A Practical approach to teaching EBM to pediatric residents – beyond the journal club

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Maribeth B. Chitkara, MD, Rachel Boykan, MD, Martha S. Wright, MD, MEd, Colleen M. Kenefick, MLS, AHIP

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NO DISCLOSURES

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A Practical approach to teaching EBM to pediatric residents – beyond the journal club

Objectives

1. To design a curriculum that teaches basic evidence-based medicine (EBM) knowledge and skills
2. To provide tools and resources for implementing or improving an existing EBM curriculum
3. To develop an evaluation tool for appraising an EBM curriculum

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Agenda

1. Introduction
2. Review of current curricula
3. Introduction to the Six-step Method
4. Identify your needs
5. Librarian's Perspective
6. Curricular design elements
7. Plan a curriculum
8. Evaluation methods
9. Wrap-up

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Introductions

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- The questions of **how** to teach these skills and **when** they should be taught have stimulated the development of educational offerings in the undergraduate, GME and continuing medical education (CME) arenas

(Bordley et al., 1997; Coomarasamy & Khan, 2004; Flores-Mateo & Argimon, 2007;)

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What is out there?

Review of current curricula

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A Practical approach to teaching EBM: Overview of curricular approaches

- Journal club
- Didactic sessions
  - Orientation
  - Noon conference
  - Lecture series
  - Workshops/short courses
- EBM case conferences
- EBM morning report

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A Practical approach to teaching EBM: Overview of curricular approaches

- At the bedside
  - Prescriptions
  - "Guided mentorship"
- Dedicated Rotation blocks
- Web-based programs
  - On-line lectures
  - Case studies
  - Interactive learning modules
  - Blogs
  - Mobile Apps

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A Practical approach to teaching EBM: What works, according to the literature?

- Systematic reviews of educational outcomes for EBM skills curricula in GME
  - Coomarasamy and Khan (2004)
    - Knowledge improved with variety of methods
    - Clinically integrated curricula associated with attitude and behavior changes
  - Flores-Matteo and Argimon (2007)
    - Small gains in knowledge, skills, attitudes and behaviors with various methods
    - Paucity of validated instruments
  - Parkes 2010

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A Practical approach to teaching EBM: What works, according to the literature?

- Khan and Coomarasamy reviewed CME literature to identify CME best practices that could be generalized to GME EBM training interventions *(Khan & Coomarasamy, 2006)*
    - Found that the most effective interventions included:
        - Self-directed EBM educational offerings that allow an individual to meet self-identified learning objectives
        - Utilization of interactive and multi-faceted teaching and learning strategies
        - Incorporation into the clinical setting
        - Provision of feedback and opportunity for sequential reinforcement

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A Practical approach to teaching EBM: What works, according to the literature?

- Hatala R, Guyatt G. Evaluating the teaching of evidence-based medicine. *JAMA.* 2002;288:1110-1111.

  "Ironically, if one were to develop guidelines for how to teach [evidence-based medicine] based on these results, they would be based on the lowest level of evidence"

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A Practical approach to teaching EBM: What works, according to the literature?

- Journal club
  - is most common venue, but lacks clinical application
    - Kersten et al, survey of pediatric chief residents.
      - 70% of residencies use JC as vehicle for teaching EBM, but it isn't applied

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A Practical approach to teaching EBM: What works, according to the literature?

- Integrated/Longitudinal Curricula
  - Green & Ellis: 7 week course for IM residents
  - Allan et al, Longitudinal curriculum for FM residents
  - Nicholson & Shieh, IM residents on hospitalist rotation (pilot study)
- Web-based
  - Kim et al, IM residents
  - Hadley et al, European RCT of EBM teaching of interns

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A Practical approach to teaching EBM: What works, according to the literature?

- Small Group Formats, active learner
  - R Kunz et al, 2009 multicenter European study
- Information Management
  - Slawson & Shaughnessy
  - Use your librarian

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A Practical approach to teaching EBM: Undergraduate Medical Curricula

- Gap in the literature
- Carnegie Foundation Call for Reform of Medical Education, 2010
  - Standardization of outcomes, individualization of process
  - Integration of knowledge and clinical experience
  - Development of habits of inquiry and improvement into medical education
  - Focus on progressive formation of medical identity

Irby et al. Calls for Reform of Medical Education by the Carnegie Foundation for the Advancement of Teaching: 1920 and 2010, Acad Med, 2010.

A Practical approach to teaching EBM: Undergraduate Medical Curricula

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A Practical approach to teaching EBM: Curricular Design Elements: The six-step approach

1. Problem Identification/General Needs Assessment
2. Targeted Needs Assessment
3. Goals & Objectives
4. Educational Strategies
5. Implementation
6. Evaluation and Feedback

Kern DE, Thomas PA, Howard DM, Bass EB.
Curriculum development for medical education: A six-step approach.
Baltimore: The Johns Hopkins University Press; 1998.

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A Practical approach to teaching EBM: Individual self-reflection Breakout

- What are your programs' needs or gaps?
- What have you done so far?
- What has worked in the past?
- Why?
- What has not worked in the past?
- Why?

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A Practical approach to teaching EBM: The librarian's perspective

- How to meet and recruit librarians
- Consultative services
- Basic resources
- The librarian as teacher
- Top 5 resources
  - Handouts in packet

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A Practical approach to teaching EBM: The librarian's perspective

- How to meet and recruit librarians
  - Go where librarians work (it may not be a library) to discuss the project
  - Librarians may need additional training in EBM strategies
  - Recognize the need for librarian skills in clinical settings with financial support
  - Find a librarian member of the Academy of Health Information Professionals (AHIP)

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A Practical approach to teaching EBM: The librarian's perspective

- Consultative services
  - Have a medical librarian assigned to your department
  - Arrange for either regular office hours or space on site at the point of need
  - Developing search strategies for systematic reviews
  - Reviewing strategies for CATs
  - Awareness of new educational technologies
  - Assistance with obscure materials

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A Practical approach to teaching EBM: The librarian's perspective

