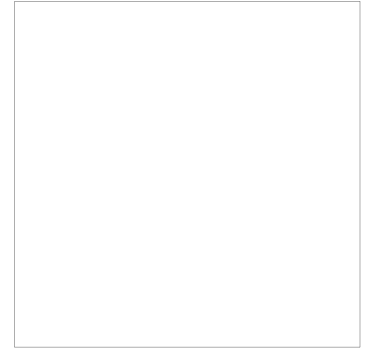


**Introduction to  
Information Mastery  
AND  
Answering clinical  
questions using the Web**

**Mark H. Ebell MD, MS, University of Georgia  
John Hickner, MD, MS, University of Illinois  
at Chicago**

# Welcome!

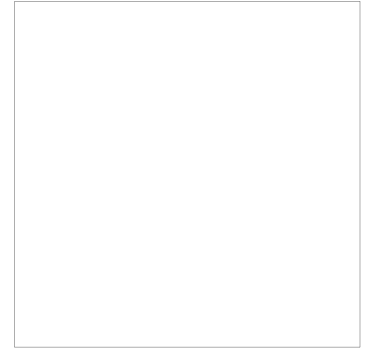


Not your usual CME...

- (Almost) no Powerpoint
- 30 minute talks
- Truly evidence-based
- Speakers are not industry supported

## Each talk is based largely on:

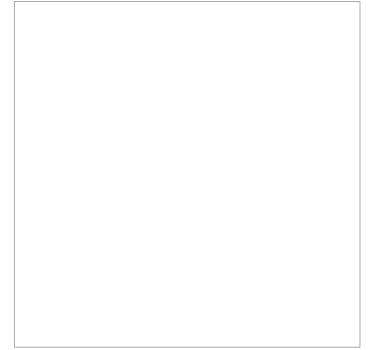
- POEMs from the past 2-4 years
- Cochrane systematic reviews
- Evidence-based guidelines
- Editor's Choice will cover an assortment of topics not addressed elsewhere
- **Follow along, or better yet read ahead**



# Faculty

## John Hickner MD, MSc

- Family physician with 36 years clinical practice; 22 years of practice in the UP, Escanaba, Michigan
- Editor in Chief, Journal of Family Practice
- Faculty, Michigan State University then University of Chicago
- Former Chair, Cleveland Clinic
- Chair, University of Illinois - Chicago
- Research: patient safety, access to care, quality, common primary care problems



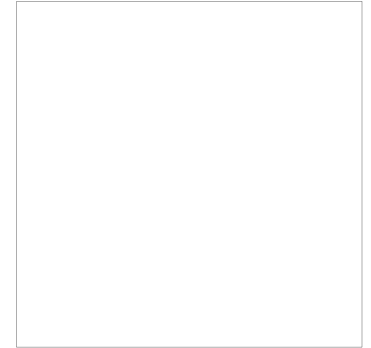
# Faculty

## Gary Ferencick, MD

- Division Chief for General Internal Medicine at Michigan State University's College of Human Medicine.
- He maintains an active inpatient and outpatient practice and is the recipient of 10 awards for excellence in teaching.
- Currently serves as a senior associate editor for *Essential Evidence*
- Commentator for Primary Care Medical Abstracts



