



Eighteen years later: Is Evidence-based Practice really adult?

Professor Paul Glasziou
University of Oxford



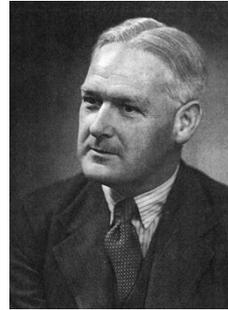
Who are we?

- I have been to a previous Sicily meeting
- I teach EBHC
- I use EBHC in clinical practice
- I am from
 - ▣ Asia
 - ▣ Africa
 - ▣ Europe
 - ▣ North America
 - ▣ South America

Some milestones in the history of EBM



James Lind
publishes review &
clinical trial in
Treatise on Scurvy



Bradford-Hill
publishes *Principles of
Medical Statistics* &
MRC trial of streptomycin



Inspiring Innovation and Discovery

Home

More About

**Clinical
Epidemiology
& Biostatistics**

900 AD

1780

1840

1937/48

1967

1970's



Al-Rhazi

Al-Rhazi

For I once saved one
group by it, while I
intentionally neglected
another group.
By doing that, I wished
to reach a conclusion.



Pierre-Charles-Alexandre Louis (1787–1872).

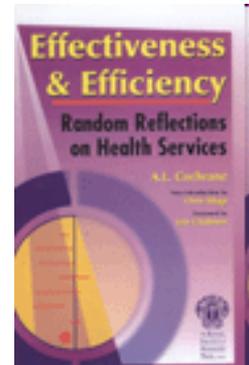
Pierre Louis

Develops his
“numerical method”
and changes blood
letting practice in
France



Alvan Feinstein

publishes his book
Clinical Judgement





Coping with the growth in trials?

MEDLINE 2006/day

1,600 articles

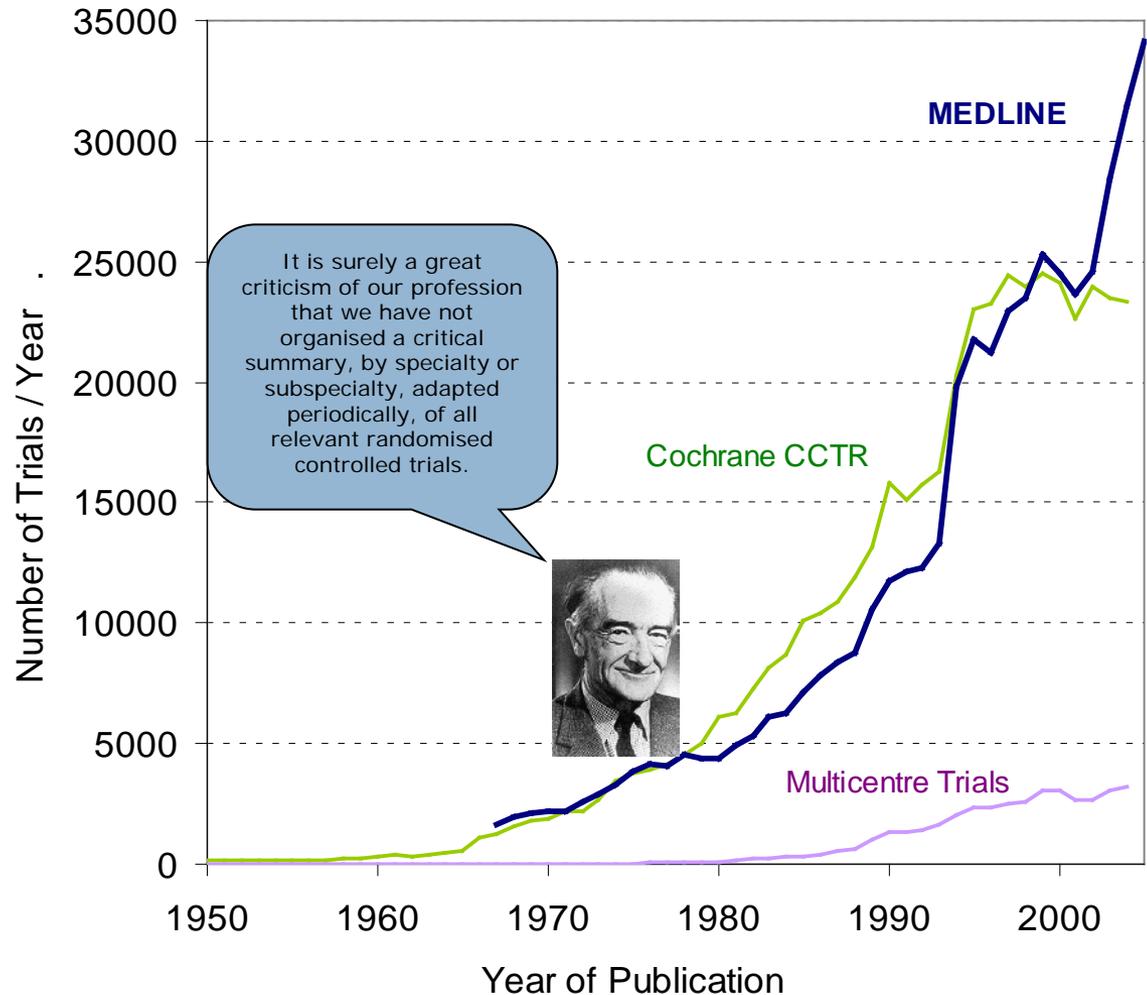
95 trials

4 reviews*

*CDSR per day

1 new

1 update





“EBM” - birth of a term

Update of CMAJ series on how to read a paper

JAMA User guides 1991
authors seek a new term
~~Clinical epidemiology?~~
~~Scientific medicine?~~
Evidence-based medicine!



THE MEDICAL LITERATURE

- Alexandra Barratt, MBBS, MPH, PhD
 - Les Irwig, MBCh, PhD
 - Paul Glasziou, MBBS, PhD
 - Robert G. Cumming, MBBS, MPH, PhD
 - Angela Raffle, BSc (Hons), MBChB
 - Nicholas Hicks, MA, BMBCh
 - J. A. Muir Gray, CBE, MD
 - Gordon H. Guyatt, MD, MSc
- for the Evidence-Based Medicine Working Group

CLINICAL SCENARIO
You are a family physician seeing a 47-year-old woman and her husband of the same age. They are concerned because a friend recently found out that she had bowel cancer and has urged them both to undergo screening with fecal occult blood tests (FOBTs) because, she says, prevention is much better than the cure she is now undergoing. Both your patients have no family history of bowel cancer and no change in bowel habit. They ask whether you agree that they should be screened.

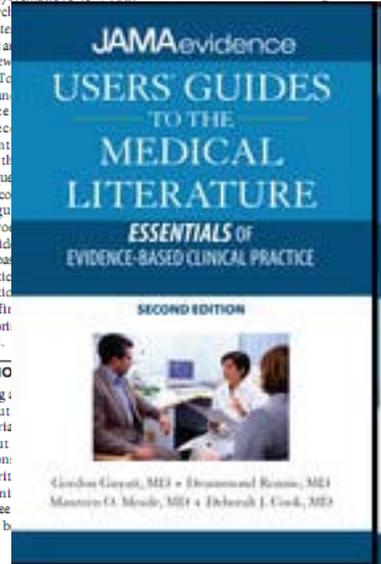
You know that trials of FOBT screening have demonstrated that screening can reduce mortality from colorectal cancer (CRC), but you also recall that FOBTs can have a high false-positive rate that then requires investigation by colonoscopy. You are unsure whether screening these relatively young, asymptomatic people at average risk of bowel cancer is likely to do more good than harm. You decide to check the literature to see if there are any guide-

lines or recommendations about screening for CRC that might help you.

