



**LEARNING AND TEACHING EVIDENCE-BASED MEDICINE
MEDEDU 2220
JUNE 2008**

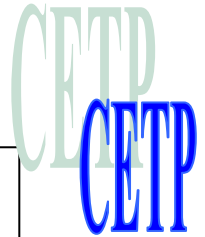


COURSE DIRECTOR: Megan Cunnane, M.D., MSc

LOCATION: 220 Parkvale Building
DATES: June 2-25, Mondays and Wednesdays
TIMES: 1:00-3:00 pm
TEXT: Evidence-Based Medicine: Learning and Teaching EBM
CREDITS: 1

<u>SESSION DATE</u>	<u>SESSION CONTENT</u>	<u>SESSION LEADER</u>
SESSION I Monday, June 2	“Modes” for Teaching EBM The 5 A’s of EBM Practice Targeting Specific Skills in EBM: Generating an Answerable Clinical Question and Acquiring Evidence	Megan Cunnane, M.D.
SESSION II Wednesday, June 4	Learning and Teaching about Therapy: Appraising the Validity of a Therapy Article	Megan Cunnane, M.D.
SESSION III Monday, June 9	Learning and Teaching about Therapy: Interpreting the Results of a Therapy Article	Megan Cunnane, M.D.
SESSION IV Wednesday, June 11	Learning and Teaching about Diagnosis Articles	Megan Cunnane, M.D.
SESSION V Monday, June 16	Learning and Teaching about Prognosis Articles	Megan Cunnane, M.D.
SESSION VI Wednesday, June 21	Learning and Teaching about Harm Articles	Megan Cunnane, M.D.
SESSION VII Monday, June 23	Learning and Teaching about Summaries of the Literature: Systematic Reviews and Meta-Analysis	Megan Cunnane, M.D.
SESSION VIII Wednesday, June 25	Practicing Teaching Techniques: Evidence-Based Medicine “Jeopardy”	Megan Cunnane, M.D.

GRADE ALLOCATION: 50% in-class participation
20% final project
30% “grab bag” exercise and homework



**LEARNING AND TEACHING ABOUT EVIDENCE-BASED
MEDICINE
MEDEDU 2100**

SESSION I Monday, June 2	“Modes” for Teaching EBM The 5 A’s for EBM Practice Targeting Skills in EBM Practice: <i>Generating an Answerable Clinical Question and Acquiring Evidence</i>	Megan Cunnane, M.D.
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LEARNING OBJECTIVES

- To introduce the three different “modes” for teaching EBM
- To review the “five A’s” for practicing EBM: Assess, Ask, Acquire, Appraise, Apply
- To introduce the targeting of specific skills in practicing EBM: generating an answerable clinical question and acquiring evidence

ASSIGNMENT

- **READ:** Chapters 1 & 2 in: Straus, S.E., Richardson, W.S., Glasziou, P., Haynes, R.B. Evidence-Based Medicine: How to Practice and Teach EBM, 3rd ed. Edinburgh: Churchill Livingstone; 2005.
- **READ:** Richardson, W.S. “Teaching Evidence-Based Practice on Foot,” *ACP Journal Club* 2005; 143(2): A10.
- **Recommended reading:**
 - Haynes, R.B. “Of studies, syntheses, synopses, summaries, and systems: the “5S” evolution of services for finding current best evidence,” *ACP Journal Club* 2006; 145:A8-A9.
 - Greenhalgh, T. “How to read a paper: The Medline database,” *BMJ* 1997; 315: 180-183.
- **GRAB –BAG:** Teaching the answerable clinical question, using evidence resources, efficient searching techniques
- **FOR HAND-IN (everyone who does not do the grab-bag):** “Rate the Resource” worksheet
- **READ FOR PREPARATION FOR SESSION II:** Montori, V.M., Guyatt, G.H. “Intention-to-Treat Principle,” *CMAJ* 2001; 165(10): 1339-1341.

SESSION II Wednesday, June 4	Learning and Teaching About Therapy: Appraising the Validity of a Therapy Article	Megan Cunnane, M.D.
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LEARNING OBJECTIVES

- To review the concepts of bias and random error
- To review the methodology of Randomized Controlled Trials, and consider potential sources of bias
- To understand important concepts in assessing the validity of a therapy article: 1) random allocation; 2) allocation concealment; 3) blinding; 4) follow-up; 5) intention-to-treat principle
- To demonstrate techniques for teaching these concepts

ASSIGNMENT

- **READ:** Chapter 5, pages 115-142 in: Straus, S.E., Richardson, W.S., Glasziou, P., Haynes, R.B. Evidence-Based Medicine: How to Practice and Teach EBM, 3rd ed. Edinburgh: Churchill Livingstone; 2005.
- **Recommended reading:**

Schulz, K.F., Grimes, D.A. "Generation of Allocation Sequences in Randomised Trials: chance, not choice," *The Lancet* 2002; 359: 515-519.