# Faculty



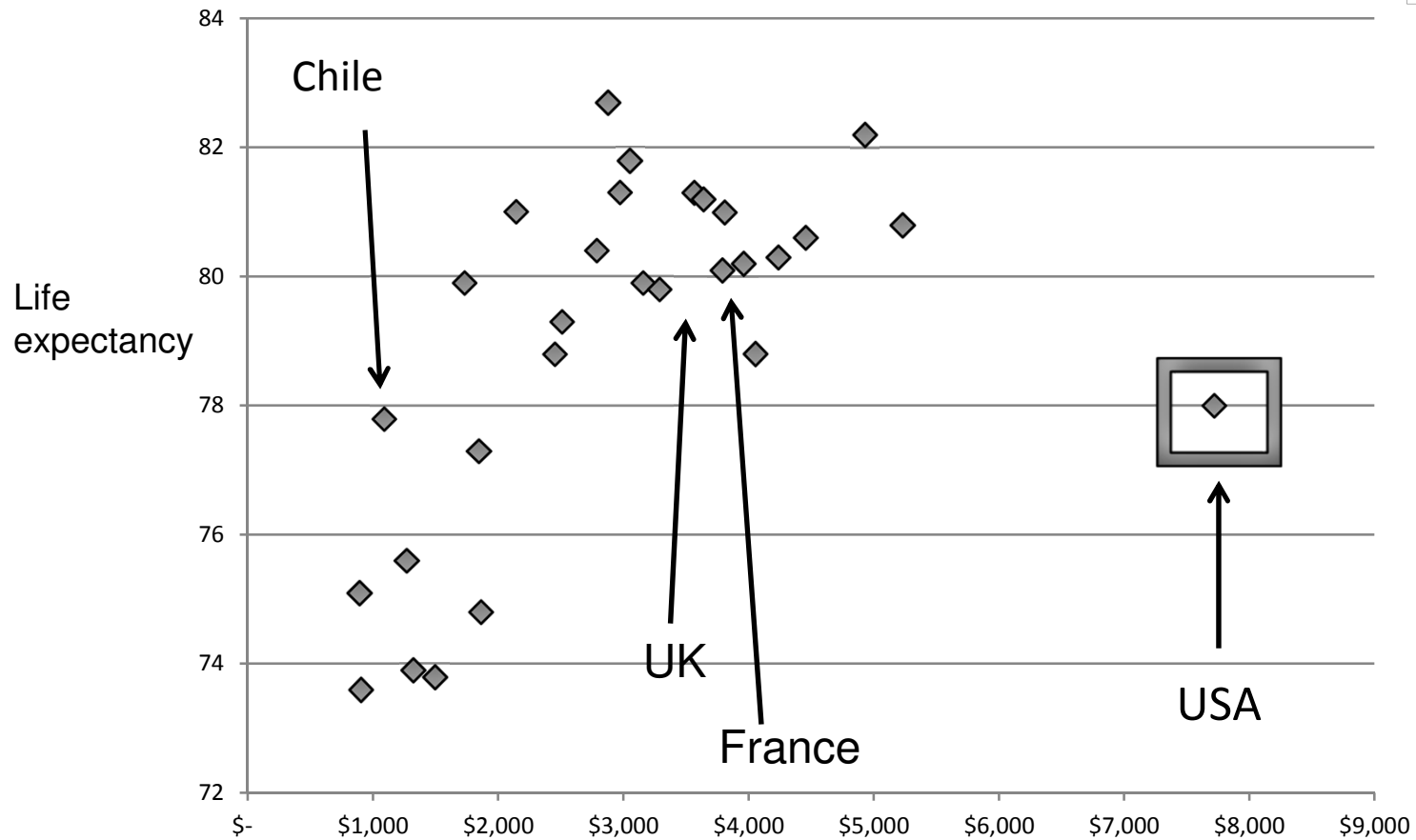
## Mark H. Ebell MD, MS

- Family physician, began career in solo rural practice (Colbert, GA)
- Faculty at Wayne State, Michigan State and now University of Georgia
- Editor-in-chief of Essential Evidence, Deputy editor of American Family Physician, member of USPSTF
- Research in clinical decision support, informatics, systematic reviews of diagnosis, and acute RTI



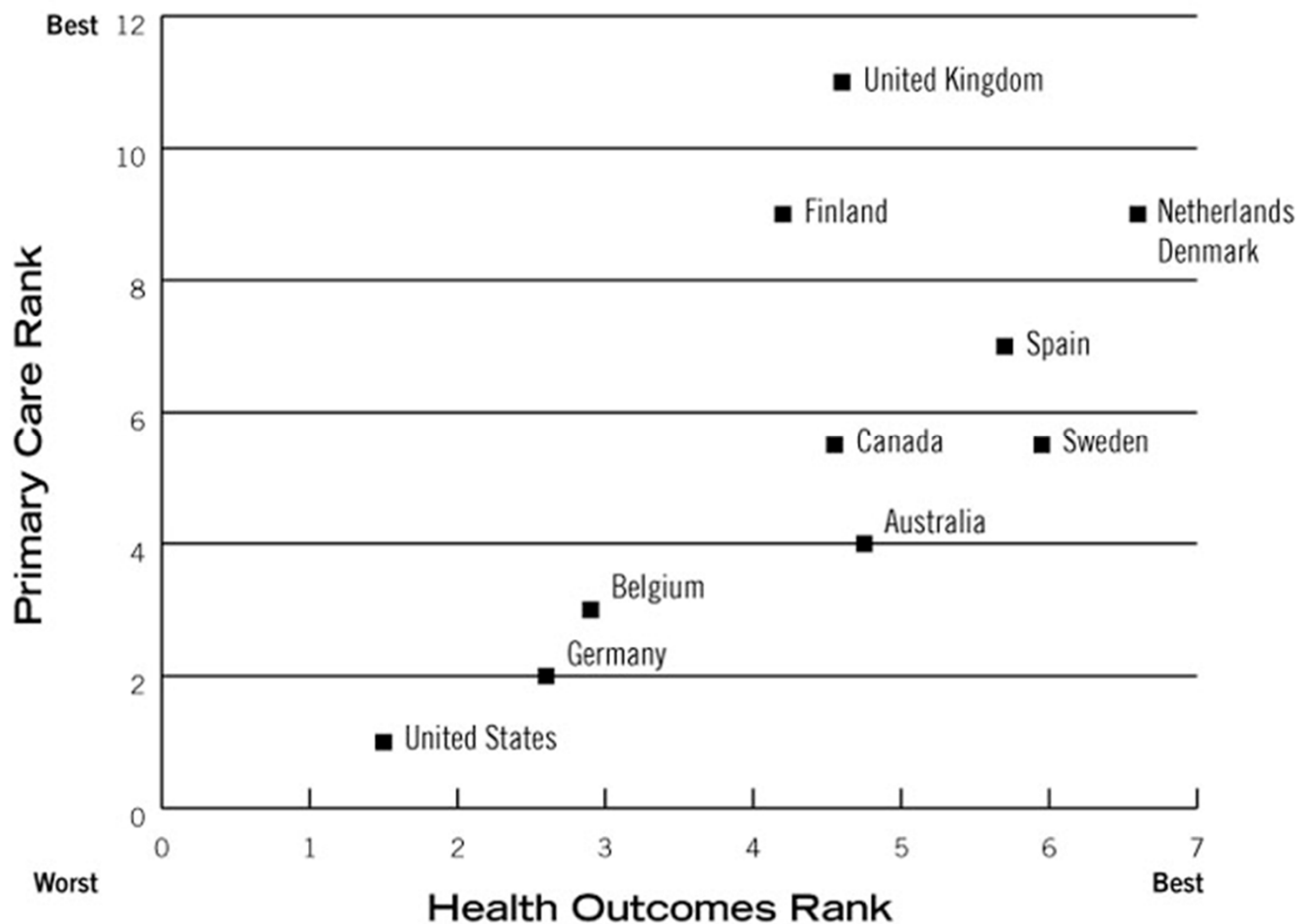
# We can do better: Cost vs life expectancy