THE SEARCH
Since you know there is more than 1 randomized controlled trial (RCT), you look first for a systematic review. Your MEDLINE search of occult blood tests for colorectal neoplasms at a systematic review of the literature by Teichgraber et al.¹ would influence whether to recommend screening to your patient. The positive rate of the trials and the effects of subsequent treatment, and cost for a practice guideline (AGA) guideline,² which is based on the systematic review, are the additional factors you were hoping to provide so you print the article and read.

INTRODUCTION
When assessing the evidence for a recommendation about whether to apply the criteria for this series about care intervention, consider other criteria: whether screening is worthwhile, with large b-

enefits and harms among the elderly.³ In other situations, clinicians must often weigh the benefits and harms when considering whether to screen.^{1,2} This guide ex-

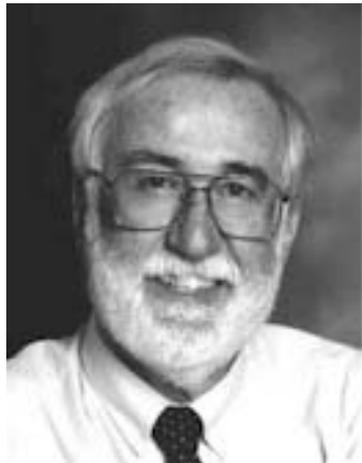




1993: Sackett moves to Oxford

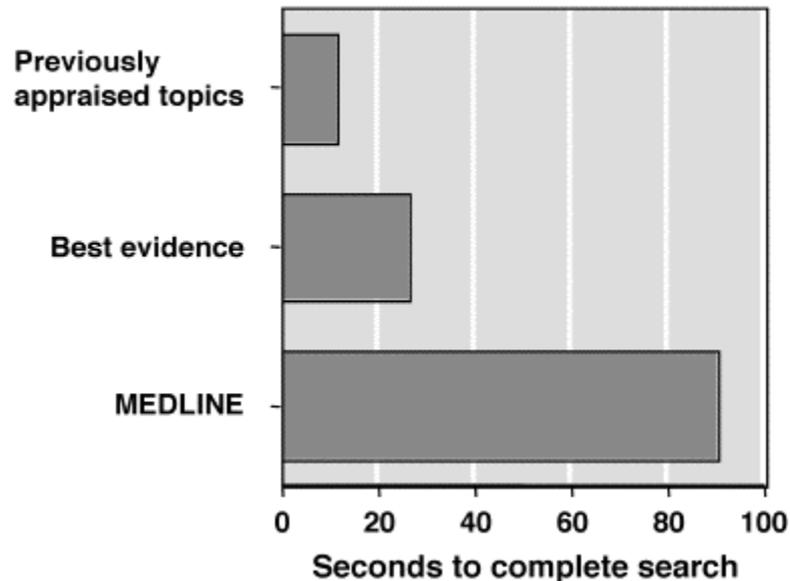
An EBM Approach to Education

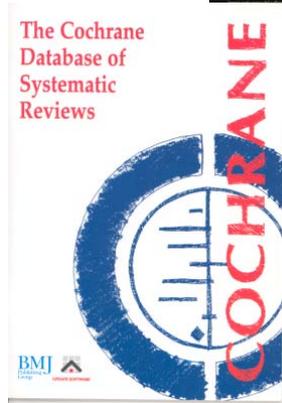
- Evidence cart on ward rounds - 1995
- Looked up 2-3 questions per patient
- Took 15-90 seconds to find
- Change about 1/3 decisions
- Rounds took longer!



Dave Sackett

Time to complete searches on the evidence cart



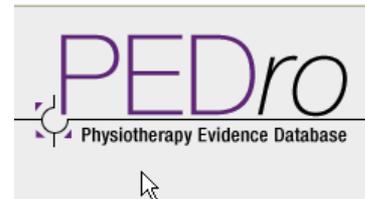


PubMed Clinical Queries

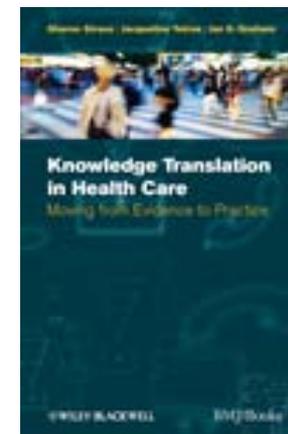
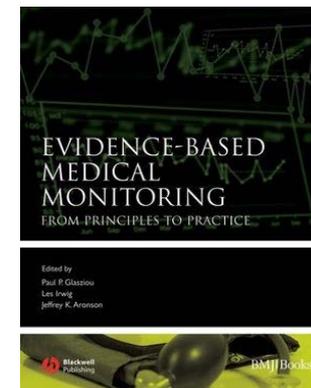
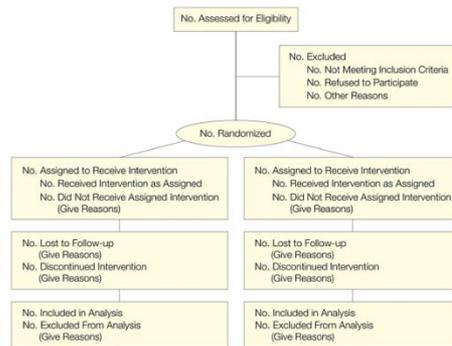
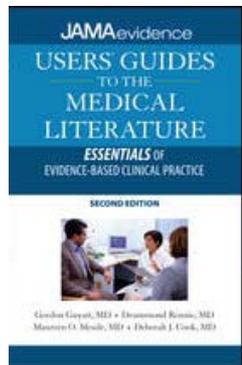
PubMed Nucleotide

This page provides the following specializ

- [Search by Clinical Study Category](#)
- [Find Systematic Reviews](#)
- [Medical Genetics Searches](#)



1990 1995 2000 2005 2010



Structured Abstracts
CONSORT statement



What should be the EBM curriculum?

Skills for each of the 4 steps*

Top

Debate

Highly accessed

Open Access

Abstract

Sicily statement on evidence-based practice

Background

Martin Dawes¹ ✉, **William Summerskill**² ✉, **Paul Glasziou**³ ✉, **Antonino Cartabellotta**⁴ ✉, **Janet Martin**⁵ ✉, **Kevork Hopayian**⁶ ✉, **Franz Porzsolt**⁷ ✉, **Amanda Burls**⁸ ✉ and **James Osborne**⁹ ✉

Discussion

Summary

Competing interests

Authors contr...

