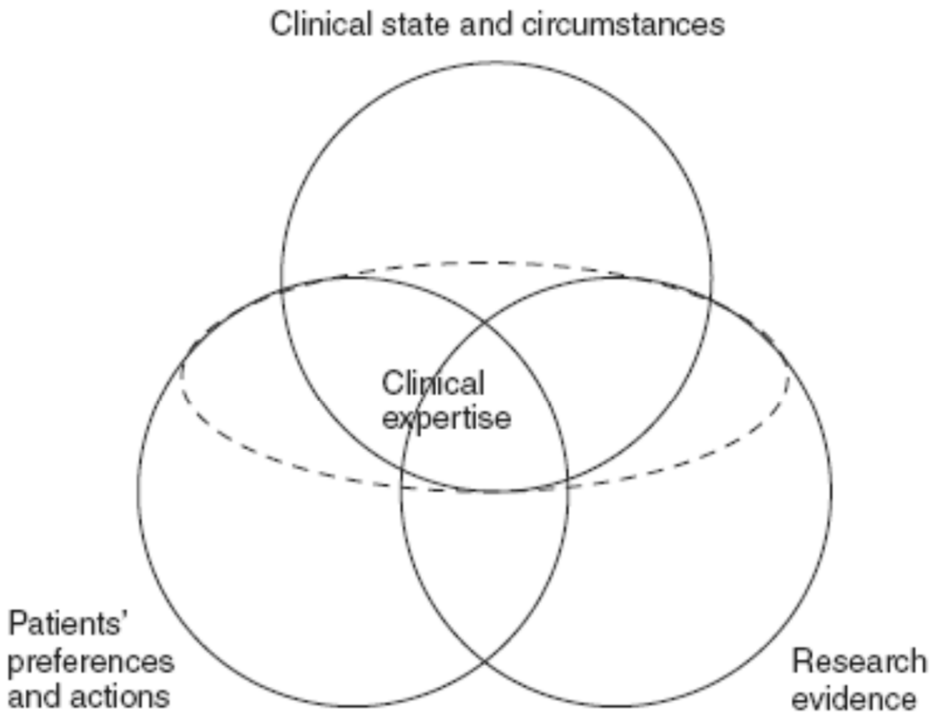


Fig. 2. Updated model for evidence-based clinical decisions.

Haynes, R. B., Devereaux, P. J., & Guyatt, G. H. (2003). Clinical expertise in the era of evidence-based medicine and patient choice. *Evidence-Based Medicine*, *7*, 36–38.

What EBM is <u>not</u>:

- EBM is <u>not</u> cook-book medicine
  - evidence needs extrapolation to my patient's unique biology and values
- EBM is <u>not</u> cost-cutting medicine
  - when efficacy for my patient is paramount, costs may rise, not fall

5. Six steps for practicing EBM

The patient	**1. Start with the patient -- a clinical problem or question arises out of the care of the patient**
The question	**2. Construct a well built clinical question derived from the case**
The resource	**3. Select the appropriate resource(s) and conduct a search**
The evaluation	**4. Appraise that evidence for its validity (closeness to the truth) and applicability (usefulness in clinical practice)**
The patient	**5. Return to the patient -- integrate that evidence with clinical expertise, patient preferences and apply it to practice**
Self-evaluation	**6. Evaluate your performance with**

5.1 Asking the good clinical question: PICO

1. Patient or problem

- How would you describe a group of patients similar to yours? What are the most important characteristics of the patient? This may include the primary problem, disease, or co-existing conditions. Sometimes the sex, age or race of a patient might be relevant to the diagnosis or treatment of a disease.
- **2. Intervention, prognostic factor, or exposure**
- Which main intervention, prognostic factor, or exposure are you considering? What do you want to do for the patient? Prescribe a drug? Order a test? Order surgery? What factor may influence the prognosis of the patient? Age? Co-existing problems? What was the patient exposed to? Asbestos? Cigarette smoke?

5.1 Asking the good clinical question: PICO

- **3. Comparison**
- What is the main alternative to compare with the intervention? Are you trying to decide between two drugs, a drug and no medication or placebo, or two diagnostic tests? Your clinical question does not always need a specific comparison.
- **4. Outcomes**
- What can you hope to accomplish, measure, improve or affect? What are you trying to do for the patient? Relieve or eliminate the symptoms? Reduce the number of adverse events? Improve function or test scores?