Life expectancy (years) vs healthcare \$/capita  
(2008, OECD)

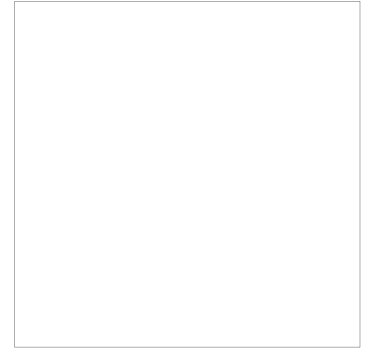


# We are part of the answer: Importance of primary care

Figure 2 (Data source: B. Starfield, *Primary Care: Balancing Health Needs, Services and Technology*. NYC: Oxford University Press. 1998)

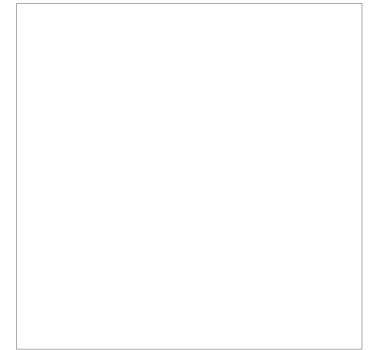






**The challenge of evidence-based practice: how can we find the most useful information without getting swamped?**

# Outcomes matter... what do your patients REALLY care about?



Basic science theory and pathophysiology

Surrogate markers in animals

Surrogate markers in humans (e.g. LDL, blood sugar)

Disease-specific clinical outcomes (e.g. CV mortality)

All-cause mortality, morbidity, and quality of life

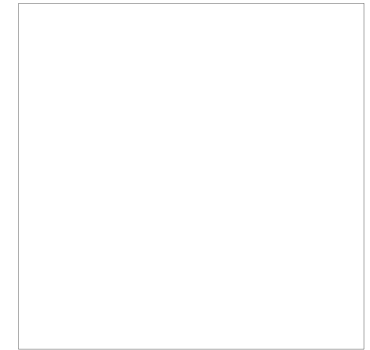
---

Disease-Oriented Evidence

---

Patient-Oriented Evidence

# What is the most useful medical information?

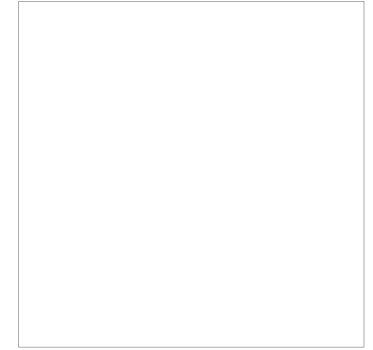


Usefulness = Relevance x Validity

Work

- **Whether** to read an article, not just **how** to read an article as with original EBM teaching.
- Central concept in “Information Mastery” approach of Dave Slawson (UVirginia) and Allen Shaughnessy (Tufts), proposed in 1994.

# Information Mastery

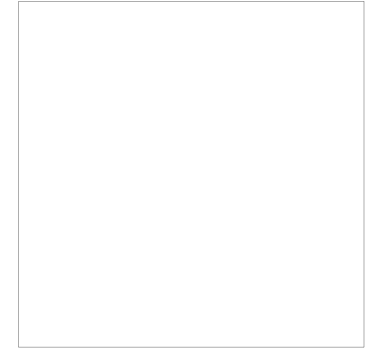


**Usefulness = Relevance x Validity**

## **Work**

- Common or important problem in your practice
- Relevant population was studied
- Patient-oriented outcomes reported (how well or long patients live)

# Information Mastery

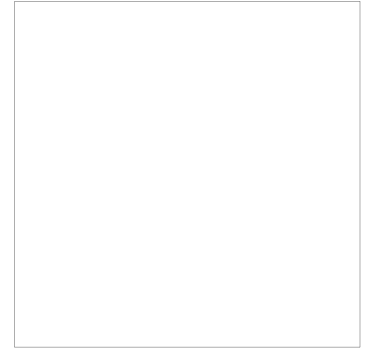


**Usefulness = Relevance x Validity**

## **Work**

- Was study was designed to minimize bias?
- Unintentional and intentional?
- Most physicians need an expert in critical appraisal to evaluate studies