Acknowledgements

References

Pre-publication history

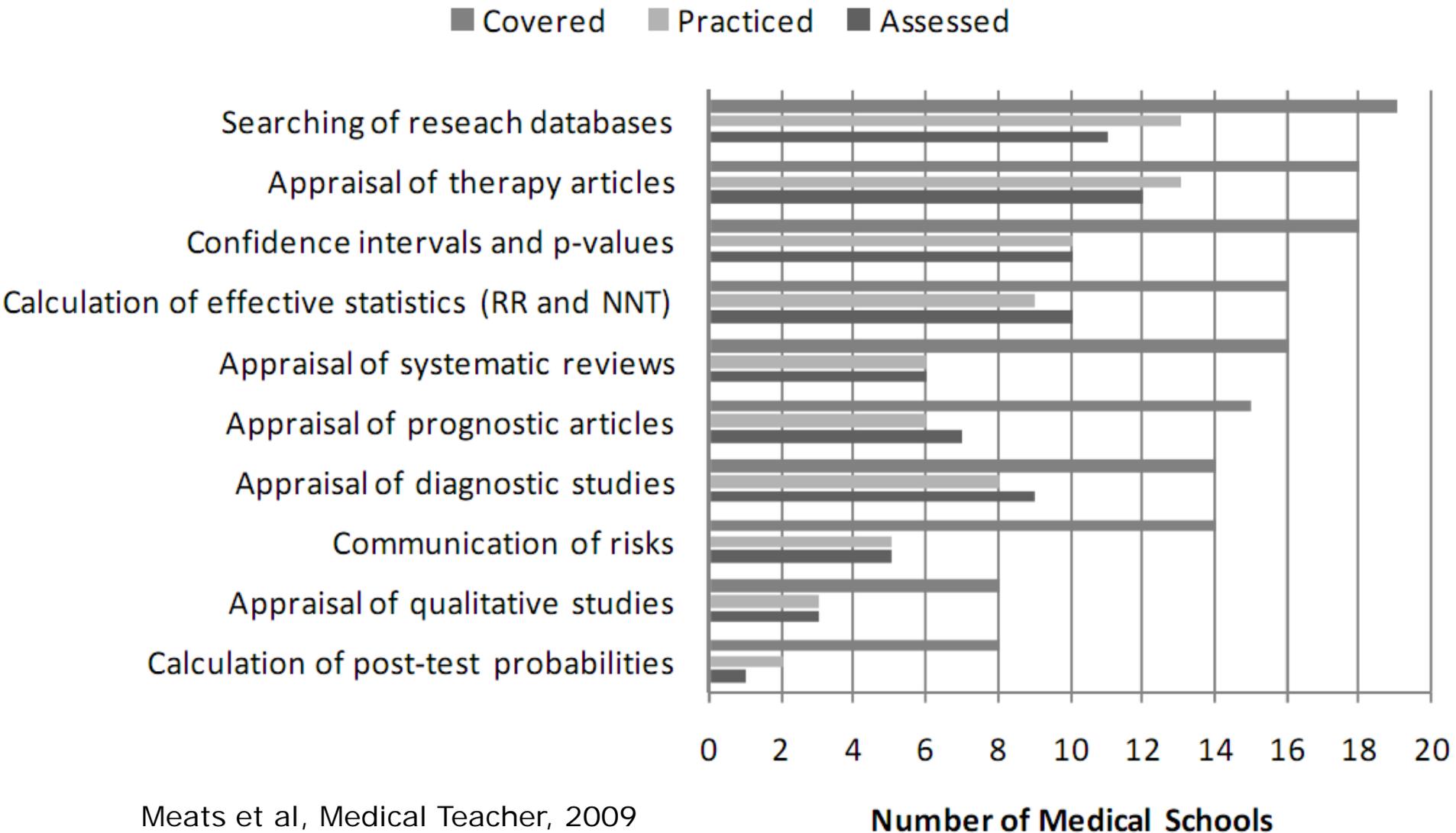


Italy
London,

com



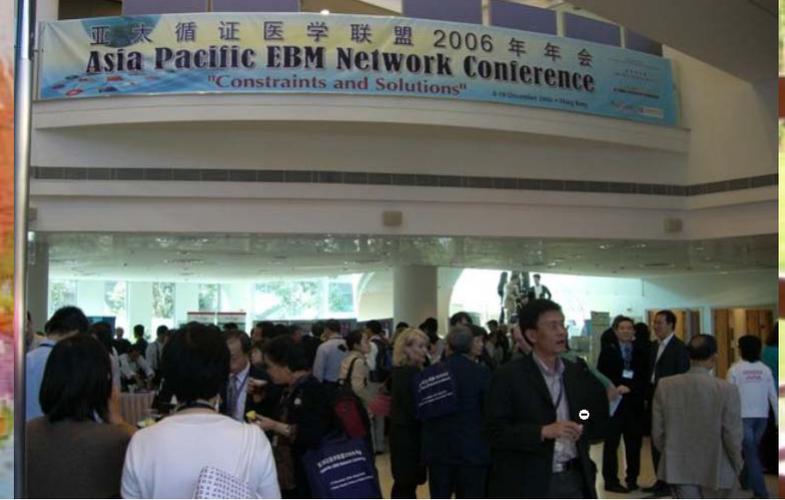
EBM teaching in UK Medical Schools (based on 20 replies from 32 schools)





EBM has spread ...

Sicily International EBHC Meeting:
2001, 2003, 2005, 2007, 2009



2nd Pan-Arab EBM conference



National Academic Mailing List Service

[Subscriber's Corner](#) [Email Lists](#)



