

CRITICAL APPRAISAL TO CLINICAL RECOMMENDATION:

Implementing Evidence Based Practice Skills into Athletic Training Practice



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"I expect you all to be independent, innovative, critical thinkers, who will do exactly as I say!"



Learning Outcomes...

At the completion of this series, participants should be able to...

- (1) Successfully implement a teaching strategy which facilitates the learning of the critical appraisal process.
- (2) Evaluate a non-randomized control trial.
- (3) Determine level of evidence, strength of recommendation, and a clinical bottom line that can be used to inform clinical practice by students of Athletic Training.



Primary References

1. Steves R, Hootman JM. Evidence-based medicine: What is it and how does it apply to athletic training. *J Athl Train.* 2004;39:83-87.
2. Theroux R. How to bring evidence into your practice. *AWONN Lifelines.* 2006;10(3):244-249.
3. Hurley WL, Denegar CR, Hertel J. Research methods: A framework for evidence-based clinical practice.
4. Centre for Evidence Based Medicine: <http://www.cebm.net/>
5. Enhancing the QUALity and Transparency Of health Research: <http://www.equator-network.org/>

(Big picture reading – IOM (To Err Is Human, Crossing the Quality Chasm, Health Profession Education: A Bridge to Quality, Redefining Continuing Education in Health Professions)

EBP Across the Curriculum

First Semester

- **6 weeks: Introduction to EBP Principles**
 - AT 462/562: Interventions I
- **Sensitivity, specificity, odds ratios, prevalence, prediction values**
 - AT 454/554: Lower Extremity

Second Semester

- **2 Critically Appraised Papers**
 - AT 464/564: Interventions II
- **Sensitivity, specificity, odds ratios, prevalence, prediction values**
 - AT 454/554: Lower Extremity
- **Incidence, prevalence, frequency related to prevention**
 - AT 442/542: AT Techniques II

EBP Across the Curriculum

Third Semester

- **Critically Appraised Topic**
- **Abstract Submission to District Meeting**
 - AT 474/574: Interventions III
- **Grand Rounds**
 - AT 443/543: AT Techniques III

Fourth Semester

- **Oral or poster presentation at District Meeting**
 - AT 490/790: Seminar



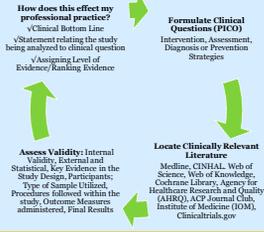
Basics of EBP Outcomes... (as consumers)

- (1) Develop and/or refine a clinical question in the "PICO" format.
- (2) Locate and access evidence-based literature from traditional databases (i.e. Medline, Web of Science, CINHAHL, etc.) and contemporary sources (National Guideline Clearinghouse, AHRQ, Cochrane Libraries, etc.)
- (3) Critically Appraising the Evidence: In terms of reliability, rank level of evidence and strength of recommendation.
- (4) Applying the Evidence - Draw conclusions related to the clinical bottom-line
- (5) Evaluating the Performance of EBAT
- (6) Articulate and disseminate findings in an acceptable technical format, inclusive of sound style and grammar.



Critical Appraisal...

Best Research Evidence
Clinical Expertise
Patient Values



Crossing the Quality Chasm: A New Health System for the 21st Century (IOM, 2001)

Literature Project

- First semester project
 - Teaching tool
 - Appraisal process
 - Building block – start to the process
 - Builds to CAP and CAT



Critical Appraisal to Clinical Recommendation Reading Scientific Literature Guide Sheet (Cohort Study)

In-class assignment relative to evidence-based practice: An introduction to ERP, please follow these instructions

- Assignment:
- 1) Hunt, WJ, Dwyer DE, Hesse J. Research Methods in Therapeutic for Evidence-Based Clinical Practice. Williams and Wilkins: Evidence-Based Practice and Evidence-Based Practice, 2004, 28-37.
 - 2) Assessing the Quality and Transparency of Health Research. <http://www.fda.gov/oc/ohrt/>
 - 3) PRISMA Statement

STEP 1: Develop a clinical question and locate one article you feel will adequately help you answer your question.