- Basic resources
  - ClinicalEvidence BMJ
  - Cochrane Library
  - Essential Evidence Plus (formerly known as InfoPOEMS)
  - PubMed
  - PubMed Clinical Queries
  - TRIP Database (Turning Research Into Practice)

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A Practical approach to teaching EBM: The librarian's perspective

- Basic resources
  - Additional databases will soon be available from commercial publishers
  - Advocate within your institution for adequate resources and funding for scholarly products
  - Hint: By collaborating with librarians and making your information needs known, you are more likely to get these information resources

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A Practical approach to teaching EBM: The librarian's perspective

- The librarian as teacher
  - Librarians bring a unique amalgam of skills, experience, and perspective to EBM
  - Trained in efficient searching expertise
  - Teach instructional overview of selected EBM resources
  - EBM training workshops and search support both during and after class
  - Create and maintain course website or libguide

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A Practical approach to teaching EBM: The librarian's perspective

- And the evidence is…
  - There is general improvement in clinical question writing, search strategies, article selection, and use of resources with librarians
  - A single session on literature searching is better than nothing, but to really create behavior change takes reinforcement of learning over time
  - Specific teaching methods may not matter for long-term retention

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A Practical approach to teaching EBM: Top Five EBM Mobile Apps

Centre for Evidence-Based Medicine

Their goal is to help develop, disseminate, and evaluate resources that can be used to practice and teach EBM for undergraduate, postgraduate and continuing education for health care professionals from a variety of clinical disciplines. Included are critical appraisal worksheets, teaching tips, and an educational prescriptions section.
http://ktclearinghouse.ca/cebm

centre for
Evidence-Based Medicine
TORONTO

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A Practical approach to teaching EBM: Top Five EBM Mobile Apps

National Guideline Clearinghouse

An initiative of the Agency for Healthcare Research and Quality (AHRQ) to provide physicians and other health professionals an accessible mechanism for obtaining objective, detailed information on clinical practice guidelines and to further their dissemination, implementation, and use.
http://www.guideline.gov/

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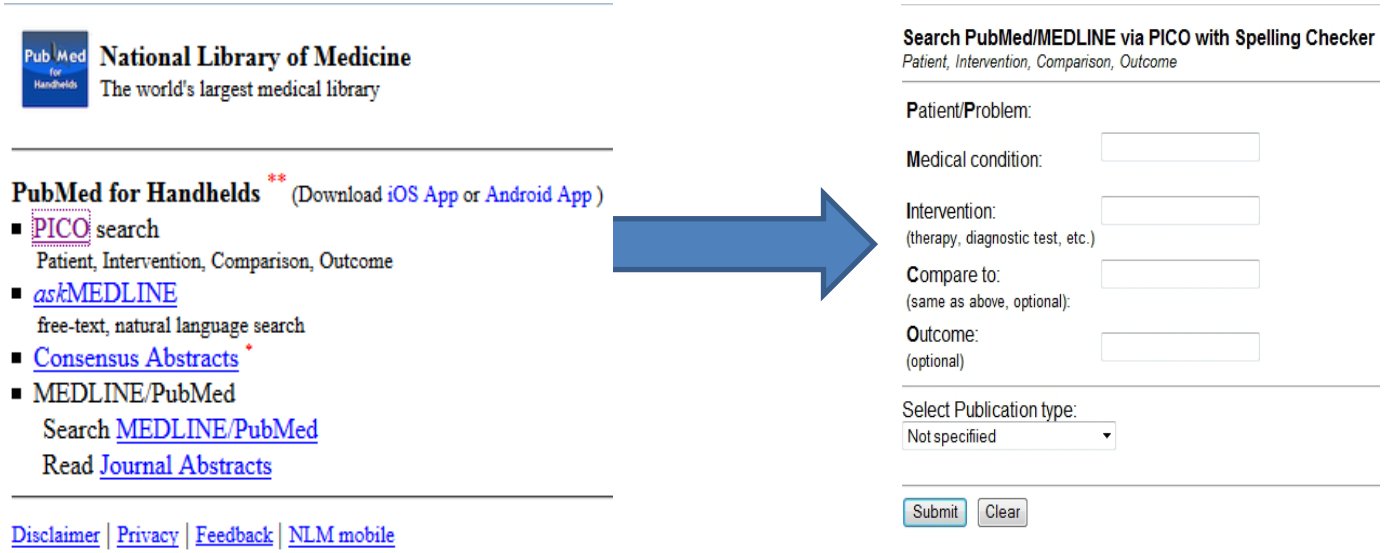
A Practical approach to teaching EBM: Top Five EBM Mobile Apps

PubMed for Handhelds

A website for searching MEDLINE® with the web browser of any mobile device. The application is platform independent and uses both the PICO search or terms to search and links to full-text articles.



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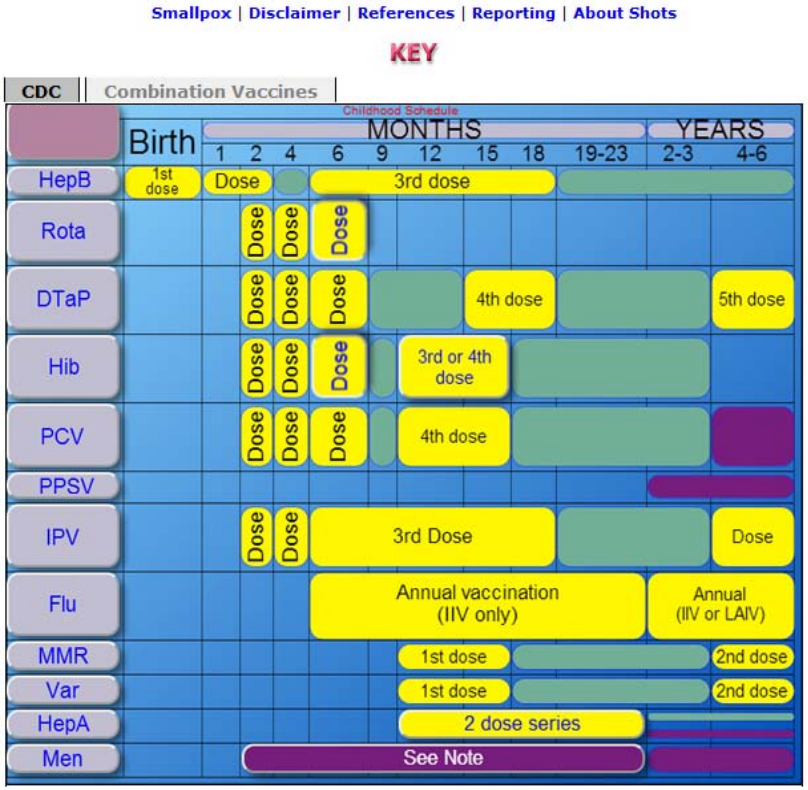
SHOTS by STFM 2013