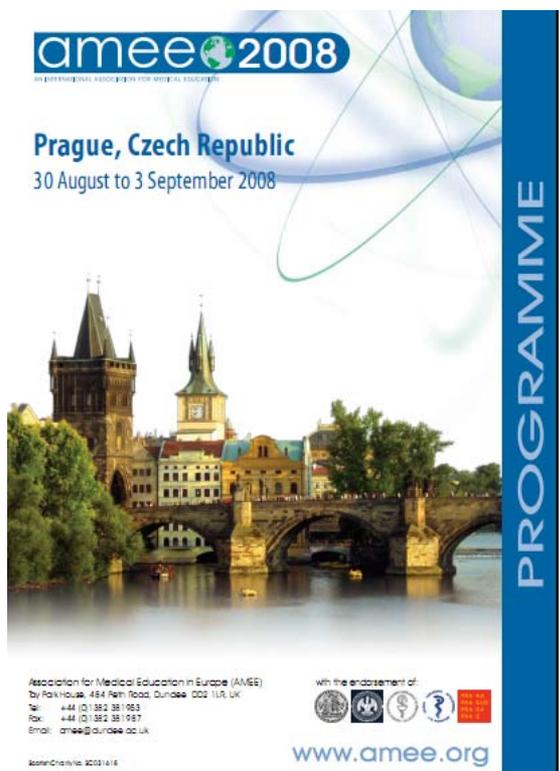
EVIDENCE-BASED-HEALTH List

1,500 members



... but EBM is (comparatively) small

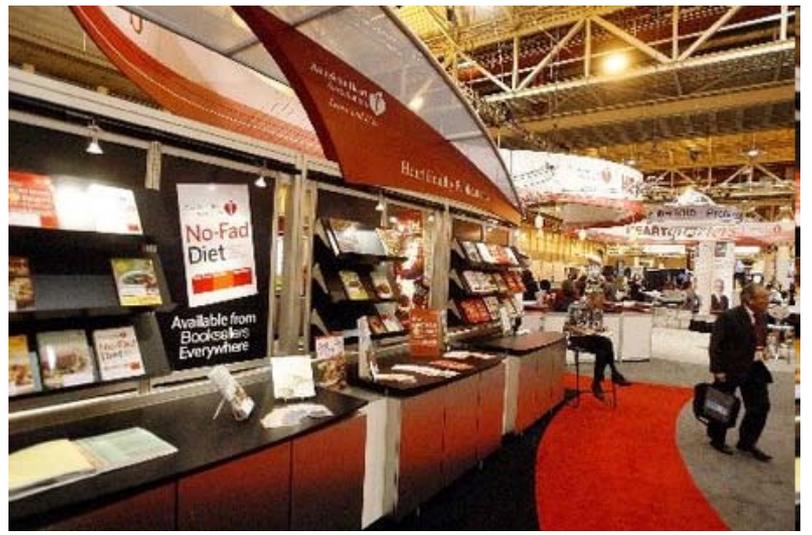
Medical Education



1,800 attendees

American Heart Association  | SCIENTIFIC SESSIONS 2009

Exhibits: November 15-17 | Sessions: November 14-18 | Orlando, Florida



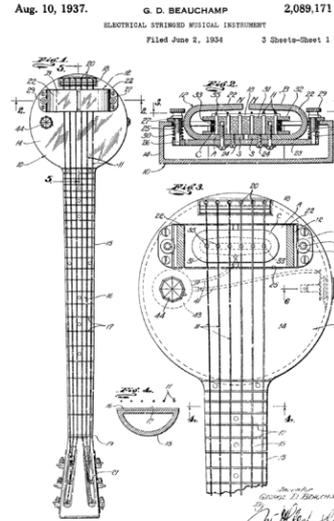
30,000 attendees



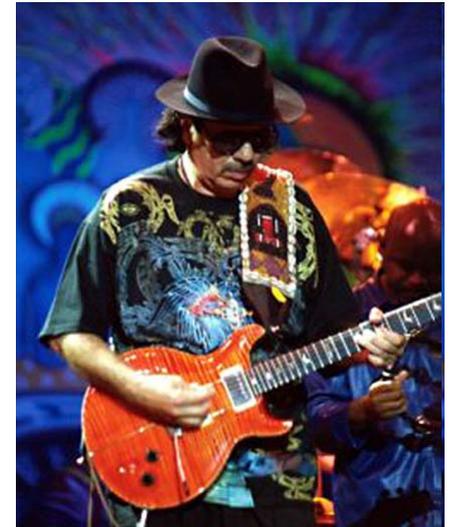
Evolution and persistence pays



1672



1931





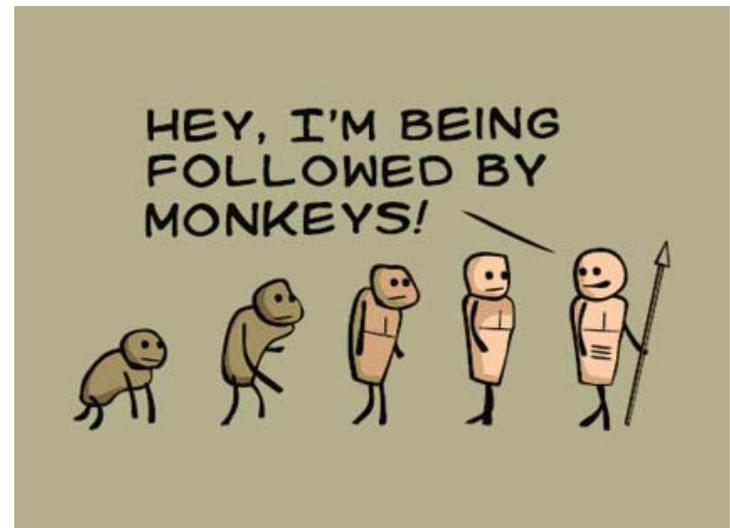
EBM rocks!





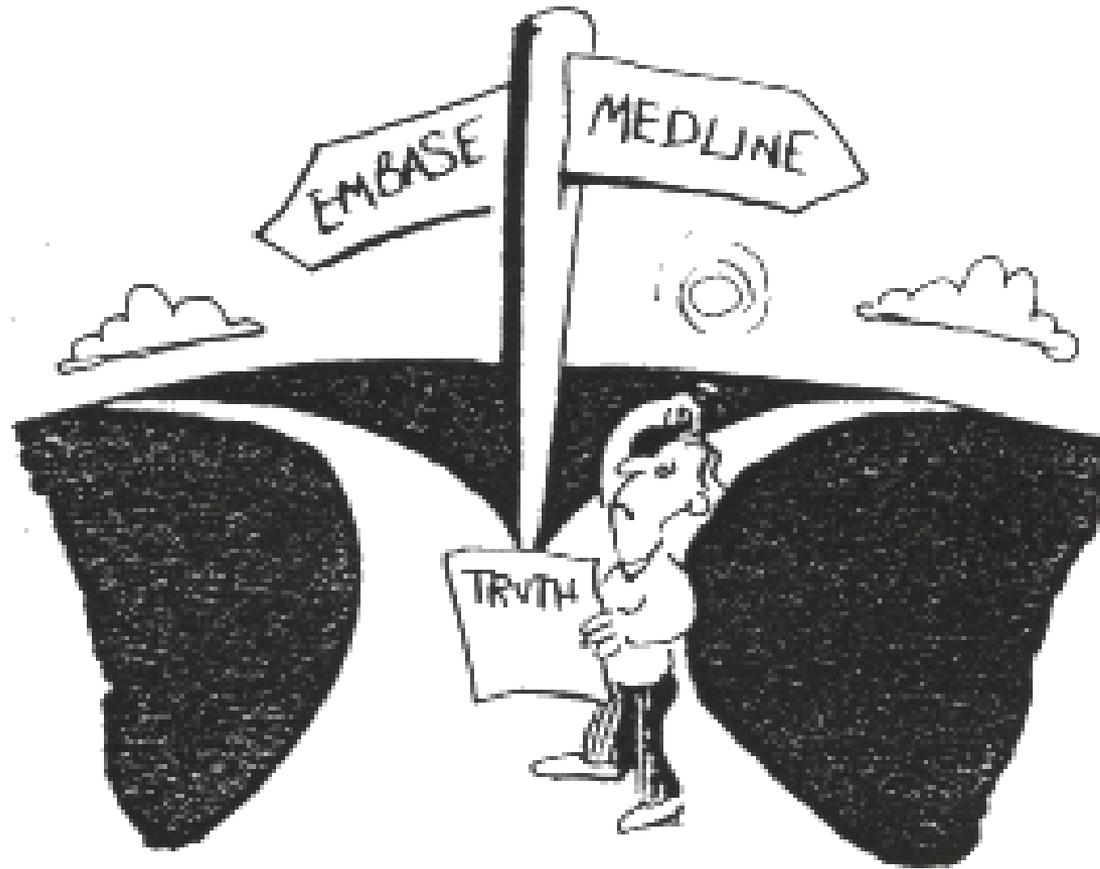
Past & future: EBM is evolving

- More evidence; better tools
- Better search methods
- Better appraisal techniques
- Better application methods





Step 2. Searching: finding good answers?





Impact of searching on correctness of answers to clinical questions

	Right to Right	Wrong to Right	<i>Right to Wrong</i>	<i>Wrong to Wrong</i>
McKibbon (GP or IM)	28%	13%	11%	48%



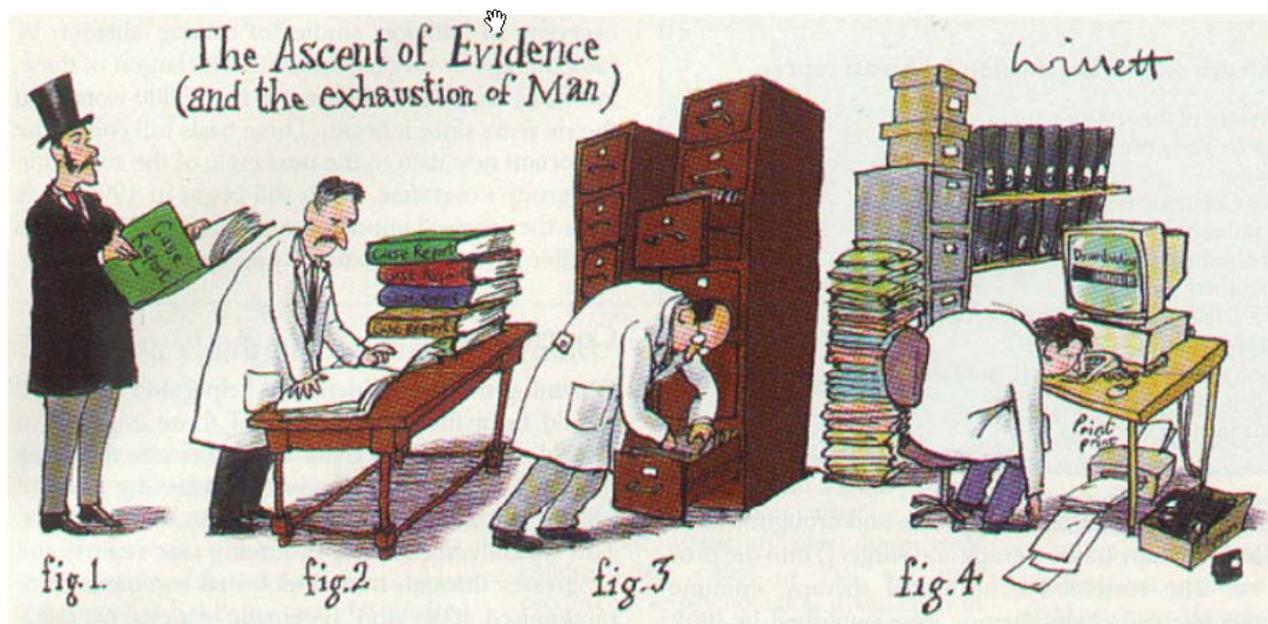
Impact of searching on correctness of answers to clinical questions