Schulz, K.F., Grimes, D.A. "Allocation Concealment in Randomised Trials: defending against deciphering," *The Lancet* 2002; 359:614-618.

Schulz, K.F., Grimes, D.A. "Sample size slippages in randomized trials: exclusions and the lost and wayward," *The Lancet* 2002; 359:781-85.
- **GRAB-BAG:** Teaching the difference between allocation concealment and blinding, methods of randomization, ITT analysis, definitions of bias and random error
- **READ AND HAND-IN (*everyone who does not do the grab-bag*):**

Choose **one** of the following articles to *read*:

Winblad, B, Engedal, K, Soininen, H. et al. "A 1-year, randomized, placebo-controlled study of donepezil in patients with mild to moderate AD," *Neurology* 2001; 57:489-95.

Johnson, D.W., Jacobson, S., Edney, P.C., et al. "A comparison of nebulised budesonide, intramuscular dexamethasone, and placebo for moderately severe croup," *NEJM* 1998; 339: 498-503.

VanGelder, I.C., Hagens, V.E., et al. "A comparison of rate control and rhythm control in patients with recurrent persistent atrial fibrillation. *NEJM* 2002; 347:1834-40.

Complete and Hand-in: Validity criteria using Therapy CAT: give the article a validity "score" and explain your rationale for the score.
- **READ FOR PREPARATION FOR SESSION III:** Doll, H., Carney, S. "Introduction to biostatistics: Part 3. Statistical approaches to uncertainty: P values and confidence intervals unpacked," *ACP Journal Club* 2006; 144:A8.

SESSION III Monday, June 9	Learning and Teaching About Therapy: Interpreting the Results of a Therapy Article	Megan Cunnane, M.D.
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LEARNING OBJECTIVES

- To review the measures of association that are used in the reporting of therapy trials: Relative Risk, Relative Risk Reduction, Absolute Risk Difference, Number Needed to Treat
- To review measures of precision for study results: Confidence Intervals
- To demonstrate techniques for teaching these concepts

ASSIGNMENT

- **READ:** Appendix 1 (pages 263-267) in: Straus, S.E., Richardson, W.S., Glasziou, P., Haynes, R.B. Evidence-Based Medicine: How to Practice and Teach EBM, 3rd ed. Edinburgh: Churchill Livingstone; 2005.
- **READ:** Barratt, A., Wyer, P.C., Hatala, R., McGinn, T., et al. "Tips for teachers of evidence-based medicine: 1. Relative risk reduction, absolute risk reduction, and number needed to treat." *CMAJ* 2004; 171 (4): online 1-8.
- **Recommended reading:**
 - Montori, V.M., Kleinbart, J., Newman, T.B., Keitz, S. "Tips for teachers of evidence-based medicine: 2. Confidence intervals and p values," *CMAJ* 2004; 171(6): online 1-12.
 - Guyatt, G., Jaeschke, R., Heddle, N., Cook, D., et al. "Basic Statistics for Clinicians: 1. Hypothesis Testing," *CMAJ* 1995; 152(1): 27-32
 - Guyatt, G., Jaeschke, R., Heddle, N., Cook, D., et al. "Basic Statistics for Clinicians: 2. Interpreting Study Results: Confidence Intervals," *CMAJ* 1995; 152(2): 169-173.
- **GRAB-BAG:** Calculating ARD, calculating NNT, interpreting confidence intervals, describing the difference between ARD and RRR
- **READ AND HAND-IN (*everyone who does not do the grab-bag*):**
Choose **one** of the following articles to read:
 - Winblad, B, Engedal, K, Soininen, H. et al. "A 1-year, randomized, placebo-controlled study of donepezil in patients with mild to moderate AD," *Neurology* 2001; 57:489-95.
 - Johnson, D.W., Jacobson, S., Edney, P.C., et al. "A comparison of nebulised budesonide, intramuscular dexamethasone, and placebo for moderately severe croup," *NEJM* 1998; 339: 498-503.
 - VanGelder, I.C., Hagens, V.E., et al. "A comparison of rate control and rhythm control in patients with recurrent persistent atrial fibrillation. *NEJM* 2002; 347:1834-40. .