Produced by the Society of Teachers of Family Medicine this is the most comprehensive electronic version of the CDC immunization schedule for all ages with updated recommendations from the CDC Advisory Committee on Immunization.
Web, iPhone, and Android versions are available.
http://www.immunizationed.org/



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A Practical approach to teaching EBM: Top Five EBM Mobile Apps

USDA's Nutrition Evidence Library (NEL)

These are systematic reviews that inform Federal nutrition policy and programs. The Library evaluates, synthesizes, and grades the strength of the evidence to support conclusions for Federal nutrition policy and programs. An objective and transparent methodology is used to define the state of food and nutrition-related science, making food and nutrition research accessible to all Americans.
http://www.nutritionevidencelibrary.com/

Click here to see the 2010 Dietary Guidelines Advisory Committee's NEL evidence-based systematic reviews

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A Practical approach to teaching EBM: Curricular Design Elements

Our Curricula

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A Practical approach to teaching EBM: Curricular Design Elements - Plan

- Goals
- Objectives
- Educational strategies/methods
- Implementation
  - Who do I need to involve
  - Funding
  - Support (time, $)
  - Pilot plan
  - Other challenges?

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A Practical approach to teaching EBM: Curricular Design Elements: The six-step approach

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Problem Identification	**1) Physicians need EBM skills to inform patient care decisions and promote life-long learning** **2) The ACGME requires that residents achieve competency in EBM skills** **3) Patients expect that physicians will possess current knowledge** **4) Without these skills, physicians of the future will not be able to manage the quantity of information**
Learner's Needs Assessment	**Although all interns reported that they received EBM training in medical school, knowledge and skills as assessed by Fresno test were significantly lacking especially in question construction, Medline searching, basic statistics for EBM and critical appraisal skills**

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A Practical approach to teaching EBM: Curricular Design Elements: The six-step approach

Goal and Objectives	**Goal: Residents will practice evidence-based medicine competently in the clinical setting** **Objectives:** **After participation in this curriculum, the resident will be able to:** **1) construct searchable clinical questions as demonstrated by completion of the work sheets on "The Question and the Search" from the self-study module** **2) identify and use on-line resources to locate the best evidence to answer clinical questions as demonstrated by the presentation of critically appraised topics (CATs) during Senior Rounds** **3) appraise the evidence by applying specific criteria for articles on therapy, prognosis, diagnostic testing, clinical guidelines and systematic reviews as demonstrated by the successful completion of the self-study module and completion of at least 10 worksheets for Journal Club articles** **4) demonstrate the use of these skills in actual patient care situations as demonstrated by the presentation of CATs at Senior Rounds**

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Educational Strategies	**Multi-method, longitudinal, clinically integrated activities** **1) Completion of on-line self-study program in EBM by interns** **2) Participation in monthly Journal Clubs with appraisal worksheets** **3) Contribution of one article synopsis to the Rainbow Babies and Children's Journal Watch each block that they are on an elective** **4) Presentation of 1-2 CATs (critically appraised topics) during Senior Rounds on patient care questions**
Implementation	**Began with journal clubs, added CAT's next, finally implemented on-line tutorial**
Evaluation	**Learner evaluation: Fresno Test, Journal club worksheets, CATs** **Curriculum evaluation: Resident satisfaction**

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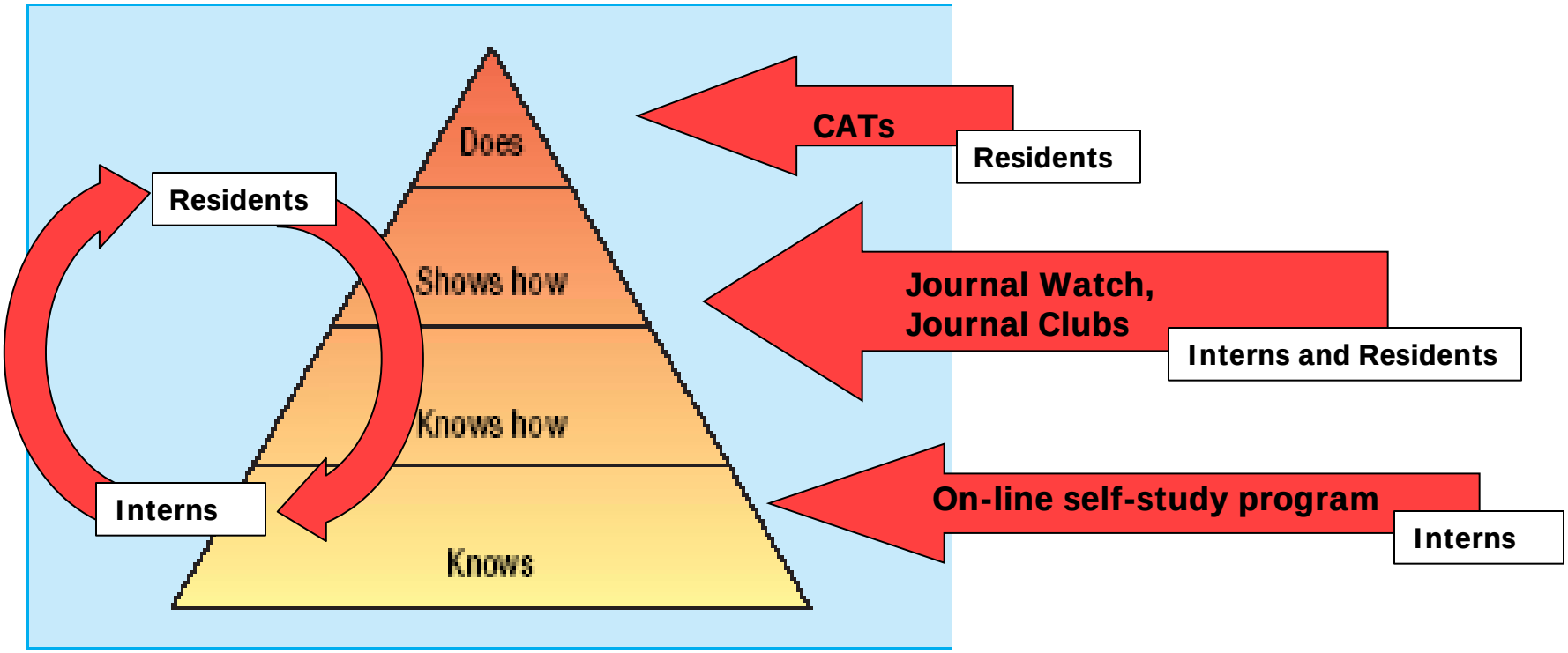