# Information Mastery

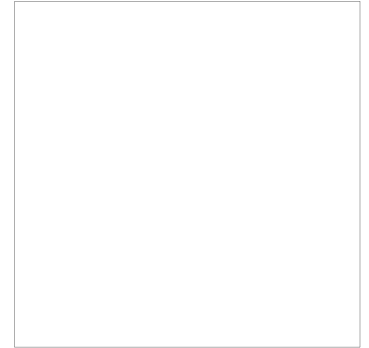


**Usefulness = Relevance x Validity**

## **Work**

- Concise summaries emailed to you (POEMs)
- Algorithms, tables, figures, interactive tools
- Concise bullets, not lengthy text
- Point of care access

# **POEMs: Patient Oriented Evidence that Matters**



- **Relevant**
  - Reports improved patient-oriented outcomes
- **Valid**
  - Study designed to avoid intentional and unintentional bias
- **It Matters**
  - Would change your practice

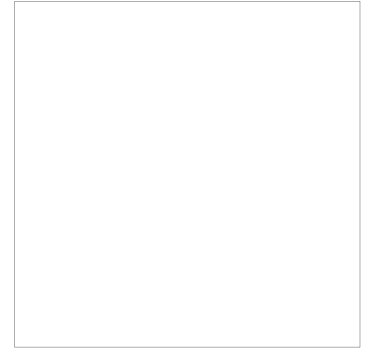
**POEMs tell you about new information that has potential to improve how long or well your patients live**

# Comparing POEMs and DOEs (disease oriented evidence)

Example	DOE	POEM	Comment
Avandia <sup>TM</sup>	Lowers blood sugar	↑ CV mortality, CHF	POEM ≠ DOE
Metformin	Lowers blood sugar	↓ all-cause mortality	POEM = DOE
Tight blood sugar control for Type 2 DM	Lower is always better!	No change and possibly even increased mortality	POEM ≠ DOE
Diuretics for BP	Diuretic ↓ BP	Diuretic ↓ mortality	POEM = DOE
Arthroscopic surgery for OA of knee	Cleaning joint debris is good	No change in symptoms/ function	POEM ≠ DOE
Antiarrhythmics	Encanide ↓ PVCs on ECG	Encanide ↑ mortality	POEM ≠ DOE



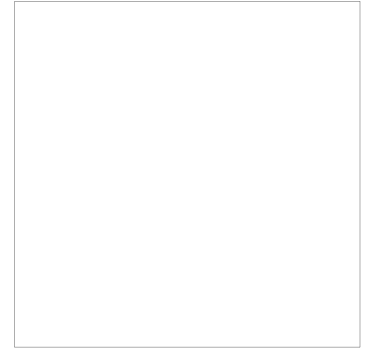
# POEMs as a practical filter to keep current



- Each year
  - 600,000 articles added to PubMed
  - 20,000 articles per year in top 100 English language clinical journals
  - **Only 250 articles meet the criteria for POEMs**

Only 1.2% of articles in top journals, and only 0.04% of articles indexed in PubMed each year

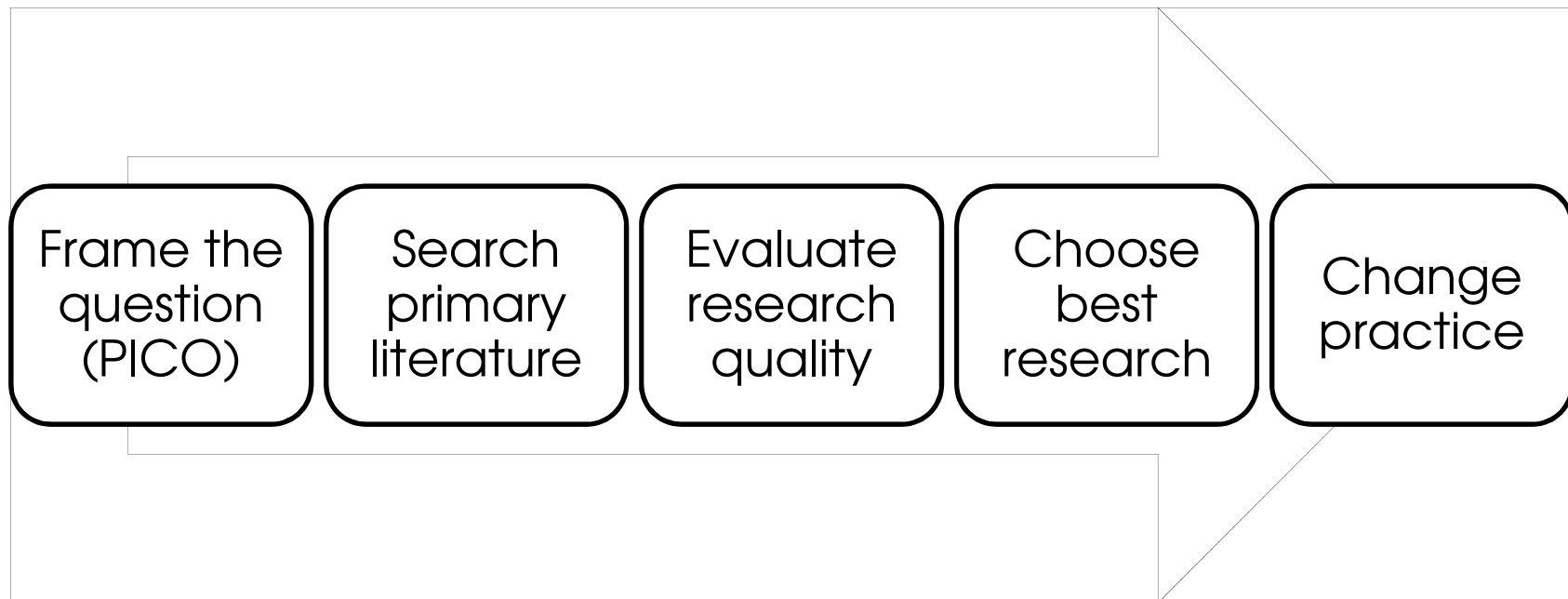
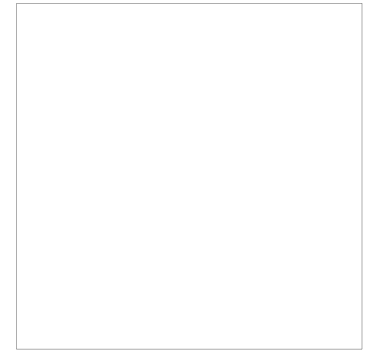
# Some hints for answering questions



