Introduction to Information Mastery
AND
Answering clinical questions using the Web

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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 Ferenchick, 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)

US$ spent per person on healthcare
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

- **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 \times 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)

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

Frame the question (PICO)
Search primary literature
Evaluate research quality
Choose best research
Change practice
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 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

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
PubMed Clinical Queries

Search: "acute bronchitis" antibiotics

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 73
Documentation-based clinical decision support to improve antibiotic prescribing for acute respiratory infections in primary care: a cluster randomized, double-blind, placebo-controlled trial [Inform Prim Care. 2009]
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 controlled trial [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)

Systematic Reviews
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) [Cochrane Database Syst Rev. 2008]

See all (40)

Medical Genetics
Topic: All
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]

Filter citations to topics in medical genetics.

See all (2)
### 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

<table>
<thead>
<tr>
<th>Category</th>
<th>Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapy</td>
<td>Narrow</td>
</tr>
</tbody>
</table>

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. 1999)  
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)

#### 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  
(J Antimicrob Chemother. 2001)  
See all (3)

#### Medical Genetics

Results: 1 of 1  
Emergence of macrolide-resistant Mycoplasma pneumoniae with a 23S rRNA gene mutation.  
(An antimicrob Agents Chemother. 2005)  
Filter citations to topics in medical genetics.

Filter citations for systematic reviews, meta-analyses, reviews of clinical trials, evidence-based medicine, consensus development conferences, and guidelines.  
See related sources.
Azithromycin for acute bronchitis: a randomised, double-blind, controlled trial.

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 of 3 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=0.86). Among the 97 patients in the azithromycin group and 92 in the vitamin C group, there were no differences in the frequency of adverse effects; three patients in the vitamin C group discontinued the study 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.

PMD: 12020525 [PubMed - indexed for MEDLINE]
PubMed Clinical Queries

Search:

"otitis externa" ciprofloxacin

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
1. Plasma and ear tissue concentrations of enrofloxacin and its metabolite ciprofloxacin in dogs with chronic end-stage otitis externa after intravenous [Vet Dermatol. 2009]
2. Comparison of efficacy and safety of ciprofloxacin otic solution 0.2% versus polymyxin B-neomycin-hydrocortisone in the treatment [Curr Med Res Opin. 2008]
3. A single topical agent is clinically equivalent to the combination of topical and oral antibiotic treatment for otitis externa. [Am J Otolaryngol. 2008]
5. 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 after intravenous [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
1. 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]
2. Pooled analysis of two clinical trials comparing the clinical outcomes of topical ciprofloxacin/dexamethasone otic suspension and polymyxin. [Clin Ther. 2007]

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.
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!