Complete and Hand-in: **Results** section on Therapy CAT for selected article. Be prepared to summarize the study in the form of a Verbal Study Synopsis to the class.
- **READ FOR PREPARATION FOR SESSION IV:** Grimes, D.A., Schulz, K.F. "Refining clinical diagnosis with likelihood ratios," *The Lancet* 2005; 365:1500-05.

SESSION IV Wednesday, June 11	Learning and Teaching about Diagnosis Articles	Megan Cunnane, M.D.
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LEARNING OBJECTIVES

- To understand and demonstrate teaching techniques for interpreting the results of diagnosis articles: sensitivity, specificity, LRs and multi-level LRs
- To review Bayes' theorem and the test/treatment threshold
- To review concepts that are important for assessing the validity of a diagnostic study: diagnostic uncertainty, blinding, ascertainment

ASSIGNMENT

- **READ:** Chapter 3 in: Straus, S.E., Richardson, W.S., Glasziou, P., Haynes, R.B. Evidence-Based Medicine: How to Practice and Teach EBM, 3rd ed. Edinburgh: Churchill Livingstone; 2005.

- **Recommended reading:**

Montori, V.M., Wyer, P., Newman, T.B., Keitz, S. "Tips for Teachers of Evidence-Based Medicine:5. The effect of spectrum of disease on the performance of diagnostic tests," *CMAJ* 2005; 173(4): online 1-7.

McGee, S. "Simplifying Likelihood Ratios," *J Gen Intern Med* 2002; 17:647-50.

- **GRAB-BAG:** Defining LRs, sensitivity, and specificity; demonstrating the use of LRs with Bayes' theorem; design of diagnostic studies and choice of gold standard
- **READ and HAND-IN (everyone who does not do the grab-bag):**
Choose **one** of the following articles to read:

Margaretten, M.E., Kohlwes, J, Moore, D. et al. "Does This Adult Patient Have Septic Arthritis?" *JAMA* 2007; 297(13): 1478-1488.

Bent, S., Nallamothe, B.K., Simel, D., et al. "Does This Woman Have an Acute Uncomplicated Urinary Tract Infection?" *JAMA* 2002; 287(20): 2701-2710.

Holroyd-Leduc, J.M., Tannenbaum, C., Thorpe, K.E., et al. "What Type of Urinary Incontinence Does This Woman Have?" *JAMA* 2008; 299(12): 1446-1456.

Goldstein, L.B., Simel, D.L. "Is This Patient Having a Stroke?" *JAMA* 2005; 293(19): 2391-2402.

Complete and Hand-in: For the condition in question, which symptoms or signs are most helpful for making the diagnosis? Justify your answer.

- **READ FOR PREPARATION FOR SESSION V:** Grimes, D.A., Schulz, K.F., "Bias and Causal Associations in Observational Research," *The Lancet* 2002; 359:248-52.

SESSION V Monday, June 16	Learning and Teaching about Prognosis/Risk Articles	Megan Cunnane, M.D.
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LEARNING OBJECTIVES

- To understand basic concepts of observational study designs, the choice of study design to answer a research question, and advantages/disadvantages of each
- To review the various types of bias that may be encountered with observational study designs: selection bias, information bias, and confounding
- To review and demonstrate teaching techniques for interpreting the results of prognosis articles: survival curves and hazard ratios

ASSIGNMENT

- **READ:** Chapter 4 in: Straus, S.E., Richardson, W.S., Glasziou, P., Haynes, R.B. Evidence-Based Medicine: How to Practice and Teach EBM, 3rd ed. Edinburgh: Churchill Livingstone; 2005.
- **Recommended reading:**

Grimes, D.A., Schulz, K.F. "Cohort studies: marching towards outcomes," *The Lancet* 2002; 359:341-45.

Grimes, D.A., Schulz, K.F. "An overview of clinical research: the lay of the land," *The Lancet* 2002; 359: 57-61.

Spruance, S.L., Reid, J.E., Grace, M., et al. "Hazard Ratio in Clinical Trials," *Antimicrobial Agents and Chemotherapy* 2004; 48:2787-2792.