1. Use secondary sources first: let someone else do the searching and filtering and evidence assessment
2. Get smart about searching PubMed
3. Load up your smartphone with apps

# Primary vs secondary literature

Old approach to answering questions



# Primary vs secondary literature

New approach to answering questions

Frame a clinical  
question

Search secondary  
literature

Only if that fails do you have to:

Search  
primary  
literature

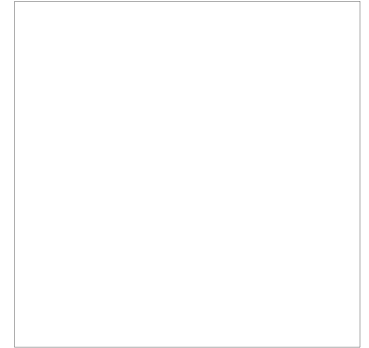
Evaluate  
research  
relevance

Evaluate  
research  
validity

Choose best  
research

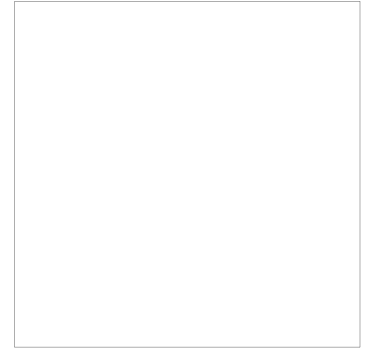
Change  
practice

# Examples of Secondary Sources



- Essential Evidence
  - Daily InfoPOEMs via email
  - Online reference with evidence-based topic summaries, interactive decision support, Cochrane abstracts, guidelines, diagnostic test data
  - [www.essentialevidence.com](http://www.essentialevidence.com) is an example
  - Disclosure: Dr. Ebell helped develop it and is editor-in-chief
  
- Other evidence-based secondary sources
  - DynaMed, UpToDate?, National Guidelines Clearinghouse, Clinical Evidence, ACP PIER

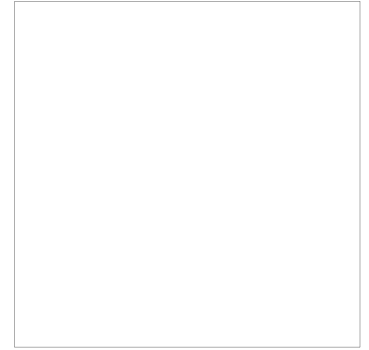
# What does Ebell do in the clinic?



1. Simple prescribing question → ePocrates
2. Otherwise, check Essential Evidence first
3. If no answer, check National Guidelines Clearinghouse and possibly NICE (UK)
4. If still no answer, do quick PubMed search using Clinical Queries filters
5. Hickner approach: UpToDate, DynaMed, Google!

# National Guidelines Clearinghouse

- <http://www.guidelines.gov>



PubMed home - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.ncbi.nlm.nih.gov/sites/entrez?holding=gaugalib

Google pubmed uga Search Sidewiki Bookmarks Translate

PubMed home UGA Libraries News & Events » Blog... PubMed home

NCBI Resources How To My NCBI | Sign In

**PubMed.gov**  
U.S. National Library of Medicine  
National Institutes of Health

Search: PubMed Advanced search Help

Search Clear

**Welcome to PubMed**

PubMed comprises more than 19 million citations for biomedical articles from MEDLINE and life science journals. Citations may include links to full-text articles from PubMed Central or publisher web sites.