Miller G. The assessment of clinical skills/competence/ performance.*Acad Med.* 1990;65(9):S63-S67.

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Pediatric-specific On-line Tutorial

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EBM Tutorial for Pediatric Residents

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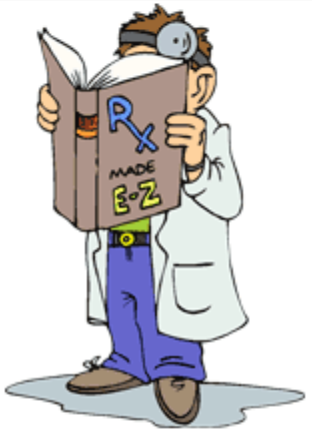
INTRODUCTION

The following computer based tutorial contains 11 modules designed to help you develop the fundamental skills necessary for evidence-based clinical practice. Complete the first 5 modules in order and then the last 6 in any order you choose. After you have completed the modules, take the Final Quiz to assess your EBM knowledge and skills.



Modules

1. EBM: What it is and what it isn't- Read about the controversies in medicine surrounding EBM
2. Basic Statistics for Physicians- Learn to apply the statistical tests used most commonly in patient-related research
3. ASK: The well-constructed clinical question-Discover how formulating your patient-related question is the key to an efficient search
4. ACCESS: How to perform a successful search- Practice locating patient-related information using a variety of databases and search engines
5. APPRAISE: Is it a "good" study?- Determine whether the studies you find are of good quality
6. Appraising a study on THERAPY- Examine an article on epinephrine in bronchiolitis to determine whether you would apply it to patients you take care of
7. Appraising a study on DIAGNOSTIC TESTS- Review an article on clinical scoring systems for the diagnosis of

☆ Module 6: APPRAISING an Article on THERAPY

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Module 6: APPRAISING an Article on THERAPY

Objective

After completing this module you wil be able to:

1) Assess the validity of a study on **THERAPY**

2) Define and apply absolute risk reduction, relative risk reduction and number needed to treat in patient care situations

3) Determine the applicability of a study to a specific patient

Appraisal of an article includes 3 steps: **Assessment of validity, interpretation of the results and determination of the applicability of the results to your patient.**

To assess the validity of a study on **THERAPY**, you should look to see if the study design includes certain components and if these components have been addressed appropriately. These include, among other things:

-Randomization

-Blinding

-Sample size

-Follow-up

Using your knowledge of statistics you will interpret the results, specifically focusing on:

-Absolute and relative risk reduction

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

specifically focusing on:

-Absolute and relative risk reduction

-Number needed to treat

-Confidence intervals

Application of the results to your patient will depend on the study validity, how similar your patient is to those in the study and your patient's own values and interest.

Module 6: APPRAISING an Article on THERAPY

Exercise

1) Read the User's Guide chapter on Therapy
2) Read the clinical scenario and the accompanying article
3) Complete the worksheet and print it for your portfolio

It is February and you pick up a patient on the "attending" schedule in afternoon RAP clinic. You look at the chief complaint on the chart and it is listed as "ear pain." As you enter the room, you see a tearful 20 month old, holding his right ear. His mom reports he's been holding his ear since just before bed last night, so did not sleep as well as usual, and has been tearful and fussy all day today. She thinks he had an ear infection once last year, and he does not attend daycare or have siblings. When you look in his right ear, the TM is bulging and erythematous with an effusion. You complete your exam to evaluate for mastoiditis and pneumonia, and determine that the child is otherwise well.

As you are walking back to the conference room to precept the patient, you think to yourself whether you would like to write the child for antibiotics now, or if you would like to treat his symptoms with some acetaminophen and employ the "watch and wait" method of otitis media antibiotic treatment. You wonder what the most recent research has to say...

Guyatt G, et al, Therapy. In User's Guides to the Medical Literature: A Manual for Evidence based Clinical Practice. Guyatt G and Rennie D, eds. AMA Press, Chicago III, 2002

Hoberman A, Paradise JL, Rockette HE, et al. Treatment of Acute otitis media in children under 2 years of age. N Engl J Med 2011;364:105-15.