	Right to Right	Wrong to Right	<i>Right to Wrong</i>	<i>Wrong to Wrong</i>
McKibbon (GP or IM)	28%	13%	11%	48%
Quick Clinical (GPs)	21%	32%	7%	40%
Hersh (Med students)	20%	31%	12%	36%
Hersh (Nursing)	18%	17%	14%	52%



Searching: possible solutions

- Better searching training
- Better search engines (QuickClinical, TRIP, etc)
- Question-Answering service (clinical librarian)





Improved Search Filters



PubMed Clinical Queries

All Databases

PubMed

Nucleotide

Protein

Genome

Structure

OMIM

PMC

Journals

Books

About Entrez

Text Version

Entrez PubMed

Overview

Help

FAQ

Tutorials

New/Noteworthy

E-Utilities

PubMed Services

Journals Database

MeSH Database

Single Citation Matcher

Batch Citation Matcher

Clinical Queries

Special Queries

LinkOut

My NCBI

Related Resources

Order Documents

NLM Mobile

NLM Gateway

TOXNET

This page provides the following specialized PubMed searches for clinicians:

- [Search by Clinical Study Category](#)
- [Find Systematic Reviews](#)
- [Medical Genetics Searches](#)

After running one of these searches, you may further refine your results using PubMed's [Limits](#) feature.

Results of searches on these pages are limited to specific clinical research areas. For comprehensive searches, use [PubMed](#) directly.

Clinical Queries using Research Methodology Filters

Search by Clinical Study Category

This search finds citations that correlate broad and sensitive or narrow and specific. See the [filter table](#) for details.

Search

Category

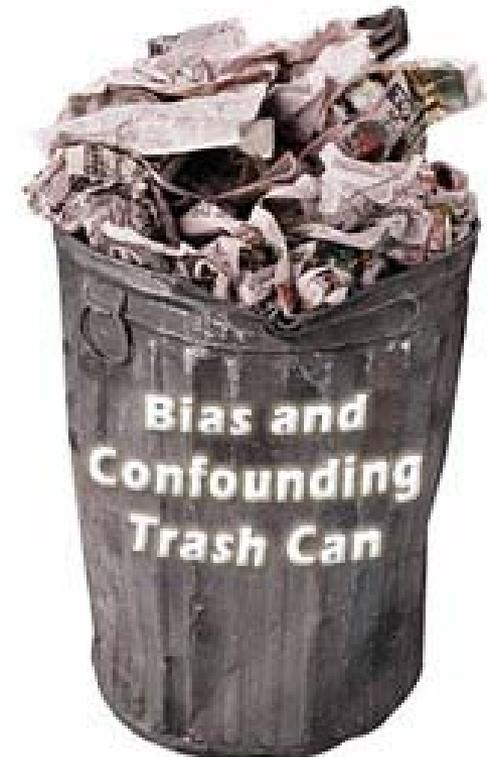
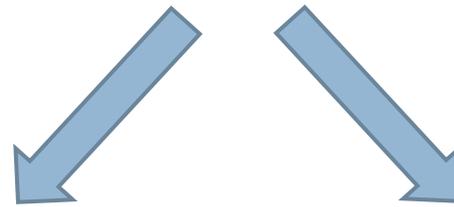
- etiology
- diagnosis
- therapy
- prognosis
- clinical prediction guides

Category	Optimized For	Sensitive/ Specific	PubMed Equivalent
therapy	sensitive/broad	99%/70%	((clinical[Title/Abstract] AND trial[Title/Abstract]) OR clinical trials[MeSH Terms] OR clinical trial[Publication Type] OR random*[Title/Abstract] OR random allocation[MeSH Terms] OR therapeutic use[MeSH Subheading])
	specific/narrow	93%/97%	(randomized controlled trial[Publication Type] OR (randomized[Title/Abstract] AND controlled[Title/Abstract] AND trial[Title/Abstract]))
diagnosis	sensitive/broad	98%/74%	(sensitiv*[Title/Abstract] OR sensitivity and specificity[MeSH Terms] OR diagnos*[Title/Abstract] OR diagnosis[MeSH noexp] OR diagnostic * [MeSH noexp] OR diagnosis, differential[MeSH noexp] OR diagnosis[Subheading noexp])
	specific/narrow	64%/98%	(specificity[Title/Abstract])
etiology	sensitive/broad	93%/63%	(risk*[Title/Abstract] OR risk*[MeSH noexp] OR risk * [MeSH noexp] OR cohort studies[MeSH Terms] OR group*[Text Word])
	specific/narrow	51%/95%	((relative[Title/Abstract] AND risk*[Title/Abstract]) OR (relative risk[Text Word] OR risks[Text Word] OR cohort studies[MeSH noexp] OR (cohort[Title/Abstract] AND stud*[Title/Abstract])))
prognosis	sensitive/broad	90%/80%	(incidence[MeSH noexp] OR mortality[MeSH Terms] OR follow up studies[MeSH noexp] OR prognos*[Text Word] OR predict*[Text Word] OR course*[Text Word])
	specific/narrow	52%/94%	(prognos*[Title/Abstract] OR (first[Title/Abstract] AND episode[Title/Abstract]) OR cohort[Title/Abstract])
clinical prediction guides	sensitive/broad	96%/79%	(predict*[tiab] OR predictive value of tests[mh] OR scor*[tiab] OR observ*[tiab] OR observer variation[mh])
	specific/narrow	54%/99%	(validation[tiab] OR validate[tiab])



Step 3. Critical Appraisal

It's peer-reviewed, therefore it must be OK?





Clinicians cannot tell good from poor quality research

BMJ study of 607 reviewers

- ▣ 14 deliberate errors inserted

Detection rates

- ▣ On average <3 of 9 major errors detected
- ▣ Poor Randomisation (by name or day) - 47%
- ▣ Not intention-to-treat analysis - 22%
- ▣ Poor response rate - 41%

Modestly improved by 1-day training

Schroter S et al, J R Soc Med. 2008: 507-14.