**Using PubMed**

- PubMed Quick Start
- New and Noteworthy
- PubMed Tutorials
- Full Text Articles
- PubMed FAQs

**PubMed Tools**

- Single Citation Matcher
- Batch Citation Matcher
- Clinical Queries**
- Topic-Specific Queries

**More Resources**

- MeSH Database
- Journals Database
- Clinical Trials
- E-Utilities

Done



Type your search terms here

Search acute bronchitis antibiotics

Search Clear

Results of searches on this page are limited to specific clinical research areas. For comprehensive searches, use PubMed directly.

### Clinical Study Categories

### Systematic Reviews

### Medical Genetics

Category: Therapy  
Scope: Narrow

Select category and scope here

All

Results: 5 of 310

- Documentation-based clinical decision support to improve antibiotic prescribing for acute respiratory infections in primary care: a clus [Inform Prim Care. 2009]
  - Efficacy and tolerability of EPs 7630 in children and adolescents with acute bronchitis - a randomized, double blind, placebo-controlled [Int J Clin Pharmacol Ther. 2010]
  - Efficacy and tolerability of EPs 7630 in patients (aged 6-18 years old) with acute bronchitis. [Acta Paediatr. 2010]
  - ED antibiotic use for acute respiratory illnesses since pneumonia performance measure inception. [Am J Emerg Med. 2010]
  - Effect of procalcitonin-based guidelines vs standard guidelines on antibiotic use in lower respiratory tract infections: the ProHOSP randomized control [JAMA. 2009]
- See all (310)

Results: 5 of 103

- [Consensus conference on acute bronchiolitis (II): epidemiology of acute bronchiolitis. Review of the scientific evidence] [An Pediatr (Barc). 2010]
  - Cost and clinical consequence of antibiotic non-adherence in acute exacerbations of chronic bronchitis. [Int J Tuberc Lung Dis. 2009]
  - Penicillins vs trimethoprim-based regimens for acute bacterial exacerbations of chronic bronchitis: meta-analysis of randomized contro [Can Fam Physician. 2009]
  - [Diagnosis and treatment of bronchiectasis. Spanish Society of Pneumology and Thoracic Surgery] [Arch Bronconeumol. 2008]
  - Management of acute bronchiolitis: can evidence based guidelines alter clinical practice? [Thorax. 2008]
- See all (103)

Results: 5 of 12

- Neonatal pertussis presenting as acute bronchiolitis: direct detection of the Bordetella pertussis genome using loop-mediated isothermal amplificati [Eur J Pediatr. 2009]
  - Multiple simultaneous viral infections in infants with acute respiratory tract infections in Spain. [J Clin Virol. 2008]
  - Fluoroquinolone-resistant group B streptococci in acute exacerbation of chronic bronchitis. [Emerg Infect Dis. 2008]
  - Antimicrobial resistance in Haemophilus influenzae. [Clin Microbiol Rev. 2007]
  - Pseudomonas aeruginosa chronic colonization in cystic fibrosis patients. [Curr Opin Pediatr. 2007]
- See all (12)

Filter citations to a specific clinical study category and scope. These search filters were developed by Jaynes RB et al.

Filter citations for systematic reviews, meta-analyses, reviews of clinical trials, evidence-based medicine, consensus development conferences, and guidelines. See related sources.

Filter citations to topics in medical genetics.

PubMed Clinical Queries - Windows Internet Explorer

http://www.ncbi.nlm.nih.gov/sites/pubmedutils/clinical

NCBI Resources How To My NCBI Sign In

## PubMed Clinical Queries

Search "acute bronchitis" antibiotics Search Clear

Results of searches on this page are limited to specific clinical research areas. For comprehensive searches, use PubMed directly.

### Clinical Study Categories

Category: Therapy

Scope: Narrow

### Systematic Reviews

### Medical Genetics

Topic: All

---

Results: 5 of 73

Documentation-based clinical decision support to improve antibiotic prescribing for acute respiratory infections in primary care: a clus [Inform Prim Care. 2009]

Efficacy and tolerability of EPs 7630 in children and adolescents with acute bronchitis - a randomized, double-blind, placebo-controlled [Int J Clin Pharmacol Ther. 2010]

Efficacy and tolerability of EPs 7630 in patients (aged 6-18 years old) with acute bronchitis. [Acta Paediatr. 2010]

Effect of procalcitonin-based guidelines vs standard guidelines on antibiotic use in lower respiratory tract infections: the ProHOSP randomized control [JAMA. 2009]

Placebo found equivalent to amoxicillin for treatment of acute bronchitis in Nairobi, Kenya: a triple blind, randomised, equivalence trial. [Thorax. 2008]

[See all \(73\)](#)

[Filter](#) citations to a specific clinical study category and scope. These search filters were developed by [Haynes RB et al.](#)

Results: 5 of 40

Chinese medicinal herbs for acute bronchitis. [Cochrane Database Syst Rev. 2008]

Azithromycin for acute lower respiratory tract infections. [Cochrane Database Syst Rev. 2008]

Bronchitis (acute). [Clin Evid (Online). 2008]

[Clinical and therapeutic management of respiratory tract infections. Consensus document of the Andalusian Infectious Diseases § [Enferm Infecc Microbiol Clin. 2007]

Haemophilus influenzae oral whole cell vaccination for preventing acute exacerbations of chronic bronchitis. [Cochrane Database Syst Rev. 2006]

[See all \(40\)](#)

[Filter](#) citations for systematic reviews, meta-analyses, reviews of clinical trials, evidence-based medicine, consensus development conferences, and guidelines. See [related sources](#).