THERAPY Appraisal Worksheet

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Rainbow Babies and Children's Hospital Resident Journal Club

Using and Appraising a Systematic Review

(Adapted from Sackett, Guyatt and U. of Alberta EBM toolkit)

Resident Name:_____

Objectives:

1. Describe the differences between a review, a systematic review and a meta-analysis
2. List the strengths and weaknesses of systematic reviews
3. Interpret the results of a systematic review and determine whether the overall results are valid
4. Decide how to apply these results in clinical practice

Assignment

1. Read scenario
2. Read Oxman AD, Guyatt G, Cook D and Montori V. Summarizing the Evidence. In : Users' Guides to the Medical Literature, Guyatt G and Rennie D eds. Chicago IL: AMA Press 2002.
3. Critically appraise the attached article using the worksheet. Record your thoughts on the worksheet and turn it in (whether you are at the session or not) for inclusion in your portfolio
4. Draw conclusions regarding how you would apply this information to the patient in the scenario

Scenario:

You are in the ED seeing an 8 yo boy with RLQ pain. His CT is positive for appendicitis. You tell the family about the findings and that he'll need to go to the OR for an appendectomy. The patient's mother asks if surgery is absolutely necessary-she read on the internet that appendicitis can be treated with antibiotics…

You excuse yourself to do a quick search…

What is your clinical question? (Don't forget PICO)

What was your Search Strategy?

Citation: Varadhan KK, Neal KR, and Lobo DN. Safety and efficacy of antibiotics compared with appendicectomy for treatment of uncomplicated acute appendicitis: meta-analysis of randomised controlled trials. BMJ. 2012; 344: e2156.

Summary of article:

I. VALIDITY: Are the results of this systematic review valid?	
Did the systematic review address a focused clinical question?	
Does it describe a comprehensive (exhaustive?) search for all relevant studies? Is it unlikely that important articles were missed (Where did they search: Bibliographic databases? Other sources? Personal contacts? Abstracts? Non-English studies)	

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Pediatric Residency Program
Journal Watch Submission Form

Reminders for Journal Watch:

1. Choose a recent article pertaining to your current rotation.
2. Comment on how the article will affect your current practice.
3. Please limit your submission to 250 words or less. Submissions greater than 250 words will be returned to the resident for editing.
4. Please pay attention to grammatical errors and misspellings.
5. Do not copy any parts of the article or abstract word-for-word.

Resident Name:

Subspecialty:

Journal Citation (Authors. Article Title. Name of Journal. Year;Volume: Start page-End page.):

Summary:

Implications for Your Practice:

Please send one copy of this form to Peds_Chiefs@UHHospitals.org.

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Journal Watch
Spring 2012

Adolescent Medicine

DiClemente R et al. Association between sexually transmitted diseases and young adults' self-reported abstinence. Pediatrics 2011;127(2):208-211.

This study prospectively assessed the correlation between adolescent self-reported sexual behavior in the last 12 months and the presence of laboratory-confirmed, non-viral sexually-transmitted infections (STIs). The comparison included 14,012 demographically representative young adults (92% of all National Longitudinal Study of Adolescent Health participants) who were interviewed about their penile/vaginal sex and provided a urine specimen to test for Chlamydia trachomatis and Neisseria gonorrhea, and a polymerase chain reaction (PCR) assay to detect Trichomonas vaginalis. The study found that ten percent of adolescents reporting no sexual intercourse in the last year nonetheless had positive urine for STIs. This subpopulation was indistinguishable from its STI-negative peers in race, education, sex, or socioeconomic status. These results, therefore, further strengthen the current clinical practice of many adolescent clinics of STI testing for all sexually-active patients, even those denying recent intercourse. The investigation did, however, have several notable weaknesses. Foremost, adolescents who completed the survey but opted out of STI testing were not identical to the included population; they were more likely to be affluent, Caucasian or Asian, and have completed high school. Additionally, since this was the third wave of the National Longitudinal Study of Adolescent Health, an adolescent cohort first selected in the early 1990s, the mean age of participants for interview was 21.9 years - while the mean age of the average sexually active adolescent is far younger. These weaknesses minimally undermine the study's wider application of the magnitude of incongruence between self-reported sexual activity and STI testing and strongly support STI testing for adolescents independent of sexual activity screening questions.

Submitted by: Anya Kleinman

Comment: Nice review by Dr. Kleinman. At the Pediatric Practice we screen every 6 months for STIs and there is more data in support of same. Of course, STI screening does not take the place of a sensitive and confidential interview regarding sexual activity and practices, which is still an important part of good adolescent well care. LF

Allergy and Immunology

Burks AW, Jones SM, Boyce JA, Sicherer SH, Wood RA, Assa'ad A, and Sampson HA. NIAID-sponsored 2010 guidelines for managing food allergy: applications in the pediatric population. Pediatrics 2011;128:955-965.

This article reviews guidelines for food allergy from the 2010 NIAID guidelines. Diagnosis of food allergy should be made with consistent history (anaphylaxis or skin, eye, respiratory or GI symptoms consistent with food allergy) in combination with diagnostic testing (skin prick or food specific IgE testing). Food challenge is the gold standard for diagnosis. Comorbidities include moderate to severe atopic dermatitis, eosinophilic espohagitis, gastritis, enteritis or enterocolitis, enteropathy or allergic proctocolitis, along with other atopic diseases. The article suggested allergy testing in children with moderate-to-severe atopic dermatitis not responsive to optimal therapy. In addition, it reinforced that no restrictions need to be placed on solid foods introduced after 4-6 months, including potentially allergenic foods. Management of food allergy is primarily avoidance. No preventive medications are available and immunotherapy is not currently recommended. For children who do not have a proven food allergy, avoiding potentially allergenic foods is not recommended in the management of atopic dermatitis, asthma or

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Pediatric Residency Program

CRITICALLY APPRAISED TOPIC 2012-2013

Process

- Ask a patient care question
- Translate it into a searchable question (Remember PICO)
- Search the literature for the best evidence (ONECITATION) to answer the question
- Appraise the evidence for validity and applicability
- Present your findings to the group in 10 MINUTES OR LESS

Resident Name: Date:
CLINICAL QUESTION:
Type of question: - Therapy/Prevention ▫ Diagnosis ▫ Prognosis ▫ Other:
Ideal type of study: - RCT ▫ Meta-Analysis ▫ Systematic Review ▫ Practice Guideline - Cohort Study ▫ Case Control ▫ Case Series/Case Report
Search Strategy:
Citation: Type of Study:
BRIEF summary of the methods:
Is the study valid (see back)?
What are the results?
Will this article change your patient management?
CLINICAL BOTTOM LINE:

A Practical approach to teaching EBM: Curricular Design Elements: The six-step approach

Stony Brook Long Island Children's Hospital

Goal and Objectives	**Goal:** **Use EBM routinely in the care of one's patients** **Objectives:** **1 Formulate a PICO question and search the literature** **2. Practice EBM skills in the clinical context** **3. Learn critical appraisal, basic study design and statistics**

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A Practical approach to teaching EBM: Curricular Design Elements: The six-step approach

Educational Strategies	**Longitudinal curriculum with clinical application** **1) Year one: 6 small group sessions for interns, each with guided practice and clinical application** **1) PICO Question formation** **2) Searching Strategies** **3) Critical appraisal (4 small groups)** **2) Year two: CAT presented to entire department; creation of a CAT bank** **3) Year three: Residents as teachers** **1) Seniors precept small group sessions**
Implementation	**1) Year three currently under way** **2) Three cohorts of residents enrolled**
Evaluation	**Learner evaluation: Berlin Questionnaire, Surveys, Pre- and Post-Quiz,** **Curriculum evaluation: Resident satisfaction, Faculty satisfaction with CAT**

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Practice Cases for PICO/Searching classes

Please complete a PICO question (first session) and a search (second session) for each of these questions. You may use any class materials you would like, including the searching algorithm and table. Please complete a separate worksheet for each question. You may work together as a group or in pairs.

1. You are taking care of a 12 month-old female with no significant past medical history, who has been admitted to the inpatient pediatric service after having had a seizure for the first time. The seizure was described as a generalized tonic-clonic seizure, with a 30-minute post-ictal state. She has had no documented fevers, but now on has a fever of 101 (f). She still seems slightly tired and not back to baseline, as per her parents. Your attending wants you to order a head CT. The child's parents are very concerned about the effects of radiation. What should you tell them?

2. You are taking care of a 7 month-old boy with 6 days of rhinorrhea, cough and wheezing. Rapid tests for RSV and influenza are both negative; RVP is pending. He has been afebrile, but still has a need for oxygen and bronchodilators after 2 days in the hospital. His parents ask you what the likelihood is that he will develop asthma in the future.

3. You are seeing an 8 year-old boy with intermittent epigastric pain for 6 months. He describes it as daily, though cannot describe a consistent pattern. He has had no vomiting or diarrhea, and has had no weight loss. You are concerned about H Pylori. You have heard about a stool test for H Pylori, and wonder if it will be as good as endoscopy and biopsy, which may seem invasive for this child who is otherwise doing well.

Resident's PICO/Searching Worksheet

Resident's Name: _____ Date: _____

Question Formation

1. Clinical Question:

2. PICO Question

P (patient, problem, population): _____
I (intervention/indicator): _____
C (comparison/control/complication): _____
O (outcome): _____

3. Type of scenario:

- o Diagnosis _____
- o Harm _____
- o Etiology _____
- o Prognosis _____
- o Therapy/Prevention _____
- o Other _____

4. Type of ideal study (number all that apply, in the order of importance):

- o Case Control Study _____
- o Case series/Report _____
- o Cohort Study _____
- o Comparison Study _____
- o Cross Sectional Study _____
- o Editorials/Opinions _____
- o Meta analysis _____
- o Randomized Controlled trial _____
- o Systematic Review _____

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<table>
<tr><td>THERAPY WORKSHEET</td><td>PICO:</td><td>Citation:</td></tr>
<tr><td>P (pt/population):
I (intervention):
C (comparison):
O (outcome):</td><td></td><td></td></tr>
<tr><td>Are the results VALID?</td><td>Assignment of treatments randomized?</td><td></td></tr>
<tr><td>PRIMARY GUIDES</td><td>Were all subjects accounted for at conclusion?</td><td></td></tr>
<tr><td></td><td>Was follow-up complete?</td><td></td></tr>
<tr><td></td><td>Intention to treat?</td><td></td></tr>
<tr><td>SECONDARY GUIDES</td><td>Blinded?</td><td></td></tr>
<tr><td></td><td>Groups similar at start?</td><td></td></tr>
<tr><td></td><td>Were groups treated equally aside from intervention?</td><td></td></tr>
<tr><td>What are the RESULTS?</td><td><table><tr><td></td><td>Outcome present</td><td>Outcome absent</td></tr><tr><td>Drug/tx</td><td>a</td><td>b</td></tr><tr><td>Placebo</td><td>c</td><td>d</td></tr></table></td><td><table><tr><td></td><td>Outcome present</td><td>Outcome absent</td></tr><tr><td>Drug/tx</td><td></td><td></td></tr><tr><td>Placebo</td><td></td><td></td></tr></table></td></tr>
<tr><td></td><td>CER = c/c+d
EER = a/a=b
ARR = CER-EER
NNT = 1/ARR</td><td></td></tr>
<tr><td></td><td>How precise was the estimate of effect (95% CI)</td><td></td></tr>
<tr><td>Are the results APPLICABLE to my patient?</td><td>Can I apply results to my patient?</td><td></td></tr>
<tr><td></td><td>Were all clinically important outcomes considered?</td><td></td></tr>
<tr><td></td><td>Are treatment benefits worth potential harm and costs?</td><td></td></tr>
<tr><td>Based on these results, my practice will show (check)</td><td>Big/Little/No Change (Explain)</td><td></td></tr>
</table>

Name:_____ Date:_____

Synthesis of articles reviewed for CAT presentation

1. Some things to consider as you complete the table, below:
   a. Do they come to the same conclusions?
      i. If not, why not?
   b. Is one study better than another? Why or why not?
      i. Validity
      ii. Reproducibility (precision of results)
      iii. Strength of data
      iv. Limitations
      v. Applicability to your patients