Directions:

- 1) Using the PICO model, design a clinical question that is relevant to you. If you don't feel you are versed in with a clinical question on your own, ask with your clinical instructor another a classmate your attending/teaching assistant to generate an interesting question.
- 2) Develop a search using appropriate keywords and a database you enjoy searching.
- 3) Do the best you can – report your findings.

CLINICAL QUESTION This clinical question should follow the PICO format.

• P = patient/population and/or condition
 • I = intervention
 • C = comparison/comparator or control group
 • O = outcome (pertinent to the medical condition)

ARTICLE used to search:
 Database(s) used:
 Search term(s):
 Search strategy:
 Search results:
 Search criteria:

Sample Clinical Question for Today:

Which clinical category is the question (check the following boxes):

Diagnostic	_____
Therapeutic	_____
Prognostic	_____
Preventive	_____
Other	_____

PART 2: NOT ALL RESEARCH IS EQUAL

- Read and Evaluate the article using the guidelines below:

Directions:

- (1) Using either the basic evaluation strategy, evaluate the article you have located
 - Additional in depth review using the STROBE Statement is included for the methods and results section
- (2) Please elaborate your findings in the table below:

Begin by reading the title:	Does it make sense to you? After finishing the article – is the article related to the title?
Next, read the abstract:	Does it make sense to you? After reading the article, do you feel the author/authors abstracted the correct information?
Consider the key terms:	Are you familiar with the terminology?
Read the introduction:	Do you have a good understanding of the general topic? What is the purpose of the study/article? Are the purpose and aims clearly stated? Is the purpose of the study clinically relevant?
Read the body of the article: Methods (How, where and when	Do you get a sense of how one section transitions to the next? What is the population that was studied? How many were in the population and/or sample? Do the methods seem to reasonably link to the purpose? (Is this a valid study); Is enough information provided to allow

Additional Discussion on METHODS adapted from the STROBE Statement (Observational Studies)

Study design	Are key elements of study design presented early in the paper?	Y_N
Setting	Are the following described: setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	Y_N
Participants	(a) Cohort study—Are eligibility criteria, and the sources and methods of selection of participants described? Are methods of follow-up described? (b) Cohort study—For matched studies, are matching criteria and number of exposed and unexposed described?	Y_N
Variables	Are the following clearly defined? All outcomes, exposures, predictors, potential confounders, and effect modifiers. Are diagnostic criteria described, if applicable?	Y_N
Data sources/measurement	For each variable of interest, are sources of data and details of methods of assessment (measurement) described. Are comparability of assessment methods described if there is more than one group?	Y_N
Bias	Are efforts to address potential sources of bias described?	Y_N
Study size	Is there a description of how the study size was arrived at?	Y_N
Quantitative variables	Is there an explanation of how quantitative variables were handled in the analyses? If applicable, is there a description of how groupings were chosen and why?	Y_N
Statistical methods	(a) Are all statistical methods described, including those used to control for confounding? (b) Are any methods used to examine subgroups and interactions described? (c) Is there an explanation of how missing data were addressed? (d) Is there an explanation of how loss to follow-up was addressed, if applicable? (e) Is there a description of any sensitivity analyses?	Y_N

Read the body of the article: Results Do you get a sense of how one section transitions to the next? How are the results written/displayed? What is the statistical design of the study? Is this familiar to you?