Results: 2 of 2

Emergence of a Streptococcus pneumoniae clinical isolate highly resistant to telithromycin and fluoroquinolones. [J Clin Microbiol. 2005]

Emergence of macrolide-resistant Mycoplasma pneumoniae with a 23S rRNA gene mutation. [Antimicrob Agents Chemother. 2005]

[See all \(2\)](#)

[Filter](#) citations to topics in medical genetics.

Internet | Protected Mode: On 100%

PubMed Clinical Queries - Windows Internet Explorer

http://www.ncbi.nlm.nih.gov/sites/pubmedutils/clinical

NCBI Resources How To My NCBI Sign In

## PubMed Clinical Queries

Search "acute bronchitis" azithromycin

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

### Clinical Study Categories

Category:

Scope:

---

Results: 5 of 8

Azithromycin for acute lower respiratory tract infections.  
[Cochrane Database Syst Rev. 2008]

Azithromycin for acute bronchitis: a randomised, double-blind, controlled trial.  
[Lancet. 2002]

[Pharmacovigilance study of azithromycin tablets (500 mg) in the treatment of adult patients with respiratory tract infections] [Rev Esp Quimioter. 2000]

The pattern of micro-organisms and the efficacy of new macrolide in acute lower respiratory tract infections.  
[Respirology. 1998]

Once-daily, 3-day azithromycin versus a three-times-daily, 10-day course of co-amoxiclav in the treatment of adults with lower respiratory tract infections.  
[J Antimicrob Chemother. 1996]

[See all \(8\)](#)

---

[Filter](#) citations to a specific clinical study category and scope. These search filters were developed by [Haynes RB et al.](#)

### Systematic Reviews

---

Results: 3 of 3

Azithromycin for acute lower respiratory tract infections.  
[Cochrane Database Syst Rev. 2008]

Azithromycin for acute lower respiratory tract infections.  
[Cochrane Database Syst Rev. 2004]

Meta-analysis of randomized controlled trials on the comparative efficacy and safety of azithromycin against other antibiotics for lower respiratory tract infections.  
[J Antimicrob Chemother. 2001]

[See all \(3\)](#)

---

[Filter](#) citations for systematic reviews, meta-analyses, reviews of clinical trials, evidence-based medicine, consensus development conferences, and guidelines. See [related sources](#).

### Medical Genetics

Topic:

---

Results: 1 of 1

Emergence of macrolide-resistant *Mycoplasma pneumoniae* with a 23S rRNA gene mutation.  
[Antimicrob Agents Chemother. 2005]

[See all \(1\)](#)

---

[Filter](#) citations to topics in medical genetics.

Internet | Protected Mode: On 100%

Azithromycin for acute bronchitis: a randomised, d... [Lancet. 2002] - PubMed result - Windows Internet Explorer

http://www.ncbi.nlm.nih.gov/pubmed/12020525

NCBI Resources How To My NCBI Sign In

PubMed.gov  
U.S. National Library of Medicine  
National Institutes of Health

Search: PubMed Limits Advanced search Help

Search Clear

Display Settings: Abstract Send to: THE LANCET

Lancet. 2002 May 11;359(9318):1648-54.

**Azithromycin for acute bronchitis: a randomised, double-blind, controlled trial.**

Evans AT, Husain S, Durairaj L, Sadowski LS, Charles-Damte M, Wang Y.  
Collaborative Research Unit, Department of Medicine, Cook County Hospital and Rush Medical College, Chicago, IL 60612, USA. aevans@cchil.org

Comment in:  
[J Fam Pract. 2002 Sep;51\(9\):783.](#)

Abstract  
BACKGROUND: The value of azithromycin for treatment of acute bronchitis is unknown, even though this drug is commonly prescribed. We have investigated this question in a randomised, double-blind, controlled trial. METHODS: Adults diagnosed with acute bronchitis without evidence of underlying lung disease, were randomly assigned azithromycin (n=112) or vitamin C (n=108) for 5 days (total dose for each 1.5 g). All individuals were also given liquid dextromethorphan and albuterol inhaler with a spacer. The primary outcome was improvement in health-related quality of life at 7 days; an important difference was defined as 0.5 or greater. Analysis was by intention to treat. FINDINGS: The study was stopped by the data-monitoring and safety committee when 220 patients had been recruited. On day 7, the adjusted difference in health-related quality of life was small and not significant (difference 0.03 [95% CI -0.20 to 0.26], p=0.8). (89% of 97 patients in the azithromycin group and 82 (89%) of 92 in the vitamin C group had returned to their usual activities by day 7 (difference 0.5% [-10% to 9%], p>0.9). There were no differences in the frequency of adverse effects; three patients in the vitamin C group discontinued the study medicine because of perceived adverse effects, compared with none in the azithromycin group. Most patients (81%) reported benefit from the albuterol inhaler. INTERPRETATION: Azithromycin is no better than low-dose vitamin C for acute bronchitis. Further studies are needed to identify the best treatment for this disorder.