	Citation #1:	Citation #2:	Citation #3:	Citation #4:
Reference				
Study Question				
Study Design				
Are the results VALID (elaborate for each study, according to the worksheet completed for each study)?				
What are the RESULTS (summarize for each study, according to methods used)?				
Are there limitations of the study, and if so, what?				
Are the results APPLICABLE to my patient? What may be limitations of applicability?				
Clinical Bottom Line for each study				

The Role of Ultrasound in Screening for Developmental Dysplasia of the Hip

Laurie Campfield, PGY-2

There is no question that accurate diagnosis of developmental dysplasia of the hip is paramount. Missed diagnoses and missed interventions can lead to devastating outcomes in an otherwise largely preventable clinical situation. Appropriate diagnostic screening for DDH has proven difficult to study, possibly in part due to the fact that the prevalence of DDH is not high. There is also no confirmatory gold standard diagnostic test for DDH. Clinical exams and ultrasound screening are widely accepted via the guidelines put forth by the AAP; however, solid evidence is lacking. A lack of agreement upon the natural progression of DDH (i.e. need for intervention vs. capability to spontaneously resolve), coupled with the large degree of operator dependence during both clinical and ultrasonographic exam also lead to confliction.

For these reasons an extensive review of the literature was conducted to determine if in newborn infants, does ultrasound screening with clinical exam vs. clinical exam alone improve outcomes? PubMed, PubMed Clinical Queries, the Cochrane Library, and the TRIP database were searched using the keywords "developmental hip dysplasia", "ultrasound", "screening", and "infants". This search yielded 5 studies that were subsequently critically appraised: one randomized controlled trial, two prospective cohorts, and two systematic reviews (one being a Cochrane Review). The clinical bottom line from the critical appraisal is that while sensitive, clinical exam when used alone has low specificity, and thus ultrasound screening may be needed as an adjunct diagnostic tool. Also, ultrasound does seem to detect more infants with DDH than clinical exam alone, and ultrasound may help to avoid unnecessary splinting/harnessing in infants. However, the net benefits of ultrasound screening are not clear, and there is insufficient evidence to give clear evidence-based recommendations for practice. Therefore, until further research can be designed to measure functional outcomes in a standardized fashion; the AAP Guidelines remain the current best source for our clinical practice.

Literature Reviewed:

- Dogruel, et al. Clinical examination versus ultrasonography in detecting developmental dysplasia of the hip. International Orthopedics 2008, 32:415-419.
- Elbourne, et al. Ultrasonography in the diagnosis and management of developmental hip dysplasia (UK Hip Trial): clinical and economic results of a multicentre randomised controlled trial. The Lancet 2002, 360:2009-2017.
- Goldberg, Michael. Early detection of developmental hip dysplasia: synopsis of the AAP clinical guidelines. Pediatrics in Review 2001;22;131.
- Roovers, et al. Effectiveness of ultrasound screening for developmental dysplasia of the hip. Arch Dis Child Fetal Neonatal Ed 2005; 90:F25-F30.
- Shipman, et al. Screening for developmental dysplasia of the hip: a systematic literature review for the USPSTF. Pediatrics 2006; 117;e557.
- Shorter, et al. Screening programmes for developmental dysplasia of the hip in newborn infants (Review). The Cochrane Collaboration 2011. Issue 9.
- USPSTF. Screening for developmental dysplasia of the hip: recommendation statement. Pediatrics 2006; 117;898.

home

Welcome to the EBM Wiki for inpatient pediatrics!

Dr. Chitkara:

3/21/13: What is the incidence of kernicterus from the use of ceftriaxone in young infants?

3/15/13: What is the utility of azithromycin for treatment of gastroparesis? Erythromycin? What is the postulated mechanism of action?

From Katie Bradford:

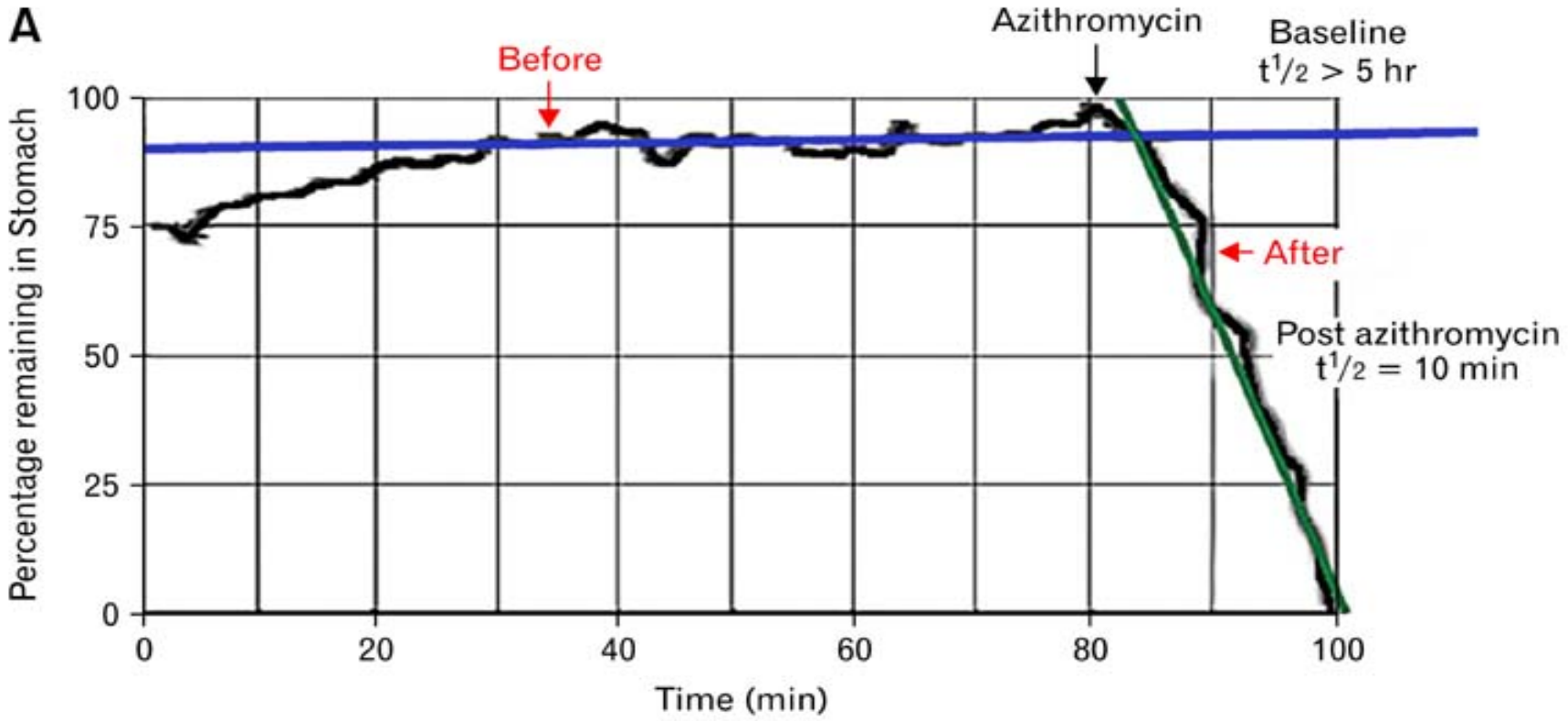
Larson, JM, Tavakkoli, A, Drane, WE, Toskes, PP, and Moshiree, B. "Advantages of Azithromycin Over Erythromycin in Improving the Gastric Emptying Half-Time in Adult Patients With Gastroparesis." *J Neurogastroenterol Motil*. 2010 Oct;16(4):407-413. English. Published online 2010 October 30. http://dx.doi.org/10.5056/jnm.2010.16.4.407