Guyatt, G., Walter, S., Shannon, H., Cook, D. "Basic Statistics for Clinicians: 4. Correlation and Regression," *CMAJ* 1995; 152(4): 497-504.
- **GRAB-BAG:** Defining survival curves and hazard ratios; describing cohort study design; describing case-control study design; definition of confounding
- **EVERYONE ELSE who does not do grab-bag:** Work on final project
- **FINAL PROJECT:** Using the "20 questions" worksheet, propose an intervention for introducing EBM into *your* educational environment. Carefully consider the needs of your educational program, the goals of the intervention, the target audience, the modes that you will employ, and strategies for optimizing success and avoiding failure. Describe your intervention, and your consideration of these factors, in a 1-2 page write-up.
- **READ FOR PREPARATION FOR SESSION VI:** Jaeschke, R., Guyatt, G., Shannon, H., Walter, S., et al. "Basic Statistics for Clinicians: 3. Assessing the Effects of Treatment: Measures of Association," *CMAJ* 1995; 152(3): 351-357.

SESSION VI Wednesday, June 18	Learning and Teaching about Harm/Etiology Articles	Megan Cunnane, M.D.
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LEARNING OBJECTIVES

- To review the types of study designs that can be used to answer questions about harm/etiology
- To review the case-control study design and how to appropriately choose controls
- To introduce an additional measure of association: the odds ratio
- To demonstrate techniques for teaching these concepts

ASSIGNMENT

- **READ:** Chapter 6 in: Straus, S.E., Richardson, W.S., Glasziou, P., Haynes, R.B. Evidence-Based Medicine: How to Practice and Teach EBM, 3rd ed. Edinburgh: Churchill Livingstone; 2005.
- **Recommended reading:**

Schulz, K.F., Grimes, D.A. "Case-control studies: research in reverse," *The Lancet* 2002; 359:431-434.

Grimes, D.A., Schulz, K.F. "Compared to what? Finding controls for case-control studies," *The Lancet* 2002; 265:1429-33.

Davies, H., Crombie, I., and Tavakoli, M. "When can odds ratios mislead?" *BMJ* 1998; 316:989-991

Deeks, J. "Swots corner: What is an odds ratio?" *Bandolier* 1996; May 25-6.
- **GRAB-BAG:** Defining odds ratios; difference between odds ratio and risk ratio; describing the nested case-control study design; describing why odds ratios must be used with case-control study designs
- **EVERYONE ELSE who does not do grab-bag:** Work on final project
- **READ FOR PREPARATION FOR SESSION VII:** Greenhalgh, T. "How to read a paper: Paper that summaries other papers (systematic reviews and meta-analyses)," *BMJ* 1997; 315:672-675.

SESSION VII Monday, June 23	Learning and Teaching about Summaries of the Literature	Megan Cunnane, M.D.
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LEARNING OBJECTIVES

- To understand the differences between narrative reviews, systematic reviews, and meta-analyses, and the advantages and disadvantages of each
- To review the steps necessary for conducting a systematic review and meta-analysis
- To understand and demonstrate teaching techniques for an important concept in systematic reviews/meta-analysis: heterogeneity

ASSIGNMENT

- **READ:** Chapter 5, pages 147-153 in: Straus, S.E., Richardson, W.S., Glasziou, P., Haynes, R.B. Evidence-Based Medicine: How to Practice and Teach EBM, 3rd ed. Edinburgh: Churchill Livingstone; 2005.
- **Recommended reading:**

Barratt, A., Wyer, P.C., Hatala, R., McGinn, T., et al. Tips for teachers of evidence-based medicine: 4. Assessing Heterogeneity of Primary Studies in Systematic Reviews and Whether to Combine Their Results, *CMAJ* 2005; 172(5): online 1-8.

Geddes, J., Freemantle, N., Streiner, D., Reynolds, S., “Understanding and interpreting systematic reviews and meta-analyses. Part 1: rationale, search strategy, and results,” and “Understanding and interpreting systematic reviews and meta-analyses. Part 2: meta-analyses,” *Evid. Based Ment. Health* 1998; 1:68-69, 102-104.
- **GRAB-BAG:** Defining a systematic review and meta-analysis; comparing and contrasting narrative reviews and systematic reviews; teaching the “hierarchy” of evidence; searching the literature for a systematic review/meta-analysis
- **EVERYONE ELSE who does not do grab-bag:** Work on final project

<u>SESSION VIII</u> Wednesday, June 25	Practicing Teaching Techniques: Evidence-Based Medicine “Jeopardy”	Megan Cunnane, M.D.
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LEARNING OBJECTIVES

- To practice methods for teaching EBM in a variety of educational settings
- To appraise these methods and discuss challenges for teaching EBM
- To discuss strategies for incorporating EBM into one’s daily educational environment