PMID: 12020525 [PubMed - indexed for MEDLINE]

+ Publication Types, MeSH Terms, Substances  
+ LinkOut - more resources

Related citations

- Review Azithromycin for acute lower respiratory tract infecti [Cochrane Database Syst Rev. 2004]
- Prospective observational study of patient-reported outcomes for azithromycin [Clin Ther. 2005]
- Review Azithromycin for acute lower respiratory tract infecti [Cochrane Database Syst Rev. 2008]
- Onset of symptom resolution in adults with acute bacterial rhinosinusitis treated with azithromycin [Clin Ther. 2007]
- Effect of short-term treatment with azithromycin on recurrent ischaemic events in patients with acute coronary syndrome [Lancet. 2003]

See reviews...

Cited by 8 PubMed Central articles

- Efficacy of amoxicillin versus amoxicillin-clavulanate for acute bacterial rhinosinusitis [Int J Chron Obstruct Pulmon Dis. 2009]
- Antibiotics in acute exacerbations of chronic obstructive pulmonary disease [Can Fam Physician. 2009]
- Concurrent acute illness and comorbid conditions poorly predict outcomes in patients with acute bronchitis [BMC Infect Dis. 2007]

See all...

All links from this record

(2 items remaining) Downloading picture http://www.ncbi.nlm.nih.gov/pov/

Internet | Protected Mode: On

PubMed Clinical Queries - Windows Internet Explorer

http://www.ncbi.nlm.nih.gov/sites/pubmedutils/clinical

NCBI Resources How To My NCBI Sign In

## PubMed Clinical Queries

Search "otitis externa" ciprofloxacin Search Clear

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

### Clinical Study Categories

Category: Therapy  
Scope: Narrow

---

Results: 5 of 9

Plasma and ear tissue concentrations of enrofloxacin and its metabolite ciprofloxacin in dogs with chronic end-stage otitis externa after intravenous [Vet Dermatol. 2009]

Comparison of efficacy and safety of ciprofloxacin otic solution 0.2% versus polymyxin B-neomycin-hydrocortisone in the treatment [Curr Med Res Opin. 2008]

A single topical agent is clinically equivalent to the combination of topical and oral antibiotic treatment for otitis externa. [Am J Otolaryngol. 2008]

A comparison of ciprofloxacin/dexamethasone with neomycin/polymyxin/hydrocortisone for otitis externa pain. [Adv Ther. 2007]

Ciprofloxacin as a representative of disk diffusion in vitro susceptibility of enrofloxacin for bacterial organisms from the middle-ear tissue of dogs with otitis externa [Vet Dermatol. 2006]

[See all \(9\)](#)

[Filter](#) citations to a specific clinical study category and scope. These search filters were developed by [Haynes RB et al.](#)

### Systematic Reviews

---

Results: 3 of 3

Ciprofloxacin 0.3%/dexamethasone 0.1% sterile otic suspension for the topical treatment of ear infections: a review of the literature. [Pediatr Infect Dis J. 2009]

Pooled analysis of two clinical trials comparing the clinical outcomes of topical ciprofloxacin/dexamethasone otic suspension and polymyxin [Clin Ther. 2007]

Ciprofloxacin: an oral quinolone for the treatment of infections with gram-negative pathogens. Committee on Antimicrobial Agents. Canadian Infectious Disease Society [CMAJ. 1994]

[See all \(3\)](#)

[Filter](#) citations for systematic reviews, meta-analyses, reviews of clinical trials, evidence-based medicine, consensus development conferences, and guidelines. See [related sources](#).

### Medical Genetics

Topic: All

---

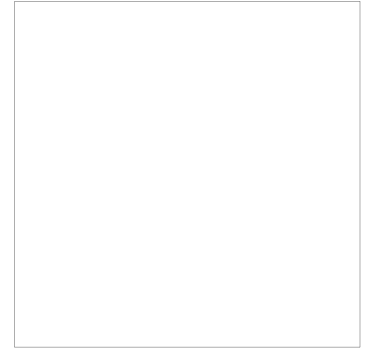
Results: 0 of 0

[See all \(0\)](#)

[Filter](#) citations to topics in medical genetics.

Internet | Protected Mode: On 100%

# Primary literature: Key points for PubMed searches



- Learn to use PubMed's "Clinical Queries" feature
- When you find a useful article, select "Related articles"
- Learn how to narrow searches using quotation marks
- Use the AND operator to further narrow your search
- Use "NOT" to exclude non-relevant articles

# Subscribe to our free podcast

InfoPOEMs – Mark Ebell and Mike Wilkes, weekly discussion of a “POEM”

- Go to iTunes, search for “POEM of the week”



Thank you!