Larson et al used a retrospective case-control analysis of 120 patients who underwent gastric emptying scintigraphy (GES) with provocative testing to investigate the efficacy of azithromycin (AZI) vs. erythromycin (ERY) as prokinetic agents. Erythromycin, which has long been recognized as an effective prokinetic agent, presents the risk of sudden cardiac death, second to QT prologation, based on its inhibition of the P450 system. Azithromycin, another macrolide, does not inhibit the P450 system, so its use in treating gastroparesis (GP) without undesired cardiac effects is an area of active research.

Statistics: 2 tailed t test with SPSS 18 software compared gastric emptying data in patients receiving IV AZI vs. IV ERY, with the null hypothesis that there would be no significant difference between these two treatment groups.

Results:
-Prior to treatment: "gastric emptying t½ was similar for both groups with a mean gastric emptying t½ for ERY = 166 ± 68 minutes and a mean gastric emptying t½ for AZI = 178 ± 77 minutes"
-Following treatment: "gastric emptying t½ for AZI = 10.4 ± 7.2 minutes and a mean gastric emptying t½ for ERY = 11.9 ± 8.4 minutes"
-No statistical difference was found between the 2 IV treatment options, with a p=0.30.

Figure 1
"Azithromycin (A) and erythromycin (B) accelerated gastric emptying as measured by gastric emptying scintigraphy. Simple linear fits were applied to obtain the gastric emptying t½ before and after provocative testing. GES, gastric emptying scintigraphy."

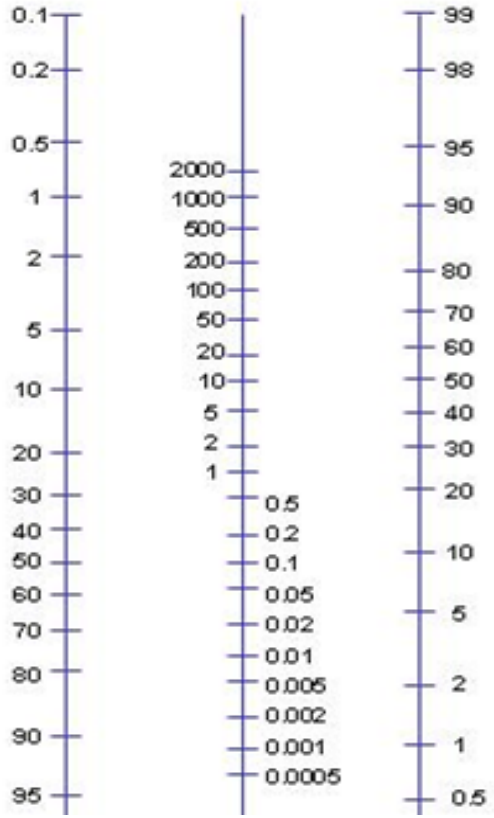


Chitkara 5/8/12:

Great work on the research...now my question is how do we turn the sensitivity and specificity into Likeliehood Ratios?

First question: What is our pre-test probability that our patient has pulmonary TB? Use your best guess
Second question: What are the positive and negative likeliehood ratios? Use an EBM calculator if you'd like
Third question: How do these likeliehood ratios affect our post-test probability? See the Fagan Nomogram below

Likelihood Ratios.docx
Details Download 155 KB



A Practical approach to teaching EBM: Plan your curriculum – complete table in packet

- Goals
- Objectives
- Educational strategies/methods
- Implementation
  - Who do I need to involve
  - Funding
  - Support (time, $)
  - Pilot plan
  - Other challenges?

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A Practical approach to teaching EBM: Plan - Evaluation methods

- Reasons to evaluate a curriculum:
  - Ensure the goals and objectives are met
- Define the evaluation goals:
  - Evaluate curriculum, evaluate individual
- Spread the word (share, publish)
- Qualitative vs. Quantitative

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A Practical approach to teaching EBM: Evaluation methods

- Qualitative vs Quantitative
  - Surveys (attitudinal)
  - Tests (knowledge-based)
    - Validated measures: Berlin, Fresno
    - Non-validated measures
- Skill-based
  - OSCE
  - Clinical rotation evaluations
  - Checklists at point of care

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A Practical approach to teaching EBM: Evaluation Methods

- Consider your resources
- Your statistician is your friend!
- Identify qualitative outcomes from goals & objectives
- Identify quantitative outcomes

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A Practical approach to teaching EBM: Parting Thoughts

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