Appraisal: possible solutions

- Better appraisal training
- Better appraisal pre-publication
- Appraisal service (evidologists)



Unified Critical Appraisal

EBM notebook

The GATE frame: critical appraisal with pictures

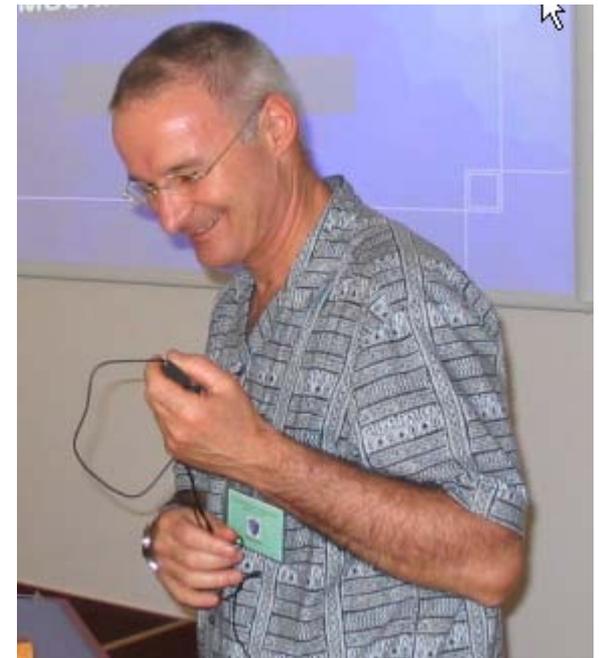
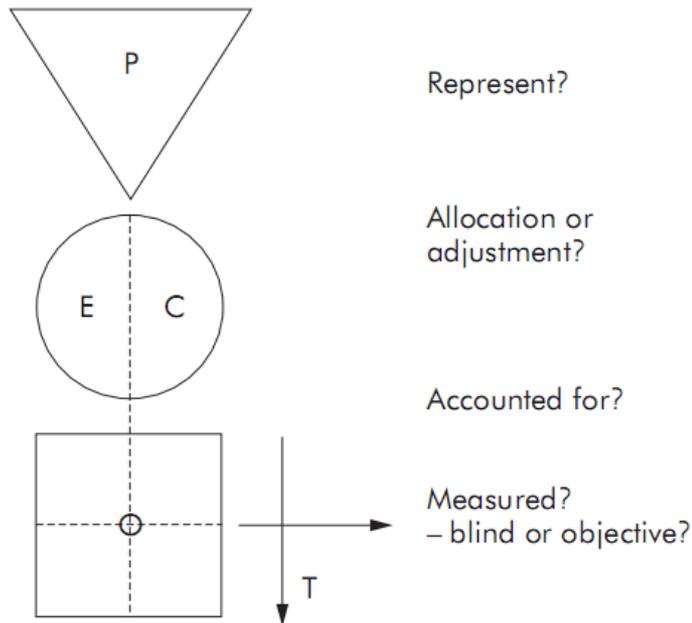


Figure 6 Study validity (RAAMbo).

Rod Jackson



Are RCTs always needed for treatment questions?

- Some immediate & dramatic effects don't need RCTs*

- Example:

- Child with nasal foreign body
 - Dislodged with Parent Kiss method
 - Case series of success 15/19
 - Botma J Laryngol Otol 2000

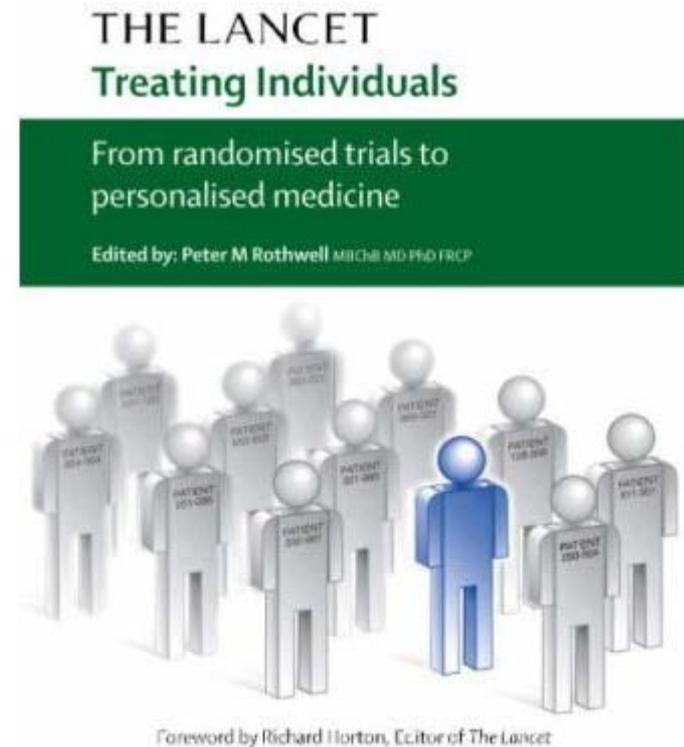


* Glasziou, Chalmers, Rawlins, McCulloch BMJ 2007



Step 4: Applying to individuals

- What do the results mean on average?
- What do they mean for this individual?
- *How do I use in practice*





Team-based EBM: digesting the evidence

Fortnightly GP “Journal Club”

Step 1 – 10 minutes (TOPICS?)

- Discuss new problems and topics (questions, EBM journal, guidelines)

Step 2 – 40 minutes (THE EVIDENCE)

- Read and appraise research paper for last weeks problem

Step 3 – 10 minutes (NEXT ACTIONS)

- Agree conclusions and “next actions”
- Organise changes in practice and follow up – who, what, when?





Summary: optimist & pessimist

- Rapid growth in research & trials
But much is poor, unsynthesised, or unusable
- Search engines improving
but clinicians may find bad information
- Skills in EBM increasing
but many medical schools still ignore





International Society for Evidence-Based Practice?



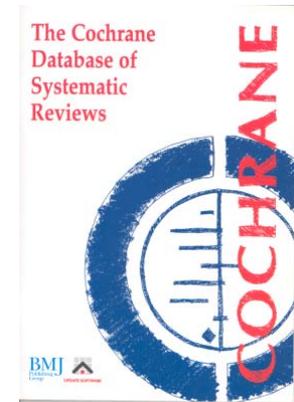
EBM Centres in

- Oxford, McMaster, Riyadh, Tabriz, Taipei, Philippines, Kuala-Lumpur, Jakarta, Australia, NZ, ...



GIMBE[®]

Gruppo Italiano per la Medicina Basata sulle Evidenze







Step 4: Ways to individualise treatment

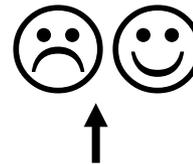
1. Chronic disease

- ▣ Single patient “trials”
- ▣ Monitoring & adjustment



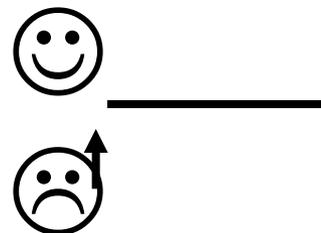
2. Acute disease

- ▣ Predicting recovery



3. Prevention

- ▣ Predicting future risk





Collaboration between practices

Quality:MK (Milton Keynes) partners

- Health:MK – 26 of 27 general practices
- NHS Milton Keynes – the payer
- Patient and Public Involvement Forum
- University of Oxford
 - ▣ Centre for Evidence Based Medicine





Team EBM within & between practices

Evidence-based discussion groups

“Share and spread”