Additional Discussion on RESULTS adapted from the STROBE Statement (Observational Studies)		
Results		
Participants	(a) Is there a report of numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analyzed? (b) Are there reasons for non-participation at each stage?	Y_N
Descriptive data	(c) Did the authors include a flow diagram? (d) Are characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders included? (e) Is there an indication of the number of participants with missing data for each variable of interest?	Y_N
Outcome data	(f) Is there a summary of follow-up time (eg, average and total amount)? Is there a report of numbers of outcome events or summary measures over time?	Y_N
Main results	(a) Is there a description of unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Do authors make clear which confounders were adjusted for and why they were included? (b) Is there a report of category boundaries when continuous variables were categorized? (c) If relevant, is there consideration for translating estimates of relative risk into absolute risk for a meaningful time period?	Y_N
Other analyses	Is there a report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses?	Y_N



Quality and Levels of Evidence...

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- Some key issues with methodology...
 - How is Population or Sample Size described?
 - If sample size, what are the qualities of the cohort? Homogeneous or heterogeneous? Lot of variability, little variability? Are these well reported?
 - Maximum Effective Size? Is the sample size large enough to support results, conclusions and/or discussion?
 - Does this sample match the patients we might see?
 - Are methods themselves sound? Control variable where-ever possible?
 - What are the statistical procedures? Is it the correct procedure?
 - What is the p value?
 - (p value = probability that a particular result would happen by chance?)



Synthesize

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Synthesize what you read:

Write out the clinical findings you think are important from this article as they relate to the clinical question. (Indicate on results and discussion)

On a scale of 1-10, how would you rate the quality of this study? Why? In your discussion, please include how the following areas of the study affected your rating. (Internal validity and reliability)

Context of the clinical question (external validity and reliability)

After reading the clinical question, what recommendations can you make from the information in the article?



Levels of Evidence...

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- Centre for Evidence Based Medicine (CEBM)
 - Oxford University
 - <http://www.cebm.net/index.aspx?o=1025>

PART 2: Complete your evaluation by:

<p>Assign a LEVEL OF EVIDENCE according to the CEBM Scale.</p>	<p>Clinical Question:</p> <p>What area of clinical practice does this clinical question address?</p> <p>____ Diagnosis ____ Prognosis ____ Treatment Benefits</p> <p>____ Treatment Harms (Common) ____ Treatment Harms (Rare)</p> <p>____ Screening</p> <p>What type of study is this?</p> <p>What level of evidence would you apply?</p>
<p>Relative to your CLINICAL QUESTION, what is the clinical bottom line?</p>	<p>3-8 key points you could take home from this article to use in your practice...</p>
<p>IMPLICATIONS FOR PRACTICE</p> <p>What is the STRENGTH OF RECOMMENDATION you would assign to the clinical recommendation(s)?</p> <p>Why?</p>	



Clinical Bottom Line...

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- Questions to ask...
 - Can we apply evidence about this intervention in caring for our patient population/condition described in our PICO?
 - Is the study sample or population similar or different?
 - Will the results of the study affect our management decisions and help our patient? If so, how might they be applied.
 - Parameters of treatment?



Grades of Recommendation

- A** consistent level 1 studies
- B** consistent level 2 or 3 studies or extrapolations from level 1 studies
- C** level 4 studies or extrapolations from level 2 or 3 studies
- D** level 5 evidence or troublingly inconsistent or inconclusive studies of any level

*Extrapolations are where data is used in a situation that has potentially clinically important differences than the original study situation.

Oxford Centre for Evidence-based Medicine Levels of Evidence (March 2009)
 (for definitions of terms used see glossary at <http://www.cebm.net/?o=1118>)
 Produced by Eva Phillips, David Gibb, Owen Siskin, Doug Selman, Shona Skene, Shona Haynes, Mark Davies group
 November 1998. Updated by Jeremy Pearson March 2009.



So what do I do now...

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- Implement clinical recommendation...
- Consider some way to build in an assessment mechanism to help determine if I have made the right decision...
- Should I disseminate my findings...
 - Critically Appraised Paper (CAP)
 - Critically Appraised Topic (CAT)
- Keep thinking of new questions...
 - Begin developing outcomes research!!!!



QUESTIONS...



"Many aeth... may I be excused? My brain is full!"