Example: identify the PICO elements

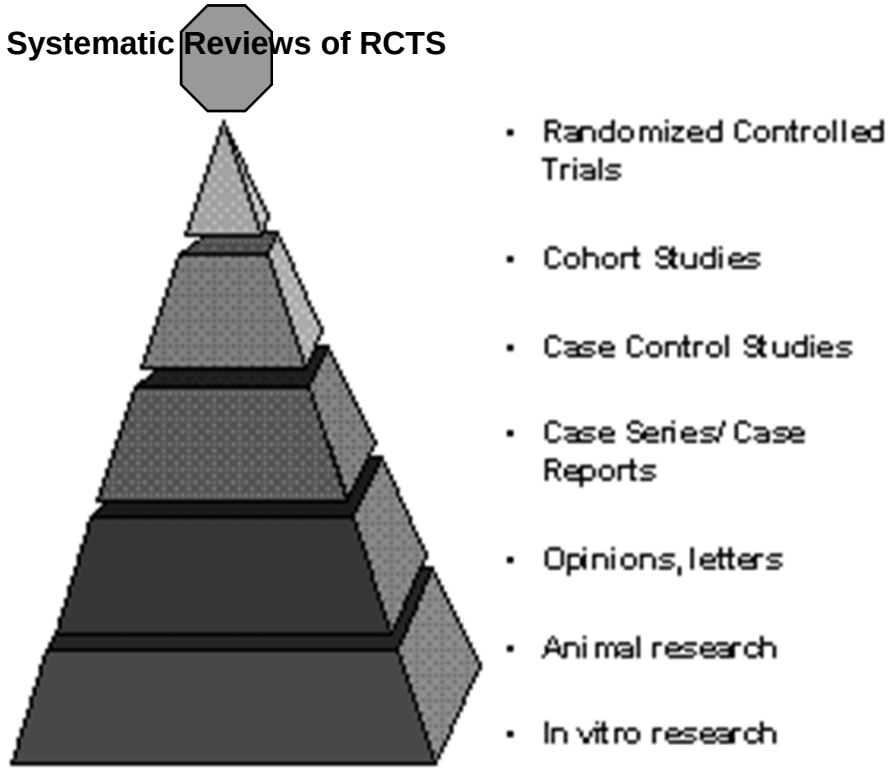
- In elderly patients with congestive heart failure, is digoxin effective in reducing the need for rehospitalization?

Types of Questions

type of question and the **type of study important**.

Diagnosis	**how to select and interpret diagnostic tests**
Therapy	**how to select treatments to offer patients that do more good than harm and that are worth the efforts and costs of using them**
Prognosis	**how to estimate the patient's likely clinical course over time and anticipate likely complications of disease**
Harm/Etiology	**how to identify causes for disease (including iatrogenic forms)**

HIERARCHY OF EVIDENCE IN EBM



Evidence Pyramid (for evidence on therapy)

Type of Question	**Suggested best type of Study**
Therapy	RCT>cohort > case control > case series
Diagnosis	prospective, blind comparison to a gold standard
Etiology/Harm	RCT > cohort > case control > case series
Prognosis	cohort study > case control > case series
Prevention	RCT>cohort study > case control > case series
Clinical Exam	prospective, blind comparison to gold standard
Cost	economic analysis

5.2 Finding the evidence

- You need the well defined research question translated into terms that you can use in the database eg Medline
- See the Monash workbook for an example

Some Sources of High-Quality Evidence.

- **<u>Primary (undigested) sources</u>**

- MEDLINE eg Ovid or PubMed

- **Secondary (predigested sources)**
- Cochrane Collaboration
- ACP Journal Club www.acponline.org
- POEMs, formerly *Journal of Family Practice* Journal Club (jfp.msu.edu)
- Clinical Evidence online (clinicalevidence.com)

Via tyds@tuks

Examples

Interventions - Diabetes: foot ulcers + amputations - Diabetes - BMJ Clinical Evidence - Mozilla Firefox

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http://0-www.clinicalevidence.com.innopac.up.ac.za/ceweb/conditions/dia/0602/0602.jsp

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Diabetes

Foot ulcers and amputations in diabetes

Dereck Hunt

Interventions | Key points | About this condition | Updates (1) | Guidelines (9) | References | Your responses

You may prefer to read the key points to this review.

Print page Print review

We have searched the evidence for systematic and rigorous answers to the clinical questions and situations below, focusing on the outcomes that matter most to patients and clinicians. We have then categorised each treatment or intervention according to its harms and benefits in those situations.

Updates (new)

We provide up-to-the-minute updates for this review so you always have the latest evidence.

Respond to this review

Remember you have the opportunity to respond to this review if you have any comments, or feel there is anything we have not covered.

Prevention

Likely to be beneficial	Screening and referral to foot care clinics
Unknown effectiveness	Education Therapeutic footwear

Treatment

Beneficial	Pressure off-loading with non-removable cast
Likely to be beneficial	Human skin equivalent Systemic hyperbaric oxygen (for infected

Done

Start | 5 Microsoft Office ... | Interventions - Diab... | Abbot | 2 Microsoft Office P... | 2 Microsoft Office O... | 03:00 PM

Example

Debridement of diabetic foot ulcers - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://0-www.mrw.interscience.wiley.com.innopac.up.ac.za/cochrane/clsysrev/articles/CD003556/frame.ht

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[Review]
Debridement of diabetic foot ulcers

PDF (Size 248K)

- Abstract
- Plain language summary
- Background
- Objectives
- Criteria for considering studies for this review
- Search methods for identification of studies
- Methods of the review
- Description of studies

[Review]

Debridement of diabetic foot ulcers

J Smith

Cochrane Database of Systematic Reviews 2007 Issue 1

DOI: 10.1002/14651858.CD003556 This version first published online: 21 October 2002 in Issue 4, 2002

Date of Most Recent Substantive Amendment: 25 June 2002

This record should be cited as: Smith J. Debridement of diabetic foot ulcers. *Cochrane Database of Systematic Reviews* 2002, Issue 4. Art. No.: CD003556. DOI: 10.1002/14651858.CD003556.

Next >

Abstract

Background

Foot ulceration is thought to affect 15% of people with diabetes at some time in their lives. Debridement is widely regarded as an effective intervention to speed up ulcer healing. The most effective method is unclear.

Done

Start | 5 Microsoft Office ... | Debridement of diab... | Abbot | 2 Microsoft Office P... | 2 Microsoft Office O... | 03:14 PM

Critical appraisal of an article

- 1. Is the study valid (free of bias)?
- 2. What are the results and are they statistically and clinically significant? How precise are they?
- 3. Can I apply these results in my practice?