- EBM skills training & toolkit
- Librarian support
- Pharmacist support

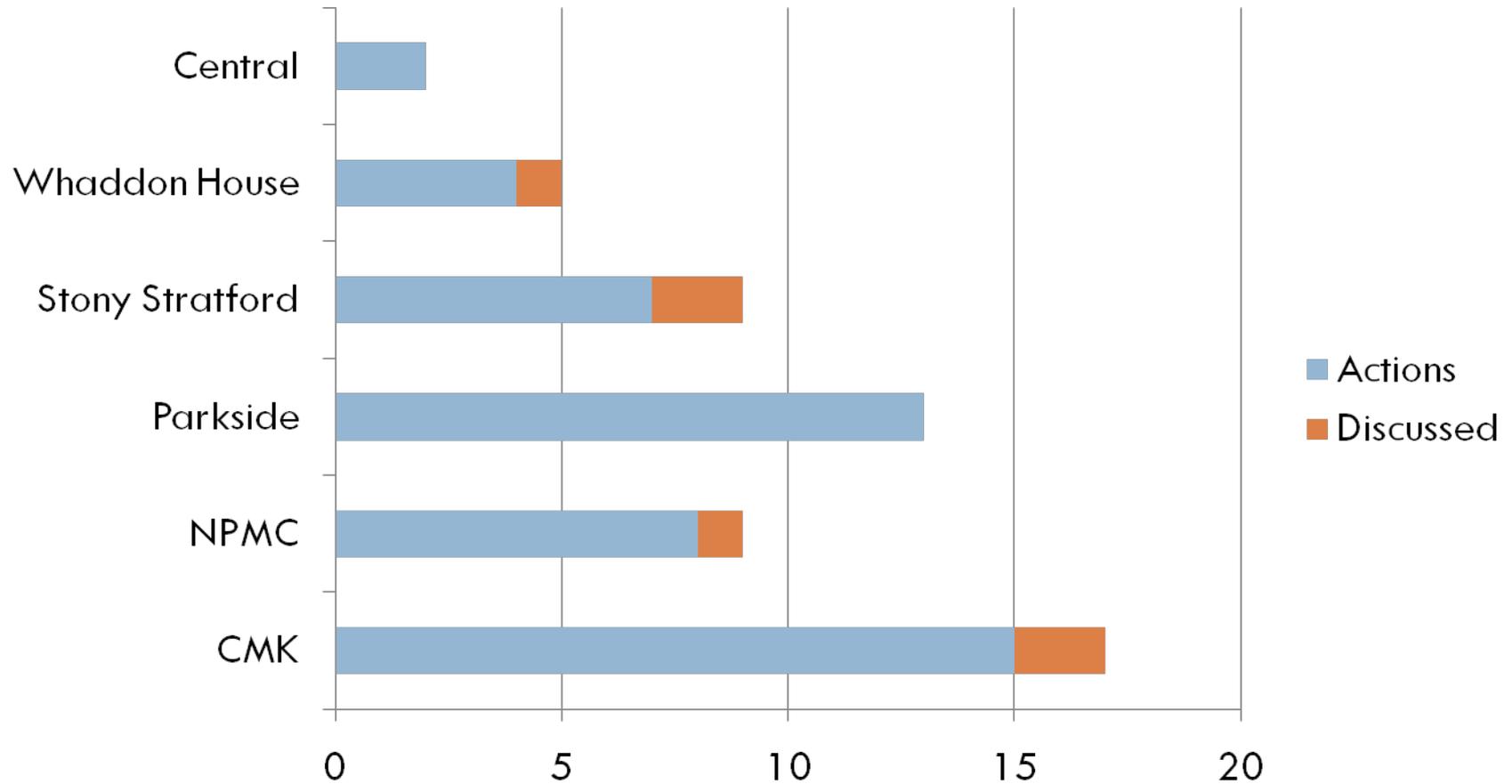


IMPACTE groups

Improving **M**edical **P**ractice by
Assessing **C**urrent **T**evidence



Practice Activity 2007-2009





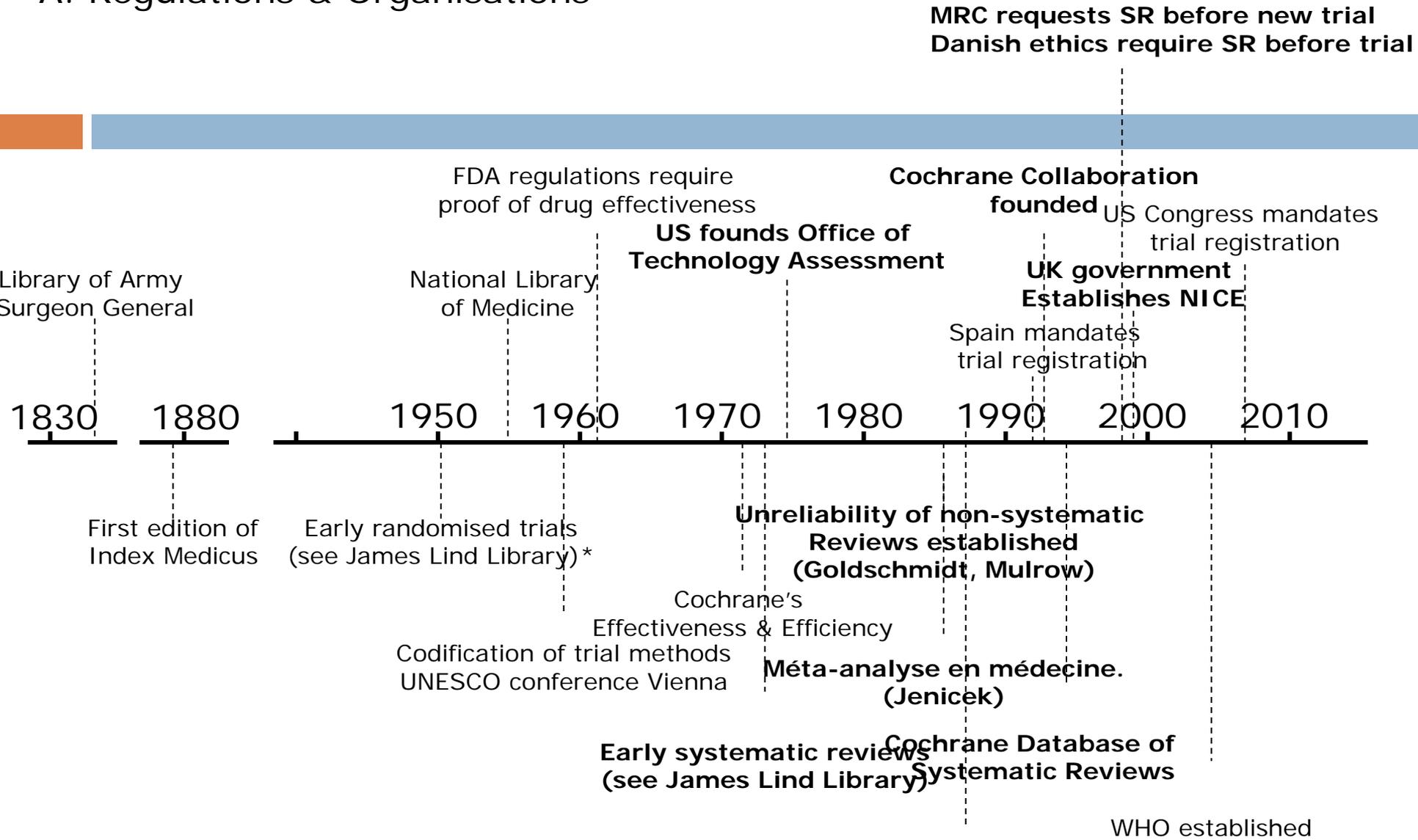
The Current Projects

- Carpal Tunnel Syndrome
- Delayed antibiotics
- Smoking Cessation
- Diabetes
- Mild to Moderate Depression
- Dyspepsia
- Patient Empowerment
- Alcohol reduction
- Weight Management
- Prescribing Projects
- Map of Medicine





A. Regulations & Organisations



B. Publications

Oxford Database of Perinatal Trials

WHO established International Trials Registry



Evidence-Based Medicine – where are we?

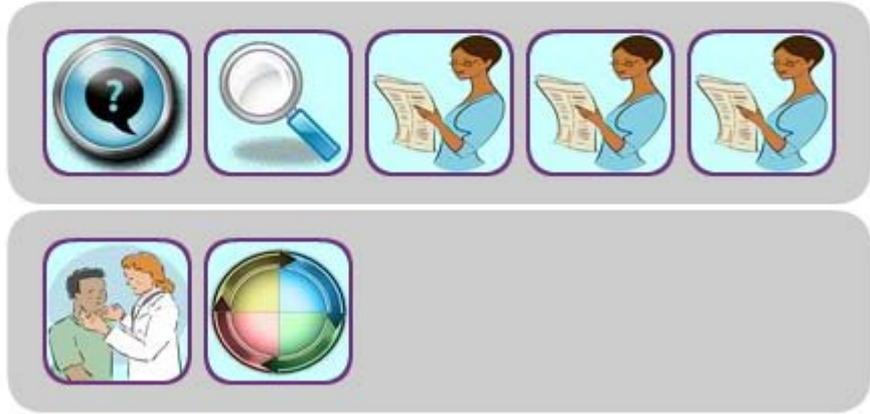
- Exponential growth in research & trials
- EBM has, and will, evolve
- Better understanding of barriers & work-based learning





EU-EBM (Evidence Based Medicine) Courses

- COURSES
 - EBM students
 - EBM teachers
- ASSESSMENTS
 - EBM students
 - EBM teachers
- GLOSSARY
- HANDBOOK
- EU EBM UNITY
- EU EBM TTT
- PUBLICATIONS
- NEWS AND EVENTS
- ABOUT US
- CONTACTS



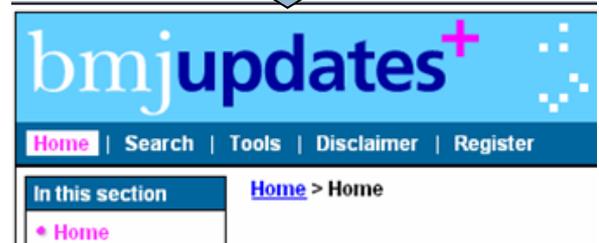


Finding Validity articles

EBM Journal Process

- 140+ journals scanned
 - 60,000 articles
- Is it **valid**? (<5%)
 - Intervention: RCT
 - Prognosis: inception cohort
 - Etc
- Is it **relevant**?
 - 6-12 GPs & specialists asked: Relevant? Newsworthy?
- < 0.5% selected

Number Needed to Read to find 1 valid is 20+



Number Needed to Read to find 1 valid & relevant is 200+





What is the treatment?

- The paper's description of sodium reduction
 - ▣ "Individual and weekly group counseling sessions were offered initially, with less intensive counseling and support thereafter, specific to sodium reduction."





What is sodium reduction?

- The paper's description
 - ▣ "Individual and weekly group counseling sessions were offered initially, with less intensive counseling and support thereafter, specific to sodium reduction."
- Previous reference
 - ▣ (i) an individual session followed by 10 weekly group 90 minute sessions with a nutritionist, followed by a transitional stage of some additional sessions
 - ▣ (ii) Topics in the weekly sessions included Getting Started, sodium basics, the morning meal, midday sources of sodium, the main meal, planning ahead, creative cooking, eating out, food cues, and social support,
 - ▣ (iii) the sessions included sampling of foods, discussion of articles on sodium reduction, and problem-solving,
 - ▣ (iv) patients kept diaries at least 6 days per week, and urine sodiums were measured.

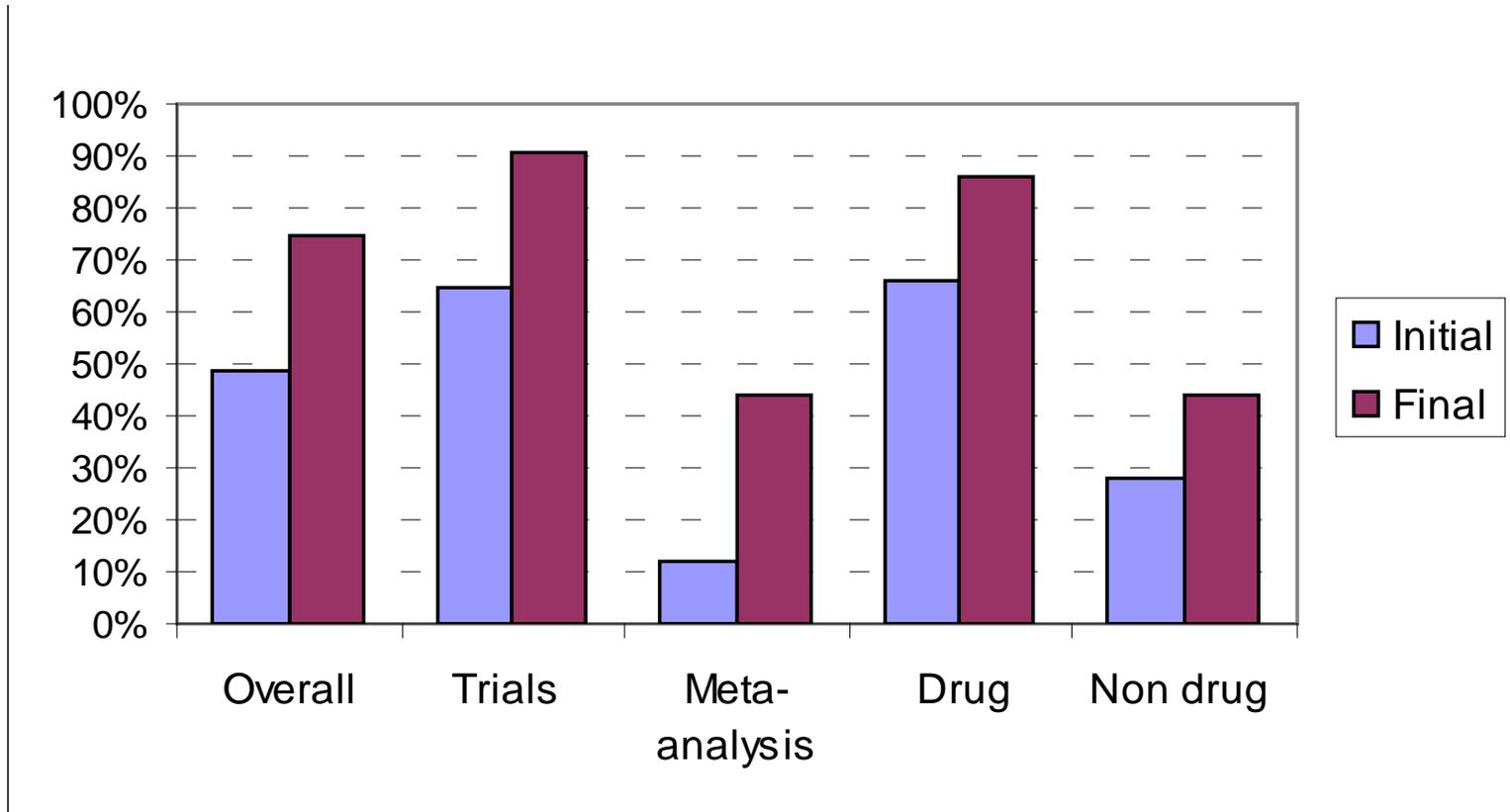


EDITORIALS

Promoting evidence-based non-drug interventions: time for a non-pharmacopoeia?

Paul P Glasziou

A compilation of effective non-drug treatments could help increase their uptake in clinical practice





Avoidable waste in the production and reporting of research evidence

Iain Chalmers, Paul Glasziou

Lancet